District Environment Plan

Prepared By

Environment Department, Government of Maharashtra

Maharashtra Pollution Control Board

Mumbai

1.0 Preamble

Hon'ble National Green Tribunal vide order dated 26/09/2019 in O.A. No. 360 of 2018 filed by Shree Nath Sharma Vs Union of India and Others directed that CPCB shall facilitate the District Magistrates in preparation of District Environmental Plan by placing Model plan on its website. This model plan may be adopted as per local requirements by all Districts under supervision of District Magistrate.

The said Order also directs that Department of Environment in respective States / UTs should collect district plans to prepare State Environment Plan, which shall be monitored by respective Chief Secretaries of State/UT by 15/12/2019.

Based on State Environmental plans, CPCB and Ministry of Environment, Forest & Climate Change shall prepare National Environmental Plan, under the supervision of Secretary, MoEF&CC and Chairman, CPCB by 31/01/2020. The National Action Plan needs to be submitted before Hon'ble NGT 15/02/2020.

In compliance to above directions, CPCB has prepared a model District Environment Plan (DEP) that covers following thematic areas;
In compliance to above directions and as per the model DEP prepared by CPCB, Environment Action plan for Mumbai District is prepared.

2.0 Introduction

Mumbai (also known as Bombay, the official name until 1995) is the capital city of the Indian state of Maharashtra. Mumbai was the second most populous city in India after Delhi and the seventh most populous city in the world. In 2008, Mumbai was named an alpha world city. It is also the wealthiest city in India, and has the highest number of millionaires and billionaires among all cities in India. Mumbai is the financial, commercial and entertainment capital of India. It is also one of the world's top ten centres of commerce in terms of global financial flow.

General Mumbai city district profile is presented in the **Table 1** and location is shown in **Figure 1**.

Table 1 Mumbai city District Profile

Description	Details
Average Climate	Summer: 27.2°C. Winter :30°C.
Geographical Location	It lies between 18˚ 52′ and 19˚ 04′ North Latitude and72˚47′ and 72˚54′ East Longitude.
Area	157 Sq. km.
Boundaries	Mumbai is bounded by the Arabian Sea to the west .Many parts of the city lie just above sea level, with elevations ranging from 10 m (33 ft) to 15 m (49 ft); the city has an average elevation of 14 m (46 ft Northern Mumbai (Salsette) is hilly and the highest point in the city is 450 m (1,476 ft) at Salsette in the Powai–Kanheri range
Languages Spoken	Marathi, Hindi, English are major languages but all Indian languages are spoken
Population	Total: 3,085,411; Male: 1,684,608 Female: 1,400,803 [*According to 2011 Census Report*]
Population Density	19652 Per Sq. km.
Literacy Rate	89.2
Rivers	Dahisar, Mithi, Oshiwara,Poisar,Tansa
ULBs	1 Numbers
Pin code	400001

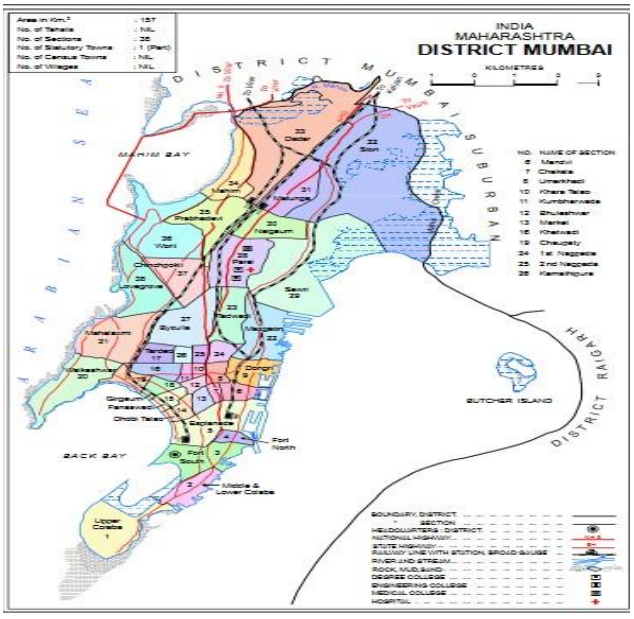

Figure 1 Location of Mumbai District

3.0 Waste Management Plan

Urban India is facing an ever increasing challenge of providing for the incremental infrastructural needs of a growing urban population. According to the 2011 census, the

population of India was 1.21 billion; of this 31% live in cities. It is further projected that by 2050 half of India's population will live in cities. With this increasing population, management of Municipal Solid Waste (MSW) in the country has emerged as a severe problem not only because of the environmental and aesthetic concerns but also because of the sheer quantities generated every day.

Solid waste management is among the basic essential services provided by municipal authorities in the country to keep cities clean. In Mumbai city primary sources of solid waste are local households, commercial establishments, hospitals, hotels, restaurants, and markets. Local Bodies are responsible for collection, storage, segregation, transportation and disposal of all solid waste generated in the city. There are 1 Urban Local Body [ULB]. in Mumbai district. **Table 2** represents the list of ULB along with population. Following section gives insight about waste management of Mumbai districts.

Table 2 Mumbai District Profile

Sr. No.	Urban Local Bodies	Population
1.	Municipal Corporation of Greater Mumbai	1,40,60,672

3.1 Domestic Solid Waste Management Plan

Mumbai district is having only 1 ULB with 24 Administrative Wards. As per collected data, total solid waste generation of Mumbai district is 7750MTD. Wherein, Dry Waste generation is 3465MTD and Wet waste is 4235MTD.

It seems that Dry waste comprises of approximately 45% of total waste generated of the district and were else Wet waste contributes 55%.

Mumbai generates nearly 720 MT/D Street Sweeping Waste, 50 MT/D of Other Waste classified as Horticulture, sanitary waste, etc. The quantification of Domestic Hazardous Waste is not estimated in Mumbai district.

3.1.1 Collection and Transport

Total Waste generation from Mumbai district is 7750MTD and almost all waste is being segregated. District have its 1 Old dump site at Mulund. 70,00,000MT of waste is stored at the dumpsite. One Sanitary landfill is available of capacity 300MTD at Kanjur although it is not in use.

There are in total 3367 nos. of Bulk Waste generations in Mumbai district providing 1693 nos. of onsite facility for wet waste.

District have 100% door to door collection facility. 9.11% of sweeping is done through Manual Road Sweeping while 90.89% of waste is collected through Manual Sweeping. 80% of segregated waste transport is available. No Digesters are installed for Bio-methanation.

14% of WW composting operation is carried out. 480MTD of waste is treated through MRF operations in Mumbai.

District is already initiated process of Linkage with Waste to Energy Boilers / Cement Plants, Linkage with Recyclers, Authorization of waste pickers, Linkage with TSDF / CBMWTF, Involvement of NGOs.

Along with Mumbai have initiated authorization of waste pickers, and issuance of ID card of personnel's involved in management of solid waste.

3.1.2 Adequacy of Infrastructure

Mumbai have adequate infrastructure to manage its waste. There are nearly 2381 community bins available to collect the waste through trolleys. District have been provided with 398 mini collection Trucks to collect the segregated generated waste. Furthermore, there are 97 Bulk waste trucks available.

Mumbai district have in all 4 Waste Transfer points. One Bio-methanation point is provided with one composting unit.

District use Material Recovery Facilities [MRF] to recover some waste. District is on verge to implement the process of producing energy from waste. 65 TPD of RDF is available. Mumbai have 46 nos. of Waste Deposit centres.

Mumbai district ensure the implementation of applicable by-laws.

3.2 C&D Waste Management Plan

The Construction and Demolition Waste [C&D Waste] generated by Mumbai district is about 12,04,102MT/A. Issuance of Permissions by ULB is been already initiated. District has established its Deposition Points.

Mumbai is establishing its own recycling plant to recycle its C & D waste with capacity of 1200MTD.

It can be observed that, Mumbai district has already implemented any By-Laws for C&D Waste Management in its local bodies.

3.3 Plastic Waste Management

Plastics are integral part of society and have varied application. Total Plastic waste generated by Mumbai district is 2709 MTD.

Mumbai has 100% door to door collection system and 80% of segregation system is implemented with 46 Plastic Waste Collection Centre. Authorization for waste collection is initiated in District. District has 0 Plastic Manufacturer whereas, 15 Waste recyclers. For Treatment and recycling of generated plastic waste, there are no Pyrolysis Oil Plant. PW Management Rules, 2016 is implemented in the ULBs.

Mumbai District has implemented the PW Management Rules, 2016 in its 6 ULB's resulting in Sealing of units producing < 50-micron plastic, prohibiting sale of carry bags < 50 micron followed by Ban on Carry bags and other single use plastics as notified by State Government.

On other hand, there are no producers associated with ULB's to produce Plastic nor any Infrastructure is supported by Producers / Brand owners to ULBs.

There's no Implementation of Extended Producers Responsibility (EPR) through Producers / Brand owners in Mumbai

3.4 Biomedical Waste Management

Bio-medical waste refers to any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining there to or in the production or testing of biological or in health camps,etc

It can be concluded that there are about 1457 bedded hospitals in Mumbai district whereas, 11575 nos. of non-bedded hospitals. Threre are in total 8865 nos. of clinics. Mumbai district do have 1252 nos. of Dental Clinics in its Municipal Corporation of Greater Mumbai followed by 1348 Pathalogoy labaratories . District have 75 nos. of Veterinary Hospitals, Blood Banks, Animal Houses, etc

Authorization of 1457 Bedded HCFs and 11575 Non-bedded HCFs has been done by SPCBs / PCCs . District have any 1 common Biomedical Waste Treatment and Disposal Facilities (CBMWTFs) which is adequate. Mumbai district also have Linkage with other CBMWTFs for disposal of Bio-medical waste. (Inspite of beign adequate)

Mumbai has HCF 2%/CBMETF 100% Barcode tracking system installed. Daily lifting qty of BMW by CBMWTF is approx. 20000kg/D. Segrigation of 80% of waste is complying by the District.

3.5 Hazardous Waste Management

There are 299 Hazardous Waste generating industries in Mumbai city and sub urbans from where 70118.63 MT/Annum of Hazardous waste is generated. 5812.415 MT/A qty of waste is Incinierable waste while 31127.08 MT/A qty of waste is land-fillable waste. 33179.14 MT/Annum of waste is Recyclable / utilizable HW .Based on the type of waste it is further sent for treatment i.e either landfilling or Recyclable/Utilizable waste. As per standard norms 97 industries have displayed a board of Hazardous Waste generation in industry. Due to unavailability of Hazarodus waste disposal site, the generated waste is sent to CHWTSDF of other district within state.

3.6 E Waste Management

No Collection Centres are established by ULBs and 6 are established by Producer under EPR scheme. There are 2 number of authorized E-Waste recyclers / Dismantler and 2 numbers are Authorized E-Waste collectors.

Citizens are not able to deposit or provide E-Waste through Toll-free Numbers in the District. The top class mobile companies have provided their collection centres from where the discarded mobiles are collected. There is no E-waste recycler nor the local bodies have linked up for same with anyone. To create awareness among the people The District administration arranges District level Awareness Campaigns

3.7 Action Plan

As per the above mentioned observation, it seems that almost all ULBs are handling solid waste generated as per the Municipal Solid Waste Management Rules, however there are certain issues that needs to be addressed for 100% implementation of the rules as mentioned in **Table 3**.

Table 3 Action Plan for Solid Waste Management

Sectors	Gaps	Action Points	Priority
Domestic Solid Waste			
Quantification	▪ Methodology for solid waste quantification	▪ Mechanism for graded weighing system either through intermediate	Immediate

Sectors	Gaps	Action Points	Priority
	should be ascertained ▪ Quantification based on Income group, culture affluence and technology to be considered	transfer station or at the common receiving station to be created. Usually one weigh bridge at any treatment / disposal location required ▪ Quadrate sampling methodology to be adopted in order to reduce quantity as well as quality	
Collection System & Transport System	▪ Some of the places, efficiency of the collection system is not up to the mark ▪ Almost 7700MTD of waste is not collected at door to door	▪ Ideally most proven method of SWM is 3 Tier System with door to door, community and transfer station approach ▪ 100% efficiency to be achieved ▪ Intermediate ▪ Approximately 1540 Ghanta Gadi would be required ▪ Additionally about 20 Compactors shall be sufficient for end to end collection and transfer	Short to Mid Term
Infrastructure	▪ Mostly composting is the main treatment methodology with about 80% coverage ▪ MRF facility is also available but limited to few ▪ Sanitary landfill are limited to 2-3 ULBs ▪	▪ Intermediate / Transfer station based decentralized waste treatment facility to be evaluated ▪ Additional 20% alternative treatment such as bio-Methanation can be explored	High
Plastic Waste	▪ Lack of SOP for not only quantification but also life cycle analysis [LCA] ▪ Limited understanding / interpretation of EPR / PRO	▪ Strengthening surveillance of life cycle assessment for type and quantity of Plastic Waste ▪ Effective EPR Policy ▪ Initiation of 100% compliance to PW Rules at the earliest	High & Immediate

Sectors	Gaps	Action Points	Priority
	▪ Only two ULBs lacking implementation of PW notification		
C&D Waste	▪ 2-3 of the ULB need to establish C&D Waste management system	▪ Minimum 1 such facility at each of the ULB to be established ▪ System for utilization of recovered material and processed C&D waste to be effectively implemented and monitored	High
Biomedical Waste	▪ Rooting and effective collection within 48hrs from the time of generation to be effectively handled ▪ Treatment facility lacks implementation of 2016 Notification in line with CPCB audited report ▪ Limited Inventorization ▪	▪ Regular Inventorization through automatic / digital platform to be developed ▪ Up-gradation of existing facility to meet 2016 CPCB norms ▪ Additional at least 1-2 facilities to cover the of umbrella zone along with increasing burden on the existing coverage area to be planned ▪ Collection mechanism to be strengthen with additional vehicles to cover vast area and scattered HCF [miniscule quantity]	Very High & Immediate
Hazardous Waste	▪ Domestic HW being mixed with solid waste posing threat ▪ No separate handling of domestic HW ▪ Not effective segregation at source	▪ Either decentralized 4 - 5 step segregation practices to be initiated or at least advisory for intermittent storage and collection of domestic HW to be initiated ▪ Inventory to be initiated and maintained	Very High & Immediate

Sectors	Gaps	Action Points	Priority
E Waste	▪ Lack of inventory ▪ Limited understanding of E waste rule and management ▪ Neither segregation nor separate transfer / handling facility ▪	▪ Detailed inventory for domestic e waste under 26 different categories ▪ Mass awareness campaign ▪ Every ULB to have at least one E waste management centre and minimum one collection / drop centre in a radius of 25-30km ▪ At least one e waste processing unit in a district	Very High & Immediate

4.0 Water Quality Management Plan

There are no Rivers in Mumbai district rather Mumbai has lakes and Ponds of 113MLD capacity within Mumbai and 2020 MLD capacity Outside Mumbai premises. With respect to the data collated about 2190 MLD of sewage is generated from Class–II cities in Mumbai. 1285 MLD treated by MCGM & 158 MLD treated through private, Govt, semi Government organisation 1443 MLD disposed into Arabian sea/Thane, Gorai Creek. 747 MLD is quantity of untreated or partially treated sewage. 80 MLD. (8 MLD & 72 MLD of sewage is flowing into Powai lake & Kannamwar nagar lake respectively)

ULB generate about 2190 MLD of sewage with an existing capacity of 1443 MLD of STP operational balance of 747 MLD partially or untreated sewage needed to bring into STP systems. Lack of well-connected sewage conveyance system is a hurdle to bring complete sewage waste under STP treatment systems. At present sewage network is of 2015 km.

Industrial effluent is much more regulated wherein 8.9MLD from 1320 numbers of industry, limited to 1 ULB are made to treat almost the entire effluent to the best possible norms as stipulated by their permits, monitored effectively and regularly with the aid of final disposal / treatment in CETP.

Jewellery Industries, Automobile Service Stations, Hotels, Laundry, Hospitals, Refinery, Power Plant, Fertilizer are prominent type of industries in Mumbai district. 1317 nos. of Industries are meeting the standard norms whereas, 3 Industries are not meeting the standard discharge norms. There are in total 82 No of complaints received or number of recurring complaints against industrial pollution in last 3 months. 4 Industries are closed for

exceeding standards in last 3 months and 2 industries where imposed by Environmental Compensation by SPCBs.

The average pH of Mithi river near road bridge flowing in Mumbai is 6.86. Whereas the average DO and BOD of these surface bodies is 3.18mg/L and 30.33mg/L respectively. Among the 11 water bodies in Mumbai district Sea water at Charni road choupathy, Village. Girgaon, has highest average pH i.e, 7.42 whereas, Sea water at Shivaji park (Dadar choupathy), Village. Dadar DO is 4.54mg/L and Mahim creek at Mahim Bay, Village. Mahim BOD is 20.50mg/L.

Detailed Issue based management action plan is provided in **Table 4**.

Table 4 Action Plan for Water Quality Management

Sectors	Gaps	Action Points	Priority
Water Resources	▪ Limited information available on mapping of surface water resources in terms of quantity ▪ Limited Inventorization of quantity, usage, availability exploitation etc. ▪ Limited Rejuvenation / remediation of water bodies ▪ Solid waste dumping in the river bodies	▪ Thorough Mapping of resources to be taken up ▪ Extensive assessment of quality to be done ▪ Criticality indicators to be established for each water body/resource ▪ Extend water quality monitoring network to include representativeness ▪ Based on the criticality initiate Rejuvenation / remediation ▪ Online Monitoring system for surface water bodies to be established ▪ Protection methods to be developed for creative stoppage of dumping of solid waste in the surface water bodies	High
Domestic	▪ Correlation between generation and treatment often misleading ▪ Water budgeting exercise often missing ▪ Computation of water footprint missing ▪ Surveillance /Inventorization in cradle to grave approach absolutely never applied	▪ Digital Platform to accommodate water budgeting / reuse potential ▪ In situ treatment for River stretches to be developed ▪ Strengthen the sewage collection network to cover 100% Population ▪ Policy for reuse / recycle of treated wastewater	Very high & Immediate

Sectors	Gaps	Action Points	Priority
	▪ Limited collection system and treatment facility especially in remote area ▪ Often polluting water resources ▪ No established reuse options / reuse network		
Industrial	▪ Limited information of industries discharging wastewater in to the river ▪ Performance of CETP is questionable ▪ Almost 66 number of industries Non-compliance of in terms of meeting discharge standards	▪ CETP performance to be more effective in line with various orders of regulatory bodies / courts ▪ Digital compliance methodology to be developed ▪ Disposal system to be under constant surveillance	High

5.0 Air Quality Management

As it is Mumbai district being one of the most vibrant and outgrowing areas in Maharashtra, Air quality assessment and sectoral management needs are ought to be essentially planned and executed. Both CPCB & MPCB through their NAMP & SAMP programme has set up 1 manual & 11 CAAQM stations across the district.

PM10 is Ambient Air is one of the prime reason of the concern and historically Mumbai has been in the centre of controversy with regards its air quality management. An exceedance factor reveals as per the monitored data that needs immediate attention as is the case in most of the areas of India. In view of the same the priamafece of every ULB shall be to establish at least one such Ambient Air Monitoring Station and coordinate / collaborate with other monitoring organisation to provide for visory to general public towards health associations and risk of exposure.

1320 nos. of industries are meeting the standard norms. Metro Work, Construction, Traffic, etc. are the Nonindustrial Air Pollution sources. There's no SOP develop for Control of Forest fires. RTO /MCGM are regulating Vehicle pollution check centres and Dust Suppression Vehicles.

Inventory and policy formulation action plan is stated in **Table 5.**

Table 5 Action Plan for Air Quality Management

Sectors	Gaps	Action Points	Priority
Air	▪ Limited CAAQMS to establish / corroborate inferences ▪ Sectoral action plans not effectively established	▪ Emission inventory and source apportionment supported with dispersion and health based iterative process for science based AQM strategy to be established ▪ Each ULB to have at least one urban and one rural CAAQMS or three manual stations at least to include criteria pollutants with minimum one location to include parameters of 2009 CPCB notification and meteorological data including cloud cover ▪ Fugitive emission control system for hot spot emission control to be installed ▪ Green barriers / Photo catalyst options to be evaluated ▪ Capacity building to be enhanced	High

6.0 Mining Activity Management plan

There is no Mining activity carried out in Mumbai district.

7.0 Noise Action Plan

The goal of noise management is to maintain low noise exposures, such that human health and well-being are protected. The specific objectives of noise management are to develop criteria for the maximum safe noise exposure levels, and to promote noise assessment and control as part of environmental health programmes.

There is no noise measuring devices with district administration to monitor the noise levels while 4 noise measuring devices with SPCBs. There are 65 nos. of complaints received on

noise pollution in last 1 year for Mumbai district which are redressed. District regularly implement ambient noise standards in residential and silent zones. Noise monitoring study is carried out in Mumbai district. Noise quality reveals mainly source specific noncompliance such as traffic related in most of the kerb side analysis. Though zoning categories and regulations therein are particularly specified, in limitation of noise regulations has always been challenge to the regulatory authority. **Table 5** spells potential management plan that could be taken up on priority by ULBs.

Table 5 Action Plan for Noise Pollution Management

Sectors	Gaps	Action Points	Priority
Noise	▪ Most of the source related noise areas show exposure beyond compliance ▪ Excessive exposure during noise generating potential events/ festivals ▪	▪ Noise mapping to be carried out for zonation purposes ▪ At source control using ▪ physical or natural attenuation methods to be adopted ▪ In the path noise control methodologies using noise absorbers creating zone of inhibition / silence zone to be done ▪ End of the pipe measures such as PEs acoustic enclosures etc. to be adopted ▪ Event based noise control policy to be effectively implemented	High

8.0 Conclusion

There seems to be vast data gaps and a detailed exercise to collate and validate data gathered through this process needs to be urgently taken up in addition to the adopting a holistic & inclusive consultative process of gathering information, collating & converging it in order to be able to device strategies of future. Also, it is equally important that projection for at least next 20 years be done in order to evaluate management plans for futuristic view to meet the objective of such vast exercise. Digital data availability needs to be one of the prime tasks of government & methods of its validation be created with scope for improvement in near future. The practice needs to be a continual one to be updated regularly in order to monitor progress and effectiveness of this process & shall be linked with financial allocations being designed to be promoted by government of the day. With regards to action plans, the priorities shall be aligned based on sustainability objectives.