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**കേരള ഗസറ്റ്**  
**KERALA GAZETTE**

**അസാധാരണം**  
**EXTRAORDINARY**

**ആധികാരികമായി പ്രസിദ്ധപ്പെടുത്തുന്നത്**  
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GOVERNMENT OF KERALA

**Abstract**

LOCAL SELF GOVERNMENT DEPARTMENT—STATE POLICY ON SOLID WASTE  
MANAGEMENT IN TERMS OF RULE 14 AND 15 OF SOLID WASTE  
MANAGEMENT RULES, 2016—NOTIFIED—ORDERS ISSUED

LOCAL SELF GOVERNMENT (DC) DEPARTMENT

**G O. (P) No. 65/2018/LSGD.**

**Dated, Thiruvananthapuram, 13th September, 2018.**

**ORDER**

The Solid Waste Management Rule, 2016 postulate preparation of a state policy and solid waste management strategy for the State or the Union Territory in consultation with stakeholders.

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Government are pleased to notify the State Policy on Solid Waste Management in terms of Rule 11 and 15 of Solid Waste Management Rules, 2016, appended to this order.

By order of the Governor,

TOM JOSE,  
*Chief Secretary.*

To

The Member Secretary, Central Pollution Control Board (with C. L.).  
The Joint Secretary to Govt. of India, Ministry of Environment, Forest and Climate Change, New Delhi (with C. L.).  
The Member Secretary, Kerala State Pollution Control Board.  
The Director of Urban Affairs, Thiruvananthapuram.  
The Director of Panchayat, Thiruvananthapuram.  
The Commissioner for Rural Development.  
The Advocate General (with C. L.).  
The Law Officer, Office of Resident Commissioner, Law Wing, Travancore Palace, Kasthurba Gandhi Marg, New Delhi (with C. L.).  
All District Collectors.  
Secretaries of all Corporations and Municipalities (through Director of Urban Affairs).  
Secretaries of all Grama Panchayat (through Director of Panchayat).  
The Executive Director, Suchitwa Mission, Thiruvananthapuram.  
The Executive Director, Information Kerala Mission.

The Principal Accountant General (Audit),(A&E)/(LBA&A), Kerala,Thiruvananthapuram.  
Environment (B) Department.  
Industries Department.  
Forest and Wild Life Department.  
The Executive Director, Information Kerala Mission, Thiruvananthapuram.  
The Director, I&PRD/Web&New Media, Thiruvananthapuram (For publishing the website of Government).  
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Copy to:

The PS to Chief Minister.  
PS to Minister (LSGD).  
Special Secretary to Chief Secretary.  
PA to Additional Chief Secretary (LSGD).  
PA to Secretary, LSG(Rural) Dept.  
CA to Special Secretary, LSGD.

## KERALA STATE POLICY ON SOLID WASTE MANAGEMENT

### BACKGROUND

Kerala is known to be God's Own Country as it succors a clean environment owing to its terrain gradient, drainage density, frequent rain events, runoff characteristics, perennial streams and rivers etc. Added to this is the multitudes of lively micro ecosystems gifted with wet valleys juxtaposed with dry hilltops decked with dense canopy of vegetation, hence, possess high environmental assimilative capacity. Further, the state has been taking concerted effort for achieving total sanitation, hygiene and health outcomes. Kerala was one of the first states in the country to do away with the dehumanizing practice of manual scavenging as a culmination of people's movement for basic human dignity. Further, Kerala is one among the first open defecation free (ODF) states in the country. Though the primary goal of sanitation is achieved and health outcomes improved, there are various secondary issues affecting the hygiene of the state. It includes increasing discharge of solid and liquid waste, cross-contamination of septage with groundwater, pollutant release from industries, vehicular traffic beyond the carrying capacity of roads, indiscriminate application of chemical fertilizers and pesticides etc. imposing serious restraints on the environmental cleanliness of the state. Irrespective of various rigorous actions by the State and Local Governments in terms of handholding support to waste generators and managers, promotion of appropriate technologies, awareness building and behavioural change initiatives, the issues with respect to waste management is persisting.

Going by the definition of waste as any unwanted or unusable material, substances, or by-products at a particular place and time, major waste streams include municipal waste (food waste and other domestic wastes), agricultural waste, electronic waste, biomedical waste and industrial waste. A comprehensive sectoral status study on solid waste management sponsored by the 'Water and Sanitation Project-South Asia' of the World Bank estimated the per capita MSW generation as 400 gpd in major urban centres, 300 gpd in municipalities and 200 gpd in rural areas. Detailed sampling studies in major urban centres of the state indicated that the waste generation is higher by almost 17.5% than the general estimates. Accordingly, the total MSW generation in Kerala is 3.7 Million tons annually, which includes 1415 tpd (tons per day) of municipal solid waste generated by six City Corporations, 4523 tpd by 87 Municipalities and 4106 tpd by 941 Gram Panchayaths.

In addition, Kerala generates about 38100 tpa of slaughter waste from 15680 units that include 182 slaughter houses, 8707 poultry stalls, 1481 poultry and meat stalls, 2632 butcher & meat shops, 2482 meat stalls and 196 miscellaneous stalls handling meat and poultry. Out of this, 809 units have no facility for waste disposal, 490 disposes to open pit, 4104 to closed pit. 8700 units reported that they have other type of waste management facility which means that they are also to be considered as units without any waste disposal facilities. Only 666 units work with treatment plants for waste disposal. Kerala has the highest number (about 27%) of health care institutions in India and the total bed strength of hospitals in Kerala is 1,13,530. It is estimated that about 83000 tpa of waste is generated in the hospitals of the state of which 15% is infectious or toxic. Kerala also generates industrial hazardous waste of the order of 71058 tpa from 542 industrial units. A Common Treatment, Storage and Disposal Facilities (TSDF) is now established at Ernakulam and 17 units have their own TSDF for managing industrial hazardous waste. There are also incineration facilities for 1750 tpa of industrial hazardous waste. There are no specific estimates on the generation of e-waste in Kerala, though it is a major waste stream in Kerala. Kerala does not have a e-waste disposal plant and the waste mostly goes into unorganized market for crude dismantling, recovery and reuse. Since 2014-15, 1198 ton of e-waste has been collected by the Clean Kerala Company and handed over to enlisted e-waste dismantler/recycler agencies.

The brand name of tourism in Kerala 'God's Own Country' is an implicit invitation to enjoy the boundless natural beauty of the state. Accumulation of waste at places, roads and public places with waste litters, polluted water bodies, stagnant contaminants, eutrophication of lakes and water ways etc. adversely affects the aesthetic appearance and hygienic environment. The 'low mortality and high morbidity syndrome' given the higher level of literacy, better healthcare infrastructure and higher utilization of health care services is pointing towards issues in environmental pollution, one of the reasons being inadequate management of waste.

## VISION

The policy envisages a healthy, prosperous and resource-efficient society in which waste are, reduced, reused, recycled and prevented wherever feasible and beneficial and disposed off in an environmentally safe manner.

## RATIONALE

Compilation of various studies indicates that by weight, 49% of the municipal solid waste is generated in households, 36% in institutions and 15% in waysides and public places. By weight, 77% of the waste generated is putrescible in nature, 18% is non-biodegradable and the rest is inert. The non-biodegradable waste includes paper (6%), plastics (4%), metals (1%), glass (1%), rubber & leather (2%), domestic hazardous materials (0.4%), inerts (5%) etc. The composition of the place and type of waste generation varies with respect to the level of urbanization and awareness. The moisture content of the waste varies from 45% to 79% depending on the season and time of collection. The calorific value of solid waste varies from 923 to 1816 Kcal/Kg depending on the place of generation and composition. As per law, there is prohibition for throwing, burning and burying of solid waste. The law also necessitates every generator to segregate the waste generated and process, treat and dispose off the biodegradable waste through composting or bio-methanation within the premises as far as possible. The principle of sustainability necessitates the citizen to imbibe the habit of reduction, reuse and recycle of materials for minimizing waste. It is predicted that the Asian countries will experience largest increase in food waste production by 44% i.e., from 278 million to 416 million tons between 2005 to 2025, thereby the CH<sub>4</sub> emission will enhance from 34 million to 48 million tons, which will impact the climate change scenario, if not handled appropriately. Similarly, there are different aspects to be considered for managing the waste generated at places scientifically for avoiding health and environmental implications. It requires a policy framework for evolving an efficient system and guiding the stakeholders appropriately. The preparation of a state policy is a mandatory requirement as per the Solid Waste Management Rules, 2016. The policy should also be consistent with the national policy on solid waste management, national urban sanitation policy and the relevant rules.

### GUIDING PRINCIPLE

The principles based on which the policy has been drafted includes the following:

1. Waste will be considered as a resource
2. 3R principle of Reduce, Reuse and Recycle will be embraced
3. Polluter pays principle will be adopted
4. Responsibility of the citizen to the waste he generates and right of the society to have hygienic environment will be protected.

### OBJECTIVES

The overall goal of this policy is to transform Kerala to a garbage-free state and thereby an environmentally healthy state. The specific goals are to:

1. Generate awareness about the responsibility of citizen, institutions and community to manage the waste generated by them
2. Bring about and sustain behavioural change to segregate waste at source based on its characteristics
3. Create awareness about the linkage of waste management with public health and environmental cleanliness
4. Promote adoption of appropriate and state of the art technologies and practices for processing and managing putrescible waste at source and non-putrescible waste centrally
5. Ensure provision of community waste management facilities for those households and institutions having space, time and financial constraints to have individual facilities
6. Maximise the possibility of reduction, reuse and recycling the garbage generated
7. Encourage promotion of entrepreneurship in various aspects linked to waste management

8. Mainstream planning and implementing measures related to waste management in all sectors as a cross-cutting issue
9. Strengthen the urban and rural local governments as well as public and private institutions and community to accord priority to waste management actions including planning, implementation and operation & maintenance management of waste management installations
10. Ensure environmental, social and safety linked safeguards for those involved in waste handling.
11. Facilitate development and appropriate deployment of human resources.

### STRATEGY

In order to reduce the harmful health and environmental impacts of waste, it is important to adopt appropriate strategies for minimizing generation of waste, promote reuse and recycling of waste and ensure zero-waste on ground. Accordingly, the following strategy shall be adopted.

1. Mandatory segregation of waste at source based on primary characteristics.
2. Aerobic or anaerobic composting of biodegradable waste at source (household & institutions) as far as possible.
3. Ensure decentralized community facilities for biodegradable waste that overflows from the source.
4. Establish door to door collection of non-biodegradable waste from all sources for bulk handling and ensure their reuse and recycling to the maximum extent.
5. Evolve a procedure for handling domestic hazardous waste and promote its implementation.
6. Promote provision of storage bins for dumping wet and dry waste by all vendors and institutions including shops, retail joints, super markets, hotels, hospitals, railway and bus stations for the use of public.

7. Enforce captive waste management systems for the bulk waste generators.
8. Promote modern centralized waste processing facilities in major cities using state of the art technologies.
9. Make use of the enabling environment created under the Haritha Keralam Mission to integrate the use of treated waste products, enhance organic agriculture and upkeep of fragile ecosystems.
10. Develop regional sanitary landfill facility to dispose of ultimately unusable materials.
11. Prevent or discourage single use and throw away materials.
12. Hygienic and aesthetic upkeep of public places by ensuring regular sweeping, cleaning and beautification.
13. Enable the reuse, recycle and value addition of construction and demolition waste.
14. Rationalize and strengthen the enforcement of rules and penalty provisions.
15. Promote automated grievance redressal system for citizen.
16. Undertake appropriate Information, Education and Communication campaign.
17. Coordinate appropriate capacity building programmes for stakeholders.
18. Develop appropriate community monitoring system for ensuring continual improvement in waste management.
19. Network with academic and research & development institutions for updation of technologies and application protocols.
20. Enlarge the service provider domain through encouraging start-ups among professionals and skilled youths.

## LEGISLATIVE BACKGROUND

Consequent to judicial intervention by the Hon'ble Supreme Court of India, a comprehensive report on the management of municipal solid waste was prepared by an Expert Committee in March 1999. Subsequently, the Ministry of Environment and Forest, Government of India notified Municipal Solid Waste (Management and Handling) Rules 2000. It emphasised segregated collection, transportation, treatment and disposal of municipal solid waste by all the Local Self Government Institutions (LSGIs). In 2016, the Rule was superseded by Solid Waste Management Rules, 2016 with emphasis on the responsibilities of waste generators in addition to various other pertinent aspects.

### **Waste Management and Constitutional Mandate**

Under the rule of law practiced in our country, constitutional mandate for environment protection is very relevant. According to the directive principles of the Constitution, the State shall endeavour to protect and improve the environment and to safeguard the forest and wild life of the country (Article 48 A of the Constitution of India). The protection of existing environment involves improved waste management. In this regard, the central government has been entrusted with country wide functions by the law, whereas, provincial or local functions are entrusted with the State administration. The State legislature can prepare laws and State executive can frame policies which are consistent with the laws and policies prepared and enforced by the Central Rules, by laws, guidelines, orders, resolutions, regulations plans, programmes etc. These can be formulated, recognized, adopted, enforced, implemented and maintained in order to ensure a healthy and pure environment.

Apart from this, it is the duty of the State under the said constitutional mandate to raise the level of the standard of living and improve public health (Article 47 of the Constitution of India). Waste Management in modern period is an essential endeavour to protect and improve human environment and ecosystem. Here the term 'State' shall be committed as per its definition given by the Constitution itself and reiterated by the Supreme Court on several occasions. State is an

inclusive term denoting union legislature and executive, state legislature and executive, the judiciary, local government authorities, and other authorities, agencies and instrumentalities of the State (Article 12 of the Constitution of India). Hence it is part of the constitutional function of the State government and local government institutions to take any kind of measures expedient to protect and improve the existing environment. Waste Management initiatives shall also be considered in this respect.

### **Constitutional Mandate of Local Governments**

The 73rd and 74th Constitutional amendments entrusted the panchayats and urban local bodies to prepare plans for economic development and social justice and their implementation under relevant schedules (Article 243 G and 243 W of the Constitution of India). Accordingly, the local government institutions are mandated with many responsibilities, which include :

- ◆ Land consolidation, soil conservation and land use
- ◆ Watershed Management and Development
- ◆ Social Forestry and Farm Forestry
- ◆ Health, Sanitation and Social Welfare
- ◆ Maintenance of community assets
- ◆ Protection of Environment and promotion of ecological aspects
- ◆ Solid Waste Management
- ◆ Public Amenities etc. (Schedule 11,12 of the Constitution of India).

The State Government is also entrusted to perform corresponding functions in public health and sanitation, water quality management and drinking water supply drainage, etc. [List (II) of the Schedule 7 of the Constitution of India]. Though the subject matter of environment protection is not specifically mentioned in any list in the Constitution, prevention of cruelty against animals, forest conservation, protection of wild animals and birds, prevention of contagious diseases etc. are specified in the Concurrent List by which the State and Central

Governments are equally responsible for environmental protection and allied matters [List (III) of the Schedule 7 of the Constitution of India]. In order to subserve their responsibilities and functions the rural and urban local bodies shall be empowered, capacitated and lobbied for better management of environment through proper dealing of degradable and non-degradable waste material.

The existing legislations with respect to local governance empowers the Panchayat and Municipal authorities to deal with waste management within their geographical limits. Essentially the law incorporates the policy of "Waste is wealth" within their provisions (Section 219 E of the Kerala Panchayat Raj Act, 1994 and Section 330 of the Kerala Municipalities Act, 1994). Mainly the following responsibilities and functions are entrusted to local government institutions.

- Removal of rubbish, solid wastes and fills
- Impose duty of owners, occupiers for collection and disposal of rubbish and solid waste
- Segregation, collection, storage, disposal of solid waste
- Removal and management of accumulated solid waste
- Prohibition of improper disposal of waste in public and private places
- Prohibition against causing nuisance
- Water Supply and Sewerage
- Power to upkeep sanitary premises
- Development, Welfare, Regulations and Administrative functions with respect to Waste Management (Chapter XX Public Safety Convenience and Health of the Kerala Panchayat Raj Act, 1994 and Chapter XVI, of the Kerala Municipalities Act, 1994).

The local governments will be persuaded adequately to deal with these functions through the policy measures and appropriate platform of actions.

## Environment Protection and Waste Management

Under the federal system of government, from the point of view of Environment Protection, the powers are shared among the Union, State and Local governments. In the present administrative framework, the lower tiers of government can perform such functions with consistency to the provisions of Central Acts; policies and directions and decisions of the higher judicial bodies. The states and local authorities can extend the ambit of these legal measures within the spirit of central laws. They shall foster respect for international law and inter country treaty obligations in connections with environmental matters.

Every citizen is duty-bound to protect and improve the natural environment including forests, lakes, rivers and wild life (Article 51 A(g), Constitution of India). Under this fundamental duty the citizen shall have the responsibility to reduce, reuse, recycle, restrict and regulate waste in different types. The fundamental human rights to live with human dignity is impossible without clean and healthy environment ensuring clean air, water, soil and life along with livelihood.

The Environment (Protection) Act, 1986 denotes the powers vested with the Central government for taking measures to protect and improve environment, delegation of powers and powers to issue directions for planning, laying down standards, impose restrictions, laying down procedures, sponsoring research studies, prepare manuals, codes, guidelines etc. [Sections 3, 4, 5 of the Environment (Protection) Act, 1986]. The Act also empowers the Central government to make Rules [Section 25 of the Environment (Protection) Act, 1986]. Accordingly, the following Rules, pertaining to solid waste management have been brought out.

- The Solid Waste Management Rules, 2016
- The Plastic Waste Management Rules, 2016
- The Recycled Plastics Manufacture and Usage Rules, 1999
- The E-Waste (Management) Rules, 2016
- The Construction and Demolition Waste Management Rules, 2016.

## ROLES AND RESPONSIBILITIES OF STAKEHOLDERS

The stakeholders who are assigned with different roles and responsibilities will be facilitated to comply with various provisions in the Constitution, Acts and Rules pertaining to environmental upkeep, particularly with respect to waste management. The stakeholders within the state domain will be enabled to fulfil their duties as specified in the Solid Waste Management Rules, 2016. It includes the generator of solid waste, Secretary-in-charge of the Local Self Government Department, the District Collector and Secretaries of various Local Government Institutions.

### Waste generators

1. Every waste generator shall:

- segregate and store the waste generated by them in three separate streams namely bio-degradable, non bio-degradable and domestic hazardous wastes in suitable bins;
- process, treat and dispose off the biodegradable waste through composting or bio-methanation within the premises as far as possible;
- handover the residual biodegradable waste that could not be processed in the premises and the non-biodegradable and domestic hazardous waste to the Haritha Karma Sena (Green Task Force) formed and engaged by the local government or other authorised waste pickers or waste collectors as per the direction or notification by the local governments from time to time;
- wrap securely the used sanitary waste like diapers, sanitary pads etc., in the pouches provided by the manufacturers or brand owners of these products or in a suitable wrapping material as instructed by the local authorities and shall place the same in the bin meant for dry waste or non-bio-degradable waste;
- compost the horticulture and garden waste within the premises as far as possible and handover the spill over waste to authorized collection agencies for handling it in the common facility established by the local government;
- store separately the construction and demolition waste, as and when generated, within the premises and inform the local government for its disposal as per Construction and Demolition Waste Management Rules, 2016;



2. No waste generator shall throw, burn or bury the solid waste generated by him, on streets, open public spaces, within and outside his premises or in drain or water bodies;

3. All waste generators shall pay the user fee for solid waste management, as specified in the bye-laws of the local bodies;

4. No person shall organise an event or gathering of more than one hundred persons at any unlicensed place without intimating the local body, at least three working days in advance and such person or the organiser of such event shall ensure segregation of waste at source and handing over of segregated waste to waste collector or agency as specified by the local body;

5. Every street vendor shall keep suitable containers for storage of biodegradable and non-biodegradable waste generated during the course of his activity and hand over them in segregated manner to the Haritha Karma Sena (Green Task Force) or other authorised waste pickers or waste collectors as per the direction or notification by the local governments from time to time;

6. Every shops, retail joints, supermarkets, institutions including railway stations, bus stations etc. shall keep suitable containers for storage of biodegradable and non-biodegradable waste generated during the activities there and hand over them in a segregated manner to the Haritha Karma Sena (Green Task Force) formed and engaged by the local government or other authorised waste pickers or waste collectors as per the direction or notification by the local governments from time to time;

7. All resident welfare and market associations shall ensure segregation of waste at source by the generators, facilitate collection of segregated waste in separate streams, hand over biodegradable waste for composting or bio-methanation within the premises as far as possible by themselves or service providers and recyclable material to authorised waste pickers or recyclers. The residual waste shall be given to the waste collectors or agency as directed by the local body;

8. All gated communities and institutions with more than 5,000 m<sup>2</sup> area shall ensure segregation of waste at source by the generators, facilitate collection of segregated waste in separate streams, hand over biodegradable waste for composting or bio-methanation within the premises as far as possible by themselves or the service providers and recyclable material to authorised waste pickers or recyclers. The residual waste shall be given to the waste collectors or agency as directed by the local body;

9. All hotels and restaurants shall ensure segregation of waste at source by the generators, facilitate collection of segregated waste in separate streams, hand over biodegradable waste for composting or bio-methanation within the premises as far as possible by themselves or the service providers and recyclable material to authorised waste pickers or recyclers. The residual waste shall be given to the waste collectors or agency as directed by the local body.

#### **State Government**

1. Whenever an Urban Local Body fails in fulfilling its mandatory function of solid waste management, State Government will take over this function and establish appropriate modern Solid Waste Management Plants. This will be operationalized by facilitating investment to establish state of the art, world class processing plants by attracting private investments. State Government will identify in collaboration with various Departments like Industries, Power, Water Resources and Agencies like State Pollution Control Board suitable land for this purpose.

2. In such cases State Government will recover appropriate amounts from ULBs (say the average expenditure incurred for waste management by the ULB annually) from the resources of the Urban Local Body.

3. State Government will engage appropriate agencies for collection and safe transport of solid waste to the processing plants.

4. State Government will arrange for providing Viability Gap Funding (VGF) to such solid waste management plants.

5. State will facilitate for sanitary land fill for the final reject in a scientific and safe manner.
6. State will identify suitable lands for sanitary land fill.
7. State will prepare separate rules for preventing the pollution of water bodies with effective regulatory and control mechanism.
8. Suitable bye-laws will be prepared and published with appropriate penalties including fines.
9. State Government shall facilitate decentralized Sewerage Treatment Plants (STP) with modern scientific and advanced technology.
10. Encourage and motivate the food waste processing at hotels, restaurant, marriage halls and other eating joints.
11. State will create necessary environmental engineering staff in ULBs with more than 50000 population.
12. A network of CCTV cameras will be established with control and command system for effective monitoring of waste management on major streets and public places.
13. The major water bodies of the State shall be notified and appropriate bye-laws will be prepared and implemented to prevent pollution of the water bodies.
14. State Government will take proper steps to ensure that appropriate modern solid waste management plants are established in all Municipal Corporations, all District Head Quarters, Urban Local Bodies, all local bodies with 50000 or more population, LSGIs with important tourism destinations and pilgrimage centres.
15. State Government will create rules to make throwing of solid waste to water bodies and discharging of untreated liquid waste to water bodies as punishable offence under Kerala Police Act.
16. State Government will consider creating an Environmental Police exclusively for the purpose of environmental up keep and waste management in the State.
17. Discharging untreated and unsafe water to water bodies will be made non bailable offence with more severe punishment and appropriate amendments will be made in the Rules for this purpose.

### **Secretary, Local Self Government Department**

The Secretary of the Local Self Government Department through the Director of Urban Affairs and Director of Panchayats and with the help of Suchitwa Mission, the Technical Support Group shall:

1. prepare the solid waste management strategy for the state in consultation with the stakeholders including representatives of local governments and formal and informal institutions and groups working in the field of waste management consistent with the rules and policy on solid waste management;
2. lay emphasis on waste reduction, reuse, recycling, recovery and optimum utilisation of various components of solid waste to ensure minimisation of waste going to the landfill and minimise impact of solid waste on human health and environment;
3. recognize the primary role played by the informal sector of waste pickers, waste collectors and recycling industry in reducing waste and provide broad guidelines regarding integration of waste picker or informal waste collectors in the waste management system;
4. enable implementation of policy statements and the provisions of the rules by all local governments;
5. facilitate preparation of master plan for every local body through the town and country planning department for setting up of solid waste processing and disposal facilities except for the local bodies who are members of common waste processing facility or regional sanitary landfill for a group of cities;
6. ensure identification and allocation of suitable land to the local bodies for setting up of processing and disposal facilities for solid wastes and incorporate them in the master plans (land use plan) of the State or as the case may be, city corporations, municipalities and panchayats through district planning committees or town and country planning department;

7. advise the local governments and direct the town planning department to ensure that a separate space for segregation, storage, decentralised processing of solid waste is demarcated in the development plan for group housing or commercial, institutional or any other non-residential complex exceeding 200 dwelling or having a plot area exceeding 5,000 m<sup>2</sup>;

8. direct the developers of Special Economic Zone, Industrial Estate, Industrial Park to earmark at least five per cent of the total area of the plot or minimum five plots or sheds for recovery and recycling facility;

9. facilitate establishment of common regional sanitary land fill for a group of cities, towns and panchayats falling within a distance of 50 km. (or more) from the regional facility on a cost sharing basis and ensure professional management of such sanitary landfills;

10. arrange for capacity building of local governments in various aspects of managing solid waste;

11. notify buffer zone for the solid waste processing and disposal facilities of more than five tons per day in consultation with the State Pollution Control Board;

12. start a scheme on registration of waste pickers and waste dealers; and

13. facilitate allocation of adequate financial provisions to the local governments and Suchitwa Mission for building efficient and sustainable solid waste management systems

#### **District Collector**

The District Collector shall:

1. facilitate identification and allocation of suitable land for setting up solid waste processing and disposal facilities to local governments in his district in close coordination with the Secretary of Local Self Government Department;

2. review the performance of local governments, at least once in a quarter on waste segregation, processing, treatment and disposal and take corrective measures in consultation with the Director of Urban Affairs, Director of Panchayats and Secretary, Local Self Government Department.

#### **Local Government Authorities**

The local government authorities shall:

1. prepare a master plan for solid waste management to achieve zero-waste on ground as per the state policy and strategy on solid waste management within six months from the date of notification of the state policy and submit a copy to Suchitwa Mission, the agency authorised by the State Government;

2. ensure segregation of waste at source and store biodegradable wastes in green coloured bins, recyclable wastes in white coloured bins and other wastes in black coloured bins;

3. ensure processing, treating and disposing off biodegradable waste at household and institutions through composting and bio-methanation as far as possible;

4. ensure processing, treatment and disposal off biodegradable waste from public places as well as households and institutions which could not have captive plants using decentralized community level plants at markets, way-side locations etc. through composting and bio-methanation;

5. arrange for door to door collection of non-biodegradable and domestic hazardous waste from all households including slums, informal settlements and housing complexes, institutional and other non residential premises, retail joints, commercial spots and commercial complexes, etc. through Haritha Karma Sena or such other arrangements;

6. establish Material Collection Facilities (MCF) for secondary collection and forwarding of non-biodegradable and domestic hazardous waste;

7. establish Resource Recovery Facilities (RRF) in each urban region of 20 km.<sup>2</sup> area or in a cluster of panchayats (say one in each Block Panchayat) for sorting and facilitating reuse and recycling of waste materials including e-waste and domestic hazardous waste;

8. establish a system to recognise organisations of waste pickers or informal waste collectors and promote and establish a system for integration of these authorised waste-pickers and waste collectors to facilitate their participation in solid waste management including door to door collection of waste;

9. facilitate formation of Self Help Groups, provide identity cards and thereafter encourage integration in solid waste management including door to door collection of waste;

10. frame bye-laws incorporating the provisions of the rules, policy guidelines and strategy aspects and ensure timely implementation. It shall also include the aspects of Extended Producers Responsibility (EPR), Polluter Pays Principle (PPP) etc.;

11. prescribe from time to time user fee as deemed appropriate and collect the fee from the waste generators on its own or through Haritha Karma Sena or such other authorised agency;

12. direct waste generators not to litter, throw, burn or bury waste on streets, open public spaces, drains, water bodies;

13. ensure safe storage and transportation of the domestic hazardous waste to the hazardous waste disposal facility or as directed by the State Pollution Control Board;

14. direct street sweepers not to burn tree leaves collected from street sweeping and store them separately and hand over to the community composting facility;

15. organize capacity building programme through the Suchitwa Mission for training different stakeholders in solid waste management;

16. establish a system of sweeping of streets, lanes and by-lanes daily, or on alternate days or twice a week depending on the density of population, commercial activity and local situation and forward the collected waste to either community composting facility or RRF;

17. collect horticulture, parks and garden waste separately and process and treat them within the premises, as far as possible;

18. make available the compost generated in the household, institution and community level plants for agricultural practices through the agricultural office attached to the local government and facilitate the phasing out of chemical fertilizers;

19. transport construction and demolition waste as per the provisions of the Construction and Demolition Waste Management Rules, 2016;

20. facilitate construction, operation and maintenance of solid waste processing facilities and associated infrastructure on their own or with private sector participation or through any agency for optimum utilisation of various components of solid waste adopting suitable technology such as bio-methanation, microbial composting, vermi-composting, anaerobic digestion or any other appropriate processing for bio-stabilisation of biodegradable wastes or waste to energy processes including refused derived fuel for combustible fraction of waste or supply as feedstock to solid waste based power plants or cement kilns;

21. give reference to decentralised processing facilities to minimize transportation cost and environmental impacts and adhere to the guidelines issued by the Ministry of Urban Development from time to time and standards prescribed by the Central Pollution Control Board while setting up solid waste processing facilities.

22. collaborate with other agency or undertake on their own for setting up regional landfill facility and arranging its operation and maintenance for disposal of residual wastes;

23. make adequate provision of funds for capital investments as well as operation and maintenance of solid waste management services in the annual budget ensuring that funds for discretionary functions of the local body have been allocated only after meeting the requirement of necessary funds for solid waste management and other obligatory functions of the local body;

24. obtain authorisation from the State Pollution Control Board for setting up waste processing, treatment or disposal facility, if the volume of waste is exceeding five metric tones per day including sanitary landfills;

25. prepare and submit annual report on or before the 30th April of the succeeding year to the Suchitwa Mission on behalf of Director, Urban Affairs, Director, Panchayats and Secretary, Local Self Government Department;

26. submit the annual report to the State Pollution Control Board by the 31st May of every year;

27. ensure capacity building to all stakeholders including contract workers and supervisors involved in various aspects of solid waste management;

28. ensure that the personal protection equipment including uniform, fluorescent jacket, hand gloves, raincoats, appropriate foot wear and masks are provided to all workers handling solid waste and the same are used by the workforce;

29. ensure that provisions for setting up of facility for collection, segregation and storage of segregated wastes, are incorporated in building plan while granting approval of building plan of a group housing society or market complex;

30. utilize non recyclable waste having calorific value of 1500 K/cal/kg or more for generating energy either or through refuse derived fuel or by giving away as feed stock for preparing refuse derived fuel. High calorific wastes shall be used for co-processing in cement or thermal power plants;

31. frame bye-laws and prescribe criteria for levying of spot fine for persons who litters or fails to comply with the provisions of the rules and delegate powers to officers or local bodies to levy spot fines as per the bye laws framed; and

32. create public awareness through information, education and communication campaign and educate the waste generators on the waste management plan and bye-law for minimizing waste generation, segregation of waste, storage in different bins, reuse of waste to the extent possible, processing and treatment of biodegradable waste using composting or bio-methanation at the source, engaging Haritha Karma Sena or such other facility for door-to-door collection of residual waste and its transfer for reuse or recycling, payment of monthly user fee, safeguards for handling, sanitary waste, domestic hazardous waste, e-waste etc.

33. allow only the non-usable, non-recyclable, non-biodegradable, non-combustible and non-reactive inert waste and pre-processing rejects and residues from waste processing facilities to go to sanitary landfill and make every effort to recycle or reuse the rejects to achieve the desired objective of zero waste going to landfill;

34. ensure scientific capping of open dumpsites as per norms to prevent its environmental impacts;

35. ensure that proper operation and maintenance of waste treatment facilities at various levels take place uninterrupted. The households and institutions shall be responsible for operating and maintaining the treatment systems that they possess and if need be avail the service of Haritha Karma Sena or such other trained groups enlisted by the local governments on payment of stipulated user fee or service charges. The local government shall assume responsibility for operating and maintaining the common waste management facilities either by themselves or by engaging Haritha Karma Sena/accredited agencies/empanelled service providers, following proper procedures.

### Secretary of the Urban Local Body

1. Waste management is being one of the most important regulatory functions of the Urban Local Body (ULB).
2. In ULBs where State Government is not taking over the responsibility of Solid Waste Management, the officer responsible for ensuring proper collection, transportation and management of waste will be the Secretary of the Urban Local Body.
3. He/she shall issue clear set of instructions and proper delegation of responsibilities to his subordinates in various Departments like Health, Engineering, Town Planning and Revenue in the Urban Local Body with regular monitoring and supervision.
4. The Secretary shall prepare and notify LSGIs specific bye-laws for management of solid waste and liquid waste in their areas of jurisdiction.
5. The Secretary shall be responsible for implementing the provisions related to Solid Waste Management Rules, 2016 and Government Orders and Circulars issued from time to time by the State Government.
6. The Secretary shall ensure proper and timely cleaning of streets and public places and ensure collection and transportation of solid waste in such a way that a 'zero waste on ground' (No heaps of waste on public roads and public places) within 6 months.
7. The Secretary shall issue licence to Dangerous and Offensive Trades and Factories (D&O Licence) to new business entities only after ascertaining the facilities for treatment of solid and liquid waste to be generated by such institutions.

### Manufacturers or brand owners of disposable products

All manufacturers or brand owners of disposable products such as tin, glass, plastics packaging, sanitary napkins, diapers etc., or brand owners who introduce such products in the market shall:

1. provide necessary financial assistance to local governments for establishment of waste management system.
2. shall put in place a system to collect back the packaging waste generated due to their production.
3. shall educate the masses for disposal of their products after use without causing environmental damage.
4. shall explore the possibility of using all recyclable materials in sanitary products such as napkin or diapers and shall provide a pouch or wrapper for disposal of each napkin or diapers along with the packet of their sanitary products.

### Industrial units

All industrial units located within one hundred km. from the refused derived fuel and waste to energy plants based on solid waste shall:

1. make arrangements to replace at least five per cent of their fuel requirement by refused derived fuel produced;

The coordination of various agencies including the Pollution Control Board, Environment Management institutions, Planning entities, District Administrations, Local Governments will also be the responsibility of the State. The State shall also promote expert agencies such as Clean Kerala Company that could provide handholding support and scientific services to the Local Governments for achieving cent per cent compliance to the mandatory provisions in solid waste management.

**Director of Urban Affairs (DUA) and Director of Panchayats (DP)**

The DUA and DP shall:

1. monitor the activities taken up by the Local Governments within their ambits and issue advisories and instructions for ensuring effective management of biodegradable, non-biodegradable and domestic hazardous waste as stipulated in Rules and policy guidelines;
2. support Suchitwa Mission to monitor and coordinate the solid waste management activities;
3. provide adequate grants to the Local Governments through the Suchitwa Mission for building efficient waste management systems in addition to the provisions made by the local governments.

**Commissioner for Rural Development(CRD)**

The CRD shall:

1. ensure setting up Resource Recovery Centres for cluster of Panchayats through the Block Panchayats and facilitate collaboration of Grama Panchayats;
2. monitor the activities taken up by the Block Panchayats and issue advisories and instructions for ensuring effective management of non-biodegradable waste.

**Suchitwa Mission (SM)**

The SM as the state level nodal agency and technical support agency shall:

1. provide technical input and support to the local governments for establishing, operating and maintaining efficient and sustainable waste management facility;
2. mobilize and augment additional financial support to local governments for setting up solid waste management facility through centrally sponsored and state sponsored schemes;

3. specify scientific advisory and extend technical and financial assistance for handling and managing special waste such as plastic, domestic-hazardous, bio-medical, slaughter, electrical and electronic, battery and tyre wastes taking into consideration quantity, concentration, physical and chemical characteristics, biological properties through the general principle of reduce, reuse, recycle and recover;

4. facilitate local governments to implement Extended Producer Responsibility for applicable special waste in consultation with the State Pollution Control Board;

5. prepare and disseminate the standards and specifications as well as operation and maintenance protocol for different waste management system/tools;

6. enable planning and preparation of master plan and detailed project reports for solid waste management and assist the local governments by issuing technical sanction;

7. facilitate planning and implementation of solid waste management projects by arranging technical support to the local governments through accredited agencies, service providers, Haritha Sahaya Sthapanam (Green Support Institution), expert agencies etc.;

8. function as the technical support agency for the Haritha Keralam Mission in the sector of waste management;

9. facilitate integration of compost generation from biodegradable waste with organic cultivation at the local government level;

10. assist to prevent waste flow to water bodies and other public spaces for ensuring the upkeep of environment;

11. function as the nodal agency of the government in sanitation and waste management sector and liaison with pertinent state and central agencies for mobilizing technical and financial support;

12. assist the different tiers of government to adopt the strategies put forward in the policy document and achieve the policy objectives;

13. monitor the progress of implementation of solid waste management activities through appropriate Management Information System (MIS) and assist the government for taking corrective measures, wherever required;

14. evaluate the technologies adopted for solid waste management and upgrade them taking into consideration the updated scientific inputs;

15. carry out surveys and studies pertaining to waste management sector and use the information gathered for improvisation of the sector;

16. scout for state of the art technologies and operational guidelines and enable the local governments and support institutions to adapt the feasible ones.

### **Kerala State Pollution Control Board (KSPCB)**

The Kerala State Pollution Control Board shall:

1. enforce all provisions of the Solid Waste Management Rules, 2016 through the local governments in their respective jurisdiction and review its implementation at least twice a year in close co-ordination with the Suchitwa Mission, Directorate of Urban Affairs, Directorate of Panchayats and Secretary, Local Self Government Department;

2. monitor environmental standards with strict adherence to the conditions as specified for waste processing and disposal sites;

3. examine the proposal for authorisation with respect to the requirement of consents under respective enactments and views of agencies like Local Self Government Department, Town and Country Planning Department, District Planning Committee, Airport or Airbase Authority, Ground Water Board/Department, Railways, power distribution companies, highway department and other relevant agencies and issue authorisation within the time limit and stipulating compliance criteria and specifying environmental standards other conditions;

4. synchronise the validity of the authorisation with the validity of consents;

5. suspend or cancel the authorization issued, if the local body or operator of the facility fails to comply with the stipulated conditions after appropriate notification;

6. renew the authorisation provided the operator of the facility has fulfilled all the provisions of the rules, standards or conditions specified in the authorisation, consents or environment clearance;

7. In case of new technologies, where no standards have been prescribed by the Central Pollution Control Board (CPCB), KSPCB shall approach CPCB for getting standards specified;

8. The KSPCB shall monitor periodically the compliance of the standards as prescribed or laid down and treatment technology as approved and the conditions stipulated in the authorisation and the standards specified;

9. The KSPCB shall give directions to local bodies for safe handling and disposal of domestic hazardous waste deposited by the waste generators at hazardous waste deposition facilities;

10. The KSPCB shall regulate inter-state movement of waste.

### **TRAINING AND CAPACITY BUILDING**

It is recognized that there is need to improve the efficiency of various formal and informal institutional systems having stakes in solid waste management across the state. It is understood that capacity development is a long-term process that requires systematic and continuous effort at the state and local government level both from the demand and supply perspective of service delivery. The capacity building shall aim to impart knowledge about the social, environmental and economic aspects of waste management as well as the technological facets. Thereby the key stakeholders will get sensitized about the benefits of waste reduction, segregation and management as well as understand the technological appropriateness for waste handling. The capacity building shall also enable the stakeholders to understand the administrative systems, multidisciplinary and cross-sectoral activities, importance of building sound institutions, promoting good practices, good governance and skilled human resource. There will be continued effort to upgrade the knowledge level of elected representatives at different tiers, state, district, block, municipal and panchayat level officials linked to waste management, employees of formal and informal institutions linked to waste management etc.



Training is an important component of the systematic approach of capacity building. This will be planned with focus on improving efficiency of management and operational staff. It requires a core group of trainers for continuous in-house training of the manpower to be deployed at various phases of solid waste management. In addition to the administrative, technical and non-technical officials, the service providers, haritha sahaya sthapanam, haritha karma sena, waste pickers, scrap dealers etc. need periodical training. Kerala Institute of Local Administration (KILA) shall be entrusted with the training responsibility under the assistance of Suchitwa Mission. The training requirements of specific target groups will be decided through Training Need Assessment (TNA) based on gap analysis. The training will be imparted through, sensitization, orientation programs, intensive tutorials, site visits and focus group discussion.

#### AWARENESS BUILDING AND BEHAVIOURAL CHANGE EDUCATION

##### Strategy and approach

The strategy shall be to select key target audience which plays a key role in generating effective awareness. Some of the target audience can be from sectors of particular interest including the female head of the family, children and youth, who require some form of role model to influence their behaviour. Broadly, the target audience can be categorized as waste generators, waste collectors and waste managers. Once the target groups are identified, the approach shall be to sensitize, orient and educate these groups. For successful implementation of any program involving public at large, it is essential to spell out clearly and make them know the manner in which the problem is proposed to be tackled to keep area clean and improve the quality of life. The communication material should be developed and must be utilized in public awareness program through the tools of publicity. The various publicity tools that could be adopted include Focus Group Discussions (FGD), Inter personal communication (IPC), Constituting watchdog committees involving locally influential people, distribution of printed materials and audio-visual aids etc. Messages through locally popular media, print and electronic audio-visual media, skit/street plays, billboards/social media etc. will also be used.

#### Information, Education and Communication (IEC) Campaign

Attitudinal and behavioural changes of the citizen is the key to the success of solid waste management. This will bring in effective community participation in all aspects of solid waste management thereby the compliance on segregation and segregated storage of waste at source, waste minimization, processing and treatment of biodegradable waste at source as far as possible, handing over of residual waste for reuse and recycle will improve significantly and sustain. The IEC campaign will target elected representatives, local government officials, educational institutions, non-government organizations, media, trade associations, households, institutions and the public at large. IEC shall be undertaken to make people understand the concept and need for segregation and storage at source, role of citizen in primary collection and handing over for reuse, recycle or recover, need for paying user fee for collection and disposal services, mitigate the impact of solid waste on public health and environment.

There shall be a two-way approach for IEC Implementation which includes (i) programme communication for bringing about behavioural changes and (ii) social mobilization for alliance building. There shall be IEC plan at the state, district and LSGI level IEC plan towards educating the citizens on key behaviour change areas. The state level plan shall focus more on mass media while each district shall have plans focusing more on mid media, outdoor IEC activities. The LSGI level plan shall focus more on one to many, one to one communications targeting local specific issues. Execution of plans at three levels shall take place in tandem to have a 360-degree impact. The presence of local stakeholders or groups in a waste management issue provides an effective mechanism for community outreach and associated information and education activity. The support of NGOs, Local Leaders, Resident Welfare Associations, and Educational Institutions etc. are indispensable for social mobilization. The responsibility of social mobilization shall be with the respective LSGI.

The IEC programmes for behavioural change and social mobilization necessitate awareness building among the stakeholders with respect to their rights, duties, obligations and accountability. Wilful violation of law, rules, policies and measure shall be identified, scrutinized, tried up, and penalized respectively.

### Green Protocol

Green Protocol for appropriate management of materials shall be followed in the state at all levels of governance, public and private functions, festivals etc. It shall promote the principles of waste minimisation through reduce and reuse. It shall discourage usage of disposables and non-recyclable articles to the maximum extent thereby the burden of waste generators and local governments for managing waste will be reduced. The government departments and local governments shall initially ensure compliance to green protocol in all their offices and activities. It shall be extended to all the households, institutions and community gradually with the participation of stakeholders thereby the usage of disposables will be curtailed and waste generated will be managed through reuse, recycle and recovery process. Local bodies shall engage with all kinds of community organisations and citizen to incrementally improve the compliance to Green Protocol.

As part of Green protocol the manufacturers shall be persuaded to minimise the waste components in the goods promoted by them and reduce the toxicity by caring the production process. The citizen shall be encouraged to reuse an article. This shall remove it from the waste stream for use in a similar or different purpose without changing its form or properties. The concept of Swap shops (exchange of used items by primary users to secondary users) shall be promoted by the state and local governments. Green protocol shall also encourage recycling after ensuring that there exists no reduction or reuse potential. Any material or product shall be recycled when it reaches the end of its life span. Recycling is the process of transforming waste materials into secondary resources for manufacturing new products. Recycling diverts a significant fraction of municipal, institutional and bulk waste to compost or energy thereby preventing their dumping or disposal in landfills. Green protocol shall also promote recovery of materials from the waste stream through imbibing the practice of segregated storage of materials at appropriate levels.

### EXTENDED PRODUCER RESPONSIBILITY (EPR)

The state and local governments shall pursue with the producers, who are responsible to work out modalities for waste collection system based on Extended Producers Responsibility either individually or collectively, through their own distribution channel or through the system established by the local governments. The State Pollution Control Board shall work out plans to ensure that the producers, importers and brand owners comply with the ERP provisions.

### RECLAMATION OF OLD WASTE DUMPS

The pre-1990 behavioural scenario facilitated the reuse of the entire solid waste generated then as manure as its composition was uniformly biodegradable. With the proliferation of plastics and other non-biodegradable materials, it was difficult to channelize the waste generated for its traditional use. Thereby, the practice accumulation and dumping increased resulting in dump yards of varying size in vacant land, generally away from the populated areas then. Many of the local governments have consumed the land available for solid waste management through indiscriminate dumping of waste. These are now pollution hotspots and therefore, shall be reclaimed through scientific intervention. As far as possible, bio-mining shall be resorted to for recovering biodegradable and non-biodegradable waste and they shall be managed adopting standard practices. If not, the old dump site shall be scientifically capped and landscaped and converted to gardens, green areas or utilized most appropriately.

### INVOLVEMENT OF INFORMAL SECTOR

The informal sector consisting of scrap dealers, waste collectors/pickers plays a significant role in solid waste management. The waste collected by the waste pickers are sorted, sold to scrap merchants who further sort, clean, and store the waste and sell such material to the appropriate recycling industry. It has been estimated that the informal sector alone recovers as much as 56% of recyclable material. The informal sector shall be encouraged to enhance their efficiency by complying with environmental, health, safety and social safeguard norms.

The informal sector shall be recognized as a necessary supplement to the formal system to manage all types of waste as it promotes reuse or recycling of materials and provides employment to a large number of people. They shall be facilitated to operate competitively and enhance the level of efficiency. They shall also be recognized for establishing linkages with the formal economy through the recycling chain and for offsetting carbon emissions by making recycling possible and reducing the extraction and use of virgin raw materials. The informal sector shall be formalised and integrated with the waste management system of each local government.

#### GENDER EQUITY ASPECTS

The caring and protective nature of service involved in activities linked to environmental upkeep, especially sanitation and waste management activities attracts more women into the sector. Therefore, they are more affected due to the adverse impacts of unscientific waste disposal practices. Due to the lack of importance attributed to the sector, high public health risk and consequent societal compulsion, women are persuaded to serve the sector for lesser wages, for collection and storage of garbage, handling the garbage management installations, and recovery of recyclables from waste dumps. In order to ensure that they are not dragged to do the stipulated works in unhygienic and in-sanitary conditions and without appropriate economic compensations and social inclusion, the local governments shall take the following precautions:

- There shall be suitable men-women ratio among the workers.
- The workers in the sector shall be extended safe, healthy and gender-friendly work environment.
- Gender-sensitive personal protective gears shall be enforced by the local government.
- The equipment, machines and vehicles for handling waste shall be easy to operate and gender-friendly.

- Regular health check-up shall be arranged for the worker and her family through the concerned PHC/CHC and health cards by the concerned local governments.
- There shall be gender-friendly sanitation facilities attached to all waste management plants including MCF, RRF, Plastic Shredding Units, especially where women are engaged.
- Care shall be taken to ensure respectable wages to workers in the formal and informal waste management sector considering the government approved wage norms.

#### MONITORING AND EVALUATION

Appropriate monitoring and evaluation process shall be ensured by different tiers of government to make sure continued improvement in the performance efficiency of waste management sector. The satisfactory implementation of the Rules and their compliance shall be monitored by the Kerala State Pollution Control Board. The State Level Empowered Committee constituted for sanitation sector and the State level Advisory Board for Solid Waste Management shall also monitor the progress and performance of the waste management sector. The process, procedure, output and outcome of the waste management activities shall be evaluated by the Suchitwa Mission and advisories shall be issued to the state and local governments. In addition, the Haritha Keralam Mission formed for enabling the integrated activities of waste management, organic agriculture and water conservation, chaired by the Chief Minister shall also review and monitor the progress of the sector. The task force constituted under the Haritha Keralam Mission at the state, district, block, city corporation, municipality and grama panchayat level chaired by the respective chief executives shall also monitor the performance of solid waste management sector and ensure corrective measures, whenever and wherever required.

## RESEARCH AND DEVELOPMENT

Waste management sector is an evolving one and requires continual and innovative improvement and improvisation. This shall be achieved through appropriate research and development activities and bringing in professional manpower in all aspects of the sector. It shall be ensured by:

- Involving R&D professionals in the Technical Support Group set-up by the State Government.
- Obtaining R&D services through recognized research and academic institutions within the state and elsewhere.
- Encouraging the students, youths, professionals, non-governmental organizations for innovations in waste management sector.
- Enhancing the capacity of accredited agencies, service providers, hariitha sahaya sthapanam etc.
- Inspiring, motivating and attracting start-ups for getting involved in the waste management sector.
- Carrying out studies and research on typical problems cropping up in waste management.
- Organizing seminars, workshops and interactive sessions periodically to understand the scientific innovations, technological improvements, new services, processes and products in the sector.

## CONCLUSION

All the stakeholders involved in the solid waste management sector shall be encouraged and motivated to perform adequate and appropriate actions as envisaged in the policy. The responsible institutions shall ensure consistent and accurate performance of all stakeholders for continual improvement of solid waste management activities.

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