GOVERNMENT OF TRIPURA
URBAN DEVELOPMENT DEPARTMENT

F. No. I(10)-PS/UDD/SWMP/18/317-381

Dated, the Agartala 9th October, 2018

NOTIFICATION

The Government of Tripura has been pleased to notify the “Solid Waste Management Policy” in terms of 11 and 15 of Solid Waste Management Rules, 2016 for implementation in Tripura inclusive of Solid Waste Management Strategy, Guidelines for establishment and operations of Treatment and Landfill facilities, Normative Standards and Procedure for Collection, Storage and Transportation and Action Plan for Solid Waste Management which is as under:

1. Introduction

The most pressing problem faced by any urban centre in India today is Municipal Solid Waste Management (MSWM). Rapid urbanization and changing lifestyles have led to the generation of huge amounts of garbage and waste in the urban areas, so much so, over the past few years, just the handling this Municipal Solid Waste (MSW) has assumed the proportion of a major organizational, financial and environmental challenge. Studies show that barely 35,600 metric tonnes (MT) or a quarter of the 1.43 lakh MT of garbage generated every day in Indian cities gets processed.

Despite MSWM being a major task of the local governments, typically accounting for a sizeable portion of the municipal budget, yet the Urban Local Bodies (ULBs) are unable to provide effective services.

An unfortunate fallout of rapid urbanization without the adequate infrastructure backup is that in all Indian cities/towns, disposal of waste is done indiscriminately, leading to stray animal menace, clogged drains and spread of diseases. The process of collection, transportation and disposal of MSW is not streamlined in most of the cities/towns with garbage heaps remaining unattended until the severity reaches unmanageable proportions. Moreover, the high organic content of Indian MSW, compounded by the hot and humid tropical climate leads to the rapid decomposition of the uncollected waste and is an ever-present health hazard. In addition, the contamination of MSW by bio-medical and industrial hazardous waste is a growing concern.

Most ULBs spend nearly sizable portion of their total overall budgetary allocation on collection & transportation, but there is less emphasis on the treatment and final disposal of MSW. Even today, the disposal of wastes is being carried out in an unscientific manner, with crude open dumping in low-lying areas being the prevalent practice followed by most ULBs. MSW is also commonly deposited at dump-yards without ascertaining the suitability of the land for waste disposal. The results of these are foul smell, breeding of flies and other pests and generation of liquid run-offs (leachate), which pose a serious threat to the underground water reserves.

MSWM practices in India are employee intensive, with large % of the total municipal staff engaged in these activities. Of late, most ULBs have been restricting new recruitment, therefore available staff strength is turning out to be inadequate and is less than desired as per norms (estimated 70% availability vis-à-vis norms). Moreover the implements, machinery and equipment used by staff are mostly of outdated technology, and serve poorly in meeting the new demands. The communication programs for effective MSWM have not been given adequate importance.
As the onus of MSWM has been assumed by ULBs, participation of the other stakeholders (waste generators, NGOs, private entities) is minimal. This and all the above-mentioned factors have hampered the efficient delivery of MSWM services. There is an urgent need to revisit, develop, and implement appropriate strategy for effectively handling MSW. The Municipal Solid Waste Rules primarily aim to achieve 100% collection and segregation of waste to ensure efficient treatment and disposal.

2. MSW Rules

In view of the serious environmental degradation resulting from the unscientific disposal of MSW, the Ministry of Environment and Forests (MoEF), Government of India, had notified the Municipal Solid Wastes (Management & Handling) Rules, 2000, (MSW Rules), stipulating all municipal authorities to scientifically manage MSW. The Government has since revamped the Municipal Solid Wastes (Management and Handling) Rules 2000 and notified the new Solid Waste Management Rules, 2016 (SWM Rules) on April 8, 2016. The salient features of the SWM Rules, 2016 are summarized in Annexure I. While the 2000 and 2016 rules deal with MSW generally, there are other rules to cover specific categories of waste that overlap with MSW. These are detailed in Annexure II. Ministry of Housing & Urban Affairs has developed a TOOLKIT FOR IMPLEMENTATION OF SOLID WASTE MANAGEMENT RULES, 2016 which is very useful guide for the purpose.

Developments in Tripura

Agartala Municipal Corporation has formulated Solid Waste Management Regulation 2017 which lays down duties of waste generators, duties of manufacturers of some products, duties of industrial units, setting up of solid waste processing & treatment facilities, duties of corporation, penalties etc. The regulation is placed at Annexure III of this policy. Other ULBs will be encouraged to adopt this regulation for their areas with changes if required.

The state has also formulated an action plan for Solid Waste Management with clear time bound action points. The action plan is placed at the end of this policy.

Compliance Criteria

Compliance criteria for each and every stage of waste management - collection, segregation at source, transportation, processing and final disposal - are set out in the MSW Rules, which include:

a. Dumping of MSW in oceans, rivers, open areas, and compaction or bailing are not acceptable.

b. The biodegradable waste has to be processed by means of composting, vermin-composting, anaerobic digestion or any other appropriate biological processing for stabilization of wastes.

c. Mixed waste containing recoverable resources should be recycled.

d. Other technologies for treatment such as Pelletisation, Gasification, Incineration etc. require clearance from Pollution Control Board before planning and implementation.

e. Land filling should be the waste disposal method for non-biodegradable, inert waste and other waste that is not suitable either for recycling or for biological processing.

3. Objective

The goal of effective MSWM services is to protect public health, the environment and natural resources (water, land, air). An effective MSWM service can be achieved only by
improving the efficiency of MSWM activities, thereby leading to the reduction of waste generation, separation of MSW and recyclable material, and recovery of compost and energy.

The objectives of this State Solid Waste Management Policy are:

a. Providing directions for carrying out the waste management activities (collection, transportation, treatment and disposal) in a manner, which is not just environmentally, socially and financially sustainable but is also economically viable.

b. Establishing an integrated and self-contained operating framework for MSWM, which would include the development of appropriate means and technologies to handle various waste management activities.

c. Enhancing the ability of ULBs to provide effective waste management services to their citizens.

4. Touchstone Principles

The touchstone principles, which govern the future approach to provision of MSWM services, include the following:

a. Promoting awareness of waste management principles among citizens and other stakeholders

b. Minimizing multiple and manual handling of waste, and designing a system to ensure that MSW does not touch the ground till treatment and final disposal

c. Defining the roles and responsibilities of various stakeholders and putting in place an operating framework, which would include appropriate contractual structures

d. Developing systems for effective resources utilisation and deployment

e. Promoting recovery of value from MSW; developing treatment and final disposal facilities, which, while adhering to the statutory requirements, are sustainable, environmentally friendly and economical.

Stakeholder Involvement

MSWM depends, as much upon organisation and co-operation between households, communities, NGOs and ULBs, as it does upon selection and application of appropriate technical solutions for various waste management activities. Towards enhancing the stakeholders’ involvement in MWSM, the State Plan proposes the following innovations:

a. Directing the waste management initiatives to the waste generator level, and entrust the responsibility of source segregation and primary collection to the relevant community based organisation / resident welfare association / Self help group (SHG)/ Outsourced Agency/ Market Committee.

b. Developing and maintaining a comprehensive plan for the Information, Education and Communication (IEC) activities and awareness programs at ULBs.

c. Utilizing the services of non-governmental organisations (NGOs) to operate and coordinate between the ULB, Community and SHG, in order to propagate the awareness program, the IEC campaign, and to provide support to the informal sector (rag pickers, waste recyclers etc.)
d. Defining the role of NGOs: In order to educate the community and bring awareness regarding the modernization of SWM program, the involvement of an intermediary, by way of a Non-Governmental Organisation is very much necessary. NGOs would help in the effective propagation of the complete awareness regarding SWM among various stakeholders so that Waste Management would take place as per the State Policy. The IEC activity would be carried out by NGOs as per the specified terms.

e. ULBs would allow SHG to enter into contracts with private operators or enter in such contract directly for various waste management activities, under specified guidelines and structures.

5. Information, Education & Communication Activity (IEC)

IEC is the key to the success of the modernization of MSWM. As stated, awareness amongst community and different stakeholders to meet the demands of the new system for a cleaner environment requires a detailed and thorough understanding at every stage. Involvement of community is going to be the main thrust of the program. As a prelude to implementation, this IEC activity is going to be taken up, which would involve the participation of some leading NGOs, who would be appointed after a careful selection process. Materials required for the IEC campaign like manuals, flipcharts and other media communication are designed by State Resource Center, Mysore. A detailed Terms of Reference has been prepared for NGO activity.

6. Five Tier Measures

The overall strategy to deal with Municipal Solid Waste will entail simultaneous action on five fronts. The 5 tiers measures will consist of prevention, minimisation, reuse, recycling, recovery and disposal. The three R's principle – reduces, reuse and recycle – all help to cut down on the amount of waste we throw away. They conserve natural resources, landfill space and energy. Plus, the three R's save land and money communities must use to dispose of waste in landfills.

7. Primary Collection

Where Primary collection, or first stage collection is concerned, the principle of reducing manual handling and doorstep collection would be promoted. The door to door collection of waste will be ensured for all the ULBs having population of 1 lakh within six months. Others will be encouraged to start this process at the earliest. For this purpose, the various activities proposed include the following:

a. Residents would be encouraged to segregate, store and deliver the MSW to primary collection staff as per procedures set out by ULBs.

b. Efforts will be made by ULBs to ensure that every household have separate storage for bio degradable, non-bio degradable & household toxic waste.

c. Auto tippers or tricycle rickshaws(preferably electric) would be used to enable doorstep collection (residents would be encouraged to deliver waste at door step at a pre-specified time).
d. Suitable arrangements may be made for collection and transportation of waste from residential complexes on regular basis.

e. Litter bins may be provided by ULBs at suitable places.

f. The procurement of auto tippers or tricycle rickshaws (preferably electric) could be done either by the ULB concerned or the SHG/NGO/private operator, and appropriate contractual arrangements would be entered into with SHG / NGO or private operator(s) to carry out primary collection activities.

g. For a central sector scheme like Swachh Bharat Mission, the procurement of SWM equipment may be done centralized by engineering wing of UDD or AMC to ensure standardization of equipment and also to avoid multiplicity of tendering process for same item. For any procurement from own fund, ULBs are free to procure equipment themselves. However, procurement can be done centrally at the request of one or more ULB.

h. A transparent selection process through bidding process for SHG/NGO/private operator will be preferred. The collection of contribution of households/organization along with property tax may be more effective. The SHG/NGO/private operator may be paid directly by ULBs.

i. The ULB would charge a “user fee” from the residents and other generators, the amount of which would be based on need and affordability criteria. Suitable collection mechanism will be developed eg collection along with property tax to ensure collection efficiency. If private operator / NGO / SHG is engaged, their monthly payment will be ensured in order to continue the collection unhindered and effectively.

j. The MSW from other larger generators (commercial zones, institutions, hotels etc.) and construction debris would be collected and transferred directly to the secondary transport system and disposed appropriately (bio-degradable to the treatment facility and others to the landfill facility).

k. Auto Composting/ Bio Bins may be used for market/residential area.

8. Street Sweeping and road side drain cleaning

Plans for efficient and effective Street cleaning include:

a. Provision of ergonomically designed implements for street sweeping to the conservancy staff.

b. Deposition of the refuse swept from the street would be directly into the secondary transportation system

c. ULB entering into appropriate contractual agreements with private operators(preferably on lump sum basis) for carrying out the activities.

d. Increased use of mechanical road sweepers for increased efficiency

9. Secondary Collection and Transportation
a. Usage of garbage containers of specified dimensions and capacity is proposed for secondary storage. The usage of concrete bins would be discontinued as per the mandatory recommendation of the Committee constituted by The Hon. Supreme Court of India.

b. MSW from the auto tippers/tricycles (obtained during primary collection) would be directly uploaded into these metal containers.

c. The garbage containers would be handled mechanically through dumper placers, or tractors with tipping trailer mechanism. Compactors have a separate system for secondary collection.

d. The transportation vehicles would carry and unload the waste mechanically at treatment plants and landfill sites depending on the type of waste.

e. The procurement of vehicles could either be by ULB concerned or could be arranged with private operators under suitable contractual arrangements. ULBs will establish a segregated chain from primary transportation to secondary transportation to disposal site.

10. Treatment and Landfill Operation

a. Pursuant to the Supreme Court guidelines and the prevalent market constraints, composting would be the preferred method of treatment. However, other methods like waste to energy, pallelization, gasification etc. also may be used subject to feasibility.

b. Landfill, as required under prevailing statutes, would need to be developed to dispose non-biodegradable matter and compost rejects except plastic which will be managed as per the prevailing statute.

c. Development of these facilities, either individually or as integrated unit, could be done under appropriate contractual arrangement (management contract / BOT contracts etc.).

d. In case of private participation, ULBs would enter into contractual arrangement.

11. Implementation Plan

All urban local bodies in the state would have compost or any other processing plant and landfill sites either individually for jointly for a few nearby bodies within a year. ULBs will be encouraged for onsite processing rather than transportation & land filling where fuel consumption & land issues are burning. Adjacent ULBs will be encouraged for a cluster approach towards processing.

12. Way Forward

Flowing from the principles outlined here, a long-term management strategy and action plan for the state has been developed based on experiences and addressing the following aspects:

a. Assessment of MSW generation at various ULBs and identification of the best possible means for managing the same.

b. Setting operational targets for each of the waste management activities and indicating the means of achieving the same for various ULBs.
c. Setting out roles and responsibilities of stakeholders under various contractual arrangements

d. Developing IEC material and promotional / awareness campaigns

e. Developing a resource utilization guidelines for different categories of ULBs

f. Setting out operational guidelines for the procurement of equipment and services
Part II
Solid Waste Management Strategy

Waste management system includes proper storage of waste generated at the source, segregation, followed by primary waste collection in segregated line and transportation to community bins or directly to the movable transfer station. Recycle and re-use will be explored to the extent feasible.

There's also street sweeping and cleansing of public places and primary transportation of the waste in the community bins and finally secondary transportation to Sanitary Landfill utilising transfer station/movable transfer station with safe and secured approach.

The main elements of the strategy is to implement source segregation with recycling/reuse for non-biodegradable (non-hazardous non-toxic) waste as per guidelines of Solid Waste Management Rules -2016 where replacing the existing collection and primary storage system. The present system shall have to be converted to full proof source segregation where the same stream shall have to be maintained in secondary transportation and final disposal at the processing site.

EXISTING SYSTEM IN AGARTALA

Presently, apart from the 3(three) wards, waste from other wards are collected in mixed mode both from residential & commercial establishment. Littered waste is also collected in the mixed mode through road sweeping. Waste is primarily kept in the community bins and finally goes to processing site at DC Nagar where segregation is done and biodegradable waste is converted into manure except recycling & reuse of non-biodegradable waste.

ISSUES

The main problem is how to collect biodegradable & non bio degradable waste from the primary source like - household, street, public places, commercial establishment etc. and to transport the same separately to the processing site and recycling unit.

- No source storage arrangement available in residential & commercial establishment for bio degradable, non-biodegradable & toxic items.
- The previously distributed bins could not meet the requirement of citizen and initiative of source separation did not become successful partly due to lack of awareness and partly due to lack of willingness on the part of citizens. Also, since the segregated transportation was not worked out, the segregation at source without tying up for next level was not fruitful.
- There is no arrangement for proper reuse & recycling of plastic and similar kind of waste.
- Establishment of separate lines (bio, no-bio & toxic waste) from collection-primary storage to processing.
- Distribution of waste bins as per colour code mentioned in the SBM.
- Establishing a proper management at all bazaar/market areas.

COLLECTION & TRANSPORTATION OF WASTE

(a) Door to Door in Residential Area.

The Municipal bodies have been providing green coloured bins in Agartala and some other ULBs. To ensure the compliance with SWM 2016 rules, efforts will be made to make available three colour coded bins viz. Green (Bio degradable), Blue (Non Bio Degradable), Red (Toxic/Hazard) for ensuring Door to door collection in a phased manner.
Community bins from the interior of the wards will be replaced in a phased manner with more number of tricycle rickshaw/three wheeler auto hoppers. Wards will have sufficient nos. of tricycle rickshaw to collect bio degradable waste-non bio degradable waste from colour coded bins which will be further disposed in the three wheeler hopper to be distributed 3 nos. (2 for green & 01 blue) in each ward.

In Agartala and if feasible in other ULBs, there will be a cluster approach for secondary transportation of bio and non bio degradable waste. Every 4 adjacent wards will be considered as a single cluster and each cluster shall have 01 green compactor of 14 cubic meters for bio degradable waste and every 8 adjacent wards will be considered as a single cluster and each cluster shall have 01 blue compactor of 14 cubic meters for bio degradable waste.

Toxic waste will be collected once in a week by tricycle hopper (50 nos) from each ward and will be transported to red coloured 4 wheeler/3 wheeler auto which will further dispose the waste directly to the processing field.

(b) Street Sweeping

The existing system will be modified to prevent the waste being mixed up with the introduction of colour code in hand cart bins (30 ltr. capacity) viz. 02 nos. of Green coloured, 03 nos. of Blue coloured and 01 no. of Red coloured bins in each hand cart. Waste from green & blue coloured will be collected daily in 02 shifts except Sunday. The same will be transferred to the movable waste compactor on road. On every Sunday, toxic waste will be collected by red coloured 4-wheeler/3 wheeler which will deposit the waste at 4 designated large covered vehicles which would further be sent to the processing field. In the same line, colour coded wheelbarrow (blue, green & red) will be arranged in street sweeping work. Sweeping staff shall have to collect both littered waste and commercial waste generated by the roadside shops in accordance to the colour code. Every roadside shop except vegetable market/meat/fish market shall keep green, blue & red colour bins. Road sweeping handcart/wheelbarrow shall collect the respective waste as per colour code.

(c) Collection from vegetable/fish/meat market

In order to minimise odour, reduce waste collection cost, a separate approach & methodology need to be followed for the bulk generator of waste. Every market should have a BIO BIN or Nisarguna technology based composting unit which is an on-site, capture and containment system used for organic material processing (starting the composting process) in an odour-free, easily accessible vessel. BIO BINS are of different sizes viz 1.1m³, 2.2m³, 4.5m³ and 9m³ with the option of resizing are available in the market. This may be installed in the bigger generator area like MG Bazar, Battala, Math Chowmuhani Bazar, Lake Chowmuhani Bazar etc in Agartala. It is a convenient contained onsite source separation solution. Once collected, the processed or partially processed organic material can be added to products such as soil conditioners, compost. A separate line will be established for collection of non-bio degradable waste from shops. In the bulk generators area to deal with toxic items Red coloured containers are to be kept by each shop keeper. ULBs shall procure BIO BINS and put in the market area in consultation with the respective market committee. The O & M shall have to be maintained by the respective bazar committee. The existing 4.5/1.1 cubic metre capacity containers will be painted blue and put in the market area. Bio-Bins or any other mode of Composting shall be procured by the respective Bazar Committee.

2. Final & Secondary collection & transportation of waste:

Waste collected by Green Line & Blue Line both from house to house collection and sweeping shall directly go to the movable compactor of green coloured rather than intermediate storage in the
containers. Waste collected by Red Line will be lifted by the red colored mini auto tipper/hopper of and will be finally disposed in the processing field.

3. Disposal or Processing:

Waste collected by Green Line shall be weighed in the processing field then dropped in the pre-sorting floor. Waste collected by Blue Line shall be weighed in the processing field then dropped in a separate area at a distance from the compost plant in the processing field. Waste collected by Red Line shall go directly to the landfill. Bio degradable waste will be converted into manure in compost plant. Non bio degradable waste will be primarily stored on a cemented base available in DC Nagar in Agartala and other identified places in ULBs and further manual segregation will be done to separate plastic and other recyclable items. ULBs may have to take a policy to earn revenue by selling these products to the entrepreneurs who deals with such recyclable. Entrepreneurs may be selected by tender/auction and on the basis of highest rate quoted by the agencies. Hazardous/Toxic wastes will be stored in the landfill site and shall have to be covered by fresh earth.

4. IEC Campaign:

An important deciding factor for success of Solid Waste management is Citizen’s participation in the waste management process. ULBs should plan to introduce the Source Segregation based waste management system within six months. For doing this, every ward shall from a Ward level 10 member Swacchata Committee which shall be chaired by respective Councilor and involving some members of the Ward Committee, representatives of NGOs, social workers, prominent citizens, volunteers etc. Zonal Advisory committees shall follow up formation of such committees and ensure formation of such committees in every ward. The respective Committees will be given detailed training in waste management and they shall device ward level IEC strategy. Ward level Volunteers shall be identified and effectively involved in the campaign. Training in current Waste Management Rules was organised in association with TSPCB for one teacher from every school, one Medical Officer from every Govt./Private Health Institution who are supposed to act as Master Trainers for their respective Institutions. As a follow up activity of the training of Master Trainers, shall be tracked. Another series of Workshops need to be conducted for bulk waste generators.

5. Notification to be published:

- Notification specifying penalty
- Notification for bulk waste generators
- Notification for formation of ward level swacchta committee
- Other notifications as required under various waste management rules.
Part III

Guidelines for establishment and operations of Treatment and landfill facilities

Treatment and landfill operation is set out under the following process:

Composting shall be preferred method of treatment. Other technologies like incineration, gasification, pelletisation can also be used in specific cases, however municipal authorities or operators wishing to employ state-of-the-art technologies shall obtain standards specified by TPCB before applying for authorization.

Landfill sites shall be established in conformity with the provisions of MSW Rules 2000. Quality of leachate shall satisfy the standards indicated in the Schedule IV of MSW Rules 2000.

1.0 Composting:

Composting will be the treatment and processing preferred option for municipal solid waste. At present there are concerns on sale of the compost. It has been proposed that the incoming waste shall be composted using aerobic composting technique so that the waste is inertised. If there is a market for the compost then the inertised waste would be sieved and compost sold while the rejects are land filled. If there were no market for compost the inertised waste would be land filled. Vermicompost has a limited market but has a good price. It is proposed that the partially digested aerobic compost can be converted to vermicompost based on the demand. Here the technology proposed for aerobic composting for inertisation, the sieving system and the vermicomposting are described.

1.1 Aerobic Composting:

The waste being generated and received at the processing site is composted aerobically. This composting process makes the waste inert. The aerobic composting process involves placing the waste into windrows. Windrows are long heaps of waste formed in a trapezoidal shape of base 4-5 m and height of 2.5 to 3 m. The dimensions would vary depending on the volume of waste to be handled per day. The windrows are placed on a specially constructed concrete platform. The windrows are turned every 6-7 days over a period of 6 weeks. The turning of the waste is done using front-end loaders. After this the material will be stored under shelter for a period of 1 week. In this process, the material get stabilized. Addition of microbial cultures like cow dung slurry or special cultures can speed up the degradation and with adequate turning the stabilization process can be completed in 30 days. This stabilized material can be sent for landfill.

1.2 Compost processing:

The compost processing involves segregation of rejects from the stabilized wastes by sieving. The stabilized materials are sieved using rotary sieves. The material movement for sieving can be manual or mechanised based on the capacity of the plant. Three-stage sieving is adequate for Karnataka. The first and second stage would be sieving the waste through 50 mm and 25 mm sieves. The materials not passing 50 mm and above are sent to landfill as reject. The material passing 50 mm but retained on 25 mm can be sold as pit filling material. The materials passing through 25 mm is then sieved through 10 mm sieve. The third and fourth stage would be sieving through 10 mm and 4 mm sieves. The material passing 10 mm sieve and retained on 4 mm sieve is the grade II compost and the material passing 4 mm is sold as Grade I compost. Organic manure could be enriched for improving its material value by organic additives like neem cake, rock phosphate, decomposed poultry litter and micro-nutrients like zinc and boron.
1.3 Vermi-composting

Earthworms eat partially decomposed waste and give out castings which is a very good
manure. Vermi-composting involves feeding the worms with organic fraction of the municipal
waste and collecting the castings to be used as organic manure. The earthworm feed on
partially decomposed wastes. The incoming municipal waste has to be composted aerobically for
about 2 to 3 weeks to ensure partial decomposition. These partially decomposed wastes are fed to the
earthworms. The earthworms would eat the waste and convert them to casting over 4-6 weeks. The
castings have to be collected manually at regular intervals. Earthworm requires shade and protection
from rain and predators. A pit over ground is preferred for storing the partially decomposed waste and
the worms. The pits have to be covered to provide protection from sun and rain. The inorganic
portion of waste, which is not eaten by the worms, is sent for landfill and the organic portions
are fed back to the worms. The adult worms and the young worms from each cycle are collected back
and used again in the next cycle.

2.0 Landfill

The rejects from the composting process have to be land filled. It is proposed that a sanitary landfill
would be developed for Class I towns. For smaller urban local bodies with lower waste generation, it
is proposed that progressive development approach to waste management shall be adopted. No
treatment of waste is proposed to start with. It is proposed that an Engineered landfill development
would take place for all the waste. Progressively the treatment and improved landfill practices
shall be implemented. Here the development required for the sanitary landfill and engineered landfill is detailed.

2.1 Sanitary landfill

The landfill is based on concepts of isolation of the landfill from surface water and containment of
wastes within the landfill. This would involve development of the landfill site with provision of the
basic infrastructure of proper road access, gatehouse with weighbridge, building with record
rooms and facilities of storage, washing and toilets for staff. The landfill proper would be developed
for isolation of the wastes from surface run off and containment of the waste to protect against
movement of leachate directly to ground. Liner systems with leachate collection would be provided.
A leachate treatment facility would also be provided. The waste would be tipped to a plan and
covered daily. Monsoon waste placement plans would be made. Once the planned waste levels are
reached a cover liner would be provided. The landfill would be developed with 20-25 year
perspective. A detailed plan for implementation would be prepared prior to investment.

2.2 Engineered landfill

The Engineered landfill would be based on the approach of progressive upgradation of integrated
solid waste management facility. The primary concept in the Engineered landfill is to have
isolation of the waste from surface run off to ensure that water entering into the waste is
minimised and consequent leachate generation is minimised. The landfill site would initially
developed so that all the rain water from outside the site do not come into the proposed landfill area
by construction of appropriate surface drains. Two strategies are proposed for the landfill based
on the prevalent ground conditions.

Where the ground consists of hard laterite or is rocky and where the excavation is not advisable it
proposed that landform method of waste management shall be adopted.

Where it is possible to excavate the ground, a pit based system of waste management shall be
adopted.
The two techniques proposed are detailed below.

2.2.1 Pit based system:

The solid waste management system here consists of digging pits of typical dimensions 5 m wide, 2.5 m deep and 50 m long or to any required length so that the pit will cater for one month of operation. The waste is filled from the top till the pit is filled. Adequate care is taken to cover the pit with plastic sheet during monsoons to ensure that direct rainwater does not enter the pit. Then the top of the pit is again covered with a liner of with average 15 to 30 cm of soil and compacted to 95 % Proctor density using appropriate rollers. The soil, which was originally excavated from the site, is stored at site for this purpose. The soil is placed such that a slope of 1 in 20 is provided from the centre. A plastic liner made of discarded HDPE sacks used for cement bags etc. stitched together is placed on this compacted soil over the entire pit area. Another layer of average 15 cm soil compacted as given above is placed on the top with slope towards the edge. Additional pits are dug and the above procedure is followed for filling and covering the pit as required on an ongoing basis. In the above process the waste inside the pit is an-aerobically composted. If a market for compost exists the waste can be exhumed from the pit sieved in 4 mm sieves and sold. The rejects in the process would be refilled in the subsequent pits or a special pit dedicated to rejects. The pits from which wastes have been removed can be used again for refilling. A complete record of the pit with the number and date of filling and what was filled shall be maintained for future reference.

2.2.2 Landform system:

The construction of a waste landform starts with the construction of soil bund. The site would be excavated to obtain the necessary soil for making the bund. The bund is trapezoidal in cross section with a top width of 0.5 m, with side slopes of IV:2H and a height of 3.0 m. The initial length of the bund shall be 50 m and the same can be extended or shortened based on waste requirement. The edge of the bund is also trapezoidal. The waste is placed from bund end and progress towards other end as per site conditions. The waste is tipped by the transport vehicle and pushed into shape using a tractor-mounted front-end loader. This process is continued based on waste arrivals. The waste line, which has been filled, would be covered with a plastic sheet made of stitched HDPE cement bags. This would be then covered with 300 mm of soil, which is excavated at location. The soil shall be placed in 15 cm layer to 95 % Proctor density. As each line gets filled up, the same shall be covered progressively. During monsoons, plastic sheets shall be used to cover all the open waste lines so that direct rains do not fall on waste. At the end of the landfill a raised platform would be available for use as play ground or other facility.
1.0 Primary collection of waste:

1.1 From Slums and other BPL settlements:
- Cost of Collection of waste to be subsidized at these locations.
- One 40 litre – HDPE bin to be placed for every unit of 100 people of the area. (Approximately 20 house holds)
- Approximate weight of waste per bin would be 15 Kgs.

Mode of transportation:
- 2 Collectors to be deployed for a normative area (about 1080 houses / 5400 population).
- One pushcart / tricycle to be provided for transfer of waste from the bins to compactor.
- Then the waste from Push Carts / Tricycles or from 40 litre collection bins is to be transferred to nearest secondary container.

Normative standard for operation:
- **Pushcart:**
  - One pushcart (Capacity – 40 to 50 kgs) can hold waste from 3 bins.
  - Approximate time taken for one such operation for delivering to secondary container = 20 minutes.
  - Number of bins handled by Collectors in a 6-hour shift = 54 bins = 810 kgs = 5400 population = 1080 houses. Depending on operational distance and travel time, quantity of waste and number of houses handled would vary.
  - If a town has 15000 slum houses, 14 batches or 28 PKs are required for slum operation.

- **Tricycle:**
  - One tricycle (Capacity – 80 to 100 kgs) can hold waste from 6 bins
  - Approximate time taken for one such operation for delivering to secondary container = 40 minutes.
  - Collectors should also collect recyclable waste if the dwellers prefer to deliver to PKs for centralized collection.
  - Recyclables to be delivered to a separate transport system using existing vehicles like tippers and tractor-trailers at pre-determined time schedules.

1.2 From non-slum residents:
Normative standard: (Collection from houses only)
a) Auto tipper:
- The auto tipper would stop at every 50 m.
- The segregated green waste is to be delivered by the residents to the vehicle either on move or stationery, at 50 m distance intervals.
- Time taken at every stop including traverse is 3 minutes.
- At least 10 houses can be handled at each stop.
- Time taken by auto tipper for collection from 500 houses before 1st transfer of waste to secondary container = 2½ - 3 hours
- Time duration for collection from 1000 houses = 6 hours. (6.30 AM to 1.30 PM) with 1 hour break in between.
- The waste collected from Auto tippers would be transferred directly to 3 cum / 4.5 cum secondary container.

b) Pushcart:
- One pushcart can cover about 160 houses in a shift.
- Pushcart can collect waste from 40 houses in one trip.
- After each trip, the waste is delivered to the secondary container. Time required for one trip will be 90 minutes.
- In a 6-hour shift 160 houses can be covered.
- One person is required for the operation of waste collection.

c) Tricycle:
- One tricycle can cover about 240 houses in a shift.
- Tricycle can collect waste from 80 houses in one trip.
- After each trip, the waste is delivered to the secondary container.
- Time required for one trip will be 2 hours.
- In a 6-hour shift 240 houses can be covered.
- One person is required for the operation of waste collection.

- **Operation of the system:**
  - The ULB should procure the vehicle in areas where SHGs cannot be formed and should operate on contract basis.
  - Agreement between ULB and Service Provider
    - Refer agreement document: Primary Collection Doc-1
  - Through RWA/SHG/Urban Street Shakti etc. under following arrangement:
    - Agreement between ULB, RWA and Service Provider
      - Refer agreement document: Primary Collection Doc-2
    - Agreement between ULB and SHG
Refer agreement document: Primary Collection Doc-3
- Agreement between ULB and RWA
Refer agreement document: Primary Collection Doc-4

- Collection from commercial establishments.
  - Waste to be collected during afternoon soon after green waste collection from houses.
  - Time duration for collection – 1 ½ hrs approximately (10% of houses).
  - Operation of the system:
    - Through RWA/SHG/Urban Street Shakti who manage the waste collection in the specified area.
    - Private operator hired by ULB

- Collection from bulk waste generators:
  - Waste generators to make their own provisions as per specified storage container for storage of waste and to synchronize its collection with transport system.
  - Waste generators may also arrange for storage and transport of waste under contract arrangement.
  - Operation of the system:
    - Through an arrangement with existing system of ULB.
    - Private operator hired by ULB

- Recyclable waste collection – from houses:
  - Periodical collection on scheduled days and at a specific time – once/twice in a week in a cyclic system during or after commercial waste collection.
  - Duration of collection – 2 hours.
  - Waste so collected would be delivered to a specified collector of recyclable waste. In the absence of an established collection system by the recycling operators, the ULB is to store at the disposal site and make arrangements for recycling agencies to collect the waste.

2.0 Secondary Storage:
- The waste from the primary collection vehicle is to be transferred to secondary containers.
- The secondary storage is the secondary containers having a capacity of 3 m³, 4.5 m³, and 7 m³.
- 7 m³ containers are proposed for large cities only.
On the basis of weight, the capacity of secondary containers are as follows:

- 3 m$^3$: 1.2 tons
- 4.5 m$^3$: 1.8 tons

The secondary containers of 3 m$^3$ and 4.5 m$^3$ are provided in the ratio of 40:60 from the convenience of transportation and storage.

The secondary storage points are to be identified based on the volume of waste generated. The guideline for locating the containers are indicated below:

- One container at the center point between a set of 500 households on the main road.
- One 3m$^3$ container as indicated above in an operational area of 1000 houses.
- One 4.5 m$^3$ container at the mid point of 2 operational areas of 1000 houses each.
- Alternately a combination of 3 m$^3$ and 4.5 m$^3$ to be located in the operational area of 1000 houses based on the volume of waste generated.
- Based on local situation and special circumstances, additional 3 m$^3$ and 4.5 m$^3$ containers may be placed in commercial zones, market areas and other places of bulk waste generators. These containers are in addition to containers for houses indicated in action plan for equipments / vehicles.

Bulk generators like Choultries, large hotels etc to be insisted for procuring and placing secondary container of required capacity as per standard design in their premises to handle their waste.

The Secondary Containers are placed on a pre-cast cement concrete floor measuring 4.85 m x 3 m

ULB will procure required number of secondary containers and manage the system.

### 3.0 Transportation of Secondary Containers:

- Secondary containers are to be transported either by Dumper Placer or Tractor Placer as per recommendation based on the size of ULB.
- Dumper Placers are to be provided for Cities with population of 1 lakh or more.
- For towns with less than 1 lakh population Tractor Placer is recommended.
- The vehicle to place empty container before lifting filled up container.
- The green waste and predominantly biodegradable waste to be transported to Treatment facility / disposal site as per arrangement.
- The inorganic waste is to be transported directly to landfill site.
• One twin container Dumper Placer would be required to make 5 trips in shift to treatment/disposal site with an average one way lead of 15 km.

**Operation of the system:**
• ULB to procure the vehicles and operate the system
• ULB procuring the vehicles to operate the system on O&M contract
• ULB to operate the system on contract basis with the Operator providing the designated type of vehicle

4.0 **Street Sweeping:**
• The roads need to be divided into three categories.
• Type A: Daily sweeping
• Type B: Four days in the week. (Sun, Tue, Thu, Sat)
• Type C: Three days in the week. (Mon, Wed, Fri)
• Same staff could be deployed for Type B & C roads.
• Normative standard for staff requirement (For 4 hr work):
  • Average road width – 80 ft: One for every 350m length
  • Average road width – 60 ft: One for every 500m length
  • Average road width – 40 ft and below: One for every 750m length
  • Street sweeping to include roadside drain cleaning.
• Use the pushcarts for collection of waste and transport using the available tractor-trailer.
• The waste should be transported directly to landfill site.

**Operation of the system:**
• ULB would operate the system through Collectors
• ULB to operate the system on contract basis with specific type of equipment under the following arrangement:
  1. Lump Sum Fee Contract:
  2. Road Length Contract:

5. **MSW management contract:**
The entire process of Solid Waste Management could be brought under Service provider who will operate all components of SWM till disposal at designated treatment and landfill site.

6. **Procurement of Equipment and Vehicles:**
The types of equipment and Vehicles for the operations of the SWM have been specified. The choice of vehicle should be based on the normative requirement depending on the class of the city/town.
Part V

Action Plan for Solid Waste Management of Tripura

In Tripura, apart from the Agartala Municipal Corporation (AMC), there are 19 (nineteen) Urban Local Bodies (ULBs) and 26 Census Towns. The generation of Municipal Solid Waste in the AMC area is about 250 MT and from the other 19 ULBs and 26 Census Towns about 340 MT. The details are given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>ULBs</th>
<th>Population (in lac)</th>
<th>Estimated Waste Generation (in MT/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agartala Municipal Corporation (AMC)</td>
<td>5.22</td>
<td>241.1</td>
</tr>
<tr>
<td>2</td>
<td>Ranirbazar</td>
<td>0.13</td>
<td>7.2</td>
</tr>
<tr>
<td>3</td>
<td>Jirania</td>
<td>0.11</td>
<td>6.3</td>
</tr>
<tr>
<td>4</td>
<td>Mohanpur</td>
<td>0.18</td>
<td>9.7</td>
</tr>
<tr>
<td>5</td>
<td>Dharmanagar Municipal Council</td>
<td>0.41</td>
<td>22.4</td>
</tr>
<tr>
<td>6</td>
<td>Kailashar Municipal Council</td>
<td>0.24</td>
<td>13.2</td>
</tr>
<tr>
<td>7</td>
<td>Ambassa Municipal Council</td>
<td>0.17</td>
<td>9.3</td>
</tr>
<tr>
<td>8</td>
<td>Khowai MC</td>
<td>0.18</td>
<td>10.1</td>
</tr>
<tr>
<td>9</td>
<td>Teliamura</td>
<td>0.21</td>
<td>11.4</td>
</tr>
<tr>
<td>10</td>
<td>Bishalgarh</td>
<td>0.21</td>
<td>11.6</td>
</tr>
<tr>
<td>11</td>
<td>Udaipur</td>
<td>0.34</td>
<td>18.5</td>
</tr>
<tr>
<td>12</td>
<td>Belonia</td>
<td>0.19</td>
<td>10.6</td>
</tr>
<tr>
<td>13</td>
<td>Melagarh</td>
<td>0.19</td>
<td>10.4</td>
</tr>
<tr>
<td>14</td>
<td>Kumarghat</td>
<td>0.14</td>
<td>7.9</td>
</tr>
<tr>
<td>15</td>
<td>Kamalpur</td>
<td>0.11</td>
<td>6.0</td>
</tr>
<tr>
<td>16</td>
<td>Sonamura</td>
<td>0.11</td>
<td>6.1</td>
</tr>
<tr>
<td>17</td>
<td>Amarpur</td>
<td>0.11</td>
<td>5.8</td>
</tr>
<tr>
<td>18</td>
<td>Shantirbazar</td>
<td>0.13</td>
<td>6.9</td>
</tr>
<tr>
<td>19</td>
<td>Sabroom</td>
<td>0.07</td>
<td>4.0</td>
</tr>
<tr>
<td>20</td>
<td>Panisagar</td>
<td>0.11</td>
<td>5.8</td>
</tr>
<tr>
<td>21</td>
<td>26 Census Towns</td>
<td>2.91</td>
<td>159.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>11.47</td>
<td>583.5</td>
</tr>
</tbody>
</table>

1.2 There are 4 (four) Urban Local Bodies under West Tripura District namely (1) Agartala Municipal Corporation, (2) Mohanpur Municipal Council, (3) Ranirbazar Municipal Council and (4) Jirania Nagar Panchayat. Average daily generation of Municipal Solid Waste under the above said four Urban Local Bodies are as follows:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Urban Local Body</th>
<th>Average quantity of Municipal generated solid wastes (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agartala Municipal Corporation</td>
<td>240 MT</td>
</tr>
<tr>
<td>2</td>
<td>Mohanpur Municipal Council</td>
<td>10 MT</td>
</tr>
<tr>
<td>3</td>
<td>Ranir Bazar Municipal Council</td>
<td>7 MT</td>
</tr>
<tr>
<td>4</td>
<td>Jirania Nagar Panchayat</td>
<td>6 MT</td>
</tr>
</tbody>
</table>

1.3 The Agartala Municipal Corporation has set up a Solid Waste Management (SWM) Plant with Sanitary Land Fill at Debendra Chandra Nagar with a capacity of 250 MT per day. As the total Municipal Solid Waste generated under all the above said 4 (four) Urban Local Bodies is about 250 MT per day, it has been decided that all the above said four Urban Local Bodies shall bring their
Municipal Solid Waste to the Solid Waste Management Plant at D.C. Nagar, near Agartala by using Modern Garbage Compactors. All the 4 (four) Urban Bodies in West Tripura District have been provided with Modern Garbage Compactors with 8 MT capacity to transport Municipal Solid Waste to the SWM Plant at DC Nagar. The SWM Plant at DC Nagar is under operation since one year and generating compost out of Municipal Solid Waste. There is a sanitary land fill attached to this SWM Plant for safe disposal of remaining municipal solid waste which is non Bio-degradable. Also there is a Plastic Plant and Eco-brick plant attached to this SWM Plant at DC Nagar in which all types of plastic collected and transported to this plant is converted to fine granules which are sold in the market. In West Tripura district, Municipal Solid Waste is being collected, transported and processed as per the MSW Rules, 2016. West Tripura District has 76 percentage of urban population. For other municipal and areas as indicated in MSW Rules, 2016, the action plan is given in detail along with timelines at para 1.5 below.

1.4. The key highlights of the Action Plan is as follows:-

1.4.1 For 16 ULBs other than 4 mentioned above and 26 Census Towns, the process for identification of land for solid waste processing facilities is on and would be completed within June, 2017 and thereafter the works completed within stipulated period.

1.4.2 The State Level Advisory Body as envisaged in the MSW, Rules, 2016 has been constituted by the State Government. The 1st Meeting of the State Level Advisory Body was held on 06-04-2017, with key stakeholders, wherein the orders of the Hon’ble NGT, the obligations of ULBs and Rural Development Department as per MSW Rules, 2016 were discussed in detail.

1.4.3 A State Level Workshop with all key stakeholders has been organized on March 04, 2017 for sensitizing all concerned to ensure that complete co-ordination and co-operation is obtained between relevant Departments. District Level Workshops have already been organized in some districts.

1.4.4 The specifications for sanitary landfills including criteria for site selection, for development of facilities at the sanitary landfills and closure on completion of landfilling, pollution prevention, water quality monitoring, ambient air quality monitoring, plantation of landfill sites, post care of landfill sites, special provisions for hilly areas, closure and rehabilitation of old dumps are being monitored and will be implemented by December, 2018. Further, the buffer zone of the Waste Management Processing site at Debendrachandra Nagar of Agartala Municipal Corporation has already been setup and all the Waste Management Disposal sites of the other ULBs shall be setup the buffer-zone, within June, 2019.

1.4.5 Agartala Municipal Corporation is paying tipping fees to the operator based on consumption of electricity in the MSW plant. This is a mechanism for ensuring that the plant runs well. The similar process will be adopted for all other ULBs in due course.

1.4.6 In AMC area the operator of the solid waste processing plant at Debendrachandra Nagar is ensuring segregation, prior to processing. The same procedure shall be adopted for all the other ULBs of the State in December, 2018

1.4.7 The actions to be taken with regard to bio-stabilization of landfills would be completed within June, 2019.

1.4.8 Guidelines related to Non-Bio-Degradable Waste & Non-recyclable Plastic should be segregated from the landfill sites and be used for construction of roads and embankments in all road projects have been circulated for rural roads under Pradhan Mantri Gram Sadak Yojana;
and further suitable directions to the concerned road construction departments shall be issued with the approval of the State Government by December, 2018.

1.4.9 The State Government has issued the order banning short life PVC and chlorinated plastics. Other State Pollution Control Boards are being consulted.

1.4.10 Appropriate orders regarding burning of waste on land and landfills have been issued on 2nd May, 2017.

1.4.11 Publication of data with regard to functioning of MSW plants would be done within May, 2019.

1.4.12 English version of the rules and obligations of the judgment have been circulated, moreover, these have been translated in Bangla.

1.5 Status & Time-lines for Action Plan for MSW in Tripura-

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>SWM Rules, 2016</th>
<th>Actionable points /Activity</th>
<th>Status &amp; Time line</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>11 (a) - (c)</td>
<td>State Solid Waste Management Policy and Strategy</td>
<td>State level Action Plan prepared. State policy to be circulated immediately.</td>
</tr>
<tr>
<td>ii.</td>
<td>11 (d)</td>
<td>Ensure implementation of rules by local authorities</td>
<td></td>
</tr>
<tr>
<td>iii.</td>
<td>11 (e)</td>
<td>Directions to the town planning department to ensure master plan for each city or town has provision for solid waste processing and disposal facilities</td>
<td>Direction issued. Agency for master plan including provision for solid waste management for Agartala &amp; other ULBs being finalised. Master plans to be completed by Dec 2018 and final plan will be ready by Aug 2019. Solid waste plan for each ULBs under preparation.</td>
</tr>
<tr>
<td>iv.</td>
<td>11 (f)</td>
<td>Identification and allocation of suitable sites for setting up solid waste processing facilities and that these are incorporated in the master plans.</td>
<td>For Capital city of Agartala, Solid waste processing plant has been established which also covers Mohanpur, Ranirbazar and Jirania ULB. Kamalpur has set up a processing plant. Instruction to be issued again to all remaining ULBs for immediate selection of suitable sites for Solid waste processing plant by Oct 2018.</td>
</tr>
<tr>
<td>v.</td>
<td>11 (h)</td>
<td>Directions to ULB regarding allocation of separate space for segregation, storage and decentralized processing of solid waste in the development plans for group housing, commercial and non-residential complexes etc.</td>
<td>Sep, 2018</td>
</tr>
<tr>
<td>vii.</td>
<td>11(i)</td>
<td>Directions to SEZ, Industrial Estate and Parks to earmark at least 5% of total area or minimum 5 plots for recovery and recycling facility</td>
<td>Already included in terms and conditions of approval.</td>
</tr>
<tr>
<td>viii.</td>
<td>11(j)</td>
<td>Facilitate establishment of common regional sanitary land fill for group of cities and towns falling within the distance of 50 km from the regional facility on cost sharing basis.</td>
<td>For Agartala, Sanitary land fill has been formed which also covers Mohanpur, Ranirbazar and Jurania ULB. Other ULBs may identify such sanitary land fill location within Oct, 2018 and Landfills will be ready by March 19.</td>
</tr>
<tr>
<td>ix.</td>
<td>11(k)</td>
<td>Capacity Building of the Local Bodies regarding managing solid waste, segregation and transportation</td>
<td>November 2018</td>
</tr>
<tr>
<td>x.</td>
<td>11(l)</td>
<td>Notification of buffer zone for solid waste processing and disposal facilities of more than 5 tons per day</td>
<td>The provisions of Buffer Zone as well as green belt are complied with for the Solid waste processing facility set at Agartala. A draft Notification may be prepared by them and submitted for approval by Oct 2018.</td>
</tr>
<tr>
<td>xi.</td>
<td>11(m)</td>
<td>Start a scheme for registration of waste pickers and waste dealers</td>
<td>Dec, 2018</td>
</tr>
<tr>
<td>xii.</td>
<td>Duties and Responsibilities of Local Authorities and Village Panchayats of Census Towns and Urban Agglomerations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xiii.</td>
<td>15(a)</td>
<td>Preparation of Solid Waste Management plan as per State Policy and Strategy</td>
<td>Agartala Municipal Corporation has prepared Solid waste Management Plan as per State Policy and strategy. Other ULBs should replicate it with required changes by Dec 2018.</td>
</tr>
<tr>
<td>xiv.</td>
<td>15(b)</td>
<td>Door to Door collection of segregated solid waste from all households</td>
<td>AMC has started except in extended areas. Melaghar and Dharmanganar have also started in some wards. AMC should start it in all the wards and other ULBs to start by march 19.</td>
</tr>
<tr>
<td>xv.</td>
<td>15(c)</td>
<td>Establish a system for recognizing informal waste pickers and collectors and their integration into with authorized ones.</td>
<td>December, 2018.</td>
</tr>
<tr>
<td>xvi.</td>
<td>15(d)</td>
<td>Formation of SHGs for waste collection</td>
<td>Being complied with in Agartala. Other ULBs may opt as per requirement by Dec 2018.</td>
</tr>
<tr>
<td>xvii.</td>
<td>15(e)</td>
<td>Frame bye-laws incorporating the provisions of these rules and ensure timely implementation;</td>
<td>Agartala MC has formulated Solid Waste Management Regulation. Other ULBs to take similar action by Dec, 2018.</td>
</tr>
<tr>
<td>xviii.</td>
<td>15(f)</td>
<td>Prescribe user fee for waste generators</td>
<td>Agartala Municipal Corporation is already charging user fee from Bulk waste Generators. Other ULBs must prescribe user fee within Dec, 2018.</td>
</tr>
<tr>
<td>xix.</td>
<td>15(g)</td>
<td>Directions to the waste generators for not littering or disposing or burning of waste in public spaces and to segregate waste at source</td>
<td>AMC has provision in the Regulation. Other ULBs should keep this provision while preparing the regulations.</td>
</tr>
<tr>
<td>xx.</td>
<td>15 (h)</td>
<td>Material recovery, sorting space and color coded bins</td>
<td>Partially started. By Dec 2018</td>
</tr>
<tr>
<td>-----</td>
<td>--------</td>
<td>------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (i)</td>
<td>Earmarking centers for domestic hazardous waste</td>
<td>March, 2019.</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (j)</td>
<td>Safe storage and transportation of domestic hazardous waste</td>
<td>March, 2019.</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (k)</td>
<td>Prohibition for burning of dry leaves</td>
<td>Notification for this already been issued by Deptt of Science, Technology &amp; Environment.</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (l)</td>
<td>Training to waste pickers and collectors</td>
<td>Dec 2018</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (m)</td>
<td>Collection of bio-degradable waste and setting of compost and biomesanation plant</td>
<td>For Agartala, Solid waste processing plant including a compost Plant has been established which also covers Mohanpur, Ranirbazar and Jirania ULB. Kamalpur MC has set up a compost plant. Other ULBs should select suitable sites by Dec 2018.</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (n)</td>
<td>Collection of street sweeping waste</td>
<td>For Agartala, it is being done. Other larger ULBs by March 2019</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (o)</td>
<td>Covered secondary storage facility for street waste</td>
<td>Being complied in AMC. Other ULBs to confirm action by Dec 2018.</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (p)</td>
<td>Collection of horticulture and parks and gardens' waste</td>
<td>Being done in AMC &amp; other ULBs.</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (q)</td>
<td>Transportation of bio-degradable waste to compost and other plants</td>
<td>For Agartala &amp; Kamalpur, bio-degradable waste is transported to Compost plant. Others by March 2019</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (r)</td>
<td>Transportation of non bio-degradable waste to material recovery or waste treatment facility</td>
<td>Do</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (s)</td>
<td>Transportation of demolition waste as per rules</td>
<td>Being done in AMC and few other ULBs. Full compliance by Dec 2018</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (t)</td>
<td>Community involvement in waste management and promoting home composting, bio-gas etc.</td>
<td>Being complied with partially. To be ensured by Dec 2018</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (u)</td>
<td>Phasing out of use of chemical fertilizers in parks and gardens with compost</td>
<td>Being complied with partially. Full compliance by March 2019</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (v)</td>
<td>Setting up of waste management facilities on its own or through private sector for optimum utilization of solid waste etc.</td>
<td>AMC &amp; Kamalpur have done. Others to comply by March 2019</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (w)</td>
<td>Setting up of sanitary landfill facilities on its own or through private sector as per Schedule I of the rules.</td>
<td>AMC has complied. Others by March 2019</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (x)</td>
<td>Adequate provision of funds in the annual budget</td>
<td>The ULBs are providing fund from their budget on best effort basis.</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (y)</td>
<td>Application to State Pollution Control Board for setting up of Waste Management facilities and landfills.</td>
<td>Being done</td>
</tr>
<tr>
<td>xxi.</td>
<td>15 (z)</td>
<td>Renewal within 60 day of expiry of authorization.</td>
<td>It will be ensured.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>xxxix.</td>
<td>15 (za)</td>
<td>Prepare and submit Annual Report in Form IV on or before the 30th April of the succeeding year to the Commissioner or Director, Municipal Administration or designated Officer; 30th April every year</td>
<td></td>
</tr>
<tr>
<td>xl.</td>
<td>15 (zb)</td>
<td>The Annual Report shall then be sent to the Secretary -in-Charge of the State Urban Development Department or village panchayat or rural development department and to the respective State Pollution Control Board or Pollution Control Committee by the 31st May of every year; 31st May of every year</td>
<td></td>
</tr>
<tr>
<td>xli.</td>
<td>15 (zc)</td>
<td>Educating workers and supervisors regarding collection and transportation of segregated waste. Action taken</td>
<td></td>
</tr>
<tr>
<td>xlii.</td>
<td>15 (zd)</td>
<td>Facilities for operators to ensure provision of proper protection gear and uniforms etc. to workers. Protection gears and uniforms are supplied in some ULBs. Full compliance by Dec 2018</td>
<td></td>
</tr>
<tr>
<td>xliii.</td>
<td>15 (ze)</td>
<td>Ensuring incorporation of centers for waste collection, segregation and storage in building plans. Tripura Building Rules provides for same.</td>
<td></td>
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<tr>
<td>xliv.</td>
<td>15 (zf)</td>
<td>Bye-laws for imposing spot fines for littering. AMC’s regulation has provision. Others to follow by Dec 2018</td>
<td></td>
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<tr>
<td>xlv.</td>
<td>15 (zg)</td>
<td>Creating public awareness regarding various aspects of waste management. Being complied with partially. Full compliance by Dec 2018</td>
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<tr>
<td>xlv.</td>
<td>15 (zh)</td>
<td>Prohibition of landfilling and dumping of mixed waste. March, 2019</td>
<td></td>
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<tr>
<td>xlvii.</td>
<td>15 (zi)</td>
<td>Ensuring that only inert waste goes to landfills. March, 2019</td>
<td></td>
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<tr>
<td>xlviii.</td>
<td>15 (zj)</td>
<td>Investigate and analyze all old open dumpsites for bio-mining and remediation. Implemented.</td>
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**Duties of State Pollution Control Board**

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<tbody>
<tr>
<td>i.</td>
<td>16 (5)</td>
<td>Directions to local bodies for safe handling and disposal of domestic hazardous waste. Complied</td>
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**Time Frame for Implementation (as per SWM Rules)**

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<tr>
<td>ii.</td>
<td>22</td>
<td>Identification of suitable sites for setting up solid waste processing facilities. March, 2018.</td>
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<tr>
<td>lii.</td>
<td></td>
<td>Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or standalone sanitary landfill facilities by all local authorities having a population of 0.5 million or more. March, 2018.</td>
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<tr>
<td>l.i.</td>
<td>Enforcing waste generators to practice segregation of bio degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source</td>
<td>2 Years [April, 2018]</td>
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<tr>
<td>l.ii.</td>
<td>Ensure door to door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities</td>
<td>2 Years [April, 2018]</td>
</tr>
<tr>
<td>l.iii.</td>
<td>Ensure separate storage, collection and transportation of construction and demolition wastes</td>
<td>2 Years [April, 2018]</td>
</tr>
<tr>
<td>l.iv.</td>
<td>Setting up solid waste processing facilities by all local bodies having 100000 or more population</td>
<td>2 Years [April, 2018]</td>
</tr>
<tr>
<td>l.v.</td>
<td>Setting up solid waste processing facilities by local bodies and census towns below 1,00,000 population</td>
<td>3 Years [April, 2019]</td>
</tr>
<tr>
<td>l.vi.</td>
<td>Setting up common or stand alone sanitary landfills by or for all local bodies having 0.5 million or more population for the disposal of only such residual wastes from the processing facilities as well as untreated inert wastes as permitted under the Rules</td>
<td>3 Years [April, 2019]</td>
</tr>
<tr>
<td>l.vii.</td>
<td>Setting up common or regional sanitary landfills by all local bodies and census towns under 0.5 million population for the disposal of permitted waste under the rules</td>
<td>3 Years [April, 2019]</td>
</tr>
<tr>
<td>l.viii.</td>
<td>Bio-remediation or capping of old and abandoned dump sites</td>
<td>5 Years [April, 2021]</td>
</tr>
</tbody>
</table>

(S. Debbarma)
Additional Secretary
Urban Development Department

1. PS to the Addl. Chief Secretary to the Hon’ble Governor, Tripura
2. PS to the Hon’ble Chief Minister, Tripura.
3. PS to the Hon’ble Minister for Urban Dev. Department, Tripura
4. PS to the all Hon’ble Minister, Tripura.
5. PS to the all Addl. Chief Secretary/Principal Secretary/Secretary/Spl Secretary, Tripura.
6. Joint Secretary, Ministry of Environment & Forests(MoEF) and Climate Change, Government of India, 3rd Floor, Prithvi Wing, Indira Parvayyan Bhawan, Jor Bagh, New Delhi-110003, Email:- jsadmn-mef@gov.in.
7. Joint Secretary, MoRD is requested to kindly arrange to nominate an Officer from Ministry Rural Development Department, Government of India, Maulana Azad Rd. Rajpath Area, Central Secretariat, New Delhi, Delhi 110001, Email:- nagesh.singh@nic.in
8. Joint Secretary, Ministry Rural Development, Government of India, Krish Bhavan, Dr. Rajendra Prasad Road, New Delhi-110001, email: asd-mord@nic.in
9. Joint Secretary, Central Pollution Board, Parivesh Bhawan, CBD-cum-Office Complex East Arjun Nagar, Delhi-110001, email:- ccb.cpcb@nic.in
10. Additional Secretary/Joint Secretary, Revenue Development Department, Govt. of Tripura.
11. The Director, Panchayat, Govt. of Tripura. email:- panchyatdir@yahoo.co.in
12. Dr. D.P.Sarkar, Director. Agriculture, Directorate of Agriculture, Krishi Bhawan, email: krishibhawantripura@gmail.com
13. The Joint Secretary, RD(MGNREGA), Rural Development Department, Tripura, Agartala.
14. Member Secretary,(MSW), Tripura State Pollution Control Board, Tripura, Gorkhabasti, Agartala, Tripura 799010. Email:- emurti7@gmail.com
15. Dr. Umesh Mishra, Professor, Civil Engineering, National Institute of Technology, Agartala/Professor, Barjala, Jirania, West Tripura, Tripura 799055.
16. Town & Country Planner, TCPO, UD Department, Govt. of Tripura, email:- umishra123@rediffmail.com
20. Dr. Rekha Banerjee, President, ARPAN Society, Krishnanagar, Nutan Palli, Agartala email: dropmail@arpansociety.in
22. Smt. Rupa Das. Head, CI Tripura Unit, I & C Complex(near Zinger Hotel)
23. Industry & Commerce Department, Tripura,
24. Chief Engineer, UDD, Govt. of Tripura, email sipniutripura@gmail.com
25. Chief Engineer(DWS), P.N.Complex, Gourkhabasti Agartala, email: cedwstripura@yahoo.com
26. Labour Commissioner, Labour Commission, Tripura, email: letripura.agt@gmail.com

Copy also to:
2. The CEO/EO all ULBs.
3. The Manager, Govt. Press, Agartala, Tripura with a request to publish the Notification in an extra—ordinary issue of Tripura Gazette.
Salient Features of SOLID WASTE MANAGEMENT RULES, 2016

The salient features of the SWM Rules, 2016 areas under;

1. **Areas Cover:** These rules are applicable to;

   (i) Every urban local body (Mega city to Panchayat level),
   (ii) outgrowths in urban agglomerations,
   (iii) census towns as declared by the Registrar General and Census Commissioner of India,
   (iv) notified areas,
   (v) notified industrial townships,
   (vi) areas under the control of Indian Railways,
   (vii) airports/airbases,
   (viii) Ports and harbours,
   (ix) defence establishments,
   (x) special economic zones,
   (xi) State and Central government organisations,
   (xii) places of pilgrims,
   (xiii) religious and historical importance as may be notified by respective State government from time to time and
   (xiv) every domestic, institutional, commercial and any other non-residential solid waste generator situated in the areas.

2. **The Waste Generators**

   - Every household
   - Event organizers
   - Street Vendors
   - RWAs & Market Associations
   - Gated Community having more than area 5000 sq.m.
   - Hotels & restaurants, etc.

3. **Duties of Waste generators and Authorities:**

   (i) Every Waste Generators shall segregate waste and store separately and hand over to Municipal workers or authorized waste pickers.

   (ii) Ministry of Environment, Forest & Climate Change shall constitute Central Monitoring Committee to monitor and review every year.
(iii) **MoUD** shall frame National Policy on SWM and coordinate with States/UTs, provide technical guidelines, financial support, training to local bodies, etc.

(iv) **Departments of Fertilizers & Chemicals** shall assist in market development for city compost and make available to companies (3/4 bags compost: 6/7 bags Fertilizers).

(v) **Ministry of Agriculture** shall make flexible Fertilizer Control Order, promote utilization of compost, testing facility for compost and issue guidelines.

(vi) **Ministry of Power** shall fix tariff of power generation from W-T-E project and ensure distribution through companies.

(vii) **MNRE** shall facilitate infrastructure for waste-to-Energy plants and provide subsidy.

(viii) **Secy-Incharge, UD(sate/UT)** shall prepare State Policy/ Strategy, adopt 3-Rs, coordinate for state planning, identification of common/ regional landfills, notify guidelines of buffer zones.

(ix) **District Collector/ Magistrate** shall facilitate identification of landfill site, quarterly review the performance of local bodies.

(x) **Secretary, Panchayats**: same as Secy. UD at Panchayat level.

(xi) **CPCB** shall coordinate with SPCBs/PCCs for monitoring and Annual Reports, formulation of standards, review new technologies, prepare guidelines for buffer zones restricting from residential, commercial and construction activities areas; and inter-state movement of waste.

(xii) **Local Authority/ Panchayats** shall prepare SWM plan with timeline and its implementation, segregate, adopt 3-Rs, material recovery, processing/ disposal of Waste, user fee and levy spot fine.

(xiii) **SPCBs/PCCs** shall monitor, issue authorization and regulate.

(xiv) **Manufacturers/ Brand owners** shall facilitate collect back wastes of their products and provide pouch for packaging sanitary wastes, etc.

(xv) **Industry** (cement, power plant, etc.) shall use RDF within 100km. (xvi)

**Operator** of facilities shall follow guidelines/standards

4. **Criteria for Hilly Region**: Avoid landfill, make waste transfer stations, strict action for littering and construct landfill at plain areas.

5. **Waste to Energy plant** for waste with 1500Kcal/kg and above for co-incineration in cement and power plants.

6. **Time Frame** for Implementation of SWM Rules:

(a) Landfill Identification: 1 year

(b) Procurement of waste processing facilities: 2 years

(c) Ensure segregation of waste : 2 years
(d) Cities upto 1 million population: 2 years
(e) Million plus cities: 3 years
(f) Setting up sanitary landfills: 3 years
(g) Bioremediation/capping of old landfills: 5 years

7. Review of implementation of rules at various levels:
   (a) MoEF & CC, Central Monitoring Committee: Every year
   (b) District Collector review performance of Local authorities: Quarterly
   (c) SPCBs/PCCs review implementation of Rules with DMA: half yearly
   (d) Secretary In charge, UD- State level Advisory Committee: half yearly
Ancillary Rules

While the 2000 and 2016 rules deal with MSW generally, the following rules cover specific categories of waste that overlap with MSW:

2. Biomedical Waste (Management and handling) Rules, 1998 (superseded)
3. Recycled Plastics Manufacture and Usage Rules, 1999
6. E-waste (Management and Handling) Rules, 2011 (superseded)

Guidelines

These technical guidelines are given by CPCB and deal with various aspects of waste management:

- Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Waste and Penalty
- Guidelines for Setting up of Operating Facility: Hazardous Waste Management
- Guidelines for Proper Functioning and Upkeep of Disposal Sites
- Guidelines for the Selection of Site for Landfilling
- Guidelines for Transportation of Hazardous Wastes
- Guidelines for Storage of Incinerable Hazardous Wastes by the Operators of Common Hazardous Waste Treatment, Storage and Disposal Facilities and Captive HW Incinerators