12.1. Introduction

Solid waste can be classified into different types depending on their source: 1) Industrial waste as hazardous waste 2) Household waste is generally classified as municipal 3) Biomedical waste or hospital waste as infectious waste and 4) E-waste Electronic wastes such as TV's, refrigerators and computer waste.

12.2. Hazardous Waste

Detection of traces of toxic chemicals in drinking water supplies, in polar ice caps, groundwater sources and episodes such as those in Minamata Bay, Japan and Love Canal, USA have focused the attention of the public worldwide on the risks posed by the inappropriate disposal of hazardous waste and accidental release of toxic chemicals into the environment. In India the concern and need to manage the hazardous waste generated in the country in a scientific manner was felt only in the mid-eighties after the occurrence of the Bhopal gas tragedy on 2/3 December 1984. The Government's attention was then drawn towards environmental damage and the casualties that hazardous chemical substances and toxic wastes can cause. The MoEF (Ministry of Environment and Forests) enacted an umbrella act i.e., the Environment (Protection) Act in 1986. Subsequent to this Act, in order to prevent indiscriminate disposal of hazardous waste, the MoEF promulgated the Hazardous Wastes (Management and Handling) Rules in 1989, and efforts to inventorise hazardous waste generation were initiated[1].

Due to the liberalised policy the pace of industrialization has been accelerated, which has resulted in increasing amounts of hazardous wastes every year. This along with a growing amount of municipal solid waste due to rapid urbanisation and hospital waste continues to remain a daunting issue of environmental concern to India.

12.3. Municipal Solid Waste

There has been a significant increase in the generation of MSW (Municipal Solid Wastes) in India over the last few decades. This is largely a result of rapid population growth in the country. The daily per capita generation of municipal solid waste in India ranges from about 100 g in small towns to 500 g in large towns. The solid waste generated in Indian cities has increased from 6 million tones in 1947 to 48 million tones in 1997 and is expected to increase to 300 million tones per annum by 2047 (CPCB, 2000). The characteristics of MSW collected from any area depends on a number of factors such as food habits, cultural traditions of inhabitants, lifestyles, climate, etc[1].

At present most of the MSW in the country is disposed off unscientifically (i.e.) lack of 'sanitary landfill'. This has adverse impacts on not only the ecosystem but also on the human environment. Unscientific disposal practices leave waste unattended at the disposal sites, which attracts birds, rodents, fleas etc., to the waste and creates unhygienic conditions like odour, release of airborne pathogens, etc. The plastic content of the municipal waste is picked up by the rag pickers for recycling either at primary collection centers or at dumpsites. Plastic are recycled mostly in factories, which do not have adequate technologies to process them in a safe manner. This exposes the workers to toxic fumes and unhygienic conditions. Moreover, since the rag picking sector is not organised, not all the recyclables, particularly plastic bags, get picked up and are found littered everywhere, reaching the drains and water bodies ultimately and choking them[1].

12.3.1. Components of Municipal Solid Waste

Municipal solid waste consists of household waste, construction and demolition debris, sanitation residue, and waste from streets. This garbage is generated mainly from residential and commercial complexes. In Tamil Nadu due to

urbanization and change in lifestyle and food habits, the amount of municipal solid waste has been increasing rapidly and its composition changing.

Table 12.1 The type of litter generated and the approximate time it takes to degenerate

Type of litter	Approximate time it takes to degenerate
Organic waste such as vegetable and fruit peels, leftover foodstuff, etc.	a week or two.
Paper	10-30 days
Cotton cloth	2-5 months
Wood	10-15 years
Woolen items	1 year
Tin, aluminium, and other metal items such as cans	100 to 500 years
Plastic bags	one million years?
Glass bottles	Undetermined

The general composition of solid wastes is as follows

Table 12.2. General composition of the municipal solid wastes

Biodegradable matter	50%
Glass	4%
Plastics	3%
Paper	5%
Metals	1%
Leather and rubber	1%
Rags	5%
Household hazardous	1%
Inert materials	30%

12.4. Biomedical waste

Hospital waste is generated during the diagnosis, treatment, or immunization of human beings or animals or in research activities in these fields or in the production or testing of biologicals. It may include wastes like sharps, soiled waste, disposables, anatomical waste, cultures, discarded medicines, chemical wastes, etc. These are in the form of disposable syringes, swabs, bandages, body fluids, human excreta, etc. This waste is highly infectious and can be a serious threat to human health if not managed in a scientific and discriminate manner. It has been roughly estimated that of the 4 kg of waste generated in a hospital at least 1 kg would be infectious[1].

Surveys carried out by various agencies show that the health care establishments in India are not giving due attention to their waste management. After the notification of the Bio-medical Waste (Handling and Management) Rules, 1998, hospitals are slowly streamlining the process of waste segregation, collection, treatment, and disposal. In Tamil Nadu the majority of beds are in the six corporation areas are as follows.

Table 12.3 Majority of beds in the six corporation areas

S.No.	Name of the Corporation	No. of beds
1.	Chennai	19600
2	Coimbatore	6500
3	Salem	2600
4	Madurai	3875
5	Trichy	2800
6	Tirunelveli	2000

12.5. E-Waste

Electronic waste or E-waste as it is popularly called is a collective terminology for the entire stream of electronic wastes such as used TV's, refrigerators, telephones, air conditioners, computers, mobile phones etc. computer waste is the most significant of all waste due to the gigantic amounts as well as the rate at which it is generated. In addition, its recycling is a complex process that involves many hazardous materials and poses significant environmental and health hazard. E-waste is of particular concern to India currently. India is setting a shining example not only in the IT sector, but unfortunately, also in importing e-waste. The primary source of computer waste in India is imports from developed countries though, recently, domestic waste also has shot up due to the astounding growth in the IT sector and its application in various new sectors, including governance.

12.5.1. E-Waste disposal in Tamil Nadu

In Tamil Nadu the electronic scrap processing industry is in the stage of infancy. The operations are restricted to dismantling of computer hardware, manual segregation of scrap after breaking the scrap by using mechanical equipments like jaw crushers and cutters. The scraps are segregated into plastic components, glass, ferrous material and non-ferrous material. Individuals in the un-organised sector also carry out such operations. No industry is available in the organized sector, which reprocesses the electronic scrap for recovering metals. The printed circuit Boards available in computer are segregated and exported to reprocessing facilities at Belgium, Hong Kong, China & Taiwan for metal recovery. Metals recovered are usually copper and gold[6].

Table 12.4. E waste recycling hot spots in Chennai

1. New Moore Market	Second hand goods market
2. Puzhal	Largest e-waste scrapyard
3. MEPZ (Sanatorium)	Hotspot for imported e-waste
4. Urapakkam	Dismantling and segregation
5. New Moore Market	Recovery and recycling

Basal Convention The Basal Convention works to control the transboundary movements of hazardous wastes and their disposal. Adopted in 1989, it was formed to respond to concerns about toxic wastes from industrialized countries being dumped into developing countries[8].

E-waste related laws of India

- **Hazardous waste (Management and Handling) Amended Rules, 2003:** These define hazardous waste as "any waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger, or is likely to cause danger, to health or environment, whether alone or when on contact with other wastes or substances. "In Schedule 1, waste generated from the electronic industry is considered as hazardous waste.
- **DGFT (Exim policy 2002-07):** The Director General of Foreign Trade under the Ministry of Commerce governs the EXIM policy, and as per the Para2.17 of EXIM Policy, 2002-07 which says: "All second hand goods shall be restricted for imports and may be imported only in accordance with the provisions of this Policy, ITC (HS), Hand book (Vol.1), Public Notice or a licence/ certificate/ permission issued in this behalf[6]."


Transportation of E-waste

12.6. Pressure

Sources of hazardous waste include those from industrial processes, mining extraction, tailings from pesticide based agricultural practices, etc. Industrial operations lead to considerable generation of hazardous waste. The major hazardous waste-generating industries in Tamil Nadu include textile, tannery, petrochemicals, pharmaceuticals, pesticides, paint and dye, petroleum, fertilisers, asbestos, caustic soda, inorganic chemicals and general engineering industries. Hazardous wastes from the industrial sectors mentioned above contain heavy metals, cyanides, pesticides, complex aromatic compounds (such as PCBs), and other chemicals which are toxic, flammable, reactive, corrosive or have explosive properties affecting the environment.

12.7. State situation:

12.7.1. Hazardous Waste

The main sources of hazardous waste and cause of an adverse impact on the State's environment are: (a) Tanneries in the Vaniyambadi and Erode belt, (b) Bleaching and dyeing industries in the Tirupur and Karur area and (c) Chemical industries in Tuticorin, Cuddalore, Chennai and Kancheepuram districts. The collection, transportation, storage, handling, treatment and disposal of hazardous wastes are important issues since improper handling and disposal could cause serious damages to the environment.

The TNPC Board has a special monitoring cell at its head office, Chennai to monitor the 17 categories of highly polluting industries, specified by the Government of India. There are 190 large and medium units identified under 17 categories of highly polluting industries and these are being closely monitored by the Board. In order to generate an updated inventory for hazardous waste in the State, an exercise in different districts was initiated by the Government of Tamil Nadu. The present information on total hazardous waste generated from industries in the state is given in table 12.5. At present, around 181,856.699 Metric tonnes of hazardous wastes are generated in the State of which nearly 42,916.982 Metric tonnes are recyclable, 128,984.214 Metric tonnes are disposable and 10,072.612 Metric tonnes is incinerable waste.

Table 12.5 Tamilnadu Pollution Control Board
Status of Hazardous Waste Generating Units in Tamilnadu

Sl.No.	Name of the District	No. of Units	Total Quantity of HW generation in MTA	Quantity of HW in MTA		
				Landfills	Recylable	Incinerable
1	Chennai	94	1644.412	187.817	1014.273	443.022
2	Coimbatore	368	23182.115	22261.478	822.481	98.156
3	Cuddalore	41	6541.246	4856.792	886.454	798.000
4	Dharmapuri	10	26.950	-	26.950	-
5	Dindugul	46	6055.585	5370.300	659.685	22.000
6	Erode	341	6191.714	5923.200	268.514	-

Sl.No.	Name of the District	No. of Units	Total Quantity of HW generation in MTA	Quantity of HW in MTA		
				Landfills	Recylable	Incinerable
7	Kancheepuram	162	8913.883	6095.389	1750.418	1068.076
8	Kaniyakumari	19	133.687	0.108	123.219	10.360
9	Karur	60	6482.429	6324.520	157.909	-
10	Krishnagiri	63	3324.168	1276.127	1481.016	567.025
11	Madurai	116	2007.506	964.064	564.230	479.212
12	Nagapattinam	17	652.337	296.280	290.587	65.470
13	Nammakkal	116	1664.310	1519.830	144.480	-
14	Nilgiri	11	685.820	618.000	51.820	16.000
15	Perambalur	13	286.361	1.675	137.686	147.000
16	Pudukkottai	29	478.527	443.067	35.400	0.060
17	Ramnad	10	9.194	0.096	9.090	0.008
18	Salem	118	13190.126	9474.828	794.816	2920.483
19	Sivaganga	20	223.508	162.020	60.788	0.700
20	Thanjavur	26	101.136	1.938	99.198	-
21	Theni	11	1029.052	1000.000	29.052	-
22	Thiruvallur	154	25011.549	5306.754	17960.480	1864.315
23	Thiruvannamalai	13	52.164	-	52.164	-
24	Thiruvarur	11	450.184	440.000	10.144	0.040
25	Thoothukudi	39	50026.929	39995.294	9958.434	73.210
26	Tirunelveli	38	1363.475	1171.582	126.501	65.392
27	Trichy	54	2906.545	990.104	972.721	943.720
28	Vellore	153	18308.324	13696.382	4264.254	347.688
29	Villupuram	17	483.631	445.180	28.436	10.015
30	Virudhunagar	40	429.831	161.389	135.782	132.660
	Grand Total	**2210**	**181,856,699**	**128,984,214**	**42,916,982**	**10,072,612**

12.7.2. Municipal Solid Waste

In Tamil Nadu, the unsegregated municipal solid wastes generated are collected and are either disposed in low-lying areas or water bodies or disposed along the roadside and are set on fire causing air pollution. The leachate from the dumped solid wastes has caused water pollution, odour nuisance are mainly caused due to the putrefaction of the organic matter present in the unsegregated municipal solid wastes. Kodungaiyur and Pallikaranai in Chennai are the standing example for municipal solid waste dumping sites[2]. The status of solid wastes generated in major cities in Tamil Nadu is furnished as below.

Table 12.6. Solid wastes generated in major cities in Tamil Nadu

Cities	Quantity of solid wastes generated in T/day
Chennai	3500
Madurai	711
Coimbatore	710
Tiruchirapalli	408
Salem	330
Tirunelveli	210

Source : TNPCB report.

12.8. Impact

12.8.1. Hazardous Waste

Improper storage, handling, transportation, treatment and disposal of hazardous waste results in adverse impact on ecosystems including the human environment. When discharged on land, heavy metals and certain organic compounds are phytotoxic and at relatively low levels can adversely affect soil productivity. In North Arcot district various chemicals used in tanning include lime, sodium carbonate, sodium bi-carbonate, common salt, sodium sulphate, chrome sulphate, fat liquors, vegetable oils and dyes. Wastewater discharged for 100 kg of skin and hide processed varies from 3000 to 3200. The biggest polluting material in the tanning industry, which is difficult to get rid off is common salt. For every 10 tons of salted hide and skin processed, 23 tons of salt is removed and in addition another one ton of salt is removed while pickling. Tannery waste is characterized by its strong colour (reddish to dull brown), high BOD, high pH and high dissolved solids. Tannery effluents, puerile, when discharged untreated, pollute the receiving stream and if allowed to percolate into the ground for a prolonged period seriously affect the groundwater table of that locality. The other major chemical constituents of waste from tanneries are sulphide and chromium. These chemicals mixed with water are discharged from the tanneries. They pollute the groundwater permanently and make it unfit for drinking, irrigation and for general consumption. It has been estimated that a single tannery can cause pollution of groundwater around a radius of 7 to 8 km[9].

12.8.2. Biomedical Waste

Most biomedical waste generated from health care facilities are at present, collected without segregation into infectious and non-infectious categories and are disposed in municipal bins located either inside or outside the facility premises. Sanitary workers pick this waste from here along with MSW and transport and dispose it at municipal dumpsites. Since the infectious waste gets mixed with municipal solid waste, it has potential to make the whole lot infectious in adverse environmental conditions. Moreover, biomedical waste also contains sharp objects (scalpels, needles, broken glasses/ampoules, etc.,) the disposal of which poses a risk of injury and exposure to infection to sanitary workers and rag pickers working at these dumpsites. Since most of these dumpsites are unscientifically managed, the chances of pathogens contained in infectious waste becoming airborne and getting released to nearby water bodies or affecting the local resident population[1].

12.8.3. E-Waste

E-waste contains over 1,000 different substances and chemicals, many of which are toxic and are likely to create serious problems for the environment and human health if not handled properly. However, classification of e-waste as hazardous, or otherwise, depends on the amount of hazardous constituents present in it. E-waste contains many toxics such as heavy metals, including lead, cadmium, mercury, Polychlorinated Biphenyls (PCBs), Poly Vinyl Chloride (PVC), etc, in some components[5].

The highly toxic chemicals found in the different components of computer parts can contaminate soil,

groundwater and air, as well as affect the workers of the unit and the community living around it. Moreover, the workers in computer waste recycling operations may face dangerous working conditions where health and environmental conditions are compromised. Hence there is a clear reason to be concerned about the trade, the technology in practice and the existing poor disposal practices of computer waste in India[6].

12.9. Response

12.9.1. Hazardous Waste

12.9.1.1. Policies for hazardous waste management

The Hazardous Wastes (Management and Handling) Rules, 1989 was introduced under Sections of the Environment (Protection) Act of 1986. The HWM Rules, 1989 provide for control of generation, collection, treatment, transport, import, storage and disposal of wastes.

Besides these rules, in 1991, the MoEF issued Guidelines for Management and Handling of Hazardous Wastes for (a) generators, (b) transport of hazardous waste, and (c) owners/operators of hazardous waste storage, treatment and disposal facility. These guidelines also established the mechanisms for the development of a reporting system for the movement of hazardous waste (the manifest system) and for the first time established procedures for closure and post-closure requirements for landfills. In 1995, these were followed by publication of guidelines for safe road transport of hazardous chemicals that established basic rules for hazardous goods transport and provided for the establishment of a transport emergency plan and for provisions on identification and assessment of hazards.

In addition to these direct rules dealing with issues of hazardous waste management, the Government has moved to enact into legislation, additional incentives for industries to comply with environmental provisions and bring market forces out into the business of environment. In this vein, the Public Liability Act 1991 was adopted to require industries dealing with hazards to ensure against accidents or damages caused by release of pollutants. The National Environmental Tribunal Act 1995 provides provisions for expeditious remedies to parties injured by environmental crimes. Legislation on a Community Right to Know 1996 has been adopted to provide more access to information regarding potential hazards from industrial operations. India is also a signatory to the Basel Convention, 1989 on control of transboundary movement of hazardous wastes and their disposal.

12.9.1.2. Initiatives taken for hazardous waste management

Emerging policy directions in the field of hazardous waste management emphasize the need for scientific disposal of waste and policies to encourage waste minimisation and adoption of cleaner technologies. Various activities initiated by the Government of India to meet these objectives are listed and discussed below:

- State governments are in the process of identifying hazardous waste disposal sites based on EIA of the potential sites
- The CPCB has prepared a ready reckoner in 1998 providing technical information on sources of hazardous wastes, their characteristics, and the methods for recycling and disposal.
- Training programmes have been organized for concerned personnel in ports and customs and in pollution control boards so as to familiarise them with precautionary measures and testing methodologies for hazardous waste constituents.
- It has been decided to impose a ban on import of hazardous wastes containing beryllium, selenium,

chromium (hexavalent), thallium, pesticides, herbicides and their intermediates/residues based on recommendations by an Expert Committee constituted at the national level for advising in matters related to hazardous wastes

- In order to control movement of Basal Wastes, cyanide wastes and mercury - and arsenic-bearing wastes have been prohibited for export and import from December 1996.
- Import of waste oil and metal bearing wastes such as zinc ash, skimming, brass and lead acid batteries for processing to recover resources would be regulated by MoEF and allowed only by environmentally acceptable technologies

12.9.1.3. Initiatives taken by the Tamil Nadu Pollution Control Board

The MoEF and Tamil Nadu Pollution Control Board have taken initiatives in this regard to streamline and track the hazardous waste imported. Five sites have been identified in Tamil Nadu state for the

1. Hazardous waste management
2. Tanneries, textiles and cement
3. Engineering
4. Waste management and planning
5. Petroleum, distilleries and miscellaneous

For the management of hazardous chemicals and hazardous wastes in an environmentally friendly safe manner, effective steps have been taken. The Board has identified 2117 units generating hazardous wastes for which 2000 authorizations under the Hazardous Wastes (Management and Handling) Rules, 1989 as amended were issued. For the establishment of secure landfill facility for the disposal of sludge generated from the treatment of textile dyeing effluents, sites at Tirupur and Karur have been identified. In addition, a site at Kancheepuram district has been identified for establishing a common hazardous waste treatment, storage and disposal facility through a private operator[10].

12.9.2. Municipal Solid Waste

The implementation of Municipal Solid Waste (Management and Handling) Rules 2000, has become the mandatory responsibility of the Urban Local bodies. Government of India has notified the Municipal Solid Wastes. As per the said rules, the municipal authorities are responsible for the collection, reception, transportation, treatment and disposal of the municipal solid wastes. As per the said rule, municipal authorities should improve the existing landfill site on or before December 2000. New site for landfill and composting should be identified by December 2002 and the composting facility must be commissioned by December 2003[2].

Based on the above Rules, Government of Tamil Nadu has issued instructions to all Urban Local bodies to establish waste processing and disposal facilities. In addition to this, the Hon'ble Supreme Court has directed cities with one million plus population to file an Action Plan for solid waste management and all the cities in Tamil Nadu having million plus population namely, Chennai, Madurai and Coimbatore Corporations have filed their Action Plans before the Hon'ble Court. The Commissionerate of Municipal Administration has taken initiatives in facilitating the preparation of similar Action Plans by all other ULBs in order to comply with the Municipal Solid Waste (Management and Handling) Rules 2000 in a time bound manner. The main requirement in this regard is the identification of suitable land for locating disposal facilities. Tamil Nadu Pollution Control Board, has been insisting all

the 6 corporation, 152 Municipalities, 561 Special village panchayats to take action for creating awareness on the segregation of wastes as wet compostables, dry recyclables, household hazardous (old tube lights, old medicines, pesticides containers, paint containers etc.,) construction debris and inorganic wastes. By segregating the municipal solid wastes at source, 20% of the recyclable wastes could be collected separately and sent for recycling industries. The 50% of the biodegradable wastes collected separately could be sent for composting facilities for converting it into organic manure. The remaining 30% of inorganic wastes alone are sent for land filling[2].

Segregation of waste at source will reduce the land area requirement for the landfill by 70% and organic manure could be produced from the biodegradable wastes. Further, 20% of the wastes generated could be recycled as useful products. The problem of odour nuisance, fly nuisance, water pollution and air pollution can be eliminated.

12.9.2.1. Action taken by Tamilnadu Pollution Control Board

All the Municipal authorities as well as the District Collectors who are responsible for the implementation of the Municipal Solid Wastes Management and Handling Rules, 2000 have been instructed to identify a site away from habitations and water bodies for the composting of compostable wastes and landfilling of inert wastes[2]. Tiruppur Municipality has identified a site for composting of segregated wastes. Tiruppur Municipality has engaged a private firm for composting of the segregated wastes. The private facility has been issued authorisation and is under operation. A private facility has also been issued authorisation at Madurai to process the municipal solid wastes generated from Madurai Corporation. The facility is yet to be commissioned. All other local bodies are in the process of identification of site for composting and secure landfill. All the Municipal commissioners have been instructed to take action to stop the disposal of unsegregated municipal solid wastes into low lying areas and water bodies in order to prevent water pollution[2]. Door to door collection of segregated wastes and two-bin system is being implemented in Udhagamandalam municipality. Municipalities have started the source segregation of municipal solid wastes generated in their limits partially or fully[2].

Also Board has issued directions to the Commissioner, Corporation of Chennai to

- Stop dumping of garbage at Kodungaiyur and Pallikaranai dump yards
- Start segregation at the transfer points by using conveyor belt system
- Take action to put up waste processing facilities at the earliest[6]

12.9.2.2. Management of Plastic Wastes

The environment problems arising due to indiscriminate use and disposal of throw away plastic items have been recognised and the Tamilnadu Pollution Conrol Board has embarked upon an intensive awareness campaign. The awareness campaign has focused on preventing the use of throw away plastics as well as eco friendly substitutes to plastic items. Billboards educating the people about the ill effects of throwaway plastics were displayed on Metropolitan Transport Corporation (MTC) buses in Chennai. Besides, regular awarenss programmes are conducted in tourist and pilgrim centers and also the girivalam path of Thriuvannamalai temple. Training has been imparted to self help groups for production of palm leaf plates, cups in Salem, Vellore and Cuddalore districts through the Central Palmgur and Palm Products Institute of Village Industries Commission. The products are eco friendly alternatives to throw away plastics items like cups, plates etc. The Nilgiris district, Hogenakkal, Kodaikannal, Rameshwaram, Valparai, Yelagiri, Yercaud and

Thirumoorthy falls etc. have been declared as throw away plastic free zones. The Government of India, Ministry of Environment and Forests notified the Recycled Plastics Manufacture and Usage Rules, 1999 under the Environment (Protection) Act, 1986 to ensure that carry bags and containers used for packing food stuff are not made of recycled plastics. As per the provision of the rules, only virgin plastics, permitted additives and colour are to be used in plastic items shall use for packaging food stuff. The Board has identified 1159 plastic products manufacturing units.

A success story : SWM in Nammakkal town

Namakkal has the distinction of becoming the only zero garbage town in the country. In order to achieve this they have practiced, door to door collection, introduced night sweeping, beautified parks and burial grounds, removed encroachments on all the roads and streets, prevent road side hotels and shops, green belt development on highways, levy charges for hotels, marriage halls, commercial complexes and garbage generating industries, and manufacturing of vermi-compost from organic waste. This experiment has been successful due to a holistic approach with all agencies cooperating together under the leadership of the District Collector[3]

12.9.3. Biomedical Waste

Government of India have notified the Bio Medical Waste (Management and Handling) Rules, 1996 as amended in 2000 under Environment (Protection) Act. 1986. The Tamilnadu Pollution Control Board enforces this rule. The Tamilnadu Pollution Control Board has inventorised 317 Government Hospitals and 2787 private hospitals. There are about 96,000 hospital beds all over the States[4] . The treatment of biomedical waste requires broadly the segregation of wastes into infectious, non-infectious and sharps, As per the Government of India directions, infectious wastes will have to be autoclaved and non-chlorinated wastes and body parts alone can be incinerated.

12.9.3.1. Biomedical Waste Management facilities in the private sector

So far, 11 sites have been identified in the private sector health care units to establish common facility in the State as noted below. The Board has issued authorization to all the above facilities[4].

Table 12.7. Biomedical Waste Management facilities for the private sector.

1.	Thenmelpakkam	Kancheepuram district	Under Operation
2.	Chennakuppam	Kancheepuram district	
3.	Orattukuppai-1	Coimbatore district	
4.	Sengipatti	Thanjavur district	
5.	Kandipedu	Vellore district	
6.	Thangayur	Salem district	
7.	Coonoor	Nilgris district	
8.	Muthuvayal	Ramanathapuram district	
9.	Ettankulam	Tirunelveli district	Under implementation
10.	Orattukuppai-2	Coimbatore district	
11.	Undurumikidakulam	Virudhunagar district	

12.8.3.2. Biomedical waste management in Government hospitals

Regarding the biomedical waste management by the Government hospitals, the Secretary to Government, Health and Family Welfare Department was requested to carryout the following.

- Take immediate action for the segregation of the biomedical wastes at source.
- To go for advanced alternate technology like autoclaving for the treatment of biomedical wastes at source
- To incinerate the pathological waste alone
- To go in for a common treatment and disposal facility for the biomedical wastes that must be located away from any habitation and water bodies.

Action has been initiated by the Health and Family Welfare Department for identification of site for establishing common biomedical waste treatment facility for the wastes from Government hospitals in 6 corporations in consultation with Tamilnadu Pollution Control Baord[4].

12.9.4. E-Waste

TNPCB is in the process of evolving a strategy for inventorisation and management of electronic scrap and e-waste generated in Tamil Nadu. Towards this initiative, TNPCB sent direction under Hazardous waste (M&H) Rules, 1989 to 50 Software companies located in Chennai, to furnish the details of generation of the waste electrical and electronic assembly item[7].

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