

RESTORATION OF POLLUTED RIVER STRETCHES IN MAHARASHTRA A concept and Plan

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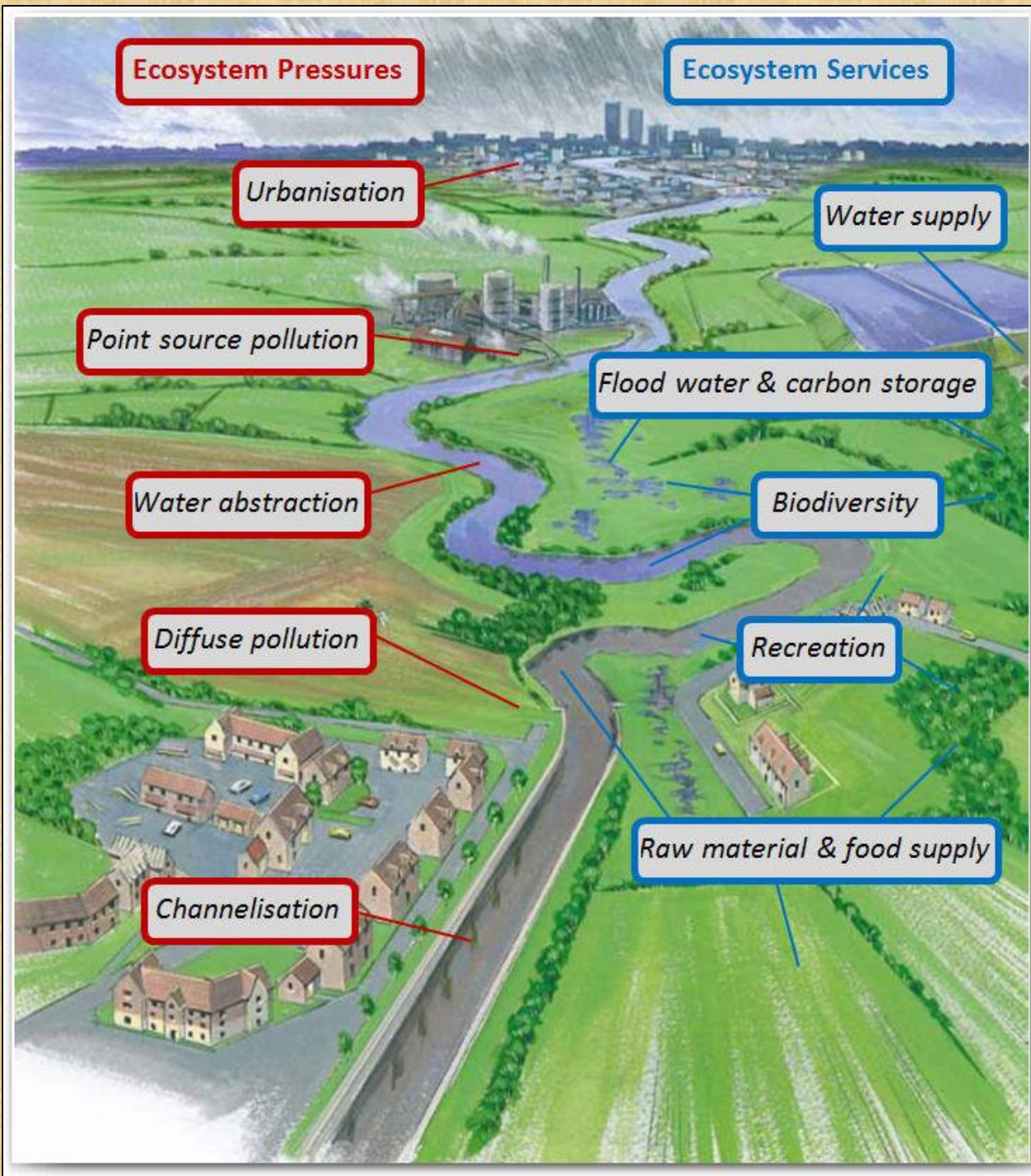


<http://mpcb.gov.in>

WHAT IS RIVER RESTORATION?

- River restoration is the process of managing rivers to reinstate natural processes, to restore biodiversity, providing benefits to both people and wildlife.
- Reintroducing natural processes can reshape rivers to provide the diversity of habitats required for a healthy river ecosystem and ensure their long-term recovery by addressing the root cause of the issue.





WHY RESTORE RIVERS?

- Rivers and their catchments provide a wide range of natural, economic and societal services.
- River degradation has led to an extensive loss of habitats and additional pressures on the aquatic and terrestrial species that use them.
- Damage to river systems has been so extensive that an urgent need has emerged, not only to conserve, but to restore these systems.
- Best practice river and catchment restoration can deliver multiple benefits including improvements to water quality, biodiversity, water supply security and reductions in flood risk and pollution.



RIVER RESTORATION AND CLIMATE CHANGE

- Climate is changing and is having an effect on the water environment. Particular risks include increases in rainfall intensity, river flow variability, drought frequency and water temperatures.
- River restoration is an important measure to mitigate against the effects of climate change.
- The reconnection of watercourses to their floodplains to help manage flood risk as well as drought. Riparian tree planting can provide shade and help manage water temperatures.

WHAT ARE THE CAUSES FOR RIVER POLLUTION?



Human
Wastes

Industrial
Wastes



Religious
events

Yes, Our
negligence



Sources of Water Pollution:

- Urban development
- Industrial Wastewater
- Resurfacing of Previously Deposited Pollutants
- Solid Waste Dumping Scenario in River
- Disposal of Domestic sewage without any treatment from Municipal Councils & villages located near bank of rivers into the rivers.
- Disposal of Municipal Solid Waste into river from villagers near bank of rivers.
- Human activities like - cloth washing, vehicle washing, animals washing and human excreta disposal.

EFFECTS OF WATER POLLUTION

- Groundwater contamination from pesticides causes reproductive damage.
- Swimming in and drinking contaminated water causes various diseases.
- Industrial chemicals and agricultural pesticides that end up in aquatic environments can accumulate in fish that are later eaten by humans.
- Ecosystems are destroyed by the rising temperature in the water, as coral reefs are affected by the bleaching effect due to warmer temperatures.
- Human-produced litter of items such as plastic bags can get aquatic animals caught and killed from suffocation.
- Water pollution causes flooding due to the accumulation of solid waste and soil erosion in streams and rivers.
- Oil spills in the water hinders the aquatic life.
- Aesthetic value decreases.

STATUS OF RIVERS IN MAHARASHTRA

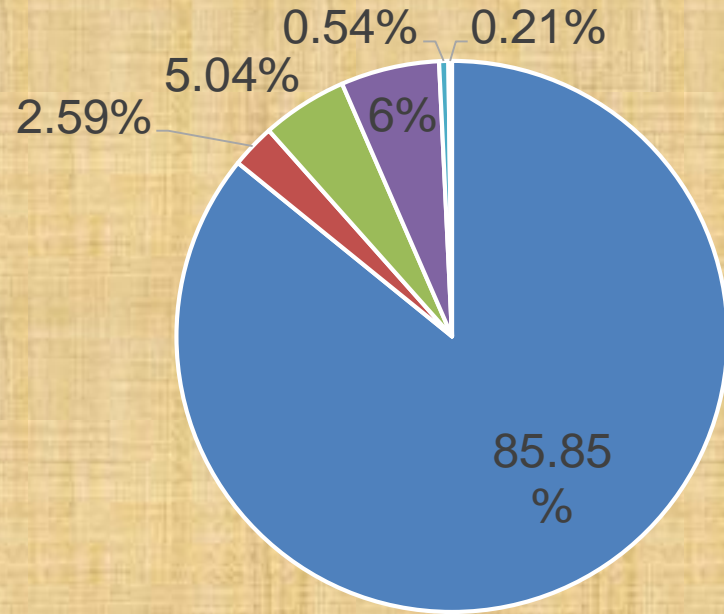
Water Quality of rivers in Maharashtra is measured at 156 locations on 49 rivers and among them 153 locations is non-complying to the Water Quality Criteria with respect to BOD. The names of 49 polluted rivers are; Wena, Wainganga, Godavari, Bhima, Krishna, Ulhas, Kundalika, Tapi, Girna, Panchganga, Nira, Bhatsa, Rangavali, Indrayani, Chandrabhaga, Vashishti, Mithi, Kanhan, Koyna, Amba, Amravati, Bindusara, Darna, Ghod, Gomai, Hiwara, Kan, Manjra, Mor, Morna, Mula, Mula- Mutha, Mutha, Panzara, Patalganga, Pawna, Pedhi, Pehlar, Penganga, Purna, Savitri, Sina, Surya, Urmodi, Vel, Vaitrana, Venna, Waghur and Wardha. These rivers are classified in priority class I, II, III, IV and V based on the level of BOD.



Source: Bhuvan Portal

Sewage Generation in Maharashtra

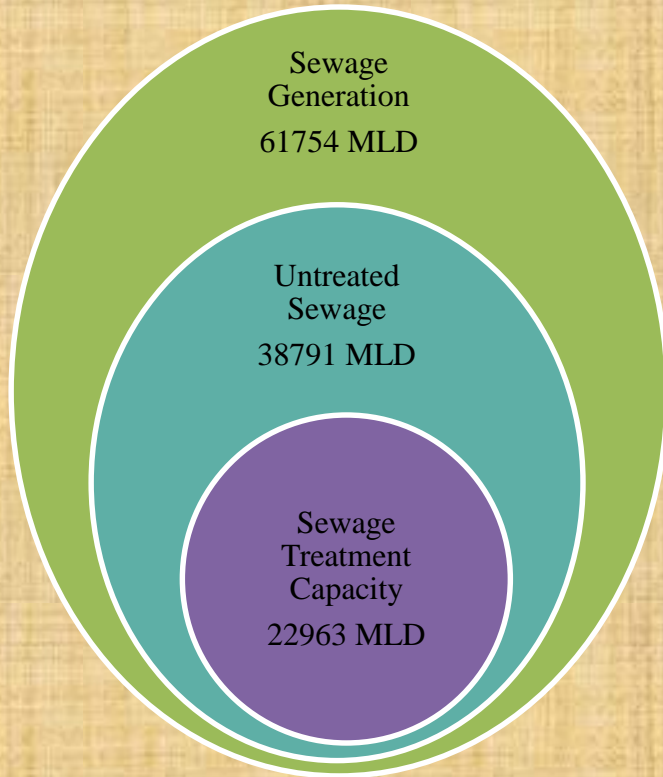
Urban Local Bodies	No.	sewage generation (MLD)	Sewage treated (MLD)	Percent treated (MLD)
Corporations	27	6264.75	3897	62.21
councils A Class	16	188.67	97.29	51.56
councils B Class	54	367.60	24.50	6.66
councils C Class	150	421.42	20.89	4.957
Cantonment Board	06	39.04	7.10	18.18
Nagar Panchayat	09	15.50	2.80	18.06
Total	262	7296.98	4049.58	



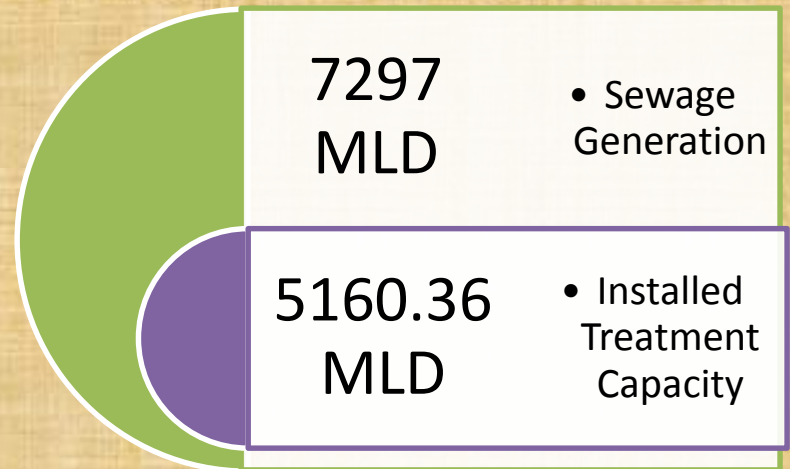
- Municipal Corporations
- Municipal Councils - A class
- Municipal Councils - B class
- Municipal Councils - C class
- Cantonment Boards
- Nagar Panchayat

STATUS OF SEWAGE GENERATION

Status of sewage generation and treatment in India

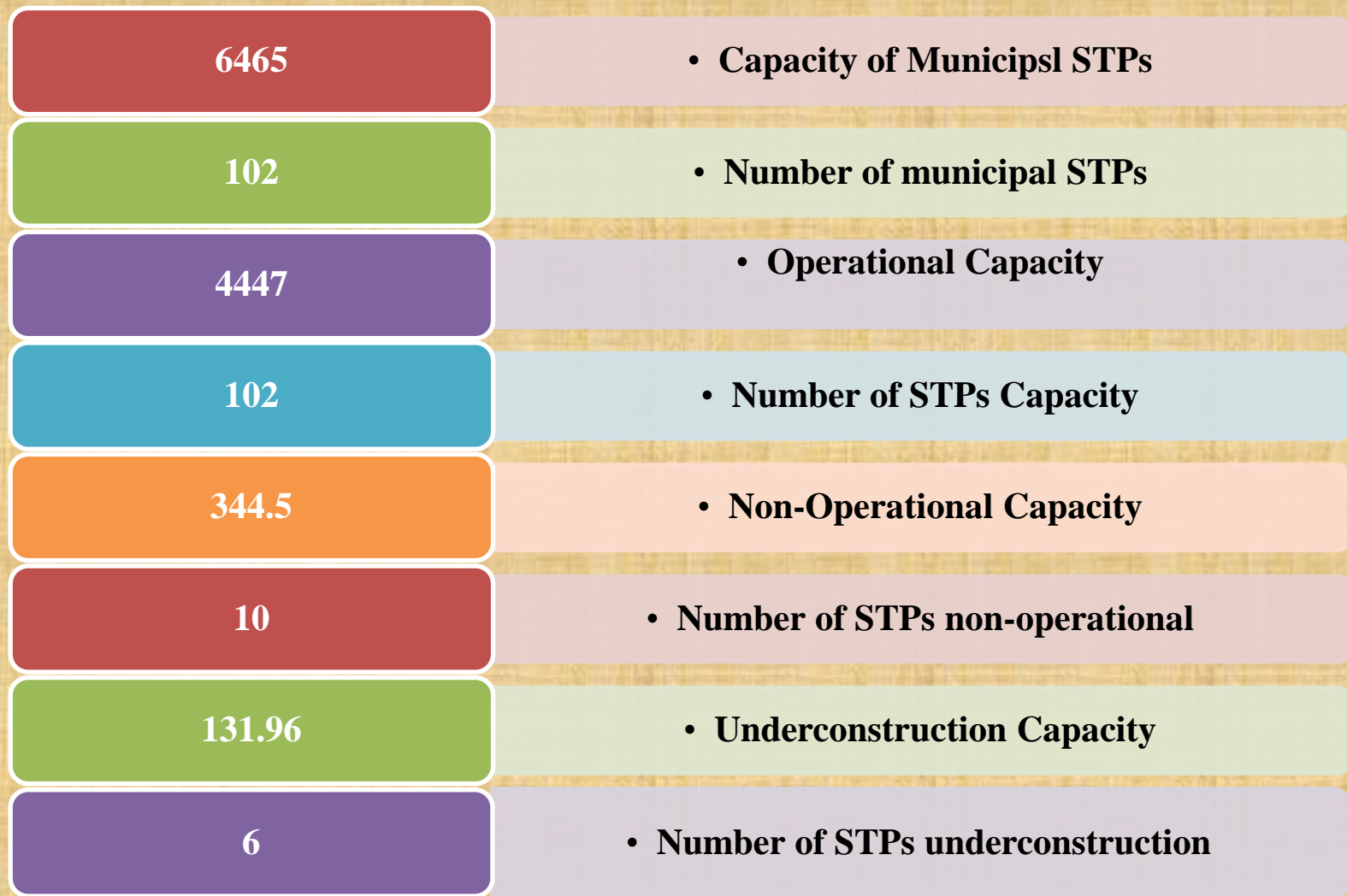


Status of Sewage generation in Maharashtra



Source: ENVIS Centre on Hygiene, Sanitation, Sewage Treatment Systems a& Technology

STATUS OF STPs LOCATED IN THE STATE



Source : ENVIS Centre on Hygiene, Sanitation, Sewage Treatment Systems a& Technology

CURRENT STATUS OF SOLID WASTE GENERATION IN THE STATE

Sr. No.	State	Towns/Cities			Solid waste generation			
		Total no. of cities	Total no. of ULBs	No. of class I & II Cities/Town	Solid waste generation (TPD)	Collected (TPD)	Treated (TPD)	Land filled (TPD)
1.	Maharashtra	262	262	A class- 13 B class-57	21867	21867	6993	14993

Source : Consolidated Annual Review Report on Implementation (CPCB)

IDENTIFICATION AND PRIORITIZATION OF POLLUTED RIVER STRETCHES

The criteria of each priority are elaborated indicating the concentration range of BOD in mg/l.

NO. OF STRETCHES	CRITERIA	DESCRIPTION
4	Criteria for Priority I	Monitoring locations exceeding BOD concentration 30 mg/l has been considered as the standard of sewage treatment plant and in river it appears without dilution. (River locations having water quality exceeding discharge standards for BOD to fresh water sources)
5	Criteria for Priority II	Monitoring locations having BOD between 20-30 mg/l.
18	Criteria for Priority III	Monitoring locations having BOD between 10-20 mg/l.
12	Criteria for Priority IV	Monitoring locations having BOD between 6-10 mg/l. 8
10	Criteria for Priority V	Monitoring locations having BOD between 3-6 mg/l.

IDENTIFICATION AND PRIORITIZATION OF POLLUTED RIVER STRETCHES

The stretches of rivers not meeting with the criteria are identified as polluted stretches and categorized in five priority classes.

Sr. No.	River Name	Stretch Identified	Approx. Length of Stretch (In Km)	BOD Range/Max Value	Priority
1	Mithi	Powai to Dharavi	15	170	I
2	Wardha	Guggus to Rajupura	30	34	I
3	Kanhan	Bhandara to Nagpur	20	8.2-31.0	II
4	Krishna	Shindi to Kurundwad	200	9.6-22	II
5	Kundalika	Salav to Roha	25	5.4-24.0	II
6	Waingana	Tumsa to Ashti	150	4.6-29.0	II
7	Amravati	Koparli to Betwad	10	8.8-20.6	III
8	Bhima	Vithalwadi to Takli	200	14	III
9	Rangavali	Tintemba to Navapur	10	9.5-12.7	III
10	Tapi	Raver to Shahada	150	12	III
11	Bhatsa	Shahapur to Bhadane	20	9.0-18.0	IV
12	Girna	Malegaon to Jalgaon	100	6.0-7.0	IV
13	Gomai	Lonkheda to Shahda	5	10	IV
14	Kan	Kvathe to Sakari	5	8	IV
15	Koyna	Karad to Papdarde	7	7.8	IV
16	Manjara	Latur to Nanded Bridge	2	6.5	IV
17	Urmodi	Dhangarwadi to Nagthane	2	9.5	IV

Sr. No.	River Name	Stretch Identified	Approx. Length of Stretch (In Km)	BOD Range/Max Value	Priority
18	Venna	Mahabaleshwar to Mahuli	50	8.6	IV
19	Panjara	Varkhade to Dhule	5	6	V
20	Patalganga	Khadepada to Khopoli	30	4.0-4.4	V
21	Pelhar	Pelhar Dam to Golani Naka	6	5	V
22	Ulhas	Kalyan to Badlapur	20	3.8-5.0	V
23	Godavari	Someshwar Temple to Rahed	300	4-40.0	I
24	Wena	Kawadghat to Hindanghat	5	7.8-18.6	III
25	Savitri	Dadli to Muthavali	2	4.4-15	III
26	Indrayani	Moshigaon to Alandigaon	96	8.1-9.2	III
27	Mula	Bopodi to Aundh Gaon	6	13.5-16.5	III
28	Mula-Mutha	Theur to Mundhwa Bridge	15	16	III
29	Mutha	Shivaji Nagar to Khadakwasla Dam	12	18.2	III
30	Pawna	Dapodi to Ravet	12	6.5-20.0	III
31	Pedhi	Narayanpur to Bhatkuli	3	14	III
32	Chandrabhaga	Pandharpur to Shegaon	12	8.4-10.6	III
33	Amba	Bense to Roha	10	5	V
34	Bindusara	Swarajnagar to Snehanagar	3	8	IV

Sr. No.	River Name	Stretch Identified	Approx. Length of Stretch (In Km)	BOD Range/Max Value	Priority
35	Morna	Akola to Takalijalam	4	34	I
36	Purna	Dhupeshwar to Asegaon	150	14-26.0	II
37	Ghod	Annapur to Shishur	10	10.5	III
38	Nira	Sangavi to Shindewadi	80	8.1-14.6	III
39	Penganga	Mehkar to Umarkhed	40	8.7-12.6	III
40	Sina	Solapur to Bankalagi	8	10.4	III
41	Vel	Nhavare to Shikarpur	10	11	III
42	Darna	Igatpuri to Sansari	40	8.7-12.6	III
43	Surya	Dhamni dam to Palghar	40	4.0-8.0	IV
44	Hiware	Pachora to Nimbora	10	4	V
45	Mor	Jalgaon to Amoda	2	4	V
46	Vaitarna	Gandhre to Sarashi	2	6	V
47	Vashishti	Khardi to Dalvatre	3	3.2-4.8	V
48	Waghur	Sunasgaon to Sakegaon	8	4	V
49	Panchganga	Shirol to Kolhapur	40	4.6-7.6	IV

Prioritywise list of rivers declared by CPCB on 2015 based on data of 2009-12 (Total 49 rivers & 49 stretches)

Priority 1 (4 nos.)	Priority 2 (5 nos.)	Priority 3 (18 nos.)	Priority 4 (12 nos.)	Priority 5 (10 nos.)
GODAVARI	KANHAN	AMRAVATI	BHATSA	AMBA
MITHI	KRISHNA	BHIMA	BINDUSARA	HIWARA
MORNA	KUNDALIKA	CHANDRABHAGA	DARNA	MOR
WARDHA	PURNA	GHOD	GIRNA	PANZARA
	WAINGANGA	INDRAYANI	GOMAI	PATALGANGA
		MULA	KAN	PELHAR
		MULA - MUTHA	KOYNA	ULHAS
		MUTHA	MANJARA	VAITARNA
		NIRA	PANCHGANGA	VASHISHTI
		PAWNA	SURYA	WAGHUR
		PEDHI	URMODI	
		PENGANGA	VENNA	
		RANGAVALI		
		SAVITRI		
		SINA		
		TAPI		
		VEL		
		WENA		

Short Term Mitigation Measures:

- 1. At the Source treatment facilities adopted as the first step for unorganized and small clusters of industries such as auto-service centre, bakeries, laundries, bottle washing units, etc.**
- 2. Effective implementation of Operation and Maintenance of ETP/STP in Organized & large scale industries including hotels & restaurants.**
- 3. Control over Open Defecation / solid waste dumping through installation of sulabh sauchalaya concept and in-situ solid waste treatment facility in each stretch.**
- 4. Treatment facility to be installed for all designated Nallahs as per Criticality Indices - either in-situ or ex-situ.**
- 5. Effective collection and transfer mechanism for sewage, industrial or otherwise source wastewater shall be implemented and connected to proposed treatment facilities.**
- 6. Silt accumulation and removal though already an ongoing practice needs to be improved by enhanced scientific & effective removal followed by scientific disposal especially silt accumulated in the nallahs at the mouth of the river**

Long Term Management Measures:

- 1. All those stretches of river represented by Pink colour code of Criticality as per indices shall be equipped with tertiary and quaternary treatment facilities**
- 2. The earlier fitted STP's and treatment facilities for at source wastewater generators for short term mitigations shall need up-gradation through installing polishing quaternary treatment units**
- 3. There might also be need for mechanical agitation / aeration through natural or other means within the course of river especially in the first half of river stretches for effectively adding up and maintaining DO levels above 6mg/l**
- 4. Absolute vigilance and zero disposal of solid waste or entry of runoffs carrying open defecated matter shall find its way into the river at any point of time**
- 5. Cluster development based on typical / representative generator of particular type of waste such as scrap dealers, bottle washing units, buffalo sheds (Gothas), electroplaters & laundry through allotting locations that are equipped with environment infrastructure facilities**
- 6. Eventually all automobile service / washing centre to adopt zero discharge policy.**

Prioritywise list of rivers as on March,2018

Priority 1 (1 nos.)	Priority 2 (0 nos.)	Priority 3 (3 nos.)	Priority 4 (12 nos.)	Priority 5 (18 nos.)
Mithi		Morna	Chandrabhaga	Bhima Bindusara
		Pawna	Ghod	Girna, Godavari
		Mula-Mutha	Mor	Gomai
			Indrayani,	Hiwara, Kan, Koyna
			Kanhan, Mula	Kundalika, Manjara,
			Nira, Patalganga	Urmodi
			Pedhi	Penganga
			Purna	Sina, Tapi
			Waghur	Vel, Venna,
			Wardha,	Wainganga, Wena

Priority Levels	Number of stretches based on 2009-12 data	Number of stretches based on 2014-15 data	Number of stretches based on 2015-16 data	Number of stretches based on 2016-17 data	Number of stretches based on 2017-18 data
Priority 1	4	1	1	1	1
Priority 2	05	0	0	0	0
Priority 3	18	8	6	4	3
Priority 4	12	10	18	11	12
Priority 5	10	20	10	28	18
Less polluted	-	10	13	5	14
Dry			1		1
Total	49	49	49	49	49

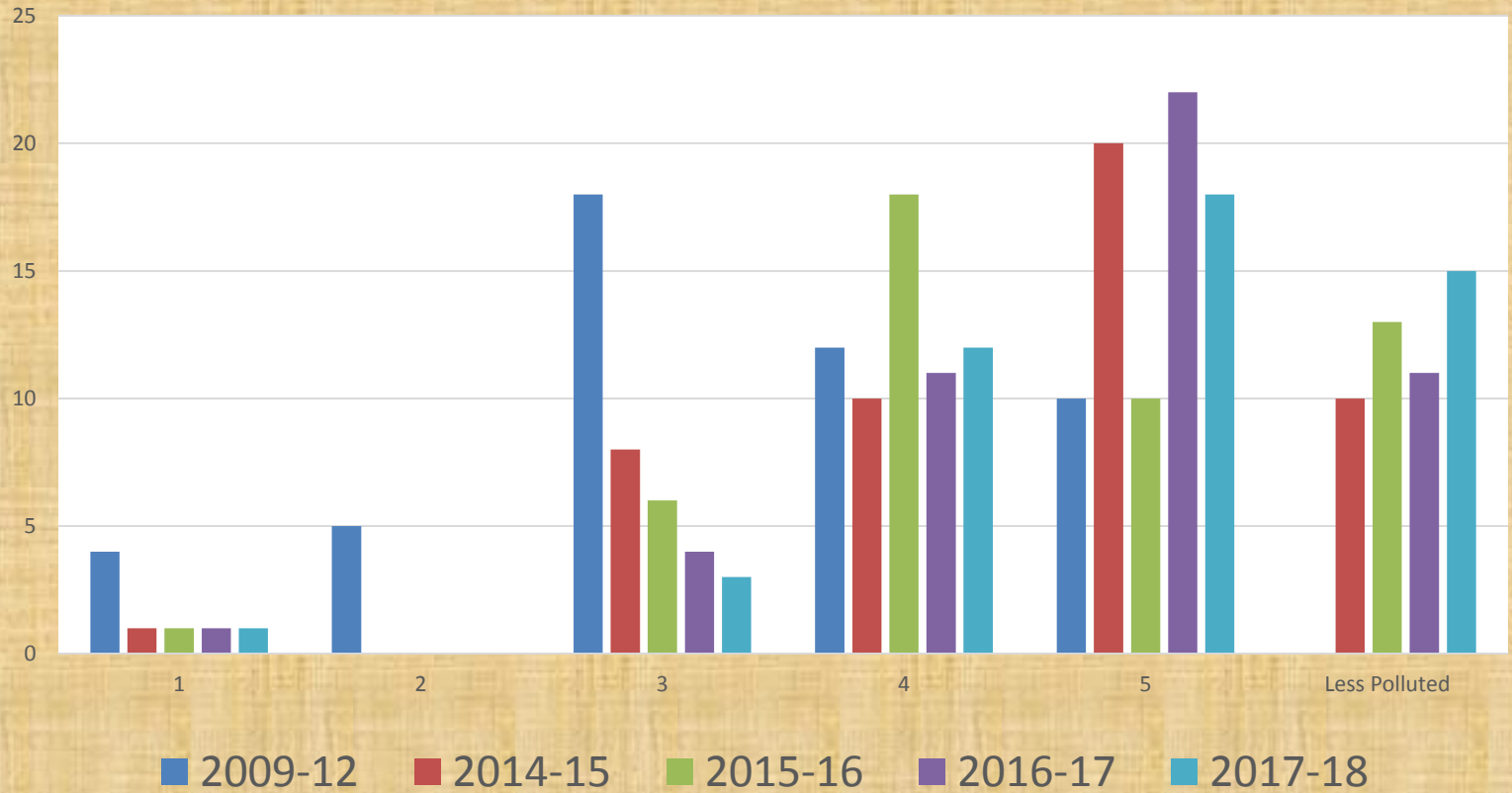
Less polluted (14 nos.)

Amba, Bhatsa, Darna, Krishna, Mutha,
Panchganga, Panzara, Pelhar,
Rangavali, Savitri, Surya, Ulhas,
Vaitarna, Vashishti

Dry (1 no.)

Amravati

Trend of Total No. Stations in Respective Priority Ranking



Priority Rank							
	1	2	3	4	5	Less Polluted	Total
2009-12	4	5	18	12	10		49
2014-15	1	0	8	10	20	10	49
2015-16	1	0	6	18	10	13	48
2016-17	1	0	4	11	22	11	49
2017-18	1	0	3	12	18	15	49

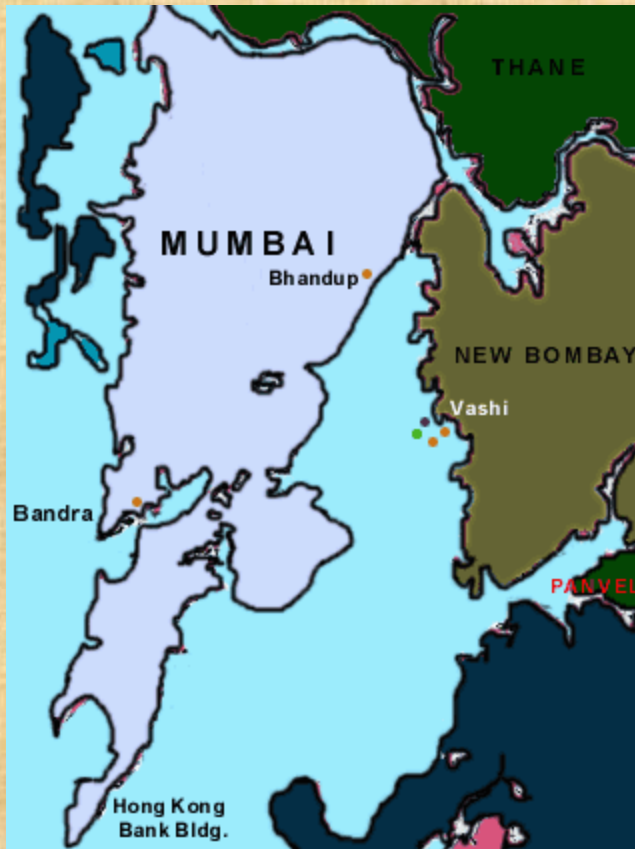
RECOMMENDED ACTIONS TO IMPROVE WATER QUALITY

- Ensuring catchments are managed economically and efficiently;
- Reducing agricultural pollution (otherwise known as diffuse pollution);
- Controlling urban pollution (otherwise known as non-agricultural diffuse pollution);
- Monitoring and reducing chemical pollutants;
- Managing waste-water, sludge and septic tanks;
- Provision of Sewage Treatment Plants wherever required and Disinfection system should be provided in existed treatment plants
- Proper sanitation facilities;
- Installation of online Monitoring stations;
- A greenbelt/greenway should be developed on both sides of the embankment;
- Reuse of treated water; and
- Renew/ Recycle practices.

ROLE OF STATES AND ULBs IN BRINGING ABOUT BEHAVIOR CHANGE

- Extensive multimedia Campaign
- Involvement of Swachh Bharat Ambassadors/ Local celebrities or those individuals who have done exemplary work for Swachh Bharat Mission
- Extensive involvement of Swachhagrahis to carry on the mass movements
- Colony wise announcements on autos/ tempos to inform & educate the public about this initiative
- Planning meeting with all stakeholders
- Involvement of religious leaders.
- Targeting youth, along with school and college children to bring about the change. Collaboration with NGOs, SHGs, youth organization such as NYKS, NSS etc to carry out ground mobilization activities.

Mumbai-Mithi River



- Estimated to generate 2500 to about 3000MLD of sewage
- Possibly only 30% supposed to be treated
- **Sea as a savior**
- **Concerns** - Open defecation in Slums, Partial / No treatment in residential areas - raw discharges, solid waste dumping, industrial discharges from unorganized sectors, etc



Namami Chandrabhaga

- Logo made by Urban Development Department, GoM, in the meeting of High Power Committee dated 05/08/2017.

“Namami Chandrabhaga Mission”

- Hon'ble Finance Minister, GOM, has announced Namami Chandrabhaga Abhiyan on 18/03/2016 in the Maharashtra Budgetary Assembly Session of 2016-17.
- Namami Chandrabhaga Authority was constituted on 12/08/2016 with the Hon'ble Chief Minister as a Chairman of the Committee and Hon'ble Minister Environment, Finance, Rural Development, Water Supply, Water Resources, Urban Development, Chief Secretary and ACS/ Principal Secretaries of the said Departments and Member Secretary is Divisional Commissioner, Pune. The Director NEERI is also one of the technical member.
- 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.

Important Aspects :

- 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.

Action Taken Report

- ❖ High Power Committee constituted under the Chairmanship of Hon'ble Chief Secretary, Govt. of Maharashtra having Divisional Commissioner, Pune as Member Secretary.
- ❖ The Committee has decided to make basic profile, utilization of funds received from Environment Deptt., the villages above 10000 population shall be treated for pollution mitigation through Rural Development Programs.
- ❖ MPCB has started strict vigilance and initiated actions against defaulters as well as persuasion with the Local Bodies for providing sewage treatment plants.
- ❖ The Local Bodies were asked to reserve 25% funds from their budgetary provision can be utilized for sewage and solid waste management.

Water Consumption and Sewage Generation in Bhima Basin

A: Councils

Sr. No.	Name of Councils	Population 2011	Water Consumption/A (MLD)	Sewage Generation	Disposal Location	Treated Water Disposal /A. (MLD)	Untreated Water Disposal/A. (MLD)
1	Indapur Municipal Council, Indapur	49549	1095	876	Bhima River	Nil	876
2	Daund Council, Daund	24208	1825	1533	Bhima River	1533	Nil
3	Jejuri Council, Jejuri	13693	1780	1533	Nil	Nil	1533
4	Saswad Council, Saswad	26689	1825	1460	Karha River	1460	Nil
5	Baramati Council, Baramati	61500	7300	4380	Nil	Nil	4380
6	Bhor Council, Bhor	17000	1216	730	Neera	Nil	730
7	Talegaon Dabhade Council	56000	4982.25	2190	Indrayani River	Nil	2190
8	Alandi Council, Alandi	17561	912.5	912.5	Indrayani River	Nil	912.5
9	Junnar Council, Junnar	24760	1168	602.25	Nil	Nil	602.25
10	Rajgurunagar Council	28592	1860	1460	Bhima River	Nil	1460
11	Shirur Council, Ghodnadi, Dist: Pune	26999	1825	1825	Ghod River	1825	Nil
12	Lonavala Council	61500	8030	6424	Indrayani River	1350.5	5073.5
13	Pune Cantonment Board, Pune	80191	11680	8322	Mula-Mutha River	5475	2847
14	Dehu Cantonment Board, Dehu	46921	3978	3650	Indrayani River	Nil	3650
15	Khadki Cantonment Board, Khadki	77473	5015.1	2190	Mula-Mutha River	2190	Nil
16	Chakan Council, Chakan	48600	1820	1514.75	Indrayani River	Nil	1514.75
	Total	6616236	56311	38069.5		13833.5	25769

B: Corporations

Sr. No.	Name of Corporation	Population 2011	Water Consumption/A (MLD)	Sewage Generation (MLD)	Disposal Location	Treated Water Disposal /A. (MLD)	Untreated Water Disposal/A. (MLD)
1	Pune Corporation	3115431	446030	271560	Mula-Mutha	206955	64605
2	Pimpri Chinchwad Corporation	2000000	164250	106215	Pawna, Indrayani-Mula	87600	18615
3	Solapur Corporation	951118	40150	32850	Sina River	29200	3650
Total		6066549	650430	406975		323755	86870

C: Industrial Estates

Sr. No.	Name of Industrial Estate	Place	Water Consumption/A (MLD)	Sewage Generation (MLD)	Disposal Location	Treated Water Disposal /A. (MLD)	Untreated Water Disposal/A. (MLD)
1	Pimpri Chinchwad Industrial Estate	Pimpri Chinchwad Corporation	29450	12400	Nil	12400	Nil
2	Kurkumbh Industrial Estate	Kurkumbh, Dist: Daund	2555	1395	Nil	1395	Nil
3	Chakan Industrial Estate	Chakan, Dist: Daund	4650	1860	Nil	1860	Nil
4	Hinjwadi Industrial Estate	Hinjwadi, Dist: Daund	4650	1860	Nil	1860	Nil
5	Talegaon Dabhade Industrial Estate	Talegaon, Dist: Daund	2325	930	Nil	930	Nil
Total			43630	18445	Nil	18445	Nil

Public Awareness During Pandharpur Vaari





MPCB has started Public Awareness through Folk Arts since 2010. Awareness about composting, Not to litter plastic, Conservation of the national resources through Hon'ble Chief Minister, Maharashtra and Minister for Environment, GOM for gathering at large during Vaari.





THANK YOU