

Sustainable Waste Management and Pollution control measures in India

Dr. Sunitha Kanipakam¹ and T. Vineela²

¹Asst. Professor, Department of Law,
Sri Padmavati Mahila Visvavidyalayam (Women's University, Tirupati, A.P., India.

²Research Scholar, Department of Law,
Sri Padmavati Mahila Visvavidyalayam (Women's University), Tirupati, A.P., India.

Abstract

The man's evolution has started from Chimpanzee to here; it took million years to find wheel and later progress. All here one can notice that the inventions or technology started from zero waste to we have gone to million tons of waste, from last ten years humans waste generating quadrupled now. If it goes in this way what is the fate of future generations and health of present generation therefore, concerns about Neighborhood and projection of work in coming ten years shall be on future. For human survival proper care in waste management and less pollution generating activities are needed and best solution is to get idea from already being done by people. It all comes down to lessening to current waste generation. Humans are rational, can think and judge between right and wrong. For survival humans do many works in their day-to-day life like cooking, eating, medicines for their ailment, inevitably, each act generates some kind of waste this waste has adverse impact upon the environment they live. affects the quality of breathing air, the drinking water, and the land and soil. Hence, it is necessary to manage this waste in an appropriate and sustainable way for the conservation of our mother earth otherwise it will become uninhabitable for future generations.

Key Words: waste management, recycle, reuse, types of waste, rules, circular economy

Introduction

Sustainable waste management,(Kevin Hill, 2022)refers to the collection, transportation, valorization and disposal of the various types of waste, in a manner that does not jeopardize the environment, human health or the only living planet of our future generations. The practice of Sustainable waste management aims to keep materials in use for as long as possible and minimizes the amount of solid waste or residual waste that is disposed of in landfill or through incineration. The generalized meaning of Waste is that any matter or substance which has been discarded after its primary use which may be worthless, defective and of no use or it may lose its original form and shape. The waste to one person is not necessarily be waste to another person.

However, in our current linear economic model (Liam Taylor October 14th, 2020) of take, make, dispose many of the used goods will be dumped in landfill. We use the raw materials taken from the earth to manufacture goods to sell and for oneself, once these products have reached the end stage of their worthwhile, we discard and through away them. In this process of linear economy, the waste of a product begins even before the products manufactured. In this regard comprehensive approach towards ensuring a sustainable waste management on the entire lifecycle of a product of our present-day consumption needed to enable us to help reduce the negative ecological & environmental, social, and financial impacts on our future generations.

The raw materials utilizing in the manufacturing of new products in paper and card boards lead to deforestation, as well as using massive amounts of energy and water. New waste management practices required for the effective management of existing waste materials and

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for the reduction of the amount of waste generation. in our day-to-day life we do several types of works, out of which waste will be generated. trash or garbage generated out of household, waste from commercial work and demolition waste commonly known as municipal waste. coming to the fastest growing waste from our modern lifestyle, the electronic or e-waste from computers to mobile phones, Bluetooth devices, Gaming equipment to toys, refrigerators to TVs tele-communications equipment, Consumer electronic devices and solar panels. Vending machines, ATMs, radioactive waste, and has endless list.

Man does anything is for happy life, keeping your environment clean is one of the prerequisites for leading a healthy and happy life. the old saying waste not, want not has much relevance to the present-day society as global leaders and local communities alike increasingly call for a fix for the throwaway culture [What a Waste 2.0, World Bank, 2018]. But beyond individuals and households, waste and challenges in waste management affects human health and livelihoods, the environment, and development.

2. Meaning and importance of sustainable waste management:

The objective of sustainable waste management is to reduce the amounts of naturalresources consumed, reusing the materials taken from nature as much as it is possible, and generating as minimal waste as possible. To maintain sustainability for the benefit of environment and for future generations focus on processes and divert wastes from the disposal is our responsibility. Sustainable waste management is a key concept of the circular economy. circular economy is a model of production and consumption (News European Parliament 26-04-2022), which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended. In practice, it implies reducing waste to a minimum. When a product reaches the end of its life, its materials are kept within the economy wherever possible. These can be productively used again and again, thereby creating further value.

3. Benefits of sustainable waste management practices and pollution control methods:

The residual waste we dump has a particular effect on the environment. For instance, pharmaceutical waste poisons our water, and waste foods invite flies and rodents. Sustainable waste management helps us understand our waste and how best to deal with it. For example [1]waste generated by pharmaceutical companies should be taken to its original manufacturer for proper disposal such as incineration, waste food should be composted, and plastics can be recycled. All these measures will help in pollution control. Thus, we can prevent the pharmaceutical waste not to poison the water, plastics do not clog marine life and food wastes do not invite rodents.

This circular economy extends many opportunities and advantages to the economy, the society, and the environment. The process of Sustainable waste management involves collecting, sorting, treating, recycling, and further, when properly facilitated provides a source of energy and resources. Consequently it creates job opportunities, improves waste management methods, and lessens the impact of human activities on the ecology and environment, which might result in improving the air and water quality.

4. Law and Regulatory bodies of sustainable waste management:

Now, therefore, in exercise of the powers conferred by sections 3, 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986) and in supersession of the Municipal Solid Waste (Management and Handling) Rules, 2000, except as respect things done or omitted to

be done before such supersession, the Central Government hereby makes the following rules for management of Solid Waste.

Handling of residual and Waste Management in India is governed by multiple sub-ordinate Regulations. The Union Ministry of Environment, Forests and Climate Change (MoEF & CC), empowers the central government to establish Central Pollution Control Board (CPCB) at central level and State Pollution Control Boards of different states (SPCB) at state level regarding waste management in India. household waste collection and recycling services are providing by the local governments. In 2016, the Union Ministry of Environment, Forests and Climate Change (MoEF & CC) released the Solid Wastage Management (SWM) Rules, which replaced by the Municipal Solid Waste (Management and Handling) Rules, and 2000 of which had been in place for 16 years. This national policy plays a significant role in the acknowledgement and inclusion of the informal sector waste pickers into the waste management process for the first time. under these rules every Waste Generators shall segregate waste at source- in to valuable dry waste like plastic, tin, glass, paper, etc. and handover recyclable material to either the authorized waste pickers or the authorized recyclers, or to the urban local body. For disposal of cases, enforcement of any legal right or giving relief and compensation for damages to persons and property relating to environment the National Green Tribunal (NGT) was established in 2010.

The various Rules governing compliance and issues of waste management in India are:

Plastic Waste Management Amendment Rules, 2021:

Being a 1.4 billion populated country, estimating the plastic usage and littered and its impact on both terrestrial and aquatic ecosystems the Government of India, Ministry of Environment, Forest and Climate Change has issued notification of the Plastic Waste Management Amendment Rules, 2021 on August 12, 2021. These Plastic Waste Management Amendment Rules, prohibits manufacture, import, stocking, distribution, sale or vending and use of plastic carry bags having less than seventy-five microns thickness with effect from 30th September 2021, and having less than thickness of one hundred and twenty microns thickness with effect from the 31st December, 2022 (pib-delhi).

Water (Prevention and Control of Pollution) Act, 1974:

Most of the rivers being fed by monsoon rains, which is limited to only three months of the year, run dry throughout the rest of the year often carrying wastewater discharges from industries or cities/towns endangering the quality of our scarce water resources. The parliament of India in its wisdom enacted the Water (Prevention and Control of Pollution) Act, 1974 with a view to maintaining and restoring wholesomeness of our water bodies. One of the mandates of CPCB is to collect, collate and disseminate technical and statistical data relating to water pollution. Hence, Water Quality Monitoring (WQM) and Surveillance are of utmost importance.

Air (Prevention and Control of Pollution) Act, 1977:

Forest Conservation Act, 1980 and Environmental Protection Act, 1986 are the other enactments for environment protection. Section 3(3) of Environmental Protection Act, 1986, empowers the Central Government to establish authorities for preventing environmental pollution in all its forms and to deal with specific environmental problems that are distinctive in nature to different parts of the country.

The Municipal Solid Waste (Management and Handling) Rules, 2000:

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These Rules were effective from September 2000 to 2016. Under these rules local bodies are required to ensure that solid waste generated in city or town is managed in accordance with the provisions of the rule relating to collection, segregation, storage, transportation, processing, and disposal. In 2016 these rules have been replaced with the new Solid Waste Management Rules (SWM), 2016 by the Union Ministry of Environment, Forests and Climate Change (MoEF & CC). In exercise of the powers conferred by sections 3, 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986) and in supersession of the Municipal Solid Waste (Management and Handling) Rules, 2000, exempting certain provisions which are done or omitted to be done before such supersession, the Central Government has made the rules for management of Solid Waste, under the name and title, the Solid Waste Management Rules, 2016.

Solid waste management rules , 2016:

(Ridhima Purwar- 2020): the objective of Solid Waste Management rules are to reduce and eliminate its hostile impact on the environment & human health. It is mandatory to the Households to separate waste into three categories viz., Organic or Biodegradable waste, Dry waste such as plastic, paper, metal, and wood: and Domestic Hazardous waste such as diapers, napkins, mosquito repellents, cleaning agents. The urban local bodies face many challenges in waste management as industrialization, rapid urbanization, and economic growth have resulted in increased municipal solid waste generation per person in India besides population density. Therefore, India relies on large scale landfills and the informal sector to help address its growing waste management challenges. The business entities and industries like hotels and hospitals have to treat organic waste either onsite or by collaborating with the urban local body. Lacking such coordination or due to poor management causes Air pollution, Water and Soil contamination. Because of this reason a municipality includes several stages of processes for effective waste management like monitoring, collection, transport, processing, recycling and disposal of waste.

Biodegradable waste: any organic material that can be degraded into simpler stable compounds by microorganisms is biodegradable waste and the bio-methanation is a process which involves the organic matter to go under enzymatic decomposition by microbial action to produce methane. **Combustible waste** -is a composition of non-biodegradable, non-recyclable, non-hazardous solid waste with a high calorific value of over 1500 kcal/kg, except plastic chlorinated materials and wood pulp, etc. Composting – means a scientific process involving microbial decomposition of organic matter. Disposal – means the disposal of post-processed residual solid waste and collected street sweepings and silt from the surface of drains to prevent contamination of groundwater, unpleasant odour and attraction of stray animals or birds. Domestic Hazardous waste – means the remaining household products which given under certain circumstances can catch fire, react or explode, or are corrosive or toxic in nature.

Duties of Waste Generators:

Each waste generator shall separate the waste that is generated and store it in three different parts which are biodegradable, non-biodegradable and household hazardous waste and store it differently. Subsequently, the collected waste shall be passed to the approved rag pickers or collectors. The sanitary waste used, for example, diapers, sanitary pads etc., shall be securely wrapped in pouches provided or in a suitable wrapping material by the manufacturers of these items and placed in the bins intended for dry or non-biodegradable wastes.

Construction and Demolition Waste Management Rules 2016:

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(Neha Grover, Aug 3, 2022) on March 29, 2016, the Ministry of Environment, Forestry, and Climate Change has notified the Construction & Demolition Waste Management Rules, 2016. These rules are applicable to anybody who generates rubbish from building construction and demolition and the responsibilities of Pollution Control Boards, State Government, Local Authorities, and Service Providers and Contractors. These waste materials include concrete, bricks, timber and lumber, roofing, drywall, landscaping, and other wastes.

Plastic Waste Management Rules 2016:

The Plastic Waste Management Rules, 2016 aim to increase minimum thickness of plastic carry bags from 40 to 50 microns and stipulate minimum thickness of 50 micron for plastic sheets also to facilitate collection and recycle of plastic waste. In order to stop littering due to light weight plastic carry bags, with effect from 30th September 2021, the thickness of plastic carry bags has been increased from fifty microns to seventy-five microns and to one hundred and twenty microns with effect from the 31st December, 2022. The Government of India announced new Plastic Waste Management (Amendment) Rules, 2022 on 16th Feb 2022 which included the modalities of Extended Producer Responsibility (EPR) and also included Rigid Plastics as a new category. All Plastic Producers, Importers, Users, and Brand owners have to comply with these rules. There are three parties that bear this responsibility. Governments that can make and enforce rules, companies that produce or use plastics, and consumers. Each party has its own responsibility.

Technology indicates human development but the garbage or plastic littering on the roads reveals their irresponsibility towards environment protection no matter how many degrees they have on their name the consumers are indifferent in utilising garbage bins kept in public spaces. Hence, plastic waste could be prevented by making consumers as well as product or shop owners who sale the product responsible for they sold and must also accept it back after use. This kind of responsibility attaching to the people concerned gives a solution to reduce of litter and clean-up costs.

E-Waste Management Rules 2016 and 2018:

The government of India, recently, has notified E-waste (management) rules 2022, which will come into force from the month of April next year according to the news report by Mint and these rules are applicable to every manufacturer and developer of e-product, producer refurbishes, dismantler and recycler of e-waste. The use of hazardous substances in manufacturing electrical and electronic equipment (EEE) has been restricted by applying to all electrical devices and radiotherapy equipment, nuclear medicine equipment and accessories, Magnetic Resonance Imaging (MRI), electric toys, air conditioners, microwaves, tablets, washing machine, refrigerator, and iPad among others.

Keeping in view of India as the second largest populous country in the world having capacity to consume large quantities of electronic goods and products for the first time in India with regard to e-waste management the central government in 2016 notified. These rules made the companies responsible up to minimum percentage of electronic goods and products to recycle. Further the Rules prescribed the ceiling limit for hazardous chemicals that are used in manufacturing electronic products such as Compact Fluorescent Lamps (CFLs) as well as other lamps consisting of mercury, and similar equipment. These rules bring producers or manufacturers under the scope of the Extended Producer Responsibility or EPR, along with the purchasers. The definition of e-waste is very broad and covers six waste categories: Temperature exchange equipment, more commonly referred to as cooling and freezing

equipment. Screens, monitors, Lamps, Large equipment, small equipment, small IT and telecommunication equipment.

As per the global e-waste monitor report, 2017 each product of the six e-waste categories has a different lifetime profile, which means that each category has different waste quantities economic values, as well as potential environmental and health impacts, if recycled inappropriately. Consequently, the collection and logistical processes and recycling technology differ for each category, in the same way as the consumers' attitudes when disposing of the electrical and electronic equipment also vary.

Biomedical Waste Management Rules 2016:

Bio-Medical Waste Management Rules, 2016 have been notified on 28th March 2016. The rules are applicable to all the persons who handle bio medical waste in any form such as generate, collect, receive or store, transport, treat and dispose. These rules are not applicable to radioactive wastes covered under the provisions of the Atomic Energy Act, 1962. Wastes included under the Municipal Solid Waste Rules, 2000, Hazardous wastes and lead acid batteries, e-wastes and also to hazardous microorganisms. Meaning of Bio-medical waste under BMWM rules refers to any waste, which is generated by the hospitals during the diagnosis, treatment or immunisation of human beings or animals or during research activities pertaining thereto or in the process of the production or testing of biological or where in health camps, which include the categories mentioned in Schedule I appended to these rules.

Duties under the rules:

It is the duty of the occupier to provide a safe, well ventilated and secured location for storage of segregated BMW within the premises of such. used chlorinated plastic bags, gloves and blood bags shall be phase out once used, within two years from the date of notification of these rules.

The occupier has to provide training to all the health care and other workers involved in handling and generating of bio medical waste. The workers and other staff shall be administered immunization doses against Hepatitis B and tetanus. A bar-code System shall be established for bags and other containers used for the purpose of containing bio-medical waste to be sent out of the premises.

Duties of the Operator under common waste Treatment and disposal facility:

Meaning of the term operator under bio-medical waste is that a person who owns or controls a Common Bio-medical Waste Treatment Facility (CBMWTF) for the purpose of collection, reception, storage, transport, treatment, disposal or any other form of handling of bio-medical waste. The operator has duty to report major accidents and remedial measures to State Pollution Control Board (SPCB) and shall ensure timely collection of BMW from healthcare facilities. Handing over of recyclable waste to after treatment by autoclaving and incineration Establish bar coding and GPS for handling within one year.

Treatment and Disposal of BMW:

The safe and sustainable management of biomedical waste is social and legal responsibility of all people supporting and financing health-care activities.

In healthcare sector if a Common Bio-medical Waste Treatment Facility has been established within 75 kms of distance no facility of such shall setup onsite. Segregation, Packing Storage

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and Transport - Bio-medical waste has been classified in to four categories based on the treatment options. Any untreated bio-medical waste shall be stored beyond a period of 48 hours in case it is necessary to store such beyond 48 hours, the occupier or the owner shall ensure that it do not affect human health and should inform the SPCB with reasons.

Monitoring of implementation of the BMW rules 2016:

The rules provide that the annual reports shall be available on the websites of the occupier, in relation to generation, collection, reception, storage, transportation, treatment and disposal shall be maintained as per the rules. In case of any major incidents of accident immediate intimation shall be done and a report shall be submitted within 24 hours.

Conclusion

The pandemic has presented a challenge in terms of capacity to scientifically dispose of generated waste and a challenge for civic authorities in charge of its collection and disposal. Poor Compliance: States are not following the CPCB guidelines on Covid-19 related waste. NGT gives top priority to waste prevention, followed by re-use, recycling, recovery and finally disposal. In the case of Mukul Kumar vs. State of Uttar Pradesh & Ors Hon'ble NGT vide its order dated 27.07.2021 had directed this Oversight Committee to furnish report about the compliance status in the State of Uttar Pradesh. Humans are rational, can think and judge between right and wrong. For survival humans do many works in their day-to-day life like cooking, eating, medicines for their ailment, inevitably, each act generates some kind of waste this waste has adverse impact upon the environment they live. affects the quality of breathing air, the drinking water, and the land and soil. Hence, it is necessary to manage this waste in an appropriate and sustainable way for the conservation of our mother earth otherwise it will become uninhabitable for future generations.

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