

REPORT ON ACTION
PLAN FOR CLEAN-UP
OF POLLUTED
STRETCH OF KANHAN
RIVER

JUNE, 2019

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KANHAN RIVER (Bhandara to Nagpur)

1.1 Executive Summary of Action Plan Restoration of Water Quality of Kanhan River

Sr. No.	Description of Item	Details																						
1.	Name of the identified polluted river and its tributaries	:	Bhandara to Nagpur																					
2.	Is river is perennial and total length of the polluted river	:	Non- perennial Length- 100 km																					
3.	Revised priority as per Jan. to Dec.2018 Analysis results	:	Priority III																					
4.	No of drains contributing to pollution and names of major drains	:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Name of the drain</th> <th style="text-align: center;">Length (km)</th> <th style="text-align: center;">Width (m)</th> </tr> </thead> <tbody> <tr> <td>JN Road Nallah</td> <td style="text-align: center;">1.5</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td>Ashok Nagar Nallah</td> <td style="text-align: center;">2.5</td> <td style="text-align: center;">1.0</td> </tr> <tr> <td>Lohiya layout Nalla</td> <td style="text-align: center;">2.5</td> <td style="text-align: center;">3.3</td> </tr> <tr> <td>Bagdor nalla,</td> <td style="text-align: center;">5</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Local nalla</td> <td style="text-align: center;">1.7</td> <td style="text-align: center;">1.5</td> </tr> <tr> <td>Local Nalla</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">1.4</td> </tr> </tbody> </table>	Name of the drain	Length (km)	Width (m)	JN Road Nallah	1.5	1.0	Ashok Nagar Nallah	2.5	1.0	Lohiya layout Nalla	2.5	3.3	Bagdor nalla,	5	3	Local nalla	1.7	1.5	Local Nalla	0.7	1.4
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5.	Major Towns on the banks of the river with population	:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Local Body</th> <th style="text-align: center;">Population</th> </tr> </thead> <tbody> <tr> <td>Kanhan Pimpri</td> <td style="text-align: center;">32,000</td> </tr> <tr> <td>Kamptee Municipal Council</td> <td style="text-align: center;">66,793</td> </tr> <tr> <td>Mouda Municipal Council</td> <td style="text-align: center;">14,606</td> </tr> </tbody> </table>	Local Body	Population	Kanhan Pimpri	32,000	Kamptee Municipal Council	66,793	Mouda Municipal Council	14,606													
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Mouda Municipal Council	14,606																							
6.	a. Sewage generation & Treatment in MLD	:	Total Sewage generation- 10.8 MLD Total Sewage Treatment- Nil																					
	b. Total no. of existing STPs and proposed STPs with total capacities in MLD	:	No STP																					
	c. Gaps in sewage treatment in MLD and no. of towns not having STPs	:	Untreated sewage 10.8 MLD & all three towns don't have STPs																					
7.	Major industrial estates located with total no. of industries	:	04 Nos of Industries																					
	a. Total water consumption and total industrial effluent generation in MLD	:	Water Consumption: 260.9 MLD Industrial Effluent Generation: 63.72 MLD																					
	b. No. of industries having captive ETPs and their treatment capacity in MLD	:	04 Nos																					
	c. No of CETP's and their treatment capacity	:	NA																					
	d. Gaps in treatment of industrial effluent	:	Nil																					
8.	Waste Management																							
	a. Solid Waste Generation & processing	:	Solid waste generation- Nagpur: 1100 MT/day Treatment: 200 MT/day by composting and RDF																					

	b. Biomedical Waste Generation & treatment	:	Nagpur: Total Biomedical waste generated: 3660 kg/day. Total Biomedical waste treated: 3660 kg/day
	c. E-Waste Management Generation & treatment	:	E-waste generated by industries is sent to MPCB authorized E-waste reprocessor
	d. Hazardous waste Management	:	<ul style="list-style-type: none"> • There are 299 Hazardous waste generating industries in Nagpur. These industries generated about 20552.1 MT Hazardous waste in year 2017-18. • The HW from is scientifically disposed through Maharashtra Enviro Power Ltd., MIDC Butibori, Nagpur • CHWTSDF capacity – Landfill: 60,000 MT/A, Incineration: 3 TPH
9.	Action plan includes mainly covering aspect such as (Proposal for utilization of sewage, ground water recharging or rain water harvesting, measures for regulating ground water use, protection and management of flood plain zone, maintaining minimum E-flows and water shed management, plantation on both sides of the river, setting up of bio-diversity parks etc., as per Hon’ble NGT Orders dated 20.09.2018 and 19.12.2018)	:	<ul style="list-style-type: none"> • RRC has already requested to Water Resource Dept, GoM for maintaining minimum E-flows and water shed management, plantation on both sides of the river, setting up of bio-diversity parks. • Water resource department, GoM has prepared integrated State Water Plan, which includes recycling of Treated sewage. • MPCB - Action plan for Utilization of Treated Sewage has been submitted to CPCB.
10.	Min. and Max. required time period for implementation of action plans		Maximum 2 years from commencement of work
11.	Total estimated budget in crores towards implementation of proposed action plans with break-up (e.g. No. of STPs, capacity, total cost; No of CETPs, total capacity, Cost towards interception and diversion of sewage/effluent to STPs/CETPs etc.,)	:	<ul style="list-style-type: none"> • The Maharashtra Pollution Control Boards has also reserved Rs. 461.42Cr. for preparation of action plan for abatement & Control of Pollution of River Water due to sewage & solid waste disposal from B & C Municipal Councils (342Nos of Urban Local Bodies.), Nagar Panchayat & Gram Panchayats. The said funds will be used for DPR preparation, development of infrastructure for sewage collection & treatment & development of infrastructure for Solid Waste Management. The DPR preparation & implementation of the same will be completed by year 2022 (i.e in next 3 years).
12.	Whether ‘River Rejuvenation Committee (RRC) constituted by the State Govt./UT	:	River Rejuvenation Committee (RRC) constituted as per the Maharashtra Government G.R. issued by

	Administration and If so, Date of constitution of 'RRC'.		the Environment Dept, GoM vide No. NGT 2018/PC-2/TC-3 dtd.13.12.2018.
13.	Responsible Organization (s) for implementation of proposed action plans	:	<ol style="list-style-type: none"> 1. Water Resource Department, GoM 2. Urban Development Department 3. Kamptee Municipal Council 4. Mouda Municipal Council
14.	Expected deliverables w r to achieving Goals	:	<ol style="list-style-type: none"> 1. To achieve 100% sewage collection and treatment 2. To achieve 100% MSW collection, transportation and treatment. 3. To achieve river water quality of Bathing standards by 2022. 4. Augmentation of River Flow and restoration of water quality-2023
15.	Initiatives taken by Govt. of Maharashtra and MPCB.	:	<ul style="list-style-type: none"> • Maharashtra Government through its forest department has announced The Plantation Program in 2016 with the aim of planting 2 crore & planted 2.82 crore saplings. Forest Department has set the target of plantation of 4Crore, 13Crore and 33Crore saplings under the mission of 50Crore plantation which shall be accomplished in the three consecutive years viz. 2017, 2018 and 2019. • GOM, announced 'Namami Chandrabhaga Abhiyan' in year 2016. It is an initiative taken to revive and rejuvenate the river Chandrabhaga and to restore its historic glory. Government of Maharashtra has prepared a comprehensive plan for cleaning of the river on the lines of 'Namami Gange'. The aim of the mission is to make the Chandrabhaga river pollution free and conserve its purity and sanctity up to year 2022. • MPC Board will provide financial & technical assistance to villages in next three years to comply with sewage & waste management. • MPC Board has issued Direction to the local bodies to make 25% budgetary provision for scientific treatment and disposal of Sewage and Solid Waste. Accordingly, Municipal Corporations have passed resolution in their General Body meeting and reserved the funds. These funds are reserved and made mandatory to utilize for preparation of DPR, establishing treatment facility, O & M of treatment facility etc. The review of the same is taken from time to time by the Board.

		<ul style="list-style-type: none"> • MPC Board has issued directions to 08 Municipal Corporations to penalize to the tune of 1pais/litre of sewage generation under 'Polluter pays principle'. • MPC Board has issued directions to non-complying CETPs to penalize to the tune of 2 paisa/litre for remediation & upgradation to comply with the consented standards.
	<p>Budget Estimates & Pooling of Resources from Local Bodies, State Pollution Control Board, State Government & Central Government</p>	<ul style="list-style-type: none"> • Maharashtra Government has already received proposal of Rs. 1104.54Cr. Under State River Conservation Program & from this amount State Government will provide necessary funds in next 3 years i.e. by 2022 for Sewage management • The Maharashtra Pollution Control Boards has also reserved Rs. 461.42Cr. for preparation of action plan for abatement & Control of Pollution of River Water due to sewage & solid waste disposal from B & C Municipal Councils (342Nos of Urban Local Bodies.), Nagar Panchayat & Gram Panchayat for reducing polluted stretches in compliance with Hon'ble NGT, principal bench directions w.r.t. "More River Stretches are now Critically Polluted". The said funds will be used for DPR preparation, development of infrastructure for sewage collection & treatment & development of infrastructure for Solid Waste Management. The DPR preparation & implementation of the same will be completed by year 2022 (i.e in next 3 years). • The Maharashtra Government through Urban Development Department has approved DPR of all 388 Urban Local Bodies for Solid Waste Management. The funds for the same amounting to Rs. 2560.0Cr has been already approved by Government & the said DPRs will be implemented & Solid Waste Management issues will be resolved by December'2019.

Preamble -

In the matter of OA No. 673 of 2018-"More river stretches are critically polluted now: CPCB", the Hon'ble NGT has passed order dated 20.09.2018 for constitution of River Rejuvenation Committee (RRC) and Special Environment Surveillance Task Force (SESTF). The report comprises 351

polluted river stretches in India out of which 53 polluted river stretches are in Maharashtra. In the state, 9 polluted stretches in priority I & 6 polluted stretches in priority II. It has been mandated to prepare Action Plan for River Stretches and make them pollution free. In compliance of the orders of the Hon'ble NGT, the State Government has constituted RRC.

River Rejuvenation Committee (RRC) constituted as per the Maharashtra Government G.R. issued by the Environment Dept, GoM vide No. NGT 2018/PC-2/TC-3 dtd.13.12.2018 with 5 members under the guidance of Principal Secretary for preparation of action plans and to monitor the implementation of these action plans. The members of RRC are as mentioned under:

1. Commissioner / Director, Directorate of Municipal Administration
2. Chief Executive Officer – Maharashtra Industrial Development Corporation
3. Director (Environment)
4. Director (Industries)
5. Member Secretary – Maharashtra Pollution Control Boards- Member & Co-ordinator of RRC

Further State Government also constituted District Level Special Task Force comprising of the following:

1. Representative of District Collector
2. Representative of District Superintendent of Police
3. Representative of Regional Officer, MPCB
4. Representative of the District Judge of the concerned District

Meetings of the RRC Committee:

- 1st Meeting of River Rejuvenation Committee (RRC) convened on 14.12.2018.
RRC reviewed draft action plans of polluted river stretches of Priority I prepared by Maharashtra PCB. It was decided by the all the committee members, to take review of local bodies and accordingly to communicate the outcomes of the meeting to the Hon'ble NGT, Principal Bench. Maharashtra PCB submitted nine draft action plans of polluted river stretches of Priority I to CPCB along with minutes of 1st meeting of RRC and submitted progress report of polluted river stretches to Hon'ble NGT on 15.12.2018
- 2nd Meeting of River Rejuvenation Committee (RRC) convened on 09.01.2019.
RRC reviewed draft action plans of polluted river stretches of Priority II prepared by Maharashtra PCB. It was decided in the meeting to add in the draft action plans funding details like source, name of scheme, timeline etc for proposed STPs by concern local bodies.

- 3rd Meeting of River Rejuvenation Committee (RRC) convened on 23.01.2019. RRC reviewed and finalised draft action plans of polluted river stretches of Priority I, II, III, IV and V prepared by Maharashtra PCB. RRC also decided to call the local bodies and review the timelines proposed in action plans from time to time.
- Maharashtra PCB submitted 53 draft action plans of polluted river stretches of Priority I, II, III, IV and V to CPCB along with minutes of 2nd & 3rd meeting of RRC and submitted progress report of polluted river stretches to Hon'ble NGT on 31.01.2019.
- CPCB Task Team on Polluted River Stretches called MPCB to give presentation on Action Plan for Priority-I & II polluted river stretches on 12.02.2019. Accordingly, the presentations were reviewed by Task team & few improvements in the action plan were suggested.
- 4th Meeting of River Rejuvenation Committee (RRC) held on 16/02/2019 & it was decided to communicate with Water Resource Department to maintain e-flow in the rivers of Maharashtra adopting good irrigation practices, protection & management of flood plain zone (FPZ), rain water harvesting, ground water charging, plantation on both sides of river, Setting up of biodiversity parks on flood plains by removing encroachments and Urban Development department communicated to take necessary steps to provide adequate funds to urban local bodies for installation of sewage treatment & MSW processing facilities in a time bound manner so as to comply with the Hon'ble NGT.
- 5th Meeting of River Rejuvenation Committee (RRC) held on 25/06/2019. It was decided that Director Environment will communicate with Water Resource Department and Urban Development Department regarding provision of funds in time bound manner for installation of STPs & MSWM facilities. RRC reviewed and approved Action Plans for restoration of polluted river stretches in priority III, IV & V.

Achievable goal:

The objective/goal of the action plan is that the quality of river water should meet with the required value as given under:-

Quality Parameter	Standard to be achieved
BOD	3.0 mg/l.
Dissolved Oxygen (DO)	More than 5.0 mg/l.
Faecal Coliform	Less than 500 MPN/100ml.

1.2 Background

The Kanhan rises on the slopes of the hills at the southern edge of the Satpura range to the north of Damua, a town in Madhya Pradesh, India. Within Maharashtra the river is at its widest at Kamptee where it receives the Pench River- a left bank tributary and its largest one. Another tributary connecting it at its right bank is Kolar River - the spill off from Kolar Dam. The river now comes to be at the northeast of Nagpur from which it receives the metropolitan city's effluent waste by way of the Nag River. A little further from Kamptee, it flows along the town Kanhan - its etymology derived from the river. Situated alongside the town is a large coal mine, one of the many coal mines situated along its river basin. From here the river flows south-east and ends its course by joining the Wainganga at the village of Ambora in Nagpur District. Kanhan River is Non-perennial River and flows mostly continue to monsoon or up to the September and some part of post monsoon.

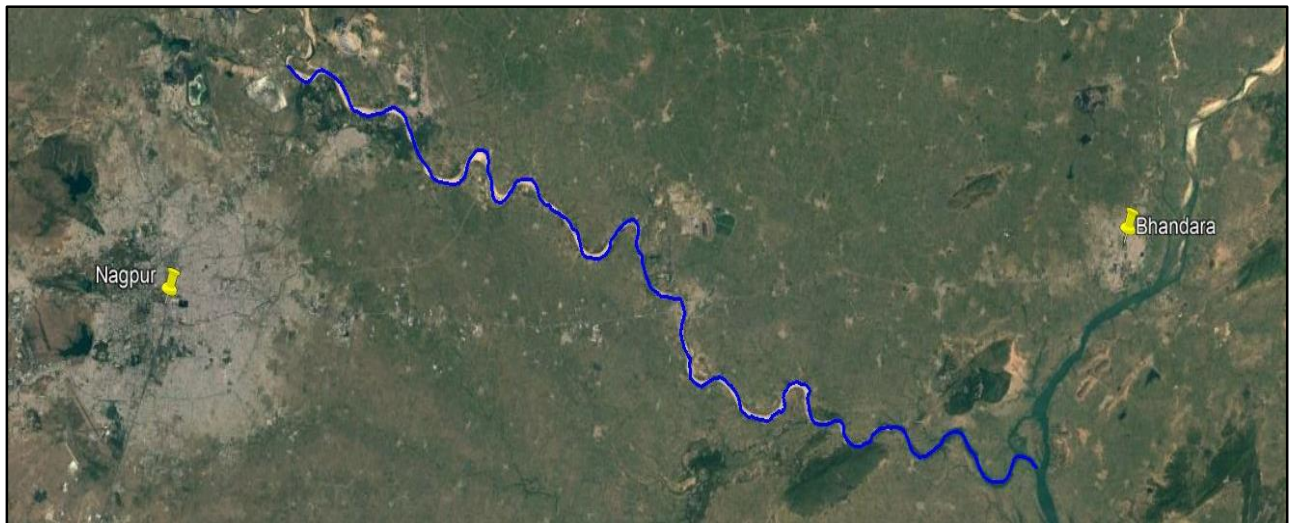


Figure 1 Stretch of Kanhan River

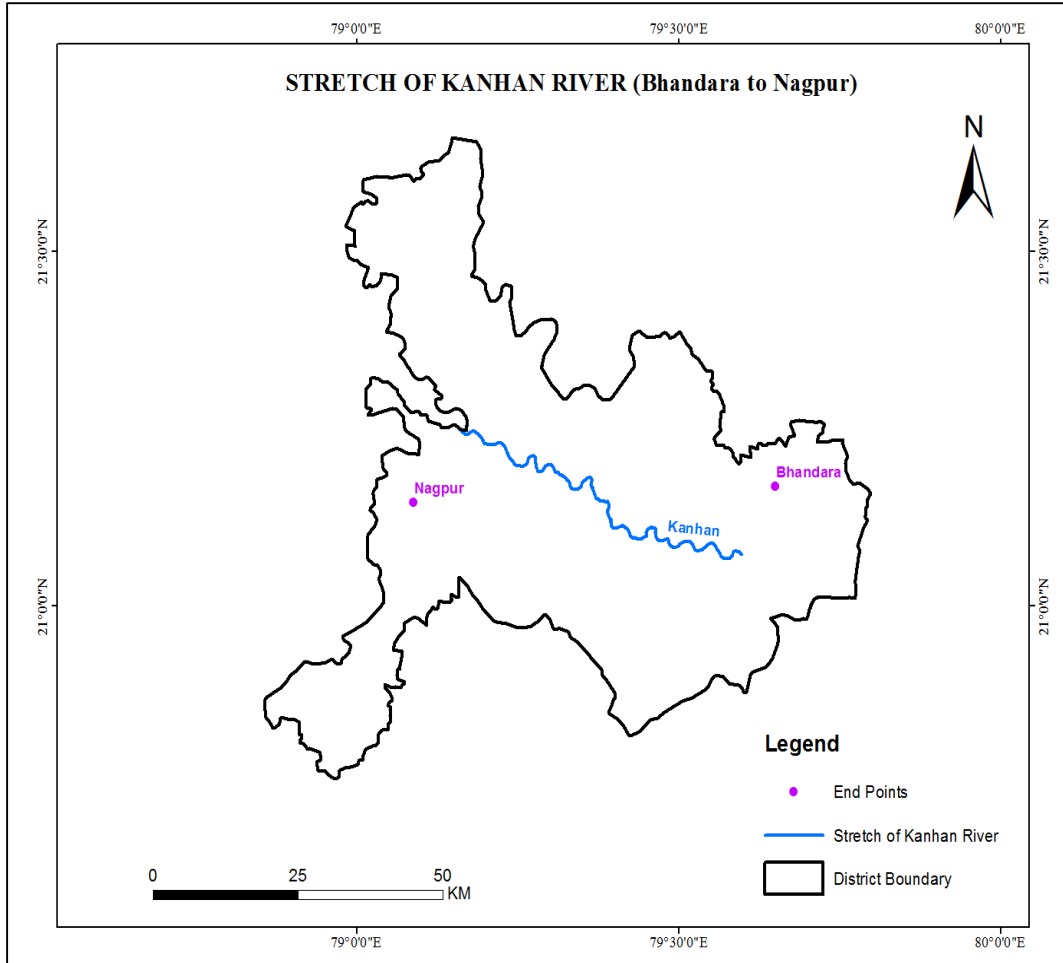


Figure 2 Map showing Stretch of Kanhan River

The river stretch extends from Bhandara to Nagpur. The length of this stretch is 100 km. Kanhan Pimpri, Kamptee and Mouda are towns situated on the banks of the river. The population along this stretch is 1,13,399 as per 2011 Census.

The current status of the river as per the monthly sampling conducted between January to December 2018 reveals that water quality of the river falls in Priority III i.e. max BOD 16.4 mg/l.

Table 1 Introduction of river stretch

Sr. No.	Description of item	Details	
1	Approx. length of stretch	100 km	
2	Major Towns located on the bank along with Population	Local Body	Population
		Kanhan Pimpri	32,000
		Kamptee Municipal Council	66,793
		Mouda Municipal Council	14,606
3	Stretch of River Perennial or Non Perennial	Non-perennial	

4	Current status of polluted river stretch (Jan – Dec 2018)	Priority III
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1.3 Status of Domestic Sewage Generation and Treatment

Nagpur is the major city along the river. The water supply to the Nagpur City is about 520 MLD & the sewage generation is around 350 MLD. This sewage goes into Nag River which meets Kanhan River near Ambhora. Nagpur Municipal Corporation has inadequate infrastructure to collect and treat the entire sewage generated from the city. This has resulted into discharge of untreated / partially treated sewage into Nag River & Pili River, which are parts of Nag river basin.

Drainage from Kanhan Pimpri local body jurisdiction having population about 32,000 souls discharging sewage into Kanhan River through three number of Drains.

Sewage from Kamptee Nagar Parishad Area having population about 66793 souls discharges untreated sewage into Kanhan River & total quantity of discharge of untreated sewage is about 9000 CMD.

The BOD level of major drain coming from Mouda Nagarpanchyat is about 22 mg/lit. and COD level is about 53 mg/lit. Regarding Ground water quality observations as per EIA study conducted by NTPC Mouda, pH ranges between 7.0 to 8.0 and hardness ranges between 166 to 660 mg/lit, within permissible limits. The chloride 31.9 mg/lit to 400 mg/lit and Sulphates 3.5 mg/lit to 128.4 mg/lit are recorded.

Table 2 Funding Details for proposed STPs

Sr. No.	Name of ULB	Name and Address of STP	Designed Capacity (MLD)	Fund Allocation Details		Target date of Completion	Remarks
				Source of Funds	Allocation Status		
1.	Kanhan Pipri Nagar Parishad,	Kanhan Pipri	8	Govt. of Maharashtra	Yet Not Finalised	--	DPR submitted to Govt.of Maharashtra
2.	Kamptee Nagar Parishad,	Kamptee	12.5	--		--	Submitted for technical sanction to MJP

Table 3 Domestic sewage aspects on the river stretch

Sr No	Particular	Remarks
1	Details of drainage system/sewerage network present/proposed	<p>Chief Officer, Nagar Parishad, Kanhan Pimpri, vide letter dated 03/01/2019 has submitted that they have submitted proposal for provision of STP of capacity 8.0 MLD estimating 32.42 Cr to the Govt. of Maharashtra for further approval. Funding by Urban Development Chief Officer, Nagar Parishad, Kamptee, vide letter dated 04/01/2019 has submitted that, they have submitted proposal for provision of STP of capacity 12.50 MLD to MJP for Technical approval.</p> <p>Mouda Nagar Parishad: At present 2 STPs of capacity 0.5 MLD each are proposed at 2 locations which will be expected to be completed by 2020. The industries located in the catchment of Kanhan River have their full-fledged primary, secondary and tertiary treatment facilities. Industrial effluent is not discharged in the Kanhan River.</p>
2	Proposal for utilization of sewage	<ul style="list-style-type: none"> Water resource department, GoM has prepared integrated State Water Plan, which includes recycling of Treated sewage. MPCB has submitted Action plan for Utilization of Treated Sewage to CPCB, in which it is mandated to utilize treated sewage for different class of users like Thermal Power Plants, Industrial Units, Construction activities, non-potable municipal uses, Agriculture-Irrigation, etc. depending on its availability. The Infrastructure Projects are mandated by MPCB to recycle 60% of treated sewage for secondary use by providing dual pipeline.

		<ul style="list-style-type: none"> The Local Bodies will be encouraged to reuse treated sewage for various purposes including to Thermal Power Plants wherever possible. e.g. Koradi TPS is receiving 100 MLD of treated sewage from Nagpur city.
3	STP sludge management	STP sludge is disinfected and used as manure.
4	Proposal for ground water recharging/rain water harvesting	<ul style="list-style-type: none"> The EC has mandated rainwater harvesting for projects above 20,000 Sq.m. G.S.D.A. is engaged in the development and management of groundwater resources in the State through various schemes. The main aim is to provide safe and potable drinking water to the community. The G.S.D.A. is engaged, in the exploration, development and augmentation of groundwater resources in the State through various schemes. This mainly includes, drilling of bore wells/tube wells under Rural Water Supply Programme, rendering technical guidance under minor irrigation programme by locating suitable dug well sites, strengthening of groundwater sources by water conservation measures, artificial recharge projects for induced groundwater, specific studies related to the periodic status of groundwater availability, protecting the existing groundwater resources through technical assistance under Groundwater Act etc.
5	Adopting good irrigation practices	Agriculture Department, GoM & Water Resource Department, GoM is requested for implementation.
6	Protection and management of Flood Plain Zones (FPZ)	Water Resource Department, GoM is requested for implementation.
7	Plantation on both sides of the river	Water Resource Department, GoM is requested for implementation.
8	Setting up of biodiversity parks on flood plains by removing encroachment	Water Resource Department, GoM is requested for implementation.

1.4 Drain out-falling into River Kanhan

There are two drains that falls into river Kanhan. Details of the drains is given in the following table.

Table 4 Particulars of drains falling into the river

Sr. No.	Location	Name of the drain	Discharge	Length (km)	Width (m)
1	JN Road Nalla Kanhan pipri Nagar parishad	JN Road Nalla	---	1.5	1.0
2	Ashok Nagar Nalla Kanhan pipri Nagar parishad	Ashok Nagar Nalla	---	2.5	1.0
3	Lohiya layout Nalla Kanhan pipri Nagar parishad	Lohiya layout Nalla	---	2.5	3.30
4	Bagdor nalla, Kamptee Nagar parishad	Bagdor nalla,	---	5	3
5	Nalla coming from Janata School, which meeting to Kanhan River	Local nalla	About 0.2 MLD	1.7	1.5
6	Nalla coming from Chakradhar nagar which meeting to Kanhan River	Local Nalla	About 0.2 MLD	0.7	1.4

Table 5 Status of Water Quality of the drains

Sr. No.	Major Drain	BOD (mg/l)	COD (mg/l)
1	JN Road Nalla Kanhan pipri Nagar parishad	90.00	252.00
2	Ashok Nagar Nalla Kanhan pipri Nagar parishad	5.00	8.00
3	Lohiya layout Nalla Kanhan pipri Nagar parishad	98.00	324.00
4	Bagdor nalla, Kamptee Nagar parishad	---	---
5	Nalla coming from Janata School, which meeting to Kanhan River.	22.0	55.0
6	Nalla coming from Chakradhar nagar which meeting to Kanhan River.	21.0	53.0

1.5 Status of Water Quality

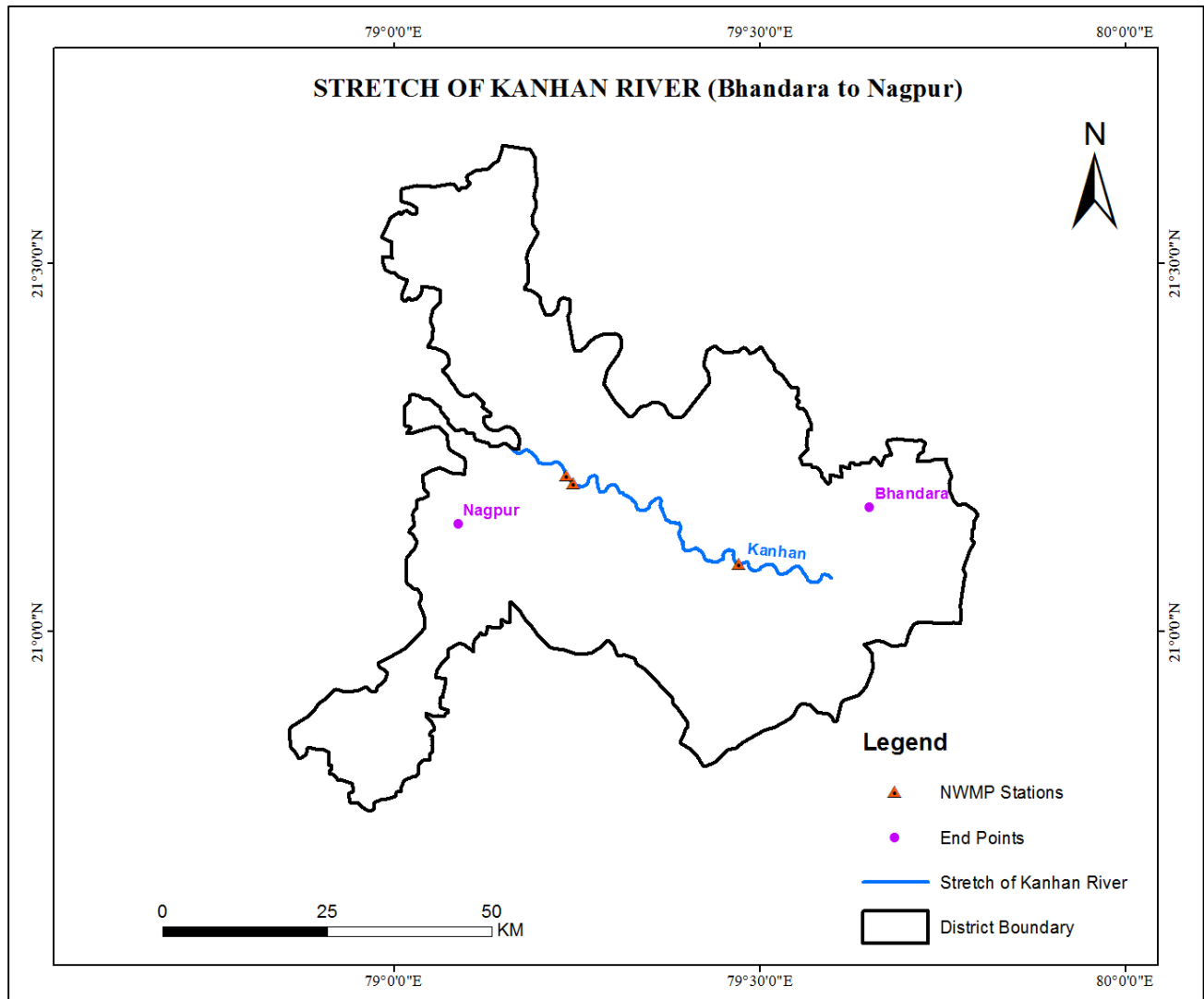


Figure 3 Map Showing NWMP Stations across Stretch of Kanhan River

Water quality of River Kanhan is assessed at 3 locations. It is observed that Dissolved Oxygen range between 2.0 – 8.4 mg/l putting together data of three years (2016-2018) which is not meeting the criteria limit of at least 4 mg/l. The Bio-chemical Oxygen Demand (BOD) varies between 3.0 – 16.4 mg/l for similar years which is exceeding the desired level of 3 mg/l. The Chemical Oxygen Demand (COD) values ranged between 8.0-56.0 mg/l indicating moderate level of industrial pollution. The Faecal and Total Coliform numbers respectively for the years referred are in the range of 11-500 MPN/100ml and 17-900 MPN/100ml indicating significant contribution of untreated sewage. The details of parameter specific concentration are provided in Table 6.

**Table 6 Water Quality of Kanhan River at U/s of M/s Vidarbha Paper Mills, Village-
Sinora, Taluka- Parseoni, District- Nagpur**

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml	Water Quality Criteria of Bathing
January	2017	8.5	8.0	4.6	17	34	Non Complying
	2018	7.92	7	4.0	58	120	Non Complying
February	2017	8	7.7	5.2	17	34	Non Complying
	2018	7.9	7.3	3.0	46	120	Complying
March	2017	8.0	6.6	6.4	17	27	Non Complying
	2018	7.7	6.63	3.0			Complying
April	2017	7.5	6.40	3.0	17	46	Complying
	2018	7.9	5.7	6.4	33	94	Non Complying
May	2017	8.2	6.40	3.2	17	94	Non Complying
	2018	8.6	5.5	6.1	46	140	Non Complying
June	2017	7.8	6.20	5.6	17	94	Non Complying
	2018	7.9	6.4	4.4	46	170	Non Complying
July	2017	7.7	6.08	4.6	31	58	Non Complying
	2018	7.69	5.9	5.1	33	220	Non Complying
August	2017	7.9	6.08	3.2	33	94	Non Complying
	2018	7.8	6.2	7.2	27	220	Non Complying
September	2017	8	6.3	3.0	58	120	Complying
	2018	8.1	6.05	6.9			Non Complying
October	2017	7.7	6.88	4.4	33	94	Non Complying
	2018	8.0	5.2	10.0	38	210	Non Complying
November	2017	6.73	5.13	7.8	58	120	Non Complying
	2018	8.4	6.8	5.2	21	170	Non Complying
December	2017	7.8	6	6.2	33	79	Non Complying
	2018	8.0	7.0	5.0	26	140	Non Complying

**Table 7 Water Quality of Kanhan River at D/s of M/s Vidarbha Paper Mills, Village-
Sinora, Taluka- Parseoni, District- Nagpur**

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml	Water Quality Criteria of Bathing
January	2017	8.5	8.0	6.8	46	170	Non Complying
	2018	7.82	6.8	5.8	79	220	Non Complying
February	2017	8	7.5	7	23	84	Non Complying
	2018	7.9	5.4	5.9	94	280	Non Complying
March	2017	8.0	6.2	7.8	22	40	Non Complying
	2018	7.9	6.59	3.2			Non Complying
April	2017	7.3	6.00	6.8	21	140	Non Complying
	2018	7.9	5.5	6.84	70	170	Non Complying
May	2017	8.1	4.30	9.4	21	140	Non Complying
	2018	8.9	5.7	6.9	94	280	Non Complying
June	2017	7.8	5.60	7.9	33	170	Non Complying
	2018	7.9	5.4	6.2	110	350	Non Complying
July	2017	7.6	5.78	7.0	33	110	Non Complying
	2018	7.8	5.3	6.2	60	280	Non Complying
August	2017	7.83	6.69	4.5	33	170	Non Complying
	2018	7.8	4.9	10.0	60	280	Non Complying
September	2017	7.9	6	4.2	79	220	Non Complying
	2018	8.05	5.94	9.8	60	280	Non Complying
October	2017	7.8	6.7	5.4	70	170	Non Complying
	2018	8.1	3.2	14.0	39	280	Non Complying
November	2017	7.67	4.93	12.0	79	220	Non Complying
	2018	8.5	6.2	7.0	70	280	Non Complying
December	2017	7.8	5.8	6.5	79	110	Non Complying
	2018	8.3	5.7	5.6	33	220	Non Complying

**Table 8 Water Quality of Kanhan River at D/s of Nagpur, Village- Agargaon, Taluka-
Kuhi, District- Nagpur**

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml	Water Quality Criteria of Bathing
January	2017	8.4	6.9	7.0	49.0	170.0	Non Complying
	2018	6.8	7.4	3.8	110.0	280	Non Complying
February	2017	7.6	6.5	9.4	49	110	Non Complying
	2018	7.4	6.9	4.8	110.0	280	Non Complying
March	2017	7.5	6.6	7.6	70.0	140.0	Non Complying
	2018	7.9	2.98	10.6	94.0	280	Non Complying
April	2017	8.1	5.9	6.2	120.0	430.0	Non Complying
	2018	7.4	5.6	10.1	140.0	350	Non Complying
May	2017	8.0	6.1	3.6	110.0	350.0	Non Complying
	2018	7.2	2	9.1	79.0	280	Non Complying
June	2017	8.7	5.0	12.0	130.0	350.0	Non Complying
	2018	7.7	5.44	7.3	94.0	280	Non Complying
July	2017	6.9	4	6.4	58.0	280.0	Non Complying
	2018	7.4	5.2	10.2	33	280	Non Complying
August	2017	7	5.9	4.2	110.0	280.0	Non Complying
	2018	7.64	6.32	12	27.0	240	Non Complying
September	2017	7.9	5.9	4.4	110.0	350.0	Non Complying
	2018	8.27	5.79	9.4	33.0	280	Non Complying
October	2017	7.6	5.66	6.9	110	280	Non Complying
	2018	7.5	6.2	4.8	39.0	350	Non Complying
November	2017	7.6	4.8	13.6	52.0	110.0	Non Complying
	2018	7.8	7.8	5.4	47.0	350	Non Complying
December	2017	8	5.7	6.8	12.0	110.0	Non Complying
	2018	8.1	7.3	5.8	33.0	220	Non Complying

It is observed from the above analysis that most maximum BOD values recorded during 2017 and 2018 do not comply with the bathing standards of 3mg/l. This may be due to non-availability of the dilution water at disposal location in the river bed. The necessary dilution will be achieved by way of discharging necessary water quantum required to maintain e-flow from dam in a periodical manner. The usual water cycle of the release of water is mostly for irrigation and domestic purposes from interval of 21 days to 45days. The continuous e-flow will be achieved subject to availability of the water in the dam.

1.6 Status of Ground Water Quality

Maharashtra Pollution Control Board (MPCB) regularly monitors the water quality across 250 Water Quality Monitoring Stations (WQMS) for both surface (155 on rivers, 34 on sea/creeks, 10 on drains, 1 dam) and ground water (24Borewells, 24Dugwell, 1 Handpumps, 1 Tubewell) under two programs of NWMP (National Water Monitoring Programme) project titled GEMS (Global Environment Monitoring System) and MINARS (Monitoring of Indian National Aquatic Resources). Surface water samples are monitored every month whereas the ground water samples are monitored every six months.

WQI for ground water

MPCB monitors ground water quality once in six months. Based on the stringency of the parameters and its relative importance in the overall quality of water for drinking purposes each parameter has been assigned specific weightage by CPCB. These weights indicate the relative harmfulness when present in water. Nine parameters (pH, Total Hardness, Calcium Hardness, Magnesium Hardness, Chloride, Total Dissolved Solids, Fluoride, Nitrate, Sulphate) are considered for calculating Water Quality Index of ground water.

Water Quality Index - Ground Water		
WQI	Water Quality	Colour Code
<50	Excellent	
50-100	Good Water	
100-200	Poor Water	
200-300	Very Poor Water	
>300	Water Unsuitable for drinking	

Table 9 Water Quality Index for 1 locations (surface water & ground water) during January - 2019

WQI Category	WQI	Number of WQI values in different category	
		No. of WQI	% of WQI
Good to Excellent	63-100	98	73.68
Medium to Good	50-63	12	9.02
Bad	38-50	9	6.77
Bad to Very Bad	38 and less	14	10.53
Total WQI values		133	100

Summary:

1. 110 WQI values or 82.70 % values are in category of Good to Excellent and Medium to Good.

2. 9 WQI values or 6.77 % are in category of Bad.
3. 14 WQI values or 10.53 % are in category of Bad to Very Bad.

Table 10 Ground water quality in Pune District

National Rural Drinking Water Programme Ministry of Drinking Water and Sanitation													
MDWS Site		Online Applications		NRDWP Reports		Data Entry		Dashboard		Download mRWS App		NRDWP Site	
Select Langug													
State: MAHARASHTRA		District: NAGPUR		Show									
Format E21- Block Quality Profile For FTK Testing													
S.No.	Block	Total Sources Tested	Tested Sources Not Found Contaminated	Nos. of Sources with Single Chemical Contaminants						Nos. of Sources with Bacteriological Contaminants Faecal Coliform	Nos. of Sources with Multiple Contaminants	Nos. of Sources with Other Contaminants	
				Iron	Fluoride	Salinity	Nitrate	Arsenic	Other				
	Total	5,834	4,392	227	24	0	12	0	91	0	344	93	
1	Bhiwapur	326	243	0	0	0	0	0	3	0	3	50	
2	Hingna	424	217	1	0	0	1	0	1	0	275	4	
3	Kalameshwar	197	180	0	0	0	0	0	0	0	0	0	
4	Kamptee	507	491	6	0	0	0	0	0	0	0	0	
5	Katol	385	379	0	0	0	0	0	0	0	0	0	
6	Kuhi	827	522	120	0	0	0	0	0	0	18	2	
7	Mauda	578	528	41	0	0	1	0	30	0	6	3	
8	Nagpur (rural)	585	422	8	5	0	0	0	4	0	4	3	
9	Narkhed	302	287	0	0	0	0	0	13	0	0	0	
10	Parseoni	436	217	0	0	0	0	0	0	0	0	0	
11	Rantek	468	362	0	0	0	0	0	0	0	0	0	
12	Savner	480	285	51	18	0	7	0	33	0	31	21	
13	Umred	319	259	0	1	0	3	0	7	0	7	10	
	Total	5,834	4,392	227	24	0	12	0	91	0	344	93	

1.7 Status of Industrial Effluent and Treatment facilities

Maharashtra is one of the most highly industrialized states in India. With a rise in industrial estates in the State, areas like Mumbai, Thane, Navi Mumbai, Kalyan, Nashik, Pune and Pimpri-Chinchwad that have a large number of pollution-prone industries are facing chronic industrial pollution. In order to maintain a safe distance between industrial units and rivers to avoid discharge of effluent into water bodies, the State has its policy which also states that no industry will be allowed to establish along a river bank. Industries are being encouraged to recycle and reuse waste. Industrial Statistics in Nagpur region is demonstrated in following Table.

Nagpur		
LSI	MSI	SSI
127	7	1665
126	26	2216
441	34	1280
White - 42		

Table 21 Particulars of Industries situated in District Nagpur & Bhandara

Industry name & address	Consent Validity	Direction issued	Total Water consumption (CMD)	Effluent generation (CMD)	ETP	OCE MS
M/s Maharashtra State Power Generation Co ltd, Khaperkheda Thermal	Applied for Renewal of consent	PD issued dtd 22/12/2018	DOM – 6150 Indl- 116860	DOM – 2460 Indl- 22795	ETP & STP Provided Treated industrial effluent is recycled	Conne cted

Power Plant (1340 MW)					back into ash sluicing activity completely. Treated Domestic effluent used for plantation within premises partly and remaining used for ash disposal.	
M/s Vidarbha Paper Mill,	Closed last 5 years	Closed	Closed	Closed	Closed	Closed
Mouda Super Thermal Power Project, NTPC Limited, Mouza Kumbhari, Tal. Mouda, Dist. Nagpur	31/08/2020	PD issued dtd 14/06/2018	Dom.:2160 Indl.:135080	Dom.:1340 Indl.:40800	ETP & STP Provided	Connected
M/s. Hindalco Industries Ltd. Mouza Dahali, Tal. Mouda, Dist. Nagpur	28/02/2022	PD issued dtd 30/10/2018	Dom.:30 Indl.:151.6	Dom.:20 Indl.:12	ETP Provided	
Venkateswara Power Project Ltd. (Unit II),(Sugar Factory), 205,206,& 208, Narendra Nagar Babdeo, Tal Mouda, Dist. Nagpur	31/12/2017 Applied for renewal	PD issued dtd 25/1/2018	Dom.:40 Indl.:460	Dom.:30 Indl.:120	ETP Provided	

There is no discharge of effluent into the river from the industries.

Table 12 Particulars of Industries situated in Nagpur District

Sr. No.	Particulars	Remarks
1	Particulars of Industries in Nagpur District	
2	No. of Directions issued to Industries	04 Nos of Industries
3	Total water consumption and total industrial effluent generation	Water Consumption: 260.9 MLD Industrial Effluent Generation: 63.72 MLD
4	No. of industries having captive ETPs and their treatment capacity in MLD	04 Nos
5	No. of CETPs existing in the catchment of the polluted river stretch and the treatment capacity	Nil
6	No. of Industries that are members of the CETPs	NA

7	Gaps in treatment of industrial effluent	NA
8	OCEMS installation Status by Industries	Connected
9	Status of Hazardous Waste Generation and Treatment	Total hazardous waste generation: 20552.1 MT Total hazardous waste treatment: 20552.1 MT

To monitor compliance of Consent conditions, performance of ETP, ECS and other measures, the Board officials inspect industries regularly. There are 489 industries identified under “Highly Polluting Industries”. The table below shows region-wise details of these highly polluting industries.

Table 13 Highly Polluting Industries as on 31/3/2018.

Industry	Amravati	Aurangabad	Chandrapur	Kalyan	Kolhapur	Mumbai	Nagpur	Nashik	Navi Mumbai	Pune	Raigad	Thane	Grand Total
Cement	-	-	5	-	1	-	1	-	-	-	-	-	7
Distillery	1	15		-	17	-	1	22	-	36	-	-	92
Dyes and Dye-intermediates	-	-	2	3	2	-	1	-	1	-	7	2	18
Fertilizer	1	2	-	-	-	1	1	4	-	1	3	-	13
Integrated Iron and Steel	-	-	1	-	1	-	4	-	-	1	2	-	9
Oil Refinery	-	-	-	-	-	2	-	-	-	-	-	-	2
Pesticide	-	-	-	1	5	-	-	1	3	-	3	3	16
Pharmaceuticals	-	13	-	12	4	-	-	2	15	9	14	23	92
Pulp & Paper	-	-	1	-	-	-	-	-	-	1	-	-	2
Sugar	1	55	2	-	41	-	5	35	-	63	-	-	202
Tannery		1	-	-	-	-		-	-	-	-	-	1
Thermal Power Plant	2	1	7	-	2	1	12	3	-	-	-	1	29
Petrochemical	-	-	-	-	-	-	-	-	1	-	5	-	6
Grand Total	5	87	18	16	73	4	25	67	20	111	34	29	489

1.8 Waste Management

1.8.1 Solid Waste Management

In the state of Maharashtra there are total 271 local bodies , comprising of 27 Municipal Corporations, 16- 'A' Class Municipal Council, 54- 'B' Class Municipal Council, 154- 'C' Class Municipal Council, 14- Nagar Panchayat, 06-Cantonment Board generating about 22897.83 MT of municipal solid waste every day, of which the Contribution in terms of percentage by the corporation is 84.72 % , by A class council is 4.25 % , by B class council is 5.04 % , by C Class Council is 5.07 % and by Others is 0.96 % . The overall percentage of treatment is 34.70 % i.e. 7945.544 MT/day quantity is treated and the remaining is disposed in an unscientific manner. Out of 27 Municipal corporations, 24 Corporations have obtained Authorization from MPCB for 22 Nos of approved sites having processing & disposal facilities and same are in operations. 109 Nos. of Municipal Councils having partially processing & disposal facilities.

Total Solid waste generation from local body area Kamptee & Kanhan Pipri Municipal Council area is 35 Ton per day. Presently there is no processing facility and solid waste is disposed only by dumping.

MSW generation from Mouda Municipal Council local area is 7 to 8 Ton/day. This Nagar Panchayat has prize of Rs.5.0 Crore from Urban Development Department. Mouda is doing 100% collection & segregation and organic waste is converted into compost. Hotel waste and other solid waste is being disposed as a cattle feed. Mouda Municipal Council has achieved 100% collection, segregation, treatment & disposal of MSW.

Total generation of MSW from Nagpur is about 1100 MT/day. 200 MT/day of the total MSW generated in Nagpur is disposed by composting and RDF.

1.8.2 Bio-medical waste Management

Total Bio-medical waste generation in is 3660 kg/day. 3660 kg/day waste is collected, transported and treated at CBMWTSDf located at Bhandewadi, Nagpur. The CBMWTSDf has installed capacity of Incinerator 100 Kg/Hr and Autoclave with installed capacity of 50 litre/cycle.

Bio-medical waste from Mouda Municipal Council is being collected from HCF by authorized agency namely M/s.Superb Hygienic Disposal, Bhandewadi, Nagpur.

1.8.3 E-Waste management

- Maharashtra Pollution Control Board awarded work order to M/s. IRG Systems South Asia Pvt. Ltd. to carry out inventorisation of E-Waste generation in the State of Maharashtra.
- Interim inventorisation report is submitted to MPCB and final report will be ready within one month.

- As per the Interim inventory report submitted to MPCB, the E-Waste generation for the year 2015 is approx. 6,46,509 MT.
- **Number of authorized dismantlers/ recyclers in the state of Maharashtra**

Present Status of E-Waste dismantling and recycling capacity			
1	E-Waste Dismantlers	70	77525 MTA
2	E-waste Recyclers	08	
	Total	78	

- E-Waste Treated (Recycled/Dismantled)
 - Year 2015-16 : 4041.72 MT
 - Year 2016-17 : 6720.69 MT
 - Year 2017-18 : 7031.5 MT
- CPCB has approved EPR of 261 producers for Maharashtra. The list of the producers is enclosed here.
- Annual report for the year 2017-18 is submitted.

Action Taken by MPCB

- MPCB is undertaking regular monitoring of EPR Authorization conditions and regular inspection of the collection points/ centers mentioned in EPR Plan.
- MPCB has issued Directions u/s 5 of the Environment (Protection) Act, 1986 read with E-waste (Management) Rules, 2016 to all Municipal Corporations in Maharashtra on 06/12/2018 for provision of collection centres.
- Co-ordination with Various State Government Departments
- Co-ordination with Urban Local Bodies (Municipal Committee /Council /Corporation).
- Awareness through Public Notice

Constraints:

- Channelization E-waste from informal sector to formal sector.
- Awareness about impact of E-waste on Environment and Rules of E-waste is required.
- Authorized collections and Segregation centers are required to be established by Local Bodies.

1.8.4 Hazardous Waste Management

The State of Maharashtra has four Common Hazardous Waste Treatment, Storage and Disposal Facilities. These facilities are located at MIDC Taloja, Trans-Thane Creek Industrial Area, MIDC

Ranjangaon, Pune and MIDC Butibori, Nagpur. These facilities collectively handle 340,847 MT of Hazardous waste per annum.

There are 299 Hazardous waste generating industries in Nagpur. These industries generated about 20552.1 MT of Hazardous waste in year 2017-18. The HW from Nagpur district is scientifically disposed through CHWTSDF at Maharashtra Enviro Power Ltd., MIDC, Butibori, Dist. Nagpur having capacity – Landfill –60,000 MT/A and Incinerable – 3TPH.

Out of the MT generation in 2017-18, 18,533 MT was Landfillable, 1,780 MT was Incinerable and 237.56 MT was Recyclable.

Table 14 Status of Waste Management in Nagpur

Sr. No	Particular	Remarks
1	Total MSW Generation	Total generation of MSW: 1100 MT/day. Total quantity of Untreated MSW: 922 MT/day
2	Existing MSW treatment and disposal facilities	200 MT/day MSW treated by composting and RDF
3	Bio-medical waste Management	Hospitals are joined to CBMWTSDF-PASCCO Environmental Solution Ltd. Total generation: 3660 kg/day Collection and treatment: 3660 kg/day
4	E-Waste management	E-waste generated by industries is sent to MPCB authorized E-waste reprocessor.
5	Hazardous Waste Management	<ul style="list-style-type: none"> There are 299 Hazardous waste generating industries in Nagpur. These industries generated about 20552.1 MT of Hazardous waste in year 2017-18. The HW from Nagpur district is scientifically disposed through CHWTSDF - Maharashtra Enviro Power Ltd., MIDC, Butibori, Dist. Nagpur CHWTSDF capacity – Landfill – 60,000 MT/A Incineration –3 TPH

1.9 Dream Project of Government of Maharashtra (GOM), Namami Chandrabhaga

GOM, has announced Namami Chandrabhaga Abhiyan on 18/03/2016 in the Budgetary Assembly Session of 2016-17. Namami Chandrabhaga is an initiative taken to revive and rejuvenate the river Chandrabhaga and to restore its historic glory. Considering the religious, social and economic importance of the river Chandrabhaga, the Government of Maharashtra has decided to prepare a comprehensive plan for cleaning of the river on the lines of ‘Namami Gange’. Hon’ble Finance Minister, GOM, directed to issue the GR about finalization of working System of the Abhiyan, vide letter dt. 07/04/2016. The aim of the Namami Chandrabhaga Abhiyan is to make the

Chandrabhaga river pollution free and conserve its purity and sanctity up to year 2022 and others are as mentioned below:

- To maintain the permanent minimum continuous flow of water in the river bed.
- To construct weirs in the river bed for maintaining water level.
- To maintain & keep minimum environmental flow of water.
- To make available sufficient public bathrooms & toilets as well as mobile bio-toilets to the publics during Pandharpur yatras.
- To install STP's for treatment of domestic wastes and scientific disposal facilities for solid waste generated from the villages & cities located on the bank of Chandrabhaga river.
- To carry out the beautification & forestation of river banks.
- To make reuse/recycle of treated industrial water generated from the industries and industrial estates located in the catchment area of Chandrabhaga river.
- As per the local need to work for public participation and development of pilgrimage area.

“Namami Chandrabhaga Pradhikaran”

Established under the Chairmanship of Hon’ble Chief Minister, GoM & Co-Chairmanship of Hon’ble Finance Minister, GoM, having Divisional Commissioner, Pune as Member Secretary.

“High Power Committee”

Established under the Chairmanship of Hon’ble Chief Secretary, GoM of Maharashtra having Divisional Commissioner, Pune as Member Secretary.

In this context, the Government has identified CSIR National Environmental Engineering Research Institute (CSIR-NEERI) as ‘Nodal Technical Expert Agency’ the project. Bhima river originates in Bhimashankar in Pune district. But when it reaches Pandharpur, it appears like a crescent moon, thus deriving the name Chandrabhaga. It flows in a 370-km stretch between Pune and Solapur districts. CSIR-NEERI was already involved by the Maharashtra Government to provide technological solutions for sanitation and sewage treatment at important cities and pilgrim centers like Nashik and Pandharpur. Furthermore, is retained CSIR-NEERI for technological interventions during the execution of the Project ‘Namami Chandrabhaga’. The Maharashtra Government intends to cleanse and make the holy river Chandrabhaga pollution free by the year 2022.

Similarly, on the line of Namami Chandrabhaga Maharashtra Government is in process of undertaking various projects for clean-up of other rivers in the State.

1.10 Involvement of Civil Society/Creation of awareness

For sustainable development it is necessary to promote and create environmental awareness among communities, businesses and governments. Therefore the Board organizes various environmental

awareness programs across the State of Maharashtra. During the year 2017-18 the following programs on environmental awareness were conducted by the Board.

Month	Subject	Details
22nd April 2017	World Earth Day	Public awareness messages published in leading newspapers namely Dainik Samna, Sakaal, Divya Marathi, Loksatta, Indian Express, Lokmat, Maharashtra Times of India, DNS, Hindustan Times and Midday on the occasion of World Earth Day.
5th June 2017	World Environment Day celebration	<p>The main event was organized at the Yashwantrao Chavan Auditorium, Mumbai on 5th June, 2017 on occasion of World Environment Day. Hon'ble Chief Minister of Maharashtra, Shri Devendra Fadnavis, Hon'ble Minister of Environment, Shri Ramdas Kadam and Member Secretary of MPCB, Dr. P. Anbalagan attended this event. During this event, award ceremony for Vasundhara Award competition organized for industries, municipal corporations and CETPs was carried out. On the occasion of World Environment Day, Vasundhara Short Film Competition based on the environment was announced by Hon'ble Chief Minister of Maharashtra at the main event. This competition will be organized for professionals as well as amateurs.</p> <p>During this event, the award ceremony for Photothon 2017 took place. This ceremony was presented by Member Secretary of MPCB, Dr. P. Anbalagan. Villages which had participated in the water conservation activity 'Jalsanvardhan Panchayat – Ek Lok Chalwal' organized by Maharashtra Pollution Control Board, Vanrai Pune and Zee 24 Taas were awarded at the hands of Hon'ble Chief Minister of Maharashtra for their exceptional performance. During this event, a short film festival related to the environment was organized for three days at Yashwantrao Chavan Centre, Mumbai with assistance from Enviro-Vigil and as a joint effort by MPCB and Environment Department, Government of Maharashtra. A large number of environmentalists attended this festival. At this time, discussion sessions with directors, producers, environment experts and analysts were also organized.</p>



Hon'ble Shri Devendra Fadnavis, Chief Minister, GoM lighting the lamp during inauguration of the World Environment Day program held at Y. B. Chavan Auditorium, Mumbai on 5th June 2017. Hon'ble Shri Ramdasji Kadam, Minister for Environment, GoM, Shri Sumit Mallik (IAS), Chief Secretary, GoM and Dr. P. Anbalagan (IAS), Member Secretary graced the occasion with their august presence.



On the eve of World Environment Day on 5th June 2017, Hon'ble Shri Devendra Fadnavis, Chief Minister, GoM giving away Vasundhara Awards to the entrepreneurs who have introduced best environment-friendly practices in their industry, at Y. B. Chavan Auditorium, Mumbai.

5th June 2017	World Environment Day	On the occasion of World Environment Day (5th June, 2017) public awareness messages were published in Maharashtra Times, Time of India, Loksatta, Indian Express, DNA, Hindustan Times, Midday (Gujarati, Urdu and English),
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			Lokmat, Dainik Sakaal, Samna, Divya Marathi and in other leading newspapers. Information about various control measures adopted for pollution control was published in this section on behalf of MPCB.
5th June 2017	World Environment Day		On the occasion of World Environment Day (5th June, 2017) public awareness programs related to the environment, canvas paintings with messages about the environment, brainstorming on public awareness and various other activities were organized by We Love India on 5th June, 2017 at Bandra. Famous movie artists, sportspersons and Hon'ble Environment Minister for State were present during these activities.
4th July 2017	'Paryavaranachi Vaari Pandharichya Daari'		An environmental public awareness campaign namely 'Paryavaranachi Vaari Pandharichya Daari' was organized on the occasion of Aashadhi Ekadashi and the foot pilgrimage to Pandharpur. As environmental issues are equally detrimental to urban and rural areas, fundamental messages such as plastic waste removal, proper use of water, electricity and natural resources, use of limited electrical power for agriculture, use of organic fertilizers, proper waste management of wet waste and dry waste were spread among the 10 lakh devotees who had gathered for the Pandharpur pilgrimage. These messages were made public through folk art, popularly known as Kirtan, Bharud, and Povada. In this 15 day long pilgrimage, Sangeet Natak Academy award winner, Smt. Chandabai Tiwari, famous Shahir Shree Devanand Mali and Hari Bhakta Parayan Shri Dnyaneshwar Maharaj Wabale created public awareness through Bharud, Povada and Kirtan respectively. This year's Pandharpur pilgrimage was inaugurated at Pune by Hon'ble Minister of State of Environment, Shri Ramdas Kadam. Honorable dignitaries such as Member Secretary of MPCB, Dr. P. Anbalagan and Hon'ble Mayor of Pune were present at this event. Guidance for this pilgrimage was sought from Dr. Prakash Khandge, a well-known researcher of folk arts. The conclusion of this pilgrimage was organized on the eve of Aashadhi Ekadashi in the presence of Hon'ble Chief Minister, Shri Devendra Fadnavis, Mrs. Amruta Fadnavis, Cabinet Minister (Solapur), Shri Vijay Deshmukh, Minister of Water and Sanitation, Shri Babanrao Lonikar, Senior Cabinet Minister, Shri Mahadev Jankar, Member Secretary of MPCB, Dr. P. Anbalagan and other honorable dignitaries.



Hon'ble Shri Devendra Fadnavis, Chief Minister addressing pilgrims on the eve of environment public awareness campaign at Pandharpur on 4th July 2017, in the presence of Dr. P. Anbalagan (IAS), Member Secretary, GoM.

August 2017	92.7 Big FM Big Green Ganesha	The Big Green Ganesha activity was co-organized by 92.7 Big FM and MPCB in the city of Mumbai. During this activity, the Big Green Ganesha van encouraged citizens at various locations to celebrate an eco-friendly Ganesh festival and to donate newspaper scrap for the even. During Ganesh festival a special studio was set up at Lalbaghcha Raja in Mumbai city for 10 days. At this time, Hon'ble Chief Minister of Maharashtra, Hon'ble Minister for Environment, Hon'ble State Minister for Environment and film celebrities spread messages for public awareness.
August 2017	Zee 24 Taas Eco-Friendly Household Ganesh Festival Competition	The Household Eco-friendly Ganesh Festival Competition was organized at the state level as a joint venture by MPCB and Zee 24 Taas. This competition has a large number of participants. Citizens celebrating household in a unique way had participated in this competition from all over the state. Response to this competition has been increasing over the years.
August 2017	ABP Maza Eco-Friendly Ganesh Festival Competition	A special public awareness campaign regarding celebrating an eco-friendly Ganesh festival in housing societies in major cities in the State was organized by MPCB and ABP Maza, a news channel. News about eco-friendly Ganesh festival celebrated in housing societies at cities such as Mumbai, Pune, Nashik and Nagpur was broadcast through the channel. Special programs on eco-friendly Ganesh festival celebrations at housing societies were also broadcast on the ABP Maza television channel. Well-known celebrities from Marathi film industry, Sayali Sanjeev and Rushi Saxema advertised the competition organized for celebrating an eco-friendly Ganesh festival through promos. Winners in this competition were awarded certificates by MPCB and Prasad. Public relations officer of MPCB was present at this time. These celebrities visited MPCB's Mantralaya. Special

		news regarding the event was broadcast by ABP Maza television channel.
August 2017	Household Eco-Friendly Ganesh Festival Competition 2017 organized by Loksatta and MPCB.	Eco-friendly household Ganesh festival decoration competition was organized jointly by MPCB and Loksatta at 6 divisions of Loksatta newspaper at Mumbai, Pune, Nashik, Nagpur, Ahmednagar and Aurangabad. More than 2000 people competed in this event. Prize distribution of this competition took place at Yashwantrao Chavan Pratishthan at the hands of Hon'ble Minister for Environment, Shri Ramdas Kadam, State Minister for Environment, Shri Pravin Pote-Patil and Member Secretary of MPCB, Dr. P. Anbalagan. A special column regarding this event was published in all editions of Loksatta newspaper.
August 2017	Eco-Friendly Ganesh Festival UFO Digital Movies financial assistance.	Public awareness messages by celebrities from Marathi and Hindi film industry were publicized at 205 digital theatres by UFO Digital Movies for two weeks to promote an eco-friendly Ganesh festival.
August 2017	Financial assistance for DNA Eco Ganesha public awareness campaign organized by DNA and MPCB.	To celebrate an environment friendly Ganesh festival, eco-friendly Ganesh idols based on the five natural elements were installed in selected malls in Mumbai city on behalf of the MPCB and DNA. MPCB played the role of co-convenor in this campaign organized by DNA. Prominent celebrities from the Hindi film industry participated in this campaign.
August 2017	Financial assistance for public awareness activity, Times Green Ganesha.	Eco-Green Ganesha competition was organized jointly by Environment Department of MPCB, Government of Maharashtra and Times of India group for public Ganesh festival organizations and housing societies in Mumbai and Pune. During this campaign, public awareness activities were conducted in various malls, movie theatres and colleges. Eco-friendly Ganesh festival workshops were conducted for school students. Various activities and cleanliness campaigns were conducted by college students for the eco-friendly Ganesh ambassador during Ganesh idol immersion at Girgaon Chowpati, Juhu beach and Versova beach at Mumbai. This campaign was launched by popular actor, Vidyut Jammwal and Hollywood Director, Chuck Russel at Lala Lajpat Rai College. A special film for public awareness had been created by Times group for this campaign. A dedicated column for this campaign was published for 10 consecutive days in the newspaper, Times of India.
August 2017	Eco-Ganesha Public awareness campaign organized by Dainik Samna and MPCB.	Eco-friendly public Ganesh festival was organized at Mumbai, Pune and Aurangabad with assistance from the newspaper, Dainik Samna. The prize distribution event was conducted in the presence of Hon'ble Minister for Environment, Shri Ramdasbhai Kadam and Member Secretary, MPCB, Dr. P. Anbalagan.



Hon'ble Shri Ramdasji Kadam, Minister for Environment, GoM giving away prizes to the participants on the eve of Eco-friendly Ganesh Public awareness campaign in the presence of Dr. P. Anbalagan (IAS), Member Secretary, MPCB

August 2017	Public awareness messages about eco-friendly Ganesh festival displayed on Times OOH BEST bus stop shelters.	Public awareness message of 'Celebrate a pollution-free Diwali' by Hon'ble Chief Minister, Hon'ble Minister for Environment and Hon'ble State Minister for Environment were displayed on bus stops in Mumbai city for a period of 15 days.
August 2017	Eco-friendly Dahi Handi 2017.	Eco Friendly Dahi Handi Festival 2017 was organized in association with IDEAL Book Company and MPCB. In this program, anti-noise pollution awareness rally was organized by famous Marathi film industry celebrities on the Open Deck Bus Service of Best Transport Service. Notable film and TV celebrities were present at this rally. On the eve of Dahi Handi, this rally was organized in the presence of street-play celebrities in Dadar, Lalbagh area. Eco-friendly Dahi Handi was smashed in the presence of young celebrities from Zee TV and ETV. At the time, in front of Chhabildas High School in Dadar, the noise-free eco-friendly Dahi Handi was smashed along with celebrities from the film and theatre industry. Public Relations Officer, MPCB was present during this event.



Anti-noise pollution awareness rally on the eve of Dahi-handi (Gopalkala) festival was organized with participation of famous Marathi film industry celebrities on the Open Deck Bus Service of Best Transport Service in the month of August 2017.



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October 2017	Public Awareness message for Diwali on television.	A public awareness message saying 'Celebrate a pollution-free Diwali' by celebrities from the film industry was broadcast by the television channels Zee 24 Taas, ABP Maza, IBN Lokmat, Star Pravah, Mi Marathi, TV9 Maharashtra, Saam TV, Jay Maharashtra and Maharashtra One.
October 2017	Public Awareness message for Diwali on FM radio.	A public awareness message saying 'Celebrate a pollution-free Diwali' was broadcast on leading FM Radio channels in the State.

October 2017	Diwali Bus Stop messages in Mumbai, Pune and Nagpur.	A public awareness message saying 'Celebrate a pollution-free Diwali' by Hon'ble Chief Minister of Maharashtra, Hon'ble Minister for Environment and Hon'ble State Minister for Environment were displayed on bus stops in the cities of Mumbai, Nagpur and Pune for a period of 15 days.
October 2017	Pollution-free Diwali Resolution Campaign Pledge 2017.	Pollution-free Diwali Resolution Campaign Pledge 2017 was organized at Mantralaya to promote celebration of a pollution-free Diwali. A pollution-free Diwali was pledged by students from schools and colleges from the entire State in the presence of Hon'ble Chief Minister of Maharashtra, Shri Devendra Fadnavis. Hon'ble Minister for Environment, Shri Ramdas Kadam, Hon'ble Minister of Water Resources & Irrigation, Shri Girish Mahajan, Hon'ble State Tourism Minister, Shri Jaykumar Rawal, Hon'ble Additional Chief Secretary of Environment Department, Shri Satish Gavai, Hon'ble Chairman of Maharashtra Pollution Control Board, Shri Milind Mhaiskar and Hon'ble Member Secretary of MPCB, Dr. P. Anbalagan attended this event. Students from various colleges in Mumbai also attended this event. Live telecast of this event was broadcast on leading news channels in the State. News about this event was published in leading newspapers in the State.
Marc 2018	Eco-Friendly Holi.	From the last few years, the widespread public awareness campaigns organized by Maharashtra Pollution Control Board to promote the celebration of an eco-friendly Holi have been receiving an increasing response. This year on behalf of the MPCB, eco-friendly colours were distributed for free to employees and officers from MPCB, Hon'ble Ministers from Mantralaya, Hon'ble Secretaries, Hon'ble Chairman, Hon'ble Speaker and Members of Legislative Assembly and Legislative Councils. Messages to promote the celebration of an eco-friendly Holi were broadcast on television and radio channels.

1.11 Greenery Development Plan of Forest Department, Government of Maharashtra

Government of Maharashtra has been instrumental in increasing tree and forest cover all over the State. GOM through its Forest Department has announced The Plantation Program in 2016 with the aim of planting 2Crore trees on 1st July 2016 was a resounding success with the final total reported figure of 2.82Crore saplings planted on a single day. After the successful implementation of 2Crore plantation program on 1st July, 20 16, the Government of Maharashtra has designed the 50Crore plantation program for 3 consecutive years viz. 4Crore, 13Crore and 33Crore for 2017,

2018 and 2019 respectively. 10% Bamboo, mangrove and medicinal plantation is also incorporated in this plantation drive.

In the Second Phase, though the target was of 4Crore plantation from 1st to 7th July, 2017, actually 5.43Crore seedlings were planted due to overwhelming response of Government employees and people at large. These saplings programs are driven with the involvement of 33 Government Departments along with Students of Schools and Colleges, NSS, NCC, CSR, NGOs, Railways, National Highways, Defense, NABARD and other stakeholders of Society.

"Limca Book of World Records" has taken cognizance of these remarkable achievements of Forest Department relating to plantation in 2016 and 2017 and felicitated with certificates. Thus Maharashtra is the first State in India who acquired the place three years consequently in "Limca Book of Records".

In the Third Phase, against the target of 13Crore plantation in 2018 between the period from 1st to 31st July 2018 we could plant 15.88Crore trees, again exceeding the said target. The response of the public was overwhelming.

GoM continued this good work for the protection, enrichment and secure environment through various Schemes and Programs. In the Fourth Phase, the year 2019 represents the most significant and important step in completing this Mission of 50 crore plantation. In this year it was intended to plant 33Crore saplings throughout Maharashtra. Preparation and Planning for the success of this year's target have been initiated from 3rd August, 2018 i.e. immediately after completion of 13Crore Plantation Program. Forest Officials along with Revenue machinery and all administrative departments are working extremely hard with the active support of all sections of the society. The details of this 2 Crore, 4Crore, 13Crore & 33Crore plantation program are attached as Annexure I, II, III & IV respectively.

In an attempt to boost conservation and protection of forests and wild life in Maharashtra, the State Forest Department has launched a drive aimed at roping in citizens to help the department in their massive 50Crore trees plantation drive. A dedicated website greenarmy.mahaforest.gov.in has been developed for registration of individuals and organizations as member of Green Army. I am happy to say that up-till now around 60 lakh members have been registered and we hope we could cross the 1Crore membership in near Future.

For maintaining the transparency, accountability and credibility, all the data relating to site selection for plantation with Geo-Tagging, development of Nurseries, digging of pits, availability of manpower, actual plantation and survival of the trees planted etc. is uploaded on the Digital Platform of Forest Department so that people can access the data at any given point of time. This has helped to build confidence amongst the people and their ever increasing participation in the plantation programme.

For the registration of plantation by the individuals, private NGOs and other stakeholders of society the mobile application called "My Plants" has been developed. Similarly, the programs like "Saplings at the Door Step", "Digital visibility on social media", "publicity campaign" are being implemented for greater public participation.

In Marathwada region of the State having low forest cover, a dedicated "Eco-Battalion" has been established at Aurangabad for tree plantation and its protection under the Defense Ministry of GIO considering establishing two more companies of this force at Beed & Latur.

The Forest Department is trying its level its level best to increase the Forest and Tree cover in the State by various innovative ideas by involvement of people in the plantation & its protection especially on Non-Forest areas as forest area is limited. Massive tree plantation program in urban & rural areas under the scheme "Nurturing Trees is Worshiping Nature" has been launched by the Govt. in line with Ranmala Village in Khed Taluka of Pune District.

The Tree based Agriculture under Mahatma Gandhi National rural Employment Guarantee Scheme (MG-NREGS) Kanya Van Samruddhi Yojana, Bhausaheb Phundkar Horticulture Plantation Programme in co-ordination with Agriculture Department, Sericulture Plantation in coordination with Textile Department, Riverside Plantation are some of scheme initiated for increasing green cover in the Non- Forest areas.

- Status report on Forest for 2017 at all India level has been published by "Forest survey of India" in February 2018 vis-a-vis status of forest & related sectors in 2015. As far as Maharashtra is concerned the findings are as follows:
- Tree cover on non-forest area has increased by 273Km.sq – Maharashtra is a leading state
- Mangrove cover has increased by 82Km.sq - Maharashtra is a leading state
- Water bodies in forest areas has gone up by 432 km.sq – Maharashtra is having higher rank
- Increase in the bamboo plantation area by 4462 km.sq – Eventually Maharashtra is placed highest in the country.

1.12 Plan for Restoration of Water Quality

Table 15 Time Bound Action Plan to Improve Water Quality for Kanhan River

Sr. No.	Target/Action Plan Expected	Agency / Organization	Expected Duration for Implementation
1	Provide STP for treatment of sewage generation from city along the river to avoid contamination of River	Kanhan Pipri & Kamptee Nagar Parishad,	1.5 Years

2	Provide MSW treatment Facility in the villages/towns located on the bank of river to avoid contamination of River	Kanhan Pipri & Kamptee Nagar Parishad,	1.5 Years
3	In-Situ Nallah Clean-up Treatment to stop untreated sewage entering into the River	Kanhan Pipri & Kamptee Nagar Parishad,	6 Months
4	To stop bathing in river water & open defecation at bank of river. Also, proper disposal of human excreta and sewage.	Local Body & Police Department	4-5 Months
5	Regular cleaning of river bed and regular flow monitoring should be initiated.	Local Body & Irrigation Department.	Continuous
6	To prevent growth of Algae/Eicchornia in river bed by installation of floating rafters and screen bars.	Local Body & Irrigation Department.	Continuous
7	Effective operation, collection & treatment of MSW.	Kanhan Pipri & Kamptee Nagar Parishad,	6 Months
8	Organize awareness programs about environment pollution	Kanhan Pipri & Kamptee Nagar Parishad,	1 Month
9	To prepare quantum of Solid Waste and Sewage generated and provision of MSW plants	Kanhan Pipri & Kamptee Nagar Parishad,	3 Months
10	Common toilets should be constructed in all areas to be covered. Stop open defecation and awareness program should be conducted in these areas	Kanhan Pipri & Kamptee Nagar Parishad,	3 Months
11	Vehicle, cloths, animal wash should be stopped on the bank of river and awareness program should be conducted in river bank areas	Kanhan Pipri & Kamptee Nagar Parishad,	1 Month
12	For biomedical solid waste, prepare a plan for collection, treatment & disposal.	Kanhan Pipri & Kamptee Nagar Parishad,	3 Month

1.13 Proposed plans for maintaining e-flow

River flows only in Monsoon season & whenever dam water is released. The amount water released from dam is such that, will not over flow from next weir at the downstream.

Recommendations

1. All Municipal Councils namely Kamptee, Mauda & Kanhan Nagar Panchayat located on the Bank of Kanhan River, whose domestic effluent/sewage flows into Kanhan River should provide sewage treatment facility for treatment of domestic effluent.

2. To develop adequate treatment facilities, it is also necessary to carry out appropriate studies of extensive monitoring and analysis of the various stretches of the river and the various nallas through which the sewage is discharged into the river. This would ascertain the strength of the waste, self-purification capacity of the river water bodies and on that basis appropriate treatment plant can be developed.
3. Treated sewage of the city can be utilized for irrigation / gardening purpose. There are no. of gardens in the city area where the treated sewage after disinfection can be very well utilized. Similarly, at present about 100 MLD treated sewage used by MAHAGENCO for generation of electricity.
4. There are issues of open defecation in the river bed from the human settlement in the unorganized sector. Hence, it is essential to develop adequate sanitation infrastructure in the city to avoid open defecation.
5. Prohibition on disposal of solid waste into the river and provision of proper solid waste treatment facility should be done.
6. Due to polluted stretch of the Nag River and Pili Rivers silting of the river bed has taken place. The dumping solid waste of the city into the river water bodies has also added to the siltation problem of the river water bodies. This has resulted into less water holding/carrying capacity of the river as subsequently affect the flow and the self-replenishment capacity of the river water bodies. Actions can be considered avoid these phenomena is both edges of the Kanhan river and its bed to be dredged and desilted to remove all the sediments, weeds and water hyacinth growing on them. This would help to ensure the smooth flow and velocity of the river water, which shall improve the self-purification capacity of the river.
7. The sewage is discharged into the river through various nallahs, which also carries the storm water. At many locations the nallahs have become stagnant due to uneven stretch and deposition of solid waste. This has caused the obstruction of sewage flow through the nallas resulting into poor oxygenation of the sewage stream. The nallah cleaning is necessary regularly to remove the dumped solid waste and streamline the flow and reduced the pollution strength.
8. The sewage water coming from the Wanjra and Uppalwadi Co-operative industrial estate should be intercepted to avoid mixing into the river water bodies. The Co-operative industrial estate has to provide their common STP's, which can treat domestic. The treated water can be utilized for irrigation purpose or gardening purpose. This can be achieved as the volume of wastewater is not substantial.
9. Constructed wetland system can be considered for the treatment of sewage in the pathway i.e. in the stretch of nallah carrying the sewage into the river.
10. The sewage entering into the river from the villages located in rural part of the Nagpur District should be intercepted. Common STP can be considered for the treatment of the sewage water and utilized the treated sewage for irrigation purpose only. This would reduce the addition of pollution load into the river water bodies. Narrow bore sewerage mentioned in CPHEEO manual should be adopted.

11. Plantation needs to be undertaken on the banks of rivers to avoid outflanking of banks and to maintain the river course.
12. Environmental Impact Assessment of existing and sand mining should be carried out in the river basin for further policy decisions.
13. Encroachments, depositions, reclamation, constructions or any kind of development should be strictly prohibited on the banks or in the beds of streams, nallahs, and rivers up to minimum of 9 m distance from high flood line.
14. Lands should be allocated and reserved considering future population growth in city development plans and regional plans for MSW, BMW, sewage and industrial effluent treatment plant, disposal sites, slaughter house, hazardous waste.
15. Installation of In-Situ Nallah clean-up System so as to avoid entry of untreated sewage into river.
16. Installation of online monitoring system for water quality & GIS platform for creating & maintaining database.
17. River rejuvenation using phytorid technology. It is a technology to improve water quality with the use of locally available plant species, with minimum or no energy utilization and low maintenance.

Table 16 Timelines for Implementation of Restoration Plan

Activities/Year	2017	2018	2019	2020	2021	2022	2023
Reconnaissance Survey							
Water Quality Sampling							
Preparation of Action Plan							
Propose and Execution (Setting up of STPs & MSWM system)	Time lines not provided by the local Body						
Augmentation of River Flow if any and restoration of water quality							