Waste management and Legacy Waste

Part of: GS Prelims and GS-III- Environment

The Environment Ministry has revised Solid Waste Management Rules after 16 years. The Rules are now applicable beyond municipal areas and will extend to urban agglomerations, census towns, notified industrial townships, areas under the control of Indian Railways, airports, airbase, port and harbour, defence establishments, special economic zones, State and Central government organizations, places of pilgrims, religious & historical importance.

62 million tonnes of waste is generated annually in the country at present, out of which 5.6 million tonnes is plastic waste, 0.17 million tonnes is biomedical waste, hazardous waste generation is 7.90 million tonnes per annum and 15 lakh tonne is e-waste. The per capita waste generation in Indian cities ranges from 200 grams to 600 grams per day. 43 million TPA is collected, 11.9 million is treated and 31 million is dumped in landfill sites, which means that only about 75-80% of the municipal waste gets collected and only 22-28% of this waste is processed and treated. “Waste generation will increase from 62 million tonnes to about 165 million tonnes in 2030”.

Some of the salient features of SWM Rules, 2016 include:-

1. The Rules are now applicable beyond Municipal areas and extend to urban agglomerations, census towns, notified industrial townships, areas under the control of Indian Railways, airports, airbase, Port and harbour, defence establishments, special economic zones, State and Central government organizations, places of pilgrims, religious & historical importance.

2. The source segregation of waste has been mandated to channelize the waste to wealth by recovery, reuse and recycle.

3. Responsibilities of Generators have been introduced to segregate waste in to three streams, Wet (Biodegradable), Dry (Plastic, Paper, metal, wood, etc.) and domestic hazardous wastes (diapers, napkins, empty containers of cleaning agents, mosquito repellents, etc.) and handover segregated wastes to authorized rag-pickers or waste collectors or local bodies.

4. Integration of waste pickers/ ragpickers and waste dealers/ Kabadiwalas in the formal system should be done by State Governments, and Self Help Group, or any other group to be formed.
5. No person should throw, burn, or bury the solid waste generated by him, on streets, open public spaces outside his premises, or in the drain, or water bodies.

6. Generator will have to pay ‘User Fee’ to waste collector and for ‘Spot Fine’ for Littering and Non-segregation.

7. Used sanitary waste like diapers, sanitary pads should be wrapped securely in pouches provided by manufacturers or brand owners of these products or in a suitable wrapping material and shall place the same in the bin meant for dry waste / non- bio-degradable waste.

8. The concept of partnership in Swachh Bharat has been introduced. Bulk and institutional generators, market associations, event organizers and hotels and restaurants have been made directly responsible for segregation and sorting the waste and manage in partnership with local bodies.

9. All hotels and restaurants should segregate biodegradable waste and set up a system of collection or follow the system of collection set up by local body to ensure that such food waste is utilized for composting / biomethanation.

10. All Resident Welfare and market Associations, Gated communities and institution with an area >5,000 sq. m should 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.

11. The bio-degradable waste should be processed, treated and disposed of through composting or bio-methanation within the premises as far as possible. The residual waste shall be given to the waste collectors or agency as directed by the local authority.

12. New townships and Group Housing Societies have been made responsible to develop in-house waste handling, and processing arrangements for bio-degradable waste.

13. Every street vendor should keep suitable containers for storage of waste generated during the course of his activity such as food waste, disposable plates, cups, cans, wrappers, coconut shells, leftover food, vegetables, fruits etc. and deposit such waste at waste storage depot or container or vehicle as notified by the local authority.
14. The developers of Special Economic Zone, industrial estate, industrial park to earmark at least 5% of the total area of the plot or minimum 5 plots/sheds for recovery and recycling facility.

15. All manufacturers of disposable products such as tin, glass, plastics packaging etc. or brand owners who introduce such products in the market shall provide necessary financial assistance to local authorities for the establishment of waste management system.

16. All such brand owners who sale or market their products in such packaging material which are non-biodegradable should put in place a system to collect back the packaging waste generated due to their production.

17. Manufacturers or Brand Owners or marketing companies of sanitary napkins and diapers should explore the possibility of using all recyclable materials in their products or they shall provide a pouch or wrapper for disposal of each napkin or diapers along with the packet of their sanitary products.

18. All such manufacturers, brand owners or marketing companies should educate the masses for wrapping and disposal of their products.

19. All industrial units using fuel and located within 100 km from a solid waste based RDF plant shall make arrangements within six months from the date of notification of these rules to replace at least 5% of their fuel requirement by RDF so produced.

20. Non-recyclable waste having calorific value of 1500 K/cal/kg or more shall not be disposed of on landfills and shall only be utilized for generating energy either or through refuse derived fuel or by giving away as feed stock for preparing refuse derived fuel.

21. High calorific wastes shall be used for co-processing in cement or thermal power plants.

22. Construction and demolition waste should be stored, separately disposed off, as per the Construction and Demolition Waste Management Rules, 2016.
23. Horticulture waste and garden waste generated from his premises should be disposed as per the directions of local authority.

24. An event, or gathering organiser of more than 100 persons at any licensed/unlicensed place, should ensure segregation of waste at source and handing over of segregated waste to waste collector or agency, as specified by local authority.

25. Special provision for management of solid waste in hilly areas:— Construction of landfill on the hill shall be avoided. A transfer station at a suitable enclosed location shall be setup to collect residual waste from the processing facility and inert waste. Suitable land shall be identified in the plain areas, down the hill, within 25 kilometers for setting up sanitary landfill. The residual waste from the transfer station shall be disposed off at this sanitary landfill.

26. In case of non-availability of such land, efforts shall be made to set up regional sanitary landfill for the inert and residual waste.

(II) Municipal Solid Waste

With the ever increasing population and urbanization, the waste management has emerged as a huge challenge in the country. Not only the waste has increased in quantity, but the characteristics of waste have also changed tremendously over a period, with the introduction of so many new gadgets and equipment. It is estimated that about 62 million tonnes of waste is generated annually in the country, out of which 5.6 million is plastic waste, 0.17 million is biomedical waste. In addition, hazardous waste generation is 7.90 million TPA and 15 lakh tonne is e-waste. The per capita waste generation in Indian cities range from 200 grams to 600 grams per day (2011). 43 million TPA is collected, 11.9 million is treated and 31 million is dumped in landfill sites.

(III) Proper solid waste management

Scientific disposal of solid waste through segregation, collection and treatment and disposal in an environmentally sound manner minimises the adverse impact on the environment. The local authorities are responsible for the development of infrastructure for collection, storage, segregation, transportation, processing and disposal of MSW.

As per information available for 2013-14, compiled by CPCB, municipal authorities have so far only set up 553 compost & vermi-compost plants, 56 bio-methanation plants, 22 RDF plants and 13 Waste to Energy (W to E) plants in the country.

(IV) Problems of unscientific MSW disposal
Only about 75-80% of the municipal waste gets collected and out of this only 22-28% is processed and treated and remaining is disposed of indiscriminately at dump yards. It is projected that by the year 2031 the MSW generation shall increase to 165 million tonnes and to 436 million tons by 2050. If cities continue to dump the waste at present rate without treatment, it will need 1240 hectares of land per year and with projected generation of 165 million tons of waste by 2031, the requirement of setting up of land fill for 20 years of 10 meters height will require 66,000 hectares of land.

As per the Report of the Task Force of erstwhile Planning Commission, the untapped waste has a potential of generating 439 MW of power from 32,890 TPD of combustible wastes including Refused Derived Fuel (RDF), 1.3 million cubic metre of biogas per day, or 72 MW of electricity from biogas and 5.4 million metric tonnes of compost annually to support agriculture.

(V) Consultation process for new Solid Waste Rules

The draft Solid Waste Management Rules were published in June, 2015 inviting public objections and suggestions. Stakeholders consultation meets were organized in New Delhi, Mumbai and Kolkata. Consultative meetings with relevant Central Ministries, State Governments, State Pollution Control Boards and major hospitals were also held. The suggestions/objections (about 111) received were examined by the Working Group in the Ministry. Based on the recommendations of the Working Group, the Ministry has published the Solid Waste Management Rules, 2016.

Note: Apart from this, Article 51 A (g) of the Constitution of India makes it a fundamental duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers, and wildlife, and to have compassion for living creatures.

Bioremediation: Bioremediation uses natural as well as recombinant microorganisms to break down toxic and hazardous substances in a solid waste by aerobic and anaerobic means.

Biomining: Biomining is the process of using microorganisms (microbes) to extract metals of economic interest from rock ores or mine waste. Biomining techniques may also be used to clean up sites that have been polluted with metals.

Way Ahead

- **Laying down clear technical norms:** It is important that Bio-mining and Bio-remediation is made compulsory for areas wherever it can be applied. It shouldn’t be left to the discretion of municipalities to decide whether there are geographical constraints that prevent the use of the aforementioned techniques.

- **Biomining and Bio Remediation** are superior as well as simple methods which are not only cost-effective but also environment-friendly. The best part is that the land which was a landfill is fully available for alternate uses.

- **Scientific Capping:** Capping, if it is inevitable, should be done scientifically with underground pits that have a good bottom and sideliners, and proper piping and gas extraction systems to prevent the escape of leachate and gases.

- **Decentralization of waste management:** It is important that waste management is decentralized. Ambikapur in Chhattisgarh and Vellore present a very good example of the same where the waste was collected in a decentralized manner, composted naturally and
is planted.

It is important that the decision-makers at all levels of government opt for more innovative and green approaches rather than falling for the technology-extensive costly methods of waste disposal which are normally being lobbied for by the manufacturers of such technologies.

Legacy waste

Recently, the National Green Tribunal (NGT) has directed a committee to assess the amount of damage caused to the environment due to the dump sites (legacy waste) in Delhi.

- The committee comprises representatives from the Central Pollution Control Board, National Environmental Engineering Research Institute (NEERI) and IIT Delhi.

Key Points

- Legacy wastes are the wastes that have been collected and kept for years at some barren land or a place dedicated for Landfill (an area to dump solid waste).
- This waste can be roughly grouped into **four categories:**
  - Contained and/or stored waste (contained or stored waste are wastes in tanks, canisters, and stainless steel bins).
  - Buried waste.
  - Contaminated soil and groundwater
  - Contaminated building materials and structures.
- **Biomining method** has been proposed by the Central Pollution Control Board (CPCB) for the effective disposal of legacy wastes.
- **Environmental Impact of Legacy Waste**
  - Legacy wastes not only occupy large space, but also become a breeding ground for pathogens, flies, malodours and generation of leachate, which may lead to water contamination.
  - They also contribute to generation of greenhouse gases and pose risk of uncontrollable fire.

Biomining

- Biomining is the process of using microorganisms (microbes) to extract metals of economic interest from rock ores or mine waste.
- Biomining techniques may also be used to clean up sites that have been polluted with metals.
- It is usually used for old dumped waste that remains in a partly or fully decomposed state with no segregation in existence between wet and dry waste.
- In the cost effective method of biomining, treatment is done by dividing the garbage heap at the site into suitable blocks to let the air percolate in the heap.
- As a result, the leachate which is the water in the heap with suspended solid particles is drained off and microbes are sprayed in the heap to initiate biological decompositions.
- The waste is turned over several times in order to devoid the waste to leachate as much as possible.
- This biological decomposition of the waste decreases the volume of the waste by 40%.

What is National Green Tribunal (NGT)?
It is a specialised body set up under the National Green Tribunal Act (2010) for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources.

With the establishment of the NGT, India became the third country in the world to set up a specialised environmental tribunal, only after Australia and New Zealand, and the first developing country to do so.

NGT is mandated to make disposal of applications or appeals finally within 6 months of filing of the same.

The NGT has five places of sittings, New Delhi is the Principal place of sitting and Bhopal, Pune, Kolkata and Chennai are the other four.

Structure of NGT

- The Tribunal comprises of the Chairperson, the Judicial Members and Expert Members. They shall hold office for a term of five years and are not eligible for reappointment.
- The Chairperson is appointed by the Central Government in consultation with Chief Justice of India.
- A Selection Committee shall be formed by the central government to appoint the Judicial Members and Expert Members.
- There are to be least 10 and maximum 20 full time Judicial members and Expert Members in the tribunal.

Powers & Jurisdiction

- The Tribunal has jurisdiction over all civil cases involving substantial question relating to environment (including enforcement of any legal right relating to environment).
- Being a statutory adjudicatory body like Courts, apart from original jurisdiction side on filing of an application, NGT also has appellate jurisdiction to hear appeal as a Court (Tribunal).
- The Tribunal is not bound by the procedure laid down under the Code of Civil Procedure 1908, but shall be guided by principles of 'natural justice'.
- While passing any order/decision/award, it shall apply the principles of sustainable development, the precautionary principle and the polluter pays principle.
- NGT by an order, can provide
  - relief and compensation to the victims of pollution and other environmental damage (including any hazardous substance),
  - for restitution of property damaged, and
  - for restitution of the environment for such area or areas, as the Tribunal may think fit.
- An order/decision/award of Tribunal is executable as a decree of a civil court.
- The NGT Act also provides a procedure for a penalty for non compliance:
  - Imprisonment for a term which may extend to three years,
  - Fine which may extend to ten crore rupees, and
  - Both fine and imprisonment.
- An appeal against order/decision/award of the NGT lies to the Supreme Court, generally within ninety days from the date of communication.
- The NGT deals with civil cases under the seven laws related to the environment, these include:
  - The Water (Prevention and Control of Pollution) Act, 1974,
  - The Water (Prevention and Control of Pollution) Cess Act, 1977,
  - The Forest (Conservation) Act, 1980,
  - The Air (Prevention and Control of Pollution) Act, 1981,
  - The Environment (Protection) Act, 1986,
  - The Public Liability Insurance Act, 1991 and
  - The Biological Diversity Act, 2002.
- Any violation pertaining to these laws or any decision taken by the Government under these laws can be challenged before the NGT.

Strengths of NGT

- Over the years NGT has emerged as a critical player in environmental regulation, passing strict orders on issues ranging from pollution to deforestation to waste management.
NGT offers a path for the evolution of environmental jurisprudence by setting up an alternative dispute resolution mechanism. It helps reduce the burden of litigation in the higher courts on environmental matters. NGT is less formal, less expensive, and a faster way of resolving environment related disputes. It plays a crucial role in curbing environment-damaging activities. The Chairperson and members are not eligible for reappointment, hence they are likely to deliver judgements independently, without succumbing to pressure from any quarter. The NGT has been instrumental in ensuring that the Environment Impact Assessment process is strictly observed.

Challenges

- Two important acts - Wildlife (Protection) Act, 1972 and Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 have been kept out of NGT's jurisdiction. This restricts the jurisdiction area functioning as crucial forest rights issue is linked directly to environment.
- The NGT decisions are being challenged in various High Courts under Article 226 (power of High Courts to issue certain writs) with many asserting the superiority of a High Court over the NGT, claiming ‘High Court is a constitutional body’. This is one of the weaknesses of the Act as there is lack of clarity about what kind of decisions can be challenged before the Supreme Court.
- Decisions of NGT have also been criticised and challenged due to their repercussions on economic growth and development.
- The absence of a formula based mechanism in determining the compensation has also brought criticism.
- The decisions given by NGT are not fully complied by the stakeholders or the government. Sometimes it is not feasible to implement within a given timeframe.
- The lack of human and financial resources has led to high pendency of cases - which undermine appeals within 6 months.
- The justice delivery mechanism is also hindered by limited number of regional benches.

Important Landmark Judgements of NGT

- In 2012, POSCO a steelmaker company signed a MoU with the Odisha government to set up steel project. NGT suspended order and this was considered a radical step in favour of the local communities and forests.
- In 2012 Almitra H. Patel vs. Union of India case, NGT gave judgment of complete prohibition on open burning of waste on lands, including landfills – regarded as the single biggest landmark case dealing with the issue of solid waste management.
- In 2013 in Uttarakhand floods case, the Alaknanda Hydro Power Co. Ltd. was ordered to compensate to the petitioner – here, the NGT directly relied on the principle of ‘polluter pays’.
- In 2015, the NGT ordered that all diesel vehicles over 10 years old will not be permitted to ply in Delhi-NCR.
- In 2017, the NGT ordered that all diesel vehicles over 10 years old will not be permitted to ply in Delhi-NCR.
- In 2017, the Art of Living Festival on Yamuna Food Plain was declared violating the environmental norms, the NGT panel imposed a penalty of Rs. 5 Crore.
- The NGT, in 2017, imposed an interim ban on plastic bags of less than 50-micron thickness in animal deaths, clogging sewers and harming the environment.”