



CENTRAL POLLUTION CONTROL BOARD
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National Plans to Make River Stretches Pollution Free
(Draft as on 28.06.2019)

1. Preamble

India is a riverine country and has numerous lakes, ponds, wells apart from ground water resources which are acting as most important resources for supporting life. Most of the rivers being fed by monsoon rains, which are limited to only three to four months of the year, run dry rest of the year. Due to rapid rise in population and growing economy of the country, there will be continuous increase in demand for water. The stress on water demand leads to endangering the quality of our scarce natural water resources apart from grave implications for public health as well as environmental quality. Poor water management and sanitation practices, inadequate funds for operation and maintenance existing infrastructure for treatment of municipal sewage, lack of adequate institutional reforms and ineffective implementation of existing provisions leading to conversion of all the natural drains into drains for carrying sewage or industrial effluent and there by attributing to river pollution. Future predictions which include worsening of the present situation due to a disturbed hydrological cycle and regional climatic variability and such a scenario would call for having reliable, justifiable, implementable national initiatives for making identified polluted river stretches free from pollution for ensuring to make available the pristine water sources for all the future generations.

2. Existing Regulatory Framework for Prevention and Control of River Pollution

Government of India has enacted various Acts and assigned functions to Ministries of Water Resources, Urban Development, Environment, Forest & Climate Change as well as Central/State Governments to achieve sustainable consumptions and usage of water resources.

2.1 *The Water (Prevention and Control of Pollution) Act, 1974*

The Water (Prevention and Control of Pollution) Act, 1974 (the "Water Act") has been enacted for prevention and control of water pollution and to maintain or restore wholesomeness of water in the country through State Boards at the State level and CPCB at the Central level. The Water Act also prohibits discharge of pollutants into water bodies beyond a given standard through SPCB consent mechanism, and lays down penalties for non-compliance. At the Centre, under

Water Act, CPCB was set up which lays down standards for prevention and control of water pollution. The Water Act mandates the Boards to plan and execute nationwide programme for prevention, control or abatement of pollution, disseminate information and knowledge by publishing technical documents and lay down standards for regulatory purpose. The regulatory provisions under The Water Act, 1974 are enshrined in section 18 for the Central Govt and Central Board. Water being the state subject, the enforcement is largely confined to the State Govt. Authorities [(i.e. State Pollution Control Board (SPCB)/Pollution Control Committee (PCC)].

2.2 Environment (Protection) Act, 1986

In the wake of the Bhopal Tragedy, the Government of India enacted Environment (Protection) Act of 1986 under Article 253 of the Constitution. Passed in March 1986, it came into force on 19 November 1986. The Act is an “umbrella” legislation provides for the protection and improvement of environment. The Environment (Protection) Act establishes the framework for studying, planning and implementing long-term requirements of environmental safety and laying down a system of speedy and adequate response to situations threatening the environment. Under the Environment (Protection) Act, the Central Government is empowered to take measures necessary to protect and improve the quality of environment by setting standards for emissions and discharges of pollution in the atmosphere by any person carrying on an industry or activity; regulating the location of industries; management of hazardous wastes, and protection of public health and welfare. In case of any non-compliance or contravention of the Environment (Protection) Act, or of the rules or directions under the said Act, the violator will be punishable with imprisonment as prescribed under the Act.

However, both Water Act and Environment (Protection) Act, 1986 (i) does not specify voluntary compliance to the discharge norms by all the industry, (ii) the penalties stipulated under the Environment (Protection) Act, 1986 are nominal; (iii) all the industrial activities which are likely to cause river pollution have not been covered through consent mechanism by the SPCBs/PCCs; (iv) States/UTs are not enforcing need based stringent norms to the industry keeping in view protection of water resources; (v) Water Act allows SPCBs/PCCs for collection of samples manually and for verification of compliance to the discharge norms, considering the work load given under various provisions, industries might be rarely inspected by the authorised authorities of SPCBs/PCCs which urges adoption of well-established new technologies which includes adoption of continuous online effluent monitoring systems, automatic closure of industry ETP outlets, initiating actions under the provisions against the violating industries with heavy penalties; and (vi) Discharge standards for STPs notified under the E (P) Act, 1986 to be made applicable after review in compliance to the Hon'ble NGT orders.

2.3 Solid Waste Management Rules

The Union Ministry of Environment, Forests and Climate Change (MoEF &CC) notified Solid Waste Management Rules (SWM), 2016 in supersession of

Municipal Solid Wastes (Management and Handling) Rules, 2000. The new SWM rules have mandated source segregation of waste in order to channelize the waste to wealth by adopting recovery, reuse and recycle principles. All waste generators including bulk waste generators would now have to segregate waste at source into three streams- Biodegradables, Dry (Plastic, Paper, metal, Wood, etc.) and Domestic hazardous waste (diapers, napkins, mosquito repellants, cleaning agents etc.) before handing it over to the collector or agency, for final disposal as specified by the local authority in accordance with these rules. The new rules also specify distance criteria for location of sanitary landfills (in plain and in hilly areas), standards for leachate generated from sanitary landfills, amended incineration emission standards, compost standards in line with Fertiliser Control Order and also specifies bio-mining and capping of existing dumpsites for ensuring environmentally sound management of municipal solid waste. *However, proper management of municipal solid waste is still in the preliminary stage and long way to go for ensuring proper management of municipal solid waste in the country and the existing scenario also attributing to water pollution in the country.*

Apart from the above, various rules were notified under the Environment (Protection) Act, 1986 which include (i) Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 and amendments made thereof; (ii) Bio-medical Waste Management Rules, 2016 and amendments made thereof (iii) E-Waste Management Rules, 2016 and amendments made thereof (iv) Plastic Waste Management Rules, 2016 and amendments made thereof, and (v) Construction and Demolition Waste Management Rules 2016, for environmentally sound management of such waste.

3. Sources of River Pollution and the Existing Scenario

Sources of river pollution are broadly categorized as point sources and non-point sources. Point sources impacting the water resources in a significant manner whereas non-point sources are contributing only during the monsoon season or the rainy days which are confined to 40 monsoon days in the large part of Indian sub-continent. Thus the control of pollution from point sources is the prime requirement and accordingly required to be prioritized.

3.1 Gaps in Municipal Sewage Management

India, being an economy in transition from developing to developed nation, is faced with two problems. On one side, lack of infrastructure and on the other, an ever-increasing urban population. The urban population in India was about 387 million in 2011 and rose to about 420 million by 2017. It is estimated that by 2050, more than 50% of the country's population estimated as 1000 million will live in cities and towns and thus the likely demand for infrastructure facilities including fresh water for drinking and resultant wastewater discharges are expected to rise sharply posing a challenge to urban planners, policy makers, environmental regulators and managers. As per the assessment carried out by CPCB in the year 2015, it is estimated that 61948 million litres per day (MLD) of domestic sewage is generated from urban areas. At present, there are 816 Sewage Treatment Plants (STPs) and

installed sewage treatment capacity is about 23277 MLD (37.57%) and capacity utilisation of STPs is about 18883 MLD (30.48 %). Gap in sewage generation and actual treatment of sewage is about 43065 MLD (69.51 %). 522 out of 816 STPs are operational and 79 STPs are non-operational. Hence, treated/untreated and partially treated municipal wastewater is flowing into nearby rivers causing river pollution in the downstream reaches. *Apart from the above, there are issues with regard to regular operation of these STPs and non-compliance to discharge standards, which are attributed mainly due to (i) lack of dedicated sewerage systems for collection and conveyance of sewage (open storm water drains carry city sewage in many cities); (ii) inappropriate technology and capacity of STPs; (iii) non-prioritization of wastewater treatment (focus has been on supply of drinking water rather than wastewater treatment); (iv) no revenue source to meet the management cost of sewage ; (v) limitation of skilled manpower, technical know-how on operation; (vi) non-sustainable approach in design of sewage management projects ; (vii) treated water not considered as valuable resources and the concept of Reuse, Recycle & Recovery not imbibed in project design; (viii) energy recovery potential not envisaged (there is a potential to meet up to 50% of the energy requirement through captive generation); (ix) multiple agencies are not making efforts for meeting the objectives; (x) ULBs are so far immune to enforcement and regulatory provisions; (xi) lack of awareness on consequences*

3.2 Gaps in Industrial Effluents Management: -

There are 88 prominent industrial clusters, 43 industrial clusters in 17 States having Comprehensive Environmental Pollution Index (CEPI) score of 70 and above are identified as Critically Polluted Areas (CPAs). Further, 32 industrial clusters with CEPI scores between 60 & below 70 are categorized as Severely Polluted Areas (SPAs).

As per an estimate carried by CPCB in the year 2005, about 11000 MLD of wastewater is generated alone from 17 categories of medium and large scale industries. The quantity of industrial discharge has increased many folds over the years in all sectors thus requires comprehensive assessment. Discharge of untreated industrial wastewater through open drains has potential for soil and groundwater contamination. One of the main challenges in control of wastewater pollution from industries is non-compliance to discharge standards.

To ensure compliance to the effluent discharge norms, most of the industry adopts either captive effluent treatment plants or disposes through common effluent treatment plants (CETPs). Having limited financial resources at their disposal in individual capacity especially in case of small scale industrial (SSI) sector, CETPs are a viable option for management of cluster origin industrial wastewater. Various schemes of Government of India have been facilitating and encouraging CETPs, over past 2 decades.

The number of CETPs increased from 88 facilities (with a capacity of 560 MLD) in the year 2005 to 194 facilities with treatment capacity of 1475 ~~4500~~ MLD spreaded across 18 States and one UT (Delhi). Tamilnadu State has 41 CETPs followed by

Gujarat (32), Maharashtra (28), Rajasthan (15), Delhi (13), Haryana (13), Karnataka (11), UP (08), Kerala (07), AP (06), Telangana (06), Punjab (04), Uttarakhand (03), M.P (02), H.P, J &K, Jharkhand, Tripura and West Bengal each 01 CETP. 124 out of 194 CETPs are connected with online continuous effluent monitoring system (OCEMS) and 29 CETPs have adopted 'Zero Liquid Discharge' systems. *However, achievement of satisfactory performance has been a challenge, including non-compliance to standards due to (i) discharge of recalcitrant effluent from heterogeneous chemical industrial sources; (ii) non-compliance to inlet effluent quality by member industries and (iii) 11 States viz., Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Goa, Meghalaya, Manipur, Mizoram, Nagaland, Odisha, Sikkim and 05 UTs viz., Andaman & Nicobar Islands, Chandigarh, Daman, Diu, Dadra & Nagar Haveli, Puducherry, Lakshadweep, yet to come up CETPs in the respective State/UTs*

3.3 Gaps in Waste Management: -

Gaps in Waste Management are detailed in subsequent paras: -

3.3.1 Hazardous Waste Management Scenario: -

As per Information received from SPCBs/PCCs for 2016-17, there are 56,350 numbers of hazardous waste (HW) generating industries in the country authorized under Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016 (HOWM, 2016), to generate about 25.46 Million Metric Tonnes (MT) of hazardous wastes. As per annual returns submitted by the occupiers, about 7.17 Million MT of hazardous waste have been generated during April, 2016-March, 2017. Quantity of hazardous waste disposed in Hazardous Waste Treatment, Storage and Disposal Facilities (TSDFs): 2.84 Million MT (39.65 %), quantity of HW recycled/utilized-3.68 Million MT (51.30 %) which includes recycling of commonly recyclable hazardous wastes-1 Million MT as per Schedule –VI of the HOWM Rules, 2016; Co-processing in Cement Kilns: 0.55 Million MT; Captive Utilisation: -1.66 Million MT; Non-Captive Utilisation (under Rule 9 of the HWM Rules, 2016)-0.47 Million MT. There are 1,733 authorized recyclers for recycling of commonly recyclable hazardous wastes (used oil/waste oil/non-ferrous scraps/etc.) listed under Schedule-IV of HOWM, Rules, 2016, having authorized capacity of 6.99 Million MT. 65 Cement Plants having authorized capacity of 7.22 Million MT are utilizing hazardous waste in the country by co-processing. Apart from utilization of hazardous waste in cement plants, there are 224 facilities for utilization of various categories of hazardous waste as a resource/energy recovery, having authorized capacity of 2.32 Million MT. There are 42 Common Hazardous Waste Treatment, Storage and Disposal Facilities (TSDFs) in 17 States and 01 UT. Out of 42 TSDFs, 18 are integrated TSDFs having both Secured Landfills (SLFs) and Incinerators; 10 have only common incinerators, and 14 have only Secured Landfills. *Still States viz., N-E States, Bihar, Chhattisgarh, Jharkhand, J & K, Goa and UTs viz., Delhi, Puducherry, Lakshadweep, A & N Islands, Chandigarh yet to develop their own TSDFs although few states have tied up with the neighboring states.*

3.3.2 Bio-medical Waste Management: -

As per annual report information for the year 2017, there are 2, 38,259 no. of Health Care Facilities (HCFs) out of which 87,281 no. of HCFs are bedded and 1,51,302 no. of HCFs are non-bedded. The total generation of bio-medical waste is about 559 Tonnes per day. 84,805 no. of HCFs have granted authorization under the BMW Rules. There are 198 no. of Common Bio-medical Waste Treatment Facilities (CBWTFs) in operation (24 under construction) and 9,841 no. of HCFs are having captive bio- medical waste treatment and disposal facilities, which are involved in treatment and disposal of 518 Tonnes out of 559 Tonnes per day bio-medical waste. As reported, 23,942 no. of HCFs/CBWTFs observed to be violating the provisions of the BMW Rules. *7 nos. of States/UTs (Andaman Nicobar, Arunachal Pradesh, Goa, Lakshadweep, Mizoram, Nagaland, and Sikkim) are not having CBWTFs for treatment of biomedical waste.*

3.3.3 Solid Waste Management: -

As per CPCB, total municipal solid waste generation in 28 SPCBs/PCCs is about 119350.835 Tonnes Per Day (TPD), out of generated municipal solid waste, 106318.037 TPD is collected (89.08 %), 31318.745 TPD (26.24 %) is treated and about 46982.251 TPD (39.36 %) of solid waste is landfilled.

There are total 3091 urban local bodies (ULBs) in 28 States are responsible for implementation of Solid Waste Management Rules, 2016 (SWM Rules, 2016). There are 2027 composting facilities, 6 Waste-To-Energy (WtE) plants are operational in 3 States namely Delhi (3 nos.), Jabalpur (1 nos.) and Maharashtra (2 nos.) apart from total 2121 dumpsites present out of which 11 are capped and 30 are converted into sanitary landfill.

At present, there are no adequate number of scientific secured landfill facilities in the Country for disposal of municipal solid waste. Most of the generated solid waste is disposed of in dumpsites and causing soil, ground groundwater contamination apart from causing nuisance to the public, though SWM Rules 2016 prescribed that landfill site should preferably be used only for depositing inert waste and rejects.

3.3.4 E-Waste Management

As per the Global E-waste Monitor report of 2017 of United Nation University the e-waste generation in the Country in the year 2016 was 2 million metric tonnes. Inventory on generation of e-waste is being prepared by various SPCBs/PCCs and only six states namely Goa, J & K, Himachal Pradesh, Madhya Pradesh, Chhattisgarh and Punjab has prepared the inventory of e-waste generation. To ensure environmentally sound management of e-waste 301 dismantler & recycler have been granted authorization in 18 States. The total authorised capacity of these authorised dismantler & recycler is 780864.6 MT per annum.

3.3.5 Plastic Waste Management

As per the information provided by the States/UTs to CPCB, total estimated plastic waste generation during the year 2017-18 in the 29 States/UTs is 22,94,734 Tons. To minimize and regulate the generation of plastic waste 18 States/UTs have imposed complete ban on plastic carry bags/products and 5 States namely Andhra Pradesh, Gujarat, Jammu & Kashmir, Kerala and West Bengal have imposed partial ban on plastic carry bags/products at religious/historical places. There are 5066 (5015-Plastic, 11-Compostable, & 40-Recycling) Registered units in 27 States/UTs and ~ 756 unregistered plastic manufacturing/recycling units are running in 12 States/UTs, namely; Bihar, Himachal Pradesh, Jammu & Kashmir, Kerala, Madhya Pradesh, Maharashtra, Odisha, Puducherry, Punjab, Tamil Nadu, Uttar Pradesh & Uttarakhand respectively.

3.3.6 Construction and Demolition Waste (C & D Waste)

C & D waste generation in India accounts up to 23.75 million tonnes annually and these figures are likely to double fold up to 2016. (Source: International Society of Waste Management, India).

4.0 Action Plan to make river stretches free from Pollution

Based on the assessment carried out and the analysis of water quality data of 521 rivers for the years 2016 & 2017, CPCB has identified 351 polluted river stretches on 323 rivers based on exceedance of water quality criteria with respect to indicator of organic pollution i.e. Biochemical Oxygen Demand (BOD) (3mg/l) in 28 States and 3 Union Territories (UTs).

Among the five priorities, highest pollution levels in rivers grouped in Priority-I and Priority-II (61 identified polluted river stretches) due to mostly untreated or partially treated sewage discharges from urban agglomerations. The large volume of sewage in the big cities along these stretches requires huge financial resources. Accordingly, allocation of funds to address the problem of these polluted stretches requires to be assessed based on detailed studies (DPR). In other river stretches falling in Priority –III to Priority-V (290 stretches), restoration with relatively smaller efforts and less funds can be achieved in view of smaller organic pollution load. More application of conventional sewage treatment plant alone is not expected to produce results. A combination of factors and treatment options will have to be examined to ensure required treatment is provided and also treated sewage water is reused.

4.1 Review of Regulatory Frame Work

The legal and institutional provisions are provided in Water (Prevention and Control of Pollution) Act, 1974 wherein standards are developed and enforced for treatment of municipal wastewater by Pollution Control Boards. There are provisions for tightening of standards by State Pollution Control Board for site specific requirements, in view of low flow or no flow in stretches of rivers or streams

and for critically polluted areas in view of high concentration of pollution loads in a specific area. The need based directions for zero discharge are prescribed for grossly polluting industrial units. However, such enforcements are not practical in case of municipal bodies. The concept of delinking of sewer to river is gaining momentum in river conservation plans and may bring visible improvement in water quality of recipient's water bodies. There is a need to make these rivers and streams perennial by introduction of minimum/environmental/ecological flows for maintaining the ecosystem of aquatic resources through institutional provisions. In addition to the above, *suggested plans relating to review of legal frame work are:*

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- a) Designated Best Use (DBU) criteria also be notified under E (P) Rules, 2016 as done in case of bathing criteria under E (P) Rules, 1986, as it helps the States/UTs to categorize rivers in the State and to take requisite remedial measures for ensuring the rivers fit for DBU.
- b) Ban illegal industrial operations, empower the District Magistrate to dismantle such industrial premises in a time frame.
- c) No industrial discharge shall be allowed without valid consent to operate from SPCB/PCC.
- d) Installation of continuous online effluent monitoring systems (COEMS) should be made mandatory for all the wastewater generating industries irrespective of type of industry sector and quantum of wastewater generation;
- e) Adoption of environmentally sound technologies for lower specific water consumption and less wastewater generation;
- f) Levying of heavy penalties based on the polluter pays principles (based on the environment compensation for the damages caused to the environment as per CPCB guidelines). Also, the assessment cost incurred by the SPCBs/PPCs/CPCB should be recovered from the industry.
- g) Validation of continuous online effluent monitoring systems and for initiating actions against the violating industries.
- h) Inventorisation of all the industrial sectors generating wastewater so as to cover under the consent mechanism (at least one time obtaining of consent under Water Act, 1974) for ensuring proper treatment and disposal of industrial effluents generated from such industries.
- i) Revisit effluent discharge norms for STPs in light of the directions passed by Hon'ble NGT.
- j) Ban on discharge of untreated effluent into the water bodies in any form.

4.2 Municipal Sewage Management

There is a need to limit water consumption from all available resources including wastewater by recycling, reuse, recharging and storages, which includes operating on-site treatment and its reuse by the generators. There is an urgent need to plan strategies and give thrust to policies giving equal weightage to augmentation of water supplied and development of wastewater treatment facilities. Municipal wastewater collection, treatment and disposal are still not a priority by the municipalities/ state governments as compared to water supply. In absence of sewer lines, untreated wastewater is flowing in the storm water drains and poses health hazards to citizens inhabited near the drain, which is a great concern.

Although municipal waste water treatment is given impetus under National River Conservation Plan (NRCP) of Ministry of Environment, Forest and Climate Change, Government of India to provide sewage treatment plant to cities discharging wastewater in rivers, there is a huge gap between wastewater generation and its treatment. Also, the operation and maintenance of STPs/ETUs are not satisfactory due to uninterrupted power supply/ lack of backup power supply, municipal authorities do not have the adequate funds for spares, payment of electricity bills, lack of skilled manpower and most of the plants are underutilized due to lack of sewer network. Low-cost, decentralized, wetland-based bio-treatment systems have high potential to improve the water quality and sanitation problems. Scientific research has shown that well designed bio-treatment systems demonstrated good performance in terms of removing pollutants from municipal wastewater. Moreover, there are low-cost and easy to operate and maintain, making them ideal for India's sanitation context. These can be used extensively in rural areas, small towns, semi-urban areas of large cities, industrial townships or institutional campuses, as well as for certain types of industries such as agro-food/beverage.

In addition to contribution towards improved public health and water quality, this approach has additional potential co-benefits such as employment generation and availability of treated wastewater for irrigation that can increase farm productivity and income. However, these potential benefits can only be realized if such bio-treatment systems are deployed widely. Prospects of large scale deployment of bio-treatment systems including potential challenges, sources of finance, manpower, appropriate government interventions and civil society support needs to be considered. These approaches have the potential to contribute significantly to the goal of important government programs such as the Swachh Bharat Mission as well as our commitment to Sustainable Development Goals. *Suggested plans for municipal sewage management are:-*

- (a) Area-wise gap analysis to be carried out at least once in five years by the Ministry of Urban Development in association with the ULBs/SPCBs/PCCs to estimate the requirement of STPs
- (b) Commissioning of adequate capacity STPs based on area-wise gap analysis and the requirements for requisite facilities

- (c) All the natural drains should be restored by interception and diversion of drains carrying sewage to the nearby existing STPs or upcoming STPs.
- (d) Removal of the encroachments for allowing the drains (till 500 m on both side of the river banks) to have natural flows especially during monsoon.
- (e) Upgradation of existing STPs with state-of-the art-technology, to ensure that the treated sewage meets STP effluent discharge norms notified under E (P) Act, 1986. The waste stabilization ponds (oxidation pond, maturation pond and duckweed pond) are most appropriate and rugged systems for small towns having land availability for treatment plant and use of treated wastewater in agriculture land.

In large urban settlements having land scarcity for establishment of sewage treatment plant and application of treated sewage for farm application, mechanical treatment systems viz. activated sludge process, trickling filter, up flow anaerobic sludge blanket (UASB), and aerated lagoons are appropriate and produce good results. There are success stories of treatment plants producing reasonably good quality water which is being used in the industrial sector for process as well as cooling purposes thereby reducing demand for fresh water.

- (f) Provision of having on-site STP by all the bulk generators such as residential apartments or welfare associations and to encourage to utilize such treated sewage for useful purposes within the residential premises;
- (g) Mandatory utilisation of treated sewage for non-potable urban and industrial use such as horticulture, cleaning of pavements, gardening, golf courts, building and road construction activities, flushing of water closets by adopting dual pipe system and agriculture by having dedicated irrigation channels;
- (h) Ensuring proper O & M of existing STPs by allocating adequate budget;
- (i) Awareness and training for the authorities operating STPs
- (j) Utilisation of the generated sludge from STPs meeting the manure quality criteria as prescribed under Solid Waste Management Rules, 2016.
- (k) R & D on in-situ remediation technologies for on-site treatment of sewage.
- (l) Only pipe line network be used for carrying sewage from source to the point of treatment and sewage carrying tanker system should not be allowed;
- (m) STPs should have a provision for holding of untreated sewage for suitable and adequate time period especially for temporary storage during

maintenance or temporary shutdown period rather than by-passing of untreated sewage.

- (n) Metered water supply and levying of charges on the consumer depending on the metered water consumption pattern which envisages adequate funds with the local and urban authorities.
- (o) Sludge generated from STPs, Septic Tanks/Soak Pits, waste from Dairy farms should be collected only through authorized Tankers/Transporter fitted with GPS provision and only such tankers or transporter should be allowed to transport only to the dedicated Bio-gas plants for methane recovery.

4.3 Industrial Effluent Management

- a) Periodic gap analysis is required to be carried out at least once in five years w.r.t inventory of industrial effluent generation and the existing infrastructure (both captive ETPs and Common Effluent Treatment Plants) in the country by all the States/UTs in association with CPCB/Industry Associations/FICCI/CII to prepare strategies for management of industrial effluent generated in the country.
- b) Adoption of clean technologies or environmentally sound state-of-the-art technologies by the industries;
- c) Adoption of automatic shutdown valve provisions at the outlet of industry in the event of non-complying to the prescribed effluent discharge norms and for control of intentional discharge of untreated effluents by the industries;
- d) Establishment of CETPs of adequate capacity in all the industrial clusters or estates and use of treated wastewater for non-potable urban and industrial use;
- e) Ensuring proper operation and maintenance of captive ETPs or CETPs;
- f) Notification of PETP Standards under E (P) Rules, 1986 for all the industrial sectors connected to CETPs;
- g) Adoption of ZLD or Adoption of new technology as per guidelines of CPCB which can reduce huge water consumption, whichever is feasible.
- h) Renewal of consents subject to time targeted reduction of wastewater generation and recycling of treated wastewater.
- i) Dedicated closed drain system for conveyance of PETP industrial effluent from industrial clusters and routed through CETPs for ensuring treatment and disposal of industrial effluent complying to the discharge norms for final disposal as permitted by the States/UTs under the consent mechanism.

- j) Environmental Surveillance Squads to be constituted by the States/UTs comprising experts from concerned departments, expert institutions for periodic surprise inspections and assessment of compliance to the conditions of consents.

4.4 Waste Management

4.4.1 Municipal Solid Waste Management

- a) Periodic gap analysis is required to be carried out at least once in five years w.r.t inventory of municipal solid waste generation and the existing infrastructure in the country by all the States/UTs in association with ULBs/ Expert Institutions such as NEERI, Nagpur to formulate strategies for management of municipal solid waste in accordance with the Municipal Solid Waste Management Rules, 2016 and amendments made thereof
- b) As a source control measures, all the bulk waste generators (Hotels/Restaurants/Market Yards/Fruit Juice Makers/ Commercial Centers/Residential Colonies or Apartment) should have on-site waste processing facilities for conversion of bio-degradable waste into manure by adopting vermiculture or by suitable plant and machinery and such converted manure should be used for horticulture
- c) Development of adequate number of integrated municipal sanitary landfills with a provision of Refuse-Derived Fuel (RDF), bio-composting, recycling, methane recovery from MSW sanitary landfills, leachate management and Waste-To-Energy provision
- d) Use of recyclable waste material from segregated from solid waste for road construction/ oil recovery/ use in Waste-To-Energy Plants and to ensure that only inert and rejects are disposed in sanitary landfills in accordance with the SWM Rules, 2016;
- e) Bio-mining and capping of all the existing municipal solid waste dumpsites as per SWM Rules, 2016.
- f) All the solid waste rag pickers should be made as a part of the urban local bodies for ensuring proper collection, transportation and disposal of solid waste to provide employment and improvement in economic and social security of such workers.

4.4.2 Hazardous Waste Management

- a) Periodic inventory of hazardous waste generating industries in the country based on scientific principles approach (at least once in five years) by all the States/UTs in association with CPCB and to carryout detailed gap analysis w.r.t hazardous waste generation and existing treatment and

disposal capacity, for formulation of strategies keeping in view proper management of generated hazardous waste in accordance with the HOWM Rules, 2016.

- b) An enforcement framework for effective enforcement of HOWM Rules, 2016 based on principle of proportionality and also precautionary principle with a view to remove ambiguity in regulatory actions and to bring transparency, predictability and consistency in enforcement for actions.
- c) IT based solutions to be evolved for tracking HW in place of existing manifest under HOWM Rules, 2016 for the purpose of integrated data handling and management solution in a time bound manner.
- d) Disposal of any industrial waste illegally be penalized with heavy penalties in accordance with the polluter pays principles on the responsible generators or operators or recycler or reuser. All the concerned industries are made responsible for cleaning up of such sites.
- e) Development of adequate capacity of Hazardous Waste TDSFs especially in the States/UTs which are yet to develop such facilities in accordance with the Hazardous Waste (Management & Transboundary Movement) Rules, 2016 as amended or to tie up with the neighboring States having such facilities by adopting manifest system.
- f) All the identified and prioritized contaminated sites to be remediated in a time bound manner based on the polluter pays principles wherever generator is identified or by the concerned State Government or UT Administration.

4.4.3 Bio-medical Waste Management: -

- a) Periodic inventory of bio-medical waste generating industries in the country based on scientific principles approach (at least once in five years) by all the States/UTs in association with CPCB and to carryout detailed gap analysis w.r.t bio-medical waste generation and existing treatment and disposal capacities, for formulation of strategies keeping in view proper management of bio-medical waste in accordance with BMW Rules, 2016.
- b) All the bio-medical waste generating HCFs (bedded and non-bedded), other than hospitals/clinics such as Veterinary Hospitals, Animal Houses, AYUSH Hospitals irrespective of the quantum of bio-medical waste generation should be covered under the authorization mechanism as prescribed under BMW Rules, 2016 to ensure proper management of bio-medical waste in the country, by all the States/UTs.
- c) Bad code system for tracking of bio-medical waste from its source to the treatment and disposal facility should be implemented with immediate effect

as per the guidelines issued by CPCB and as prescribed under BMWM Rules, 2016, by States/UTs namely Andaman Nicobar, Arunachal Pradesh, Assam, J & K, Lakshadweep, Mizoram, Orissa, Puducherry, Sikkim, Uttar Pradesh and West Bengal.

- d) In the States/UTs (viz., Arunachal Pradesh, Andaman & Nicobar, Goa, Lakshadweep, Mizoram, Nagaland and Sikkim) where CBWTFs yet to come up, till such time, HCFs shall be authorised to dispose of in designated captive deep burial pits having specifications in accordance with BMWM Rules, 2016
- e) All the HCFs (Bedded) having more than ten beds (i) which are either connected with sewerage network without terminal sewage treatment plant or not connected to public sewers, such HCFs shall have to comply with the effluent discharge standards stipulated under Schedule –II of the BMWM Rules, 2016; (ii) For discharge into public sewers with terminal facilities, the general standards as notified under the E (P) Act, 1986 shall be applicable; (iii) Health Care Facilities having less than ten beds shall have to install Sewage Treatment Plant by the 31st December 2019; (iv) Non-bedded occupiers shall dispose infectious liquid wastes only after treatment by disinfection as per Schedule-II of the BMWM Rules, 2016 as
- f) Disposal of any bio-medical waste illegally be penalized with heavy penalties in accordance with the polluter pays principles on the responsible occupier or operators of CBWTF
- g) Development of adequate number and capacity of CBWTFs in accordance with the guidelines issued by CPCB based on the coverage area–wise gap analysis with regard to the inventory of bio-medical waste generation and the existing infrastructure for treatment and disposal of generated bio-medical waste.

4.4.4 E-Waste Management: -

- a) Inventorisation of e-waste generation which include identification of producers who have obtained/ not obtained Extended Producer Responsibility (EPR), verification of quantity of e-waste collected by producers, verification of systems provided by producers for collection and channelization of e-waste, informal trading, dismantling and recycling activities, adequacy of infrastructure available with the existing dismantlers/recyclers, system of collection of e-waste from consumers by the manufacturers by the SPCBs/PCCs/CPCB/ Custom department, Ministry of commerce and Ministry of electronics & Telecommunication
- b) Development of captive state-of-the-art recycling facilities or disposal through authorised e-waste recyclers by the Electrical and Electronic manufacturers and also plugging of unauthorized e-waste recycling facilities.

4.4.5 Plastic Waste Management:-

- a) SPCBs/PCCs are ensured that action is taken against unregistered plastic manufacturing/recycling units and & no unit will be operated in non-conforming/residential areas.
- b) All Producers/Brand-owners/Importers who are applying to CPCB/SPCB for Registration as a Brand-owners/Producer have to work out modalities for waste collection system based on Extended Producer Responsibilities.

4.5 E-Flows and Watershed Management

Suggested plans for maintaining E-Flows and Water shed management: -

- a) Based on the river basin study of 6 river basins i.e. Siang River Basin, Twang River Basin, Bichom River Basin, Subansiri River Basin, Dibang River Basin and Lohit River Basin, MoEF & CC has recommended the minimum flow of the river to be 18% of the average of lean season flow of the river. However, in some of the cases, it has stated to be even 20%. Hon'ble NGT already passed orders that all the rivers in the country shall maintain minimum 15 % to 20% of the average lean season flow of that river. States and UTs should strictly ensure to comply with the requirement.
- b) A successful programme adopted for restoring all the minor irrigation tanks and lakes in Telangana State called Mission Kakatiya. Such mission also be adopted by the States and UTs under the water shed management. The programme helped in rejuvenating 46,531 tanks and lakes, storing 265 TMC water across the state in a period of five years. As a part of the Mission Kakatiya , the tanks and lakes are dug to remove silt for increasing water storage capacity. The household agricultural income has also increased 78.50% in the tank ayacut area.

4.6. **Assessment of status of improvement** in water quality due to execution of plans for prevention and control of contamination of water resources through (i) evaluation of effectiveness of pollution control measures already in existence; (ii) evaluate water quality trend over a period of during execution of approved action plans; (iii) assess improvements in assimilative capacity of rivers.

4.7 **Awareness on irrigation practices-** Considering limited water resources, awareness or training is required to be imparted to the farmers periodically on aspects relating to (i) judicious use of water; (ii) auditing performance of existing irrigation practices; (iii) best irrigation methods which can be adopted including optimum water applications depending on the crops;(iv) Changes in crop patterns which can be adopted depending on the local conditions; (v) methods to prevent

agricultural runoff; (vi) water conservation equipment; (vii) methods of storage of excess rain water within their fields etc.,

- 4.8. **Other measures** such as Protection of Flood Plain Zones (FPZ) by regulating activities in flood protection zone, removal of encroachment, adoption of rain water harvesting, ground water charging, greenery or plantation on both sides of the river up to 500 m, setting up biodiversity parks on flood plains by removing encroachments, may be given more attention.

Above action plans prepared are implemented by all the concerned authorities in a time bound manner for ensuring pollution free identified river stretches as per the time targets given in Table 1

Table 1. Proposed Targets for Making Rivers Pollution Free

TASK	PRESENT*	NGT (2021)	2022 (Proposed)	2024 (Proposed)
Sewage Management				
▪ Treatment Capacity	35 %	100%	75%	90 %
▪ Utilisation of Treated Wastewater	< 2 %	---	20 %	50 %
Industrial Effluent Management				
▪ Treatment Capacity	98 %	100%	100 %	100 %
▪ Utilisation of Treated Effluent	20 %	---	30 %	40 %
▪ Reduction of Fresh Water use	---	---	10 %	25 %
Solid Waste Management				
▪ Collection	80 %	100%	100 %	100 %
▪ Treatment	26 %	100%	75 %	100 %
E-Flow Management				
▪ Lean Flow	---	15-20%	15-20%	15-20%