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## PART-I

### 1. EXECUTIVE SUMMARY:

The role of solid waste management in public health and environmental protection cannot be over-emphasized. Improper solid waste management not only creates health hazards to the community, but also has, far reaching socio-economic and ecological consequences. Clear State Policy on the subject and a well-defined strategy is the need of the hour to successfully implement the Solid Waste Management Rules, 2016.

The Ministry of Environment, Forest & Climate Change, Government of India had notified the Municipal Solid Wastes (Management and Handling) Rules in 2000, making it mandatory for municipal authorities to set up waste processing and disposal facilities, identify sanitary landfill sites, and improve existing dumpsites. The compliance did not happen, mainly because of the inability of municipalities to implement waste segregation, and lack of institutional and financial means to implement waste processing and disposal projects. Government of India has revised the Municipal Solid Waste (Management and Handling) Rules 2000 and notified the Solid Waste Management Rules 2016 on April 8, 2016.

Improper waste management is one of the main causes of environmental pollution. The World Health Organization (WHO) has observed that 22 types of diseases are associated with improper management of municipal solid waste. Also, there are social implications of improper waste management which disproportionately affect the poorer communities living in slums and areas nearer to landfills and dumpsites. Millions of waste pickers are exposed to hazardous substances while collecting waste in the dumpsites seriously impacting their health and life expectancy. The improper waste management largely contributes to air, land and water contamination.

This policy is a necessary requirement to ensure that the Nagaland Government fulfils its moral and legal duties for safe, compliant, environmentally and financially sustainable waste management rules framed under “**The Environment (Protection) Act, 1986**”, with clear standards for appropriate segregation, storage, handling, transport and disposal under:-

- i) Solid Waste Management Rules, 2016
- ii) Plastic Waste Management Rules, 2016
- iii) Construction and Demolition Waste Management Rules, 2016
- iv) Bio-Medical Waste Management Rules, 2016
- v) E-Waste Management Rules, 2016
- vi) Batteries (Handling & Management) Rules, 2001
- vii) Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016

This policy is a necessary requirement to ensure the Nagaland Government fulfils its moral and legal duties for safe, compliant, environmentally and financially

sustainable waste management. Waste management is the generic term given to the whole spectrum of activities associated with waste, namely, its generation, segregation, storage, handling and transportation from point of source (ward/department) to final place of disposal (recycling/ landfill/ incineration or any modern technologies). This policy details the arrangements, including responsibilities, for the classification, segregation, collection, storage, handling, transportation and disposal of all waste produced as a consequence of various activities. Government policy is generally to apply the polluter pays principle. This means that the generator of the waste is obliged to ensure that the waste is properly managed. This applied equally to householders and businesses.

## **2. WASTE MANAGEMENT SCENARIO IN NAGALAND:**

Nagaland is one of the 8<sup>th</sup> North Eastern States of India blessed with rich flora and fauna and considered as one of the biological hotspots of India. It covers an area of 16,579 sq. Km and has a population of 19.79 lakhs as per Census 2011. There are 11 districts and 19 Urban Local Bodies. The total urban population is 5,70,966 persons.

In the absence of proper policy or any regulatory mechanism, waste management scenario in the State still by and large rudimentary. In the Urban areas comprising of 19 ULBs, there is only one scientific treatment Plant at Kohima having 50TPD capacity funded under the Asian Development Bank assisted North Eastern Region Urban Development Programme (NERUDP) funded through the Ministry of Housing & Urban Affairs. The rest of the ULBs have all landfill sites but dump without any proper treatment. Waste production in the urban areas is about 342 TPD.

As for the rural areas, there are no collection systems at present. But inherent practice of source segregation of wet waste for animal feed considerably reduces the problem of waste management. Although, the situation is not alarming at the moment, it is required to frame regulatory mechanism to ensure proper handling and disposal of waste in view of the changing lifestyle. At the moment there is no record of waste produced in the rural areas.

Some of the major issues faced in waste management, especially in the urban areas is the availability of land, manpower, Machineries and resources at the disposal of the Authorities. The Urban Local Bodies are mandated to look after the waste management in the urban areas but without sufficient manpower and financial empowerment.

## **3. DEFINITIONS:**

Words and expression used herein shall have the same meaning as assigned to them in the following Rules:

- i) Solid Waste Management Rules, 2016
- ii) Plastic Waste Management Rules, 2016
- iii) Construction & Demolition Waste Management Rules, 2016
- iv) Bio-Medical Waste Management Rules, 2016
- v) E-Waste Management Rules, 2016

- vi) Batteries (Handling & Management) Rules, 2001
- vii) Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016

#### 4. VISION:

*To achieve Sustainable Waste Management throughout the State by 2030.*

#### 5. SCOPE

The policy is an Integrated policy encompassing the following rules framed under The Environment (Protection) Act, 1986, with clear standards for appropriate segregation, storage, handling, transport and disposal:-

- i) Solid Waste Management Rules, 2016
- ii) Plastic Waste Management Rules, 2016
- iii) Construction and Demolition Waste Management Rules, 2016
- iv) Bio-Medical Waste Management Rules, 2016
- v) E-Waste Management Rules, 2016
- vi) Batteries (Handling & Management) Rules, 2001
- vii) Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016

#### 6. POLICY INTENT:

- i. Enable the community to reduce waste, reuse and recycle, efficient management and proper disposal of waste.
- ii. Educate the citizens to segregate bio-degradable, recyclable and inert waste at source.
- iii. To instil sense of waste management at the source and to refrain from littering
- iv. The policy appeals for effective public participation and proposes to educate the masses through IEC programmes to ensure such community participation and compliance with law.
- v. Empower the Authorities to enforce polluter to pay for waste.

#### 7. AREA OF COVERAGE/JURISDICTION:

The Policy shall extend to the whole State comprising of settlements as below:

- i. Urban Local Bodies.
- ii. Villages.
- iii. Outgrowths in Urban Agglomerations.
- iv. Census Towns as declared by the Registrar General and Census Commissioner of India.
- v. Notified Industrial Townships.
- vi. Areas under the control of Indian Railways.
- vii. Airports.
- viii. Defense/Security Establishments.
- ix. State and Central Government Organizations.

- x. Education Institutions, Hotels, Religious places, festivals & events and places of historical importance as may be notified by respective State Government from time to time.

**8. CHARACTERISTICS OF WASTE:**

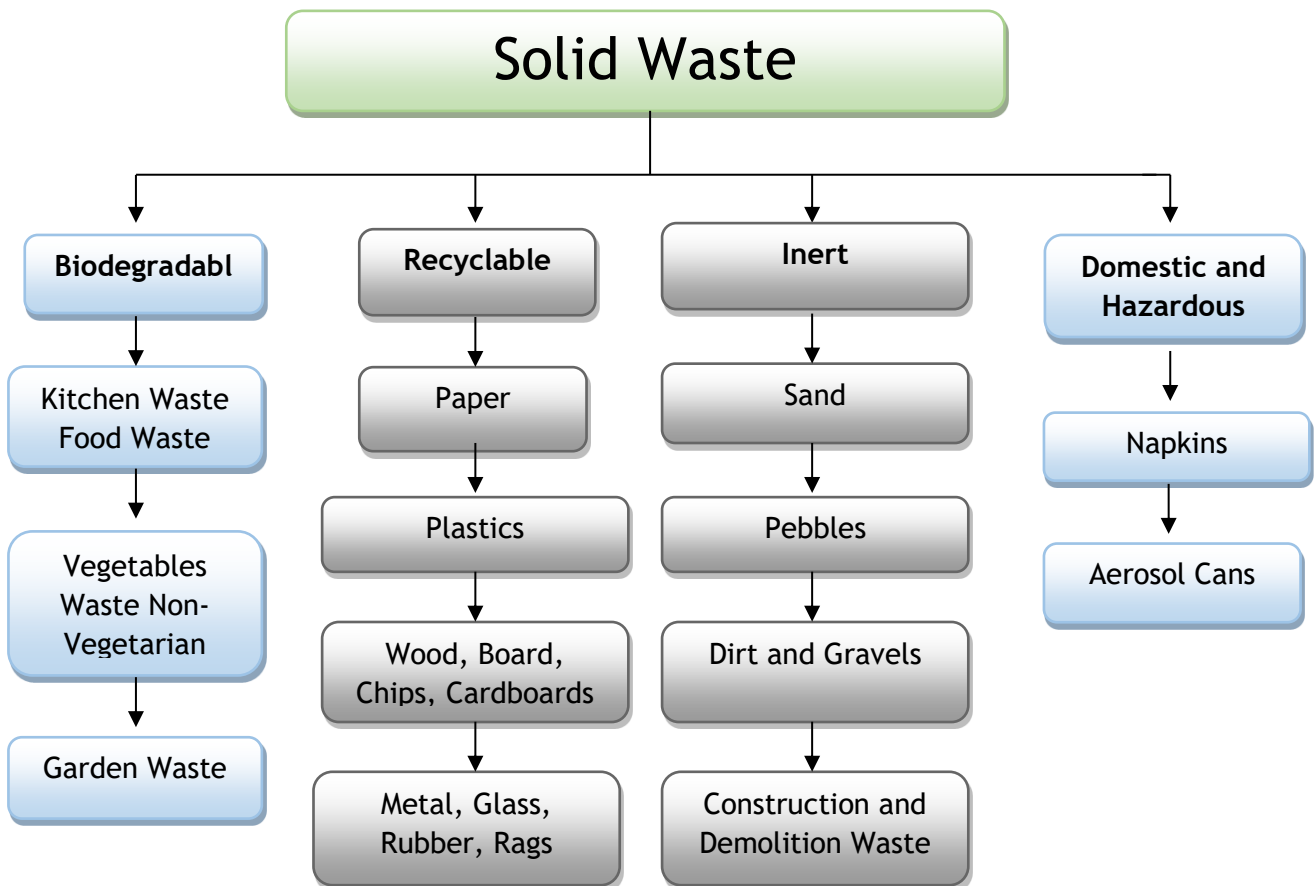
Solid waste comprises of bio-degradable, recyclable and inert waste. The biodegradable waste stream is the bulk of Solid Waste and most contaminating as it consists of discarded food, vegetables, fruits, meat and moisture, forming potent base for germs to multiply.

Next comes the recyclable waste which is most voluminous comprises of paper, plastics, metal, glass, fibre, cardboard, wood board etc. These if kept separately have lot of value but if mixed with biodegradable and inert waste, make a huge bulk of waste contaminated with germs and if crudely dumped together make for an environmental disaster.

The inert waste is from swept dust, sand, ashes and materials of building construction & repair. If kept separate these are reusable and harmless but their indiscriminate disposal will form pockets for germs and pests to lodge and proliferate in the environment.

Waste collection and processing is performed by the Local Authority in the area under its jurisdiction. Waste disposal has to meet scientific standards otherwise it has serious detrimental effects on human health and environment.

**9. WASTE BY TYPES:**



## 10. WASTE GENERATION BY SOURCE:

Source	Typical Waste Generator	Solid Waste Contents
Residential	Single and multiple households/ dwellings	Food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, metals, ashes, special wastes (e.g. bulky items, consumer electronics, batteries, oil, tires), and household hazardous wastes.
Commercial	Shops, Stores, Hotels, Restaurants, Markets, Office, Malls etc.,	Paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes
Institutional	Schools, Hostels, Hospitals, Government and Private Office Complexes	Paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes.
Construction & Demolition Waste	Construction sites, road repairs, renovation sites, demolition of buildings	Wood, Steel, Concrete Debris, Glass, Sand, Tiles, Bituminous Concrete etc.
Municipal Services	Street Sweeping, landscaping, Cleaning of parks, beaches, other recreational areas	Street sweepings, drain silt, landscape and tree trimmings, wastes from parks, beaches, and other recreational areas

## 11. SUSTAINABLE WASTE MANAGEMENT HIERARCHY:

The Integrated Solid Waste Management (ISWM) system is based on the waste management hierarchy, with the aim to reduce the amount of waste being disposed, while maximizing resource recovery and efficiency.

- i. **At Source Segregation and Reuse:** Waste Minimization and Sustainable Use/multi use of products (reuse of carry bags, packaging jars, bottles, boxes, wrappings, etc.)
- ii. **Recycling:** Processing non-biodegradable waste to recover commercially valuable material (plastic, paper metal, glass etc.)
- iii. **Composting:** Processing organic waste to recover compost.
- iv. **Waste to Energy:** Recover energy before final disposal of waste.
- v. **Disposal:** Landfills

## 12. WASTE GENERATORS:

Every domestic, institutional, commercial and any other non-residential solid waste generator situated in any of the above areas.

- i. Event Organizers
- ii. Street Vendors
- iii. Market Associations

- iv. Gated Communities having more than area 5000 sq. metres
- v. Hotels and Restaurants, etc.

### 13. PRINCIPLES AND BEST PRACTICES OF WASTE MANAGEMENT:

The best practices of solid waste management are as below:

- i. **Reduce-**
  - Reduce waste generation in the first place
  - Consume less=Waste less
  - Decline plastics and disposals
  - Decline plastic shopping bags
  - Decline packaging
  - Return packaging/dead product to manufacturers.
- ii. **Reuse-**
  - Find safe usage for leftover foods, vegetables, fruits, etc.,
  - Reuse disposables safely at personal level
  - Reuse packaging and wrapping
  - Reuse Items as much as possible
- iii. **Recycle-**
  - Return waste materials back into consumption cycle and for resource recovery.
  - Recoverable resources are to be recycled via the existing informal sector.
  - Recyclables left to the informal sector
  - We generate only 50-100 gms of non-biodegradable waste per capita per day
  - The last stage of the 3R waste hierarchy is to recycle. To recycle means that the waste will be transformed into a raw material for manufacturing a new item. There are very few materials on the earth that cannot be recycled, hence it is very effective in waste management. Thus, the 3R approach lives at the very top of the waste management hierarchy.
- iv. **Segregation at source**

Source segregation into dry and wet waste is vital for proper treatment of waste. It allows for cleaner streets and roads, effective waste treatment promoting recycling & reuse and safer disposal of waste.

The SWM Rules, 2016 defines segregation as sorting and separate storage of various components of solid waste namely, biodegradable wastes, non-biodegradable waste including recyclable waste, non-recyclable combustible waste, sanitary waste and non-recyclable inert wastes, domestic hazardous wastes, and construction & demolition waste. Segregation of waste at source will reduce injuries to waste-pickers, thus minimizing health hazards.



- v. **Integration**  
The informal sector-waste pickers and scrap dealers will be integrated to the State level Integrated Waste Management regime as primary partners. The informal sector will be represented in State Level Advisory Board (SLAB).
- vi. **No burning**  
Burning of any solid waste is a destructive and polluting process; hence no municipal solid waste shall be allowed to get disposed through open or closed burning.
- vii. **Extended Producer Responsibility**  
Industries, businesses and other bulk waste generators shall be responsible for source level segregation, storing and recovery of solid waste. The manufacturers, brand owners and distributors shall be held responsible and liable of collection, sorting, transportation, storing and recovery of plastics, e-Waste and Hazardous waste.
- viii. **Decentralised Waste Management**  
Decentralised composting, home composting etc. which involve minimal infrastructure investments and very little financial involvement which would help 80% of city's waste management. This is one of the best practices having the following advantages:
- Reduction in the collection and transportation chain of waste management and costs thereof.
  - Reduction in GHG emissions due to uncontrolled putrefaction/decay of biodegradable waste due to extended collection and transportation chains.
  - Reduction in smell/bad odour at the premises/storage points and roads & streets.
  - Elimination of uncontrolled leachate.
  - Shorter the collection & transport chain, better the quality of compost.
  - Decentralised City compost producers are more likely to use the compost themselves or develop strong off-take arrangements.
  - Saves enormously on waste-transport costs
  - Reduces waste volumes for disposal by 90%
  - Saves on manures for park maintenance
  - On-site processing of wet waste by bulk generators
- ix. **Composting of Bio-degradable waste:**  
Solid Waste (SW) primarily consists of biodegradable, non-biodegradable and inert fractions. Biological or thermal treatment of biodegradable and non-biodegradable waste can lead to recovery of useful products such as compost or energy. Biological treatment of biodegradable waste involves using micro-organisms to decompose the biodegradable components of waste into useful products. Biodegradable waste can be decomposed in two ways:

- Aerobic processes (in the presence of oxygen) such as vermicomposting, windrow composting. Types of Aerobic Composting Methods in **Annexure-I**.
  - Anaerobic processes (in the absence of oxygen through digester)
- x. **Sanitary landfills:**  
Ideally, nothing should go to a landfill. However after treating and processing waste, process rejects and inerts will need final disposal unless reused. Only about 10-20% of waste which is inert in nature should be landfilled.
- a. Criteria for identifying suitable lands for sanitary landfills in **Annexure-II**.
  - b. Diagrammatic representation on different zones for waste management dumping site in **Annexure-IV**.

## PART-II

### 14. SOLID WASTE MANAGEMENT:

Solid Waste Management (SWM) is the science associated with the management of solid waste using the best principles and practices of public health, engineering, conservation, aesthetics and other environmental considerations.

Solid Waste (SW) is the trash or garbage that is discarded in day to day activities in a human settlement. The “**Solid Waste Management Rules, 2016**” states- solid waste means and includes solid or semi-solid domestic waste including sanitary waste, commercial waste, institutional waste, catering and market waste and other non-residential wastes, street sweepings, silt removed or collected from the surface drains, horticulture waste, construction and demolition waste and treated biomedical waste excluding industrial hazardous waste, biomedical waste and e-waste generated in an area under local authorities.

Our daily activities give rise to a variety of solid wastes which harm the surroundings unless properly managed and processed. Cleaning up of waste contamination is much more expensive compared to its prevention at every stage of possible contamination. We are facing a huge challenge to properly manage waste. Faced with huge volumes and heavy expenditure for management, efforts should be made to reduce waste volumes and generate earnings from treatment thereof. The composition of municipal solid waste varies greatly from place to place and from time to time. It predominately includes food waste, household waste, market waste, packaging materials and products which are no longer useful. The sources can be residential, commercial, institutional and industrial.

Women (and children) form a large percentage of the waste-pickers. Women bear the brunt of waste-related illnesses caring for sick family members, helping children who miss school, managing with less if wage-earners are sick.

#### 14.1 Segregation of dry and wet waste:

Segregation of waste at source is very important for efficient and safe handling of discards. Segregating waste into bio degradable and non-bio degradable (Wet and Dry) will solve about 60-70% of the waste problem, Hence the Government shall make it mandatory for all households, commercial establishments, private and public institutions to follow minimum of two bin segregation at source. Segregated bio degradable discards shall be disposed through biological methods including vermi composting, aerobic composting or anaerobic digestion. Segregated non bio-degradable discards shall be sent for further segregation and recovery at waste pickers / scrap dealers facility or Material recovery facility.

Every waste generator shall segregate and store the waste generated by them in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorized waste pickers or waste collectors as per the direction or notification by the local authorities from time to time:

**Waste generators (households) should segregate waste in 2 dustbins.**

**GREEN BIN** as described by SWM Rules 2016 are

- Food wastes of all kinds cooked and uncooked, including eggshells and bones
- flower, fruit and waste including juice
- vegetable peels
- household garden/plant wastes
- Soiled paper (used toilet paper, paper towel etc.)

**BLUE BIN** should be used for dry waste. The contents of the Blue bin as described by SWM Rules 2016 are

- Paper (Newspaper, notebooks etc.)
- Cardboard & cartons
- Containers & packaging of all kinds excluding those containing hazardous materials
- Compound packaging (Tetra pack etc.)
- Plastics
- Wood
- Rag
- Discarded Clothing

**14.2 Integration**

The Government of Nagaland shall specify the role of informal sector which involves waste pickers and scrap dealers who are connected to the larger national network of recycling. Priority will be given to the informal sector when it comes to assign the right over discards / scrap materials. The waste pickers and scrap dealers will be identified and authorized to collect/receive, discards from public and government institutions for recycling. They will be integrated as partners of Solid Waste management network in the State.

For efficient utilization of untapped resources, source segregation of SWM, recycling enabled through the informal institution of and rag pickers be appropriately integrated into the system through recognition and strengthening of this sector. The municipal authorities may support association of rag pickers or NGOs in setting up Recyclable Waste Collection Centres (RWC) on municipal land where the rag pickers can sell for a price the recyclable materials collected by them. The municipal authority may also involve the rag pickers through NGOs or private sector for picking plastic and other recyclable materials from the streets in a designated area for making the cities “litter free” and preventing the useful material going to landfills. Such rag pickers could be paid incentive money for carrying out the task satisfactorily. While protecting the interest of rag pickers, care needs to be taken to prevent child labour. To facilitate sorting of recyclable materials collected by informal sector and supporting recycling industry, the municipal authorities should set up waste sorting facilities at suitable locations and permit the informal sector to use the facility for segregation of recyclables.

#### 14.3 **Waste reduction**

The primary focus of Solid Waste Management shall be on waste reduction. The concept of reducing waste generated by reducing consumption is essential to waste management hierarchy. It also involves modification of process and packaging; substitution; minimization and elimination. The Government of Nagaland shall adopt a strategy for waste reduction and changing the characteristics of waste. It is imperative for any system of waste management to take steps to reduce waste. This not only helps the state to conserve natural resources, but also save public expenditure on solid waste management. Reduction in waste generation shall be achieved by judicious and efficient use of resources. Protocol shall be made mandatory across all sectors to eliminate single use plastic products and to bring down use of low value small format plastics. The Government shall promote alternate products and services that can replace wasteful, ecologically unviable and unsustainable products.

#### 14.4 **Re-use**

The reuse of items (for multiple times) or re-purposing them for a use different from what they are originally intended for is the next essential thing in the waste reduction hierarchy. Items may be reused for one's own use (or reuse) or donated so that others can use them.

#### 14.5 **Recycling**

Non-biodegradable discards shall be recovered or reused, provided they are collected separately and kept clean. Paper, plastic, metal, glass, textile, leather and rubber, etc in the waste stream shall be made available for reuse/refurbish or recycling if they are kept clean and sorted. Many of the non-biodegradable discards accrues economic value only after they are aggregated in sizeable quantities. Integration of local informal sector/scrap traders/waste pickers will improve the efficiency of recovery, by way of direct collection of valuable discards.

#### 14.6 **No burning**

Burning of any solid waste is a destructive and polluting process; hence no municipal solid waste shall be allowed to get disposed through open or closed burning, incineration, co-incineration, or thermal processes. Burning of biodegradable/recyclable materials shall be strictly prohibited.

Burning of waste is a destructive and polluting process. Relevant technologies shall be adopted to treat non biodegradables well as bio-degradable discards. Aerobic composting and or hi-tech anaerobic digestion is suggested as technologies to manage bio degradable discards.

#### 14.7 **Decentralised Waste management**

For collection and transportation of the segregated waste in a segregated manner, cities may consider more cost effective options such as formalizing

rag pickers into the SWM chain, involving SHG or outsourcing to private entities.

**Decentralised waste management shall be implemented in the following premises**

- All institutions like colleges, hostels, hotels, hospitals, clubs, marriage-halls, jails, zoos.
- Apartment-complexes, bungalows, Government and city offices.
- All city-owned parks and sites.
- Decentralized waste management can be taken up through various processes such as:
  - Biomethanation in factory canteens
  - Vermi-culture
  - Aerobic wind-rows

#### 14.8 **Encourage Informal Recycling:**

People involved in the informal sector takes care of much of the recyclable waste for which due recognition and incentives need to be extended. Often waste pickers and scrap dealers resort to crude mechanism to recover valuable materials from mixed or segregated waste. This result in occupational hazard and contamination of valuable materials. Waste pickers/Scrap dealers need to be trained for safe recovery of materials before recognizing them as authorized recyclers in the region. Government through Health and Family Welfare Department should provide free periodical medical check-up and medical insurance for their health care. Sanitation workers are engaged in cleaning of premises. They need to be trained as trainers for the local community. They should be able to demonstrate right way of segregation of waste, composting, biogas operation etc. This will elevate the status of the safaikarmacharis (sweepers). Authorities may provide decentralized sorting-spaces, ID cards and incentives including access to medical facilities.

14.9 **Incentives:** The incentives shall be in the form of- Social security for waste pickers/waste traders, Awards/recognition for Green practices in each sector. The ULBs shall decide user-fee, incentives, conditions for licensing, fines and other penal action for non-compliance of directives of the Solid Waste Management Rules.

#### 14.10 **Dignity of Labour**

The people engaged in waste management jobs will be technically trained and updated periodically to elevate the status of such jobs. The services of people engaged in Solid Waste management will be recognized as environmental services and the people will be considered as skilled labour and or technicians. The services of cleaning, waste collection, transportation, sorting, disassembly, processing, recycling will be considered as environmental services which ensures environmental and public health. The State

Government will ensure the dignity of labour by providing safe working environment, economic opportunity and social security for the people engaged in the environmental services. Campaigns will be directed towards marketing services as well related to waste as a skilled and technical job which solves the issue of resource management and climate change.

In order to facilitate segregated waste collection, ULB workers should be provided separate equipment for collection and transportation of both dry and organic wastes. Dry resource collection centres should be set up for segregating and recycling dry waste.

#### 14.11 Extended Producer Responsibility & Bulk Generators

**'My Waste is My Responsibility'** shall be the underlying principle, where individuals have to assume the responsibility of the waste generated in their premises. Industries, businesses and other bulk waste generators shall be responsible under Extended Producer Responsibility for source level segregation, storing and recovery of solid waste. The manufacturers, brand owners and distributors shall be held responsible and liable of collection, sorting, transportation, storing and recovery of plastics, E-waste and Hazardous waste.

#### 14.12 Landfill

Sanitary Landfills are the facility for disposing inerts, compost rejects and residuals in a scientific manner. All ULBs as well as the Village Council should have Dumping sites and sanitary landfill facility. Considering the urbanization, the capacity of existing landfills and proposed landfills need to be used judiciously. Only non-recyclable rejects should go for landfilling.

##### **Types of Municipal Solid Waste to be accepted at landfills**

Waste categories suitable for sanitary landfills are the following:

- i. Non-biodegradable and inert waste by nature or through pre-treatment
- ii. Commingled waste (mixed waste) not found suitable for waste processing
- iii. Pre-processing and post-processing rejects from waste processing sites and
- iv. Non-hazardous waste not being processed or recycled.

##### **Filling shall be banned for the following waste streams:**

- i. Biodegradable waste or garden waste,
- ii. Dry recyclables, and
- iii. Hazardous waste or industrial waste (to be disposed in hazardous waste sites with special containment).

##### **Planning and Design of a Landfill**

Steps for designing, implementation and operation of a Sanitary Landfill are:

- i. Site selection,
- ii. Sanitary landfill design,
- iii. Construction of a sanitary landfill,
- iv. Sanitary landfill operation, and
- v. Closure and post-closure plan.

## 15. PLASTIC WASTE MANAGEMENT:

The quantum of solid waste is ever increasing due to increase in population, developmental activities, changes in life style, and socio-economic conditions. Plastic garbage is seen littered all over the country and has started causing several problems. Plastic waste clogs drains, causing floods. It chokes animals which eat plastic bags, etc. Plastics found in fields blocks germination and prevents rainwater absorption. Plastics waste is a significant portion of the total solid waste.

Thin single-use plastic waste is the biggest problem and its economic use needs to be explored to reduce the menace.

To provide a regulatory frame work for management of plastic waste generated in the country a “**Plastic Waste Management Rules, 2016**” is framed to give thrust on plastic waste minimization, source segregation, recycling, involving waste pickers, recyclers and waste processors in collection of plastic waste fraction either from households or any other source of its generation or intermediate material recovery facility and adopt polluter’s pay principle for the sustainability of the waste management system.

### 15.1 Uses of Plastics Wastes:

- i. As Refuse Derived Fuel (RDF) for co-processing along with coal in Thermal and Cement Industries.
- ii. As a limited substitute for Bitumen in road construction.  
Plastic garbage such as carry bags, chip bags, chocolate bar wrappers, plastic bags, bottles, lids, etc. can be shredded and added as a limited substitute for bitumen in road construction. This method makes plastic waste a useful substitute in construction, simple and cost effective.

A well-constructed Plastic Tar Road will result in the following advantages.

- Strength of the road increased
- Better resistance to water and water stagnation
- No stripping and have no potholes.
- Increased binding and better bonding of the mix.
- Increased load withstanding property.
- Overall consumption of bitumen decreases.
- Reduction in pores in aggregate and hence less rutting and raveling.
- Better soundness property.
- Maintenance cost of the road is almost nil.
- The Road life period is substantially increased.

### 15.2 Provision on Plastic Waste Management Rules 2016:

With the change in life style, plastic waste pollution has become a problem even in the remotest parts of the State. The focus of the policy shall be on 3Rs namely; Reduce, Reuse and Recycle for which responsibilities for various levels shall be as under:

- a. **Rule 5 & 6:** Responsibility of Local Body (Urban).
- b. **Rule 7:** Responsibility of Gram Panchayat/Village Council (Rural).



- c. **Rule 8:** Responsibility of Waste Generators.
- d. **Rule 9:** Responsibility of Producers, Importers and Brand Owners.
- e. **Rule 14:** Responsibility of Retailers and Street Vendors

15.3. **Prescribed Authority:**

- a. The State Pollution Control Board shall be the authority for enforcement of the provisions of this policy relating to registration, manufacture of plastic products and multi-layered packaging, processing and disposal of plastic wastes.
- b. The Secretary-in-charge of Urban Development Nagaland shall be the authority for enforcement of the provisions of these policy relating to waste management by waste generator, use of plastic carry bags, plastic sheets or like, covers made of plastic sheets and multi-layered packaging.
- c. The concerned Gram Panchayat/Village Council shall be responsible for enforcement of the provisions of these policy relating to waste management by the waste generator, use of plastic carry bags, plastic sheets or like, covers made of plastic sheets and multi-layered packaging in their respective jurisdiction of the State.
- a. The authorities shall take the assistance of the Deputy Commissioner within the territorial limits of the jurisdiction of the concerned district in the enforcement of the provisions of these rules.

15.4. **Registration of producer, recyclers and manufacturer:**

- a. No person shall manufacture carry bags or recycle plastic bags or multi-layered packaging unless the person has obtained a registration from the State Pollution Control Board.
- b. Every producer shall apply in prescribed **Form under Rule 13 (2) of PWM Rules, 2016** for the purpose of registration or for renewal of registration to the State Pollution Control Board.
- c. Every person recycling or processing waste or proposing to recycle or process plastic waste shall make an application to the State Pollution Control Board in prescribed **Form under Rule 13 (3) of PWM Rules, 2016**
- d. Every manufacturer engaged in manufacturer of plastic to be used as raw material by the producer shall make an application to the State Pollution Control Board in prescribed **Form under Rule 13 (4) of PWM Rules, 2016**
- e. The State Pollution Control Board or the Pollution Control Committee shall not issue or renew registration to plastic waste recycling or processing units unless the unit possesses a valid consent under the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) and the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) along with a certificate of registration issued by the District Industries Centre or any other Government agency authorised in this regard.

- f. The State Pollution Control Board or the Pollution Control Committee shall not renew registration of producer unless the producer possesses and action plan endorsed by the Secretary in charge of Urban Development of the concerned State for setting of plastic waste management system.
- g. On receipt of the application complete in all respects for the registration for recycling or processing of plastic waste, the State Pollution Control Board may, after such inquiry as it considers necessary and on being satisfied that the applicant possesses appropriate facilities, technical capabilities and equipment to handle plastic waste safely, may grant registration to the applicant on fulfilment of the conditions as may be laid down in terms of registration.
- h. Every State Pollution Control Board shall take a decision on the grant of registration within ninety days of receipt of an application which is complete in all respects.
- i. The registration granted under this rule shall initially be valid for a period of one year, unless revoked, suspended or cancelled and shall subsequently be granted for three years.
- j. State Pollution Control Board or the Pollution Control Committees shall not revoke, suspend or cancel registration without providing the opportunity of a hearing to the producer or person engaged in recycling or processing of plastic wastes.
- k. Every application for renewal of registration shall be made at least one hundred twenty days before the expiry of the validity of the registration certificate.

15.5. **Annual Reports:**

- a. Every person engaged in recycling or processing of plastic waste shall prepare and submit an annual report in prescribed **Form under Rule 17(1) of PWM Rules, 2016** to the local body concerned under intimation to the concerned State Pollution Control Board or Pollution Control Committee by the 30<sup>th</sup> April, of every year.
- b. Every local body shall prepare and submit an annual report in prescribed **Form under Rule 17(2) of PWM Rules, 2016** to the concerned Secretary-in-charge of the Urban Development Department under intimation to the concerned State Pollution Control Board or Pollution Control Committee by the 30<sup>th</sup> June, every year.
- c. Each State Pollution Control Board or Pollution Control Committee shall prepare and submit an annual report in prescribed **Form under Rule 17(3) of PWM Rules, 2016** to the CPCB on the implementation of these rules by the 31<sup>st</sup> July, of every year.

## 16. CONSTRUCTION & DEMOLITION (C&D) WASTE:

With the growing generation of construction and demolition waste, the Government of India has deemed it appropriate to formulate a separate regulation for construction and demolition waste namely “**Construction & Demolition Waste Management Rules, 2016**” describing the roles and responsibilities of the different stakeholders as well as the compliance criteria for the management of the construction and demolition waste.

Construction and demolition waste means “the waste comprising of building materials, debris and rubble resulting from construction, remodelling, repair and demolition of any civil structure”.

C&D waste includes bricks, tiles, stone, soil, rubble, plaster, drywall or gypsum board, wood, plumbing fixtures, non-hazardous insulating material, plastics, wall paper, glass, metal (e.g., steel, aluminium), asphalt, etc.

### 16.1 Provision on Construction & Demolition Waste Management Rules 2016:

- a. **Rule 4:** Duties of Waste Generators.
- b. **Rule 6:** Duties and responsibilities of local authorities.
- c. **Rule 8:** Duties of Nagaland Pollution Control Board.
- d. **Rule 9:** Duties of State Government.

### 16.2 Benefits of Processing C&D Waste

- a. C&D waste can be put to profitable use, given the scarcity of sand and stone for construction, thereby saving natural resources.
- b. It prevents public nuisance and traffic congestion issues arising from indiscriminate dumping of C&D waste.
- c. It saves valuable space at landfill sites.
- d. It reduces cost of bulk transportation if recycled near to source of generation.

### 16.3 Uses of Processed Construction and Demolition Waste

The use of the processed construction and demolition waste has been described below, primarily as mixed aggregates or recycled aggregates (RA) and as recycled concrete aggregates (RCA):

- i. Recycled aggregate (RA) may be used in making concrete for non-structural purposes. The extent of use would be limited to non-load bearing structures only, provided the conditions mentioned below at point no.(ii) is complied with. Examples of use – wall between two RCC load bearing members, filling walls between RCC frame, non-industrial flooring, etc.
- ii. The RA shall be free from deleterious material, such as, organic content, vegetable matter, coal, clay lumps, external substances and soft fragments like pieces of plastics, paper etc. RA shall also be free from chemicals detrimental for the strength or durability of concrete or steel reinforcement such as chlorides, etc.

- iii. Percentage of replacement of natural aggregates by RA can be up to 20% for any type of plain concrete work. The percentage can be increased up to 30% for road sub-base / base / other road related applications except wearing course. However, this shall be backed up by laboratory test reports.
- iv. RA of appropriate quality (as mentioned above) can be used for various purposes, such as, in making kerb stones, paving blocks, concrete blocks and bricks, road sub-base, pathways for pedestrian use, rural roads (used for walking and bicycles) etc.
- v. Recycled concrete aggregate (RCA) can be used in all grades of PCC (non-structural and structural).

16.4 Construction & Demolition Waste and Their Reuse Potential

Material	Process	End Use
Demolition Waste	Crushed and sorted	Recycled Aggregate
Construction Waste	Washed to remove cement and recover aggregate	Recycled Aggregate
Reinforced Concrete	Crushed sorted and steel bar removed Steel recycled	Crushed, sorted aggregate For recycling
Clay bricks and roof tiles	Cleaned Crushed and Sorted Pulverized	Reused for masonry Aggregate Mixed with lime to produce mortar
Calcium silicate bricks	Cleaned Crushed Pulverized	Reused for masonry Aggregate Recycled into new calcium silicate bricks
Natural stone masonry	Cleaned Crushed	Reused for masonry Aggregate
Natural stone slabs	Clean Crushed	Flooring, cladding Aggregate
Ceramic tiles	Cleaned Crushed	Flooring, cladding Aggregate
Asphalt Paving	Crushed and Cold Mixed Crushed and hot mixed	Road construction excluding wearing course
Mixed Demolition waste	Crushed	Fill material
Steel	Cleaned Recycled	Reused Steel Components New Steel Components

Aluminum	Cleaned Recycled	Aluminum recycling streams
Timber beams, doors	Cleaned	Reused as beams, doors etc
Timber boards	Cleaned	Reused as shuttering and other products Feedback for engineered woods
Plastics	Recycled	Plastic Recycling systems
Gypsum Plasterboard	Cleaned Crushed Recycled	Reuse as boards Soil Conditioner New Gypsum Products
Glass	Cleaned Crushed Recycled	Glass Recycling Streams

#### 16.5 Accident reporting by the construction and demolition waste processing facilities

In case of any accident during construction and demolition waste processing or treatment or disposal facility, the officer in charge of the facility in the local authority or the operator of the facility shall report of the accident in prescribed **Form under Rule 14 of C&D Waste Management Rules, 2016** to the local authority. Local Authority shall review and issue instruction if any, to the in-charge of the facility.

#### 17. BIO MEDICAL WASTE MANAGEMENT:

Medical waste is one special kind of hazardous wastes. If mishandled, it could cause disease spread and secondary pollution of dioxin. It is a potentially infectious waste materials generated at health care facilities, such as hospitals, clinics, dental practices, blood banks, and veterinary hospitals/clinics, as well as medical research facilities and laboratories. Therefore, in addition the above stated strategy on Solid Waste Management, the Bio-medical waste must be properly managed by segregation, treatment, transportation and disposal by adhering to “**Bio-Medical Waste Management Rules, 2016**”. Deep burial may be practiced where there is suitable space and there is no alternative facility. Authorization under the Rule has to be obtained from the Nagaland Pollution Control Board.

*The detailed policy shall be prepared and notified by Health & Family Welfare Department within 2 months from date of publication of this Policy in official Gazette.*

**18. E-WASTE MANAGEMENT:**

Electronic waste (e-waste) comprises waste electronics/ electrical goods that are not fit for their originally intended use or have reached their end of life. This may include items such as computers, servers, mainframes, monitors, CDs, printers, scanners, copiers, calculators, fax machines, battery cells, cellular phones, transceivers, TVs, medical apparatus and electronic components besides white goods such as refrigerators and air-conditioners. In addition to the Action Points given in the Solid Waste Management above, the “**E-Waste Management Rules, 2016**” shall be followed. Besides:-

- i) Collection by authorized dealers authorized by Nagaland Pollution Control Board.
- ii) Storage and transportation to authorized recyclers by scrap dealers or any other agency registered with Nagaland Pollution Control Board and sent to Recyclers/Refurbishers/Dismantlers approved by Central Pollution Control Board.

*The detailed policy shall be prepared by Information Technology Department in consultation with Nagaland Pollution Control Board within 2 months from date of publication of this Policy in official Gazette.*

**19. BATTERIES (MANAGEMENT & HANDLING):**

The “**Batteries (Management and Handling) Rules, 2001**” is framed with the primary objective of ensuring safe disposal of discarded batteries. Rules are evolved to have proper control and record keeping on the sale or import of lead acid batteries and recollection of the used batteries for their recycling by registered recyclers to ensure environmentally sound recycling of used batteries. It is required to ensure that all the used batteries are channelized to registered recycling facilities and stop backyard smelting of used lead acid batteries, by following the Battery (Management and Handling) Rules, 2001.

Storage, transportation to authorized recyclers by scrap dealers or any other agency registered with the Nagaland Pollution Control Board.

*The detailed policy shall be prepared by Nagaland Pollution Control Board within 2 months from date of publication of this Policy in official Gazette.*

**20. HAZARDOUS AND OTHER WASTE (MANAGEMENT & TRANSBOUNDARY MOVEMENT):**

Hazardous wastes means any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances.

It is notified to ensure safe handling, generation, processing, treatment, package, storage, transportation, use, reprocessing, collection, conversion, and offering for sale, destruction and disposal of Hazardous Waste.

Unscientific disposal methods like burning or incineration adopted to dispose hazardous and other wastes results in the emission of toxic fumes comprising of Dioxins & Furans, mercury, heavy metals leading to air pollution and associated health ailments. Disposal of hazardous wastes in water bodies or municipal dumps leads to leaching of toxic substances in land and water resulting in degradation of soil and water quality. So, there is a need for systematic management of hazardous and other waste by adopting the practices like prevention, minimization, re-use, recycling, recovery, utilization including co-processing and safe disposal of waste, which is managed under the “**Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016**” and authorization has to be obtained from the Nagaland Pollution Control Board as per the Rule.

*The detailed policy shall be prepared by Nagaland Pollution Control Board within 2 months from date of publication of this Policy in official Gazette.*

## PART-III

### 21. WAY FORWARD:

#### i. Solid Waste Management

- a. The Urban Development Department shall ensure that all Urban Local Bodies prepare an **Action Plan** individually as to how they will manage their wastes as envisaged under *Rule 11 of the SWM Rules, 2016*.
- b. The Rural Development Department shall ensure that all Village Councils prepared an **Action Plan** individually as to how they will manage their wastes as envisaged under *Rule 13 of the SWM Rules, 2016*.
- c. The Deputy Commissioner will ensure that Solid Waste Management projects are included in development activities of towns and villages as envisaged under *Rule 12 of the SWM Rules, 2016*.
- d. The Local Authorities and Village Councils of Census Towns and Urban Agglomeration shall ensure implementation of *Rule 15 of the SWM Rules, 2016*.

#### ii. Plastic Waste Management

The Urban Local Bodies/Village Councils to frame bye-laws incorporating the provisions of PWM Rules 2016 in collaboration with Nagaland Pollution Control Board.

#### iii. Construction & Demolition Waste

The Urban Local Bodies/Village Councils to frame bye-laws incorporating the provisions of C&D Waste Management Rules 2016 in collaboration with Nagaland Pollution Control Board.

***All actions in Part-III (21-i to iii) to be completed within 2 (Two) months from the date of publication of this Policy in official Gazette.***

***Way Forward for the other Rules viz. Bio-Medical Waste; E-Waste; Batteries (Handling & Management); Hazardous and Other Waste (Management & Transboundary Movement) shall be followed in the detailed Policies as envisaged in Part-II (17-20) of this Policy.***



## PART-IV

### 22. CAPACITY BUILDING AND INFORMATION EDUCATION & COMMUNICATION (IEC):

#### i. Capacity Building

The success of waste management will depend largely on the dedication and efficiency of the Local Authorities. Training, orientation, sensitizing and motivation are required to build capacity in people who implement the project as well as the beneficiaries.

- a. Technical knowledge on composting/biogas.
- b. Operation and maintenance of Resource Recovery/Segregation.
- c. Public health monitoring and reporting
- d. Basic knowledge in eco system and Biodiversity

#### ii. Awareness Campaign

Awareness campaign is crucial in bringing about behavioural change.

- a. Local authorities shall carry out extensive multimedia Campaign through various medium such as- Regional Newspapers, Local News Channels, and Local Radio Channels.
- b. Extensive involvement of Volunteers to carry on the mass movements.
- c. Ward/Khel/Colony wise announcements on autos/tempo etc. to inform & educate the public about this initiative.
- d. Planning meeting with all stakeholders such as Universities, Colleges, Schools, Commercial Establishments, Hospitals, Vendors Association, Transport Operators, Market Associations & Bulk Waste Generators etc.
- e. Involvement of religious leaders efforts for dissemination of messages on Waste Management.

#### iii. Community Participation through NGOs, SHGs, Students and Youth

Success of the campaign will depend on the strength of community participation. Campaigns, projects and activities shall be designed for involving students and youth in the State to invoke sense of ownership and to sustain the campaign. Relevant Departments along with ULBs/Village Councils shall create opportunities for academic exercises on waste, material use, behaviour change communication, social work, rural planning etc., where the students and youth can participate. The Department of Education shall initiate process to integrate clubs in the educational institutions to create an environment for the campaign on waste management.

iv. **Involvement of Private Parties:**

The Local Authorities may explore possibility of outsourcing waste management including door to door collection, transportation and disposal through private partners.

v. **Resource mobilization:**

- a. The State Government shall empower the Local Authorities financially (till such times Local Authorities are financially stable) so as effectively tackle the problems of waste management.
- b. Subsidies and financial support shall be provided to enterprising people who are interested in taking up the businesses of alternate eco-friendly products and services.
- c. User charge to be realized by Local Authorities for providing sanitation services.
- d. The State Government shall provide manpower and machineries to the Local authorities for proper waste management.

vi. **Procurement (dustbins, vehicles, GeM, composting machines etc.)**

Procurement plays a key role in ensuring 100% waste segregation at the city level. The city must ensure procurement of suitable equipment such as dustbins, segregated auto tippers, composting machines, etc. The Local Authorities can procure equipment through Government e-Market (GeM), for ease of buying.

## PART-V

### 23. ADDITIONAL PROTOCOLS:

- a. **Litter bins:** The Local Authorities shall ensure that litter bins are provided in all prominent locations within its jurisdiction.
- b. **Leaf litter:** Compost onsite. Burning should be banned.
- c. **Street-food:** Handcarts must have space for waste, and deposit it centrally at end of day.
- d. **Hotel food waste:** Non-veg to piggeries, or left-overs to night-shelters or orphanages.
- e. **Market waste:** Stall-to-stall collection on hourly basis. Wet waste to cattle or goats, Dry waste separate collection daily.
- f. **Housekeeping workers:** Developing a standard operating procedure for housekeeping in hotels, restaurants, offices and other institutions will help to have a uniform waste segregation and disposal system throughout the State.
- g. **Shopkeepers/Vendors/Hawkers:** Shop keepers, vendors and hawkers need to be exposed to alternate products, processes that will reduce use of plastics. They should be trained in source segregation, waste reduction tactics etc. This will ease off burden on cluster facilities for solid waste management.
- h. **Government Offices:** Government Offices, especially public offices should be the place of demonstration for model practices of waste handling. Source segregation with color coded bins, composting, resource recovery, green protocol etc. should be practiced in the Government offices and other institutions. Waster dispenser may be placed in all Government Offices to demonstrate and achieved the objectives of Plastic Waste management.
- i. **Data Base:** Local Authorities shall prepare a database of all local agencies providing recycling services, and encourage institutional recycling arrangements by disseminating the database to adjoining rural areas, institutions such as schools, colleges, housing societies, industrial associations, etc.
- j. **Tourists:** Nagaland is a tourist destination, it receives a large number of tourists from different parts of the world. Tourism is also a sensitive industry when it comes to rules and regulations. The Government through the Department of Tourism and with the support of tour operators shall launch a campaign to advertise the salient features about new approach towards safe handling of waste. Technical support of Environment, Forest and Climate Change Department and NGOs shall be sought to propagate the messages. A package of practices for responsible tourism shall be developed along with standard practices for material use, recovery and safe disposal of all waste.

## PART-VI

### 24. INSTITUTIONAL MECHANISM:-

A monitoring system is very important to troubleshoot and streamline the IWM programmes. It also provides for community participation and ownership of the programme.

#### i. State Level Advisory Board (SLAB):

The apex body at the State level shall be the State Level Advisory Board (SLAB) under the chairmanship of the Chief Secretary with Principal Secretary/Secretary, Urban Development Department as Member Secretary will be constituted to oversee/monitor the implementation of the Policy.

#### Members:

- One representatives each not below the rank of Joint Secretary to the Govt. of Nagaland of Environment, Forest & CC/Municipal Affairs/Rural Development/Medical/Agriculture/Labour & Employment/ Industries & Commerce/IT&C/Home/Works & Housing/PHE/ Finance/Planning & Coordination/IPR Departments.
- Director, Urban Development
- HoD, Municipal Affairs
- Member Secretary, Nagaland Pollution Control Board
- One representative from National Institute of Technology, Nagaland
- Three representatives from the Urban Local Bodies by rotation
- Two representatives from reputed NGO or civil society working for the Waste Pickers or informal recycler or solid waste management
- One representative from Waste Recycling Industry
- Two Subject Experts

#### ii. State Level Executive Committee:

A Committee chaired by a Principal Secretary/Secretary, Urban Development Department with Director, Urban Development as Vice Chairman and Member Secretary, NPCB as Member Secretary may be formed with the following members to provide executive and technical support in implementing Integrated Waste Management Policy in the State.

#### Members:

- Heads of Department of Environment, Forest & CC/Municipal Affairs/Rural Development/Medical/Agriculture/Labour & Employment/ Industries & Commerce/IT&C/Works & Housing/PHE/IPR Departments.
- Technical experts on composting/biomethanation/recycling & plastics/ Material handling and Operations/Geology & Environmental Science
- Representatives of NGO & Civil Society Organisation who are engaged in issues related to waste and or environment
- Any co-opted member (if required)

**Functions:**

- The Committee shall review, appraise technical proposals & DPRs.
- The Committee shall inspect and recommend the Waste Management Service Providers/Environment Service Groups for approval from prescribed authority.
- The Committee shall recommend list of approved technology for household composting and Hi-tech bio methanation units to SLAB for approval.
- The Committee shall suggest improvements in the waste management system established.
- The Committee shall meet at least once in three months.

iii. **District Level Monitoring Committee:**

A Committee chaired by Deputy Commissioner with District Urban Development Officer as Member Secretary of concerned district may be formed with following representatives as members for periodical evaluation & monitoring at the District level.

**Members:**

- Executive Officer/Administrator of ULB(s)
- District Officers from Environment, Forest & CC/Rural Development/ Medical/Agriculture/Labour & Employment/Industries & Commerce/ IT&C/PWD/PHE/IPR Departments.
- NGOs & Civil Society Organisations
- Technical Subject Experts
- Any co-opted member (if required)

**Functions:**

- The Committee shall review the participation of public in utilising facilities commissioned by all ULBs/Villages.
- The Committee shall initiate suitable campaign to increase awareness among the public to urge them to compost & to segregate.
- The Committee shall communicate difficulties faced by current system in accessing/using available infrastructure to the SLAB.
- The Committee shall recommend measures for improving the existing system from their previous Experience/ learning's to SLAB.
- The Committee shall recommend capacity building exercises for executives and staff involved in waste management to improve system efficiency.
- The Committee shall submit Annual Report to the SLAB on or before 30<sup>th</sup> day of April every year.
- The Committee shall meet once in 3 months.

iv. **ULB/Block Level Implementing Committees:**

- a. **ULB Level:** A Committee chaired by head of Municipality with representatives from Ward level Committees, teaching community, youth clubs, Representatives from Business community (Shopkeepers, Hoteliers, Traders, and Workshop owners), Representatives from house owners and residents etc. invited Experts and NGO representatives shall be formed.
- b. **Block Level:** A Committee chaired by Block Development Officer with all representatives from Village/Khel level Council, teaching community, youth clubs, Representatives from Business community (Shopkeepers, Hoteliers, Traders, and Workshop owners), Representatives from house owners and residents etc. invited Experts and NGO representatives

**Functions of ULB/Block Level Committees under their respective jurisdiction:**

The Committees shall ensure implementation of the Policy in their respective jurisdiction (ULBs/Villages) in addition to:

- Review of the participation of public in utilising facilities. Ward/Khel representative shall communicate situation in each of the wards/villages.
- initiate suitable campaign to increase awareness among the public to urge them to compost & to segregate
- Communicate difficulties faced by current system in accessing / using infrastructure.
- Recommend measures for improving the existing system from their previous experience/learning to the Nodal department.
- Recommend additional infrastructure as per demand to handle waste generated in the city
- Recommend and conduct training for staff who are engaged in waste management
- The Committee shall meet once in two months

## ANNEXURE-I

## Types of Aerobic Composting methods available for processing wet waste

Sl. No.	Name Of The Technology	Suitability			
		Up To 10 Households	11 – 300 Households; Medium Sized Offices, Medium Hotels, Resorts, Medium Schools, Canteens, Marriage Halls	301 – 1000 Households; Large Offices, Large Hotels, Large Schools	Decentralized Plants For Above 1000 Households Operated By ULBs/ Institutions/ Outsourced Agencies
1	Pit Composting	√	×	×	×
2	Pot Composting	√	×	×	×
3	Tri Pot Composting	√	×	×	×
4	Bio Composter	√	×	×	×
5	Ring Composting	√	×	×	×
6	Kitchen Bin Composting	√	×	×	×
7	Ecopot	√	×	×	×
8	Vermi Composting	×	√	×	×
9	Aerobic Bin Composting	×	√	×	×
10	Organic Waste Composting Machines	×	√	√	×
11	Large Scale Composting Pits	×	×	√	×
12	Windrow Composting	×	×	×	√

## ANNEXURE-II

## Criteria for Identifying Suitable Land for Sanitary Landfill Sites:

Sl. No	Place	Minimum Siting Distance
1	Coastal regulation, wetland, critical habitat areas, sensitive eco-fragile areas, and flood plains as recorded for the last 100 years	Sanitary landfill site not permitted within these identified areas
2	Rivers	100 meters (m) away from flood plain
3	Ponds, lakes, water bodies	200 m
4	Non-meandering water channel (Canal, drainage, etc.,)	30 m
5	Highway or railway line, water supply wells	500 m from center line
6	Habitation	All landfill facilities; 500 m
7	Earthquake zone	500 m from fault line fracture
8	Flood prone area	Sanitary landfill site is not permitted
9	Water table (highest level)	The bottom liner of the landfill should be above 2 m from the highest water table
10	Airport	20 kms



### ANNEXURE-III

#### Criteria for Site Selection for Storage and Processing or Recycling Facilities for Construction and Demolition Waste

- i. The processing or recycling shall be large enough to last for 20-25 years (project based on-site recycling facilities).
- ii. The processing or recycling site shall be away from habitation clusters, forest areas, water bodies, monuments, National Parks, Wetlands and places of important cultural, historical or religious interest.
- iii. A buffer zone of no development shall be maintained around solid waste processing and disposal facility, exceeding five Tonnes per day of installed capacity. This will be maintained within the total area of the solid waste processing and disposal facility. The buffer zone shall be prescribed on case to case basis by the local authority in consultation with concerned State Pollution Control Board.
- iv. Processing or recycling site shall be fenced or hedged and provided with proper gate to monitor incoming vehicles or other modes of transportation.
- v. The approach and or internal roads shall be concreted or paved so as to avoid generation of dust particles due to vehicular movement and shall be so designed to ensure free movement of vehicles and other machinery.
- vi. Provisions of Weigh Bridge to measure quantity of waste brought at landfill site, fire protection equipment and other facilities as may be required shall be provided.
- vii. Work Zone air quality at the Processing or Recycling site and ambient air quality at the vicinity shall be monitored.
- viii. A vegetative boundary shall be made around Processing or Recycling plant or site to strengthen the buffer zone.

ANNEXURE-IV

DIAGRAMMATIC REPRESENTATION ON DIFFERENT ZONES FOR WASTE MANAGEMENT DUMPING SITE

