

Environmental Status Report of Pandharpur

(During Ashadhi Ekadashi)



Prepared by
Maharashtra Pollution Control Board
Regional Office, Pune.

(August, 2005)

Environmental Status Report
of
Pandharpur
(During Ashadi Ekadashi)

Prepared by
Sub -Regional Office,
Solapur
and
Regional Office
Maharashtra Pollution Control Board
PUNE

August 2005

*Pandharpur was created first,
only then Vishnu's city in
heaven. Pandharpur was in
existence even when nothing
else with or without life existed.
The Bhima was there even
when the Ganges and the
Godavari were yet to be born.
Blessed is the auspicious
Pandharpur that stands on the
banks of the Bhima.
Pandharpur remains
undisturbed even when the rest
of the world goes to pieces. Its
foundation is nothing less than
the wheel of Vishnu and it is
indestructible. O Lord, I have
seen with my eyes this Pandharpur, says Nama.*

Namadev (in Mate, 1962)

Introduction:

The Bhima basin, located southeast of Mumbai, is part of a large inland plateau running north-south within the state of Maharashtra. It extends from the Sahayadrian watershed eastward and ranges in altitude from 700-1000 meters above sea level. The western most part of the basin lies in the mountains known as the Western Ghats which form a divide between the plateau and the coastal plain. Escarpments rising several hundred feet above valley floors abut flat-topped mesas there. Many streams rise in this largely forested region and flow eastward until they join the Bhima. These water resources are increasingly affected by resource uses in the watershed.

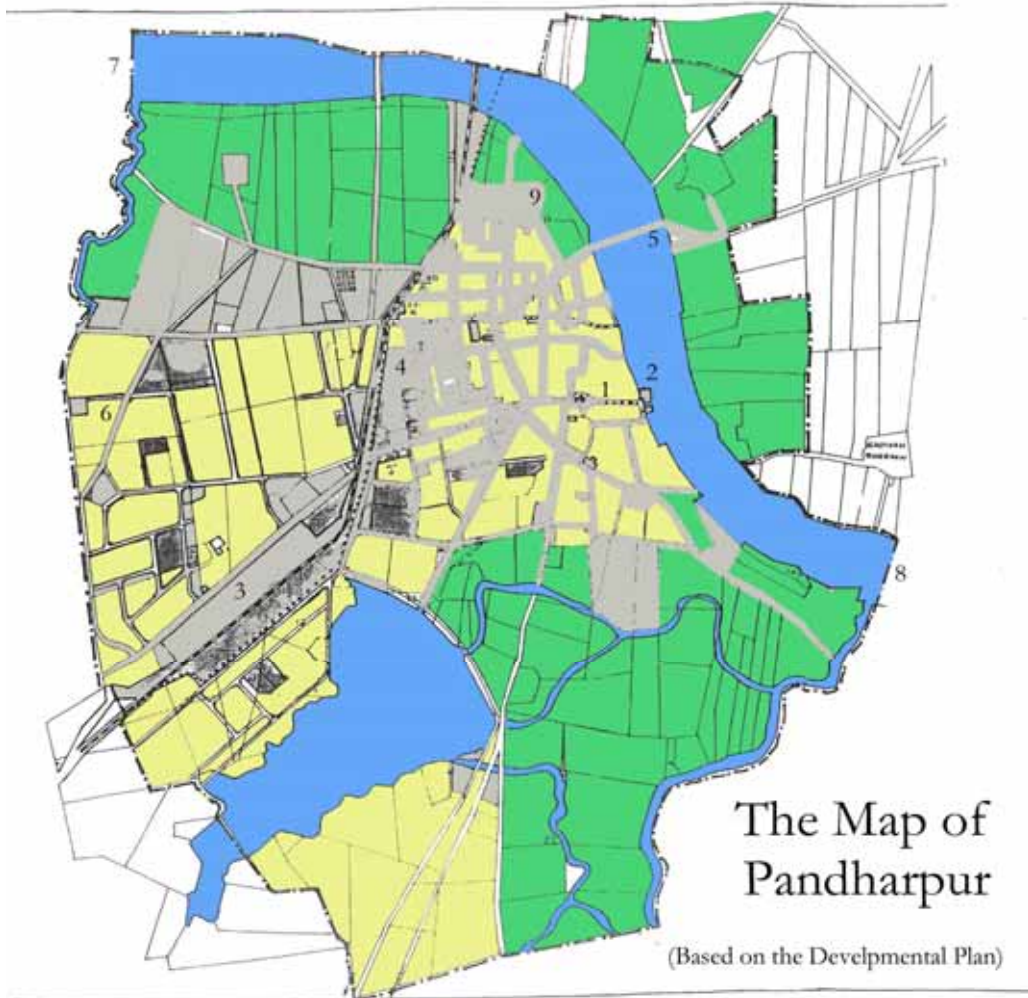
The river collects tributaries from north to south. Some pass through Pune, one of the most rapidly urbanizing cities of India. This exposure to urban activities degrades water quality before the Bhima develops into a meandering river in lower elevations. The plains lower to the Pune urban serves, as a major source of agriculture production. Concerns have emerged with respect to the quantity and quality of water resources in the basin. The major contributors of point and non-point sources of pathogens, nutrients and other pollutants in the Bhima river system particularly close to towns and cities.

Nowhere is the Bhima River more concretely linked to the sacred than at Pandharpur. Pandharpur is one of the important pilgrimage center of India located on the right bank of river Bhima also known as Chandrabhaga in this area because of its shape near Pandharpur. Pandharpur is small scale township and located at 65 kms distance towards west from Solapur. The Vitthal of Pandharpur is the premier deity or rural as well as urban Maharashtra and its neighboring states. The main purpose of the pilgrims is to take the important holy bath in river Bhima. Following song illustrate the importance of the place in mind of masses.

A song of pilgrims journeying to Pandharpur, along the river Bhima:
“I should like to become the small pebbles or the big stones, or the dust of the road which leads to Pandharpur. Thus would I be under the feet the Saints”

Eck 1981:71

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The following data is reproduced and edited from the report of Maharashtra Jeevan Pradhikaran.

Pandharpur: At a glance

General features of Pandharpur:	
Area:	17.28 km ²
Height:	465.12 m above Mean Sea Level
Average Temperature:	39° C
Average Rainfall:	600 mm.
a) Maximum rainfall in the year 1974:	1231 mm.
b) Minimum rainfall in the year 1972:	157 mm.
Soil:	Soft soil to hard rock

Increasing urbanization in India is evident from the growth of towns and cities but the following data shows Pandharpur is an exception. This could be due to region under dry zone and poor sanitation during festival times.

Population		
Year 1901:	21014	
Year 2001:	91381	
Prospective population increase based on growth of the town:		
Year	Population	Floating Population
2011	117700	11075
2026	146860	14200

Average daily pure water supply:	13 MLD
Sewage Treatment Plant of capacity:	
Phase - I (Existing system):	6.5 MLD
Phase - II (Proposed system):	7.0 MLD
Solid waste generated daily:	36 MT
Total income:	Rs. 13,50,25,700/- per year.

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Religious Background:

Pandharpur has great religious and historic importance. It is also known, as "Dakshin Kashi". It is the greatest converging point for the masses. The huge crowds gathering at Pandharpur is a visible symbol of faith of God Vithoba. Thousands of devotees come here daily, on Ekadashi and full moon days of each month and also during Adik mass (festival followed once in 4 years) to pay their homages. The town being a major pilgrimage center, the pilgrims (varkaries) come every year during four important Yatra festivals on Chaitra wari, Ashadhi wari, Kartik wari and Magh wari. Around 2-10 lakhs of pilgrims from all over India gather here for these waries for dipping into river and darshan of Lord Vithoba. They stay here for 3-4 days. So there is always a huge crowd in Pandharpur.

As reported by Pandharpur Municipal Council following number of pilgrims are coming besides town population of about one lac.

A) Normal period	
Daily pilgrims	: 10,000
B) During Ekadhashi	
15 days ekadhashi	: 25,000
Monthly ekadhashi	: 50,000
C) During Waries (Yatra)	
Chaitree	: 3-4 lakhs (10 days)
Ashadhi	: 10-12 lakhs (15 days)
Kartiki	: 8-10 lakhs (15 days)
Magh	: 3-4 lakhs (10 days)

Existing Infrastructure:

Water Supply

Pandharpur Municipal Council has various full fledged water supply schemes to meet with their requirements of drinking water for residents as well as for the floating population. Bhima river is source of water supply. There are two Jackwell located about 1 km upstream of the town. The water is treated in conventional water treatment plant having capacity of 22 MLD. The water is

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supplied at the rate of 125 LPCD to residents with provision of 25 LPCD for floating population. Average daily pure water supply is 13 MLD.

Sanitation

Previously, the drainage arrangements for Pandharpur town were not satisfactory. There were about 2400 numbers of dry latrines from which night soil was conveyed by the scavengers and sullage from individual houses was collected inside gutters and was disposed off by letting it into the nalla near Vishnupad downstream of town. Subsequently it meets Bhima river thereby polluting the river.

To solve the problem of pollution of Pandharpur town as well as Bhima river, it was decided to provide full fledged sewerage system and sewage treatment plant for the town in 2 phases as per the topography and natural slopes. Under Phase-I (Existing Sewage System) underground drainage scheme and sewage treatment scheme is provided to the thickly populated area near Vithal Mandir i.e. old gaothan covering about 25% area (4 sq. km.) of the town and 50% of population. A Sewage Treatment Plant of capacity 6.5 MLD was constructed which was completed in Dec 1994. A part of the treated sewage is used to irrigated an area of about 10 hectors and remaining treated effluent having regulatory Standard norms is let out into the river through Gopalpur nalla located downstream of city.

Salient features of existing underground sewerage scheme:

Phase-I (Underground Drainage System)			
i)	Internal Sewerage System	:	19000RM
ii)	Intercepting Sewer	:	5200RM
iii)	Outfall Sewer	:	900 RM
iv)	Dry well & wet well	:	1 No.
v)	Pumping Machinery		
	50 BHP Pump Sets	:	2 Nos.
	75 BHP Pump Sets	:	2 Nos.
vi)	525 mm dia. C. I. Rising Main	:	1200 RM
vii)	Sewage Treatment Plant of capacity	:	6.5 MLD

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After treating the sewage the influent BOD is reduced from 300 mg/l to 20 mg/l and suspended solids from 350 mg/l to 30 mg/l, which are well within the norms. The above figures show only facilities to treat sewage for the local population. Though temporary facilities are done to some extent to manage the human waste which remains inadequate thus creating problem of sanitation and hygiene.

Phase -II (Proposed Sewerage System)

The remaining areas of the town are proposed covered under Phase-II of sewerage system. It is proposed to collect sewage at the rate of 125 lit. head day from these areas and pump in to the site of existing STP, where a new STP of 7 MLD capacity is proposed to be constructed.

Industrial Pollution Load

There are only two major industries namely Vithal Sahakari Sakhar Karkhana Ltd. Venunagar (Gursale) and Solapur Zilha Sahakari Dudha Utpadak Sangha Ltd. Pandharpur (Chilling Centre) Vithal S.S.K. Ltd. Located about 7 km upstream of town. It is a sugar-manufacturing unit having a capacity of 3500 MT/ day sugar crushing. The approximate effluent generated is 1000-1200 cum/day. It has its own effluent treatment plant based on Extended Aeration Principles. Part of treated effluent is used for irrigation purpose. However, runoff and excess untreated effluent joins Gursale nalla, ultimately discharged into Bhima river on left bank at 7 km upstream of the town.

Milk Dairy unit processes 50,000 lit of milk daily. Water consumption is about 150000 lit/day taken from bore well in plant. Major effluent is generated from cleaning the cans, vessels, milk tankers and floor washing. Quantity of effluent is around 100000 lit/day. At present, there is no treatment unit. The supernatant is discharged into Malpe nalla.

Drainage & Sewerage

Presently there are three main nallas flowing across the town, namely (1) Malpe nalla, (2) Lendki nalla & (3) Gopalpur nalla. Open gutters from various parts of town are

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connected to these nallas at various places as per natural slope. The untreated sewage sullage from rest of the areas flows through these open gutters.

The domestic waste is also admitted to these nallas through surface drains. These three nallas flow as open channels up to river one at upstream and two at downstream of town and are heavily silted.

(1) Malpe Nalla:

It carries untreated sewage /sullage from Isbavi and developed area of Pandharpur town. It also carries wastewater from the Milk dairy unit at Isbavi. It meets the river at 2 kms upstream of the town also on upstream of Headworks (Jackwells) of water supply scheme. As this is fast developing residential area quantities and concentrations of sewage likely to increase.

(2) Lendki Nalla:

This nalla flows through central part of town and carries untreated sewage from the part of the town not covered by existing sewerage system. It is an open channel constructed in UCR masonry. This nallas is covered up to Mahatma Phule Chowk onwards upto Mangalwedha Naka it is open channel. It meets Gopalpur nalla behind Gopalkrushn Mandir, which ultimately meets river about 1 km downstream of Pandharpur (i.e. downstream of Vishnupad Mandir)

(3) Gopalpur Nalla:

It carries sullage from Gopalpur village overflow from existing STP and agricultural runoff percolation water meets the river along with Lendki nalla about 1 km downstream of Pandharpur town. (i.e. downstream of Vishnupad Mandir)

There are other two nallas, namely Wakhari nalla and Gursale nalla. Wakhari nalla carries sullage from wakhari village; agricultural runoff percolation water but meets the river about 3 kms upstream of Pandharpur. At present, flow of this nalla is very less. Gursale nalla carries treated effluent from Vithal Sahakari Sakhar Karkhana Ltd. Venunagar (Gursale). It joins the river at 7 kms upstream of the town.

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Location	Parameters							
	Flow MLD	BOD mg/l	COD mg/l	VSS mg/l	TSS mg/l	pH	Total Solids mg/l	Conductivity mhos/cm
Malpe nalla	0.40-1.0	32-50	80-124	20	20-40	7.25-8.0	860-940	1186-1320
Lendki nalla	4.0-5.0	160-240	400-600	20-80	45-100	7.25-8.3	860-965	1100-1370
Gopalpur nalla	1.2-1.6	20-24	92-120	18-26	15-25	7.75-8.58	800-840	1100-1240

(Source: Maharashtra Jeevan Pradhikaran regional office)

The Bhima river is not a perennial one. There is no water in it for period of more than six months. One K.T. Weir has been constructed by Irrigation Department on the river at about 5 kms upstream of Pandharpur city at Gursale for Irrigation purpose. In this K.T. Weir water is let out periodically from Ujani Dam (Major Irrigation Project). Due to this weir and other K.T. Weirs on upstream of town, normal flow of river stops near Pandharpur. There is very less or almost no water in the river around Lord Vithal Mandir area. Flow of water in the river is 'Nil' during the time of Chaitree wari i.e. in the month of March every year. Some big potholes are formed due to dredging of sand from this portion of the river. These holes/ pits are filled with sullage received from the town. Villages situated on the banks of river on downstream of the river face severe water pollution problems. For this, the only remedy is to keep constant flow (perennial) of water in the river. Wastewater (sullage) from 1. Malpe nalla 2. Gopalpur nalla (including flow of Lendki nalla) is discharged into the river. This wastewater gets accumulated in these pits and ponds of water during no flow period. This water remains there in stagnant condition till next let out of water from K.T. Weir or dam.

Discharge data of Bhima river

The data regarding maximum and minimum discharge of the river in the last few years are as below in order to assess the assimilative capacity of the water body.

a) Upstream of the town at Narsingpur

Year	Discharge in Cumccs		
	Maximum	Minimum	Average
1986-87	2477.6	0	74.4
1988-89	34.92	0	184.9
1990-91	4225	0	264.79
1992-93	1824	0	63.6
1994-95	7290	0	365.42
1995-96	545.4	0	43.66

b) Downstream of the town at Takali

Year	Discharge in Cumccs		
	Maximum	Minimum	Average
1986-87	2739.7	0	88.94
1988-89	4005	0	226.07
1990-91	3934	0	275.2
1992-93	1624	0	64.88
1994-95	7698	0	35.53
1995-96	232.7	0	6.9

Water along with sullage discharge from the nallas flows through the river. This polluted water is as a source of drinking water supply for 4-5 villages at about 8-10 km away on downstream of Pandharpur town. Usually villagers of these villages suffer from water borne diseases after drinking this polluted water.

Solid Waste Disposal

At present approximately 36 MT/day of solid waste is generated from the town including contribution due to floating population. The solid waste is collected in community bins. There are 318 community bins in the town. The solid waste is carried away by means of eight trucks up to dumping ground (compost depot) in Sant Peth area. The daily flow of pilgrims also creates unhygienic conditions around Pandharpur. The hotel food is usually consumed by the visitors and the waste is thrown into the surface drain. The pilgrims offer flowers, garlands, coconuts etc. in the temple and the river. The waste generated by these offering remains undisposed and untreated. In course of time decomposition takes place generating a foul polluting the environment.

Observations

Following are the comments made by Jeevan Pradhikaran on Pandharpur with reference to water and wastewater.

1. Drinking water supply scheme is quite fulfilling the requirement of residents and huge floating population in Pandharpur.
2. Usually in summer there is no water in the river. Incoming fresh water in Bhima river from Ujani Dam during summer season is not adequate and regular. During yatra

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- period huge number of pilgrims take bath in it for 3-4 days. After stoppage of flow, it gets accumulated in ponds for much longer period, which creates stagnation and pollution of water.
3. It is very essential to upgrade the whole system of river water flow in Pandharpur town near Vithal Mandir stretch where pilgrims take holy bath during every mid month and monthly Ekadashi and four big Yatra festivals (5-15 days period).
 4. Sanitary facilities for pilgrims at Pandharpur are very poor and as the floating population in Pandharpur during yatra period is literally 5-8 times the local population, the sanitation facilities need to be increased, improved and should be maintained in a good condition.
 5. Malpe nalla carries sewage and meets Bhima river on upstream of town as well as upstream of headworks (Jackwell) of Pandharpur Water Supply Scheme.
 6. Drainage flowing through Lendki and Gopalpur nalla, surface drains etc. is let out in the holy river, downstream of Pandharpur near Vishnupad and hence containing and polluting river water severely. It becomes unhealthy and unhygienic.
 7. Because of improper and inadequate arrangements for garbage disposal the waste generates foul smell and leads to pollution of environment and river.

Objectives outlined by Jeevan Pradhikaran:

1. To revive the aesthetic sense on bank of the river for stabilization and maintain the river water quality.
2. To develop the Ghat on river front (bank) near " Vithal Temple" for extra arrangements for holy bath and rituals.
3. To undertake afforestation along the banks of river.
4. To overcome the problem of inadequate sanitation facilities on mass scale especially during yatras (4 times a year) and solid waste collection, transportation and disposal through vermi-composting and safe disposal of other solid waste.
5. To control all types of pollution.
6. To divert, intercept drainage flow and to provide Sewerage Treatment Plant (STP) and oxidation ponds to prevent water pollution in Bhima river.
7. To make the place environmentally safe and user friendly.
8. To provide facility of toilets / urinals for pilgrim load.

Regional Office of MPCB, Pune carried out the survey during Ashadi Ekadashi is presented in the following pages.

Water Quality:

Pandharpur is the part of the large Bhima river basin. In upstream around Pune tributaries of Bhima such as Mula , Mutha and Pavana rivers receives large quantity of domestic wastewater. The rivers in these urban areas are grossly polluted. Following table clearly shows low level of DO due to degradable waste responsible for the low DO and higher BOD. These rivers then join Bhima river. In between Pandharpur and these urban areas there is large Ujani reservoir. Therefore, very little natural flow in the river in non-rainy seasons.

River Water Quality Status of Bhima River During the Year 2002-2003 (from MPCB Report)

Sr. No.	Monitoring Station	pH	BOD	COD	DO
1	D/s of Vithalwadi, Pune (M)	7.23	18.6	40	3.3
2	D/s of Bund Garden, Pune (M)	7.1	29.7	74	2.4
3	Pargaon (M)	7.15	9.75	26	4.45
4	Daund (M)	7.05	7.13	23	4.53
5	Takli, Solapur D/s (G)	7.93	6.36	24.89	6.07
6	U/s of New Bridge, Pandharpur	7.6	7	28.8	
7	D/s of Gopalpur, Pandharpur	7.6	6.8	26.4	

Water quality at Pandharpur:

Samples were collected from four different points along the river Bhima during three days of Ashadi Ekadashi. One of the samples was from Upstream Garsule Bhandhara before river enters in the city. While three samples were from the locations with large density of population during these three days. Analysis was done for pH, DO, BOD, COD, hardness and calcium. During this week large quantum of water is released from the upstream Ujani dam. This year there was also very heavy rains in the Bhima catchments area. Analysis was done three times a day to know the timely fluctuations in the water quality.



The MPCB team in action



Arrival of Shri Tukaram Maharaj Palkhi

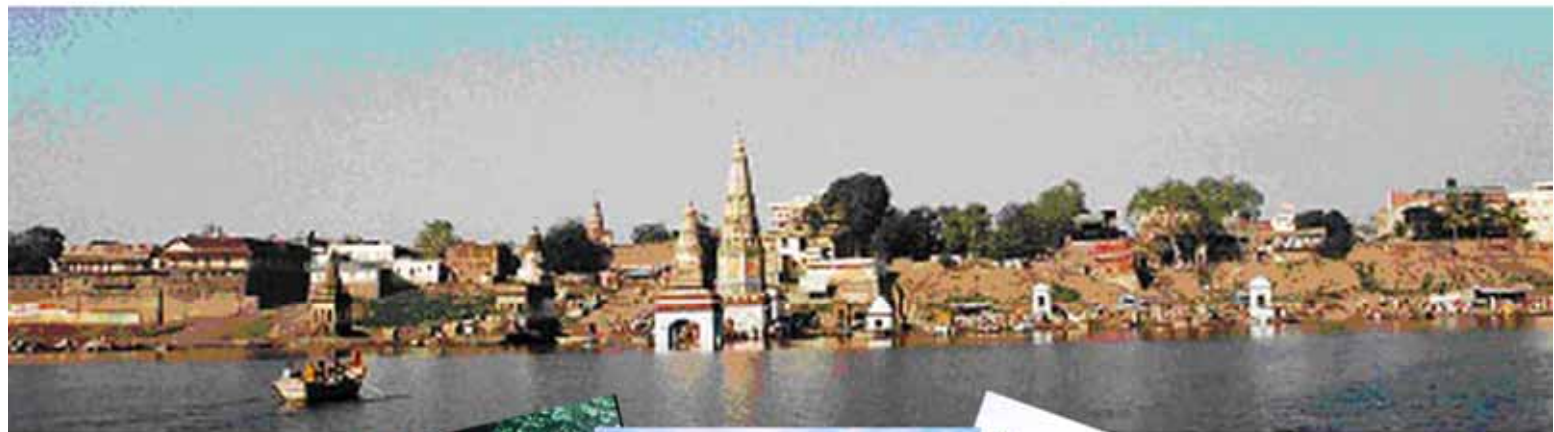


Awereness for the Environment and Health

**CHANDRABHAGA RIVER (BHIMA RIVER) SAMPLING DURING
AASHADI WARI (I.e. on 17th - 19th July, 2005)**

Sr.No.	Date	Time	Sampling Point	Parameters					
				pH	DO	BOD	COD	Hardness	Calcium
1	17-7-2005	6.00 am	Upstream Gursale Bandhara	7.96	6.66	5.4	20	140	30
		2.00 pm	do	7.86	6.27	6.2	40	116	33
		10.00 pm	do	7.87	6.48	5.8	24	112	31
2	18-7-2005	6.00 am	Upstream Gursale Bandhara	8.53	6.54	8.2	56	104	32
		2.00 pm	do	8.07	7.11	7.6	32	98	28
		10.00 pm	do	8.06	7.05	6.9	32	138	36
3	19-7-2005	6.00 am	Upstream Gursale Bandhara	8.16	6.75	7.4	44	172	40
		2.00 pm	do	8.19	6.92	6.2	24	166	41
		10.00 pm	do	8.14	6.72	6.8	32	168	40

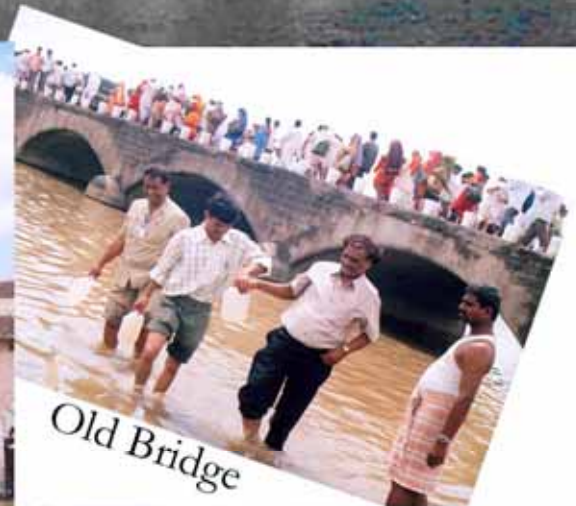
There was not much fluctuations in the parameters analyzed on 17th of July from the Old Bridge area . But the samples shows slight increase in the level of BOD and COD and also change in the oxygen indicating the inflow of sewage. There is also variations samples collected from different times in a day. Samples of morning early hours clearly indicate large inflow of human waste. While the samples of 18th shows higher levels as compare to 19th July sample.



Gursule Bandhara



The Pundalik Mandir



Old Bridge



Gopalpur



Solid waste accumulation

The Sampling Locations

**CHANDRABHAGA RIVER (BHIMA RIVER) SAMPLING DURING
AASHADI WARI (I.e. on 17th - 19th July, 2005)**

Sr.No.	Date	Time	Sampling Point	Parameters					
				pH	DO	BOD	COD	Hardness	Calcium
1	17-7-2005	6.00 am	Upstream Old Bridge	8.09	6.63	5.6	28	64	22
		2.00 pm	do	7.91	5.99	6.4	48	80	26
		10.00 pm	do	8.06	6.7	4.2	12	82	27
2	18-7-2005	6.00 am	Upstream Old Bridge	7.88	5.73	11.2	48	68	30
		2.00 pm	do	7.92	5.62	8.2	40	94	31
		10.00 pm	do	7.74	4.84	14.6	36	84	25
3	19-7-2005	6.00 am	Upstream Old Bridge	7.96	6.33	9.4	36	132	38
		2.00 pm	do	8.32	6.93	7.6	28	148	42
		10.00 pm	do	8.37	7.02	5.8	24	150	40

Samples from upstream of Pundlik mandir shoes three times more BOD and some extend COD in the morning samples than afternoon and evening.

Like previous sample morning levels are more for BOD and COD and lower level of D.O confirms the biodegradable waste entering in the river.

**CHANDRABHAGA RIVER (BHIMA RIVER) SAMPLING DURING
AASHADI WARI (I.e. on 17th - 19th July, 2005)**

Sr.No.	Date	Time	Sampling Point	Parameters					
				pH	DO	BOD	COD	Hardness	Calcium
1	17-7-2005	6.00 am	Downstream Pundalik Mandir	7.94	5.5	10.4	56	72	24
		2.00 pm	do	7.8	5.86	9.6	44	80	27
		10.00 pm	do	7.76	5.72	10.6	40	76	25
2	18-7-2005	6.00 am	Downstream Pundalik Mandir	7.71	4.68	12.6	36	86	26
		2.00 pm	do	7.89	6.7	9.4	36	88	29
		10.00 pm	do	8.18	6.83	10.6	32	80	28
3	19-7-2005	6.00 am	Downstream Pundalik Mandir	8.02	5.22	12.4	40	130	40
		2.00 pm	do	7.97	5.46	16.6	24	142	38
		10.00 pm	do	8.05	5.21	11.8	32	144	42

While the water samples from Gopalpur further downstream of main worship area also shows same trends like previous samples particularly in the morning samples. This increase in the level of 2-3 times even after the large dilution factor clearly indicate there is huge quantity of raw sewage is joining the river. If this is the case in rainy season one can imagine the sanitation and hygienic conditions during other festive times.

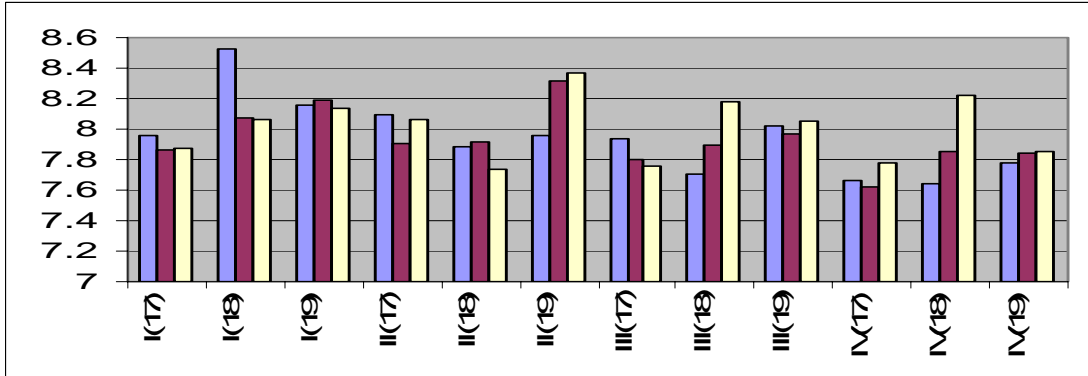
A series of graphs presented gives various in the parameters analysed from four sampling stations. These graphs show from day to day and time to time variations.

**CHANDRABHAGA RIVER (BHIMA RIVER) SAMPLING DURING
AASHADI WARI (I.e. on 17th - 19th July, 2005)**

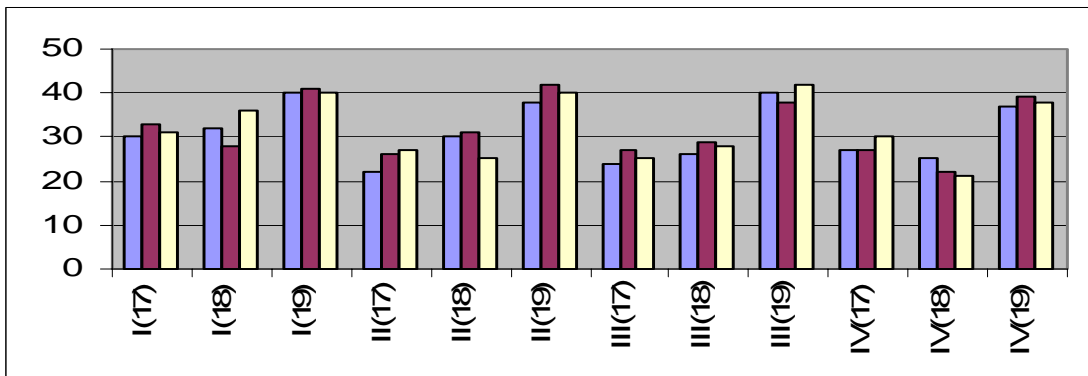
Sr.No.	Date	Time	Sampling Point	Parameters					
				pH	DO	BOD	COD	Hardness	Calcium
1	17-7-2005	6.00 am	Downstream Gopalpur	7.66	3.22	19.6	56	84	27
		2.00 pm	do	7.62	3.58	18.2	60	78	27
		10.00 pm	do	7.78	4.59	11.7	52	84	30
2	18-7-2005	6.00 am	Downstream Gopalpur	7.64	4.95	14.2	40	46	25
		2.00 pm	do	7.85	5.77	13.7	36	60	22
		10.00 pm	do	8.22	4.79	14.8	44	62	21
3	19-7-2005	6.00 am	Downstream Gopalpur	7.78	4.43	18.4	28	128	37
		2.00 pm	do	7.84	4.33	13.4	40	134	39
		10.00 pm	do	7.85	4.67	14.8	28	136	38

Change detection in the physico-chemical properties of Water

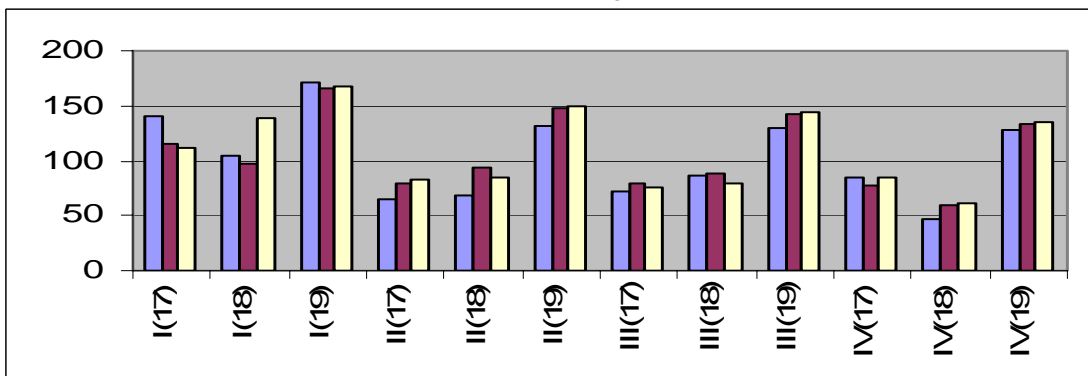
Hydrogen Ion Concentration (pH)



Calcium Content (mg/l)

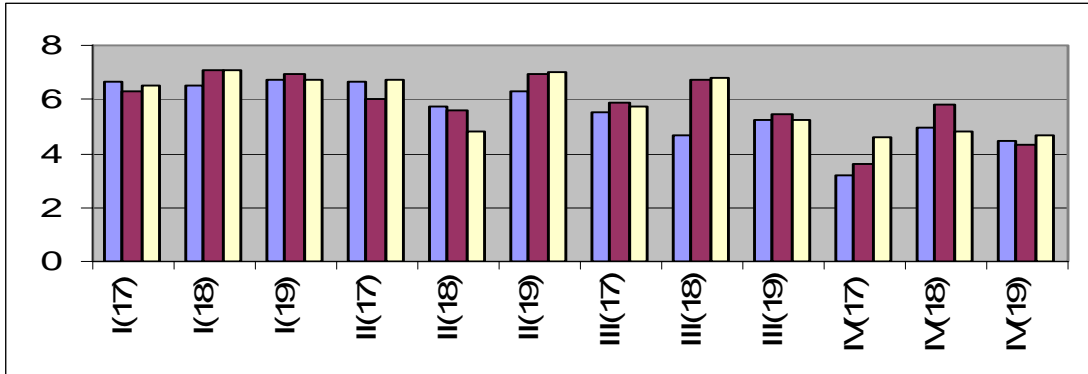


Hardness (mg/l)

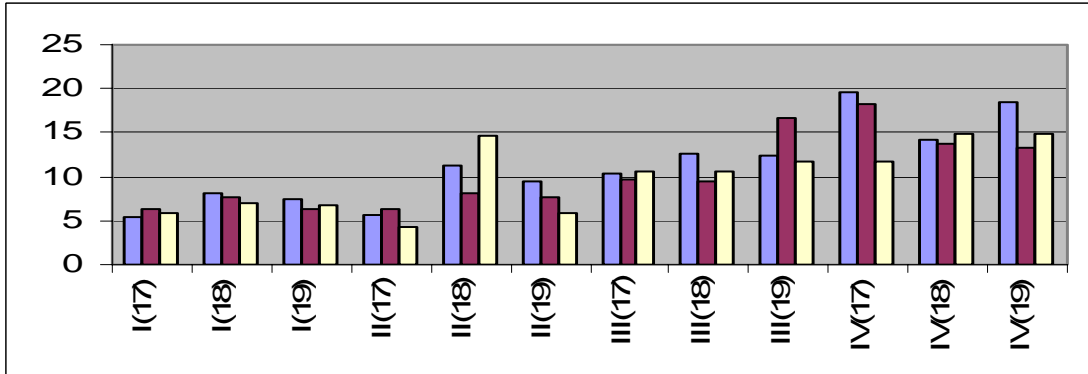


‘X’ axis: Sampling Locations (Date-wise observations) with the sampling time as series
 Locations: **Upstream I: Gursule Bandhara, II: Old Bridge** ■ Time (06.00)
 Downstream II: Pundalik Mandir, IV: Goplapur ■ Time (14.00)
 Dates: 17 (17 July, 2005); 18 (18 July, 2005); 19 (19 July, 2005) ■ Time (22.00)
‘Y’ axis: Water Parameter Values

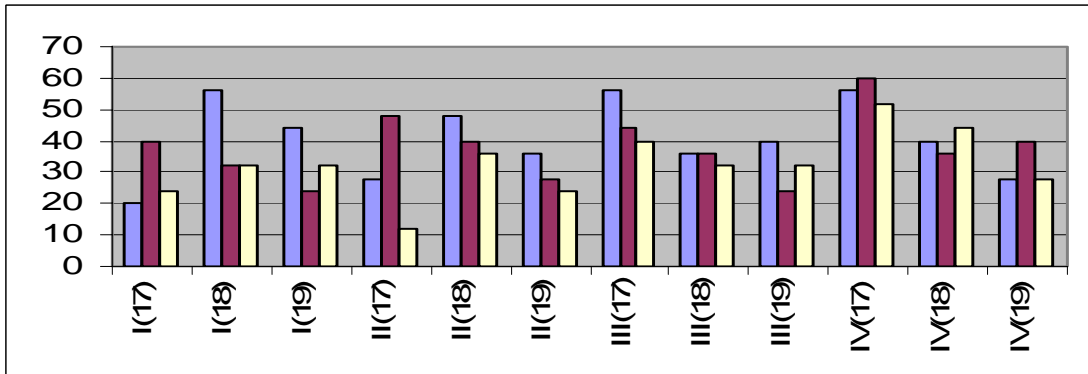
Dissolved Oxygen (mg/l)



Biological Oxygen Demand (mg/l)



Chemical Oxygen Demand (mg/l)



‘X’ axis: Sampling Locations (Date-wise observations) with the sampling time as series
 Locations: **Upstream I: Gursule Bandhara, II: Old Bridge** ■ Time (06.00)
 Downstream II: Pundalik Mandir, IV: Goplapur ■ Time (14.00)
 Dates: 17 (17 July, 2005); 18(18 July, 2005); 19 (19 July, 2005) ■ Time (22.00)
‘Y’ axis: Water Parameter Values

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Air Quality:

Analysis was also done for the ambient air quality and noise levels during three days. Samples were collected using mobile van for SO₂, Nox and SPM from three stations such as river banks of main city, ST Stand and Hospital area. Each sample was for 8 hrs duration and three times in a day from the same locality. Unlike water there is an increase in the level of SO₂, Nox and SPM in the afternoon samples than morning one.

AMBIENT AIR MONITORING DURING AASHADI WARI (I.e. on 17th - 19th July, 2005)

Sr.No.	Date	Sampling Point	PARAMETERS (6.00 to 14.00 hrs)			PARAMETERS (14.00 to 22.00 hrs)			PARAMETERS (22.00 to 06.00 hrs)		
			SO ₂	Nox	SPM	SO ₂	NoX	SPM	SO ₂	Nox	SPM
1	17-7-2005	Bhima River - Pandharpur	13.26	31.2	264.79	14.43	34.92	318.54	11.95	28.75	145.8
2	do	ST Stand, Pandharpur	11.14	26.05	235	12.39	28.87	312.7	11.37	28.45	285.3
3	do	Near Hospital	11.68	27.21	81.04	11.22	24.2	27.29	10.79	26.2	88.33

AMBIENT AIR MONITORING DURING AASHADI WARI (I.e. on 17th - 19th July, 2005)

Sr.No	Date	Sampling Point	PARAMETERS (6.00 to 14.00 hrs)			PARAMETERS (14.00 to 22.00 hrs)			PARAMETERS (22.00 to 06.00 hrs)		
			SO ₂	Nox	SPM	SO ₂	NoX	SPM	SO ₂	Nox	SPM
1	18-7-2005	Bhima River - Pandharpur	11.87	28.42	142.29	12.83	26.64	197.91	12.54	29.35	216.87
2	do	ST Stand, Pandharpur	9.18	21.72	185.42	15.01	35.6	531.04	12.83	30.74	201.66
3	do	Near Hospital	11.22	25.48	102.7	10.35	23.84	64.79	10.93	27.53	101.66

**AMBIENT AIR MONITORING DURING
AASHADI WARI (I.e. on 17th - 19th July, 2005)**

Sr.No.	Date	Sampling Point	PARAMETERS			PARAMETERS			PARAMETERS		
			(6.00 to 14.00 hrs)			(14.00 to 22.00 hrs)			(22.00 to 06.00 hrs)		
			SO2	Nox	SPM	SO2	NoX	SPM	SO2	Nox	SPM
1	19-7-2005	Bhima River - Pandharpur	12.97	29.9	183.33	12.24	30.95	146.9	18.08	38.05	704
2	do	ST Stand, Pandharpur	17.2	36.55	527.91	16.18	37.67	513.5	12.1	28.3	283.1
3	do	Near Hosptial	11.22	24.35	77.91	10.79	27.5	77.91	10,64	23.12	71.66

**AMBIENT AIR MONITORING DURING
AASHADI WARI (I.e. on 17th - 19th July, 2005) - Near Gramin Rungnalaya at Pandharpur**

Sr.No.	Date	PARAMETERS			PARAMETERS			PARAMETERS		
		(6.00 to 14.00 hrs)			(14.00 to 22.00 hrs)			(22.00 to 06.00 hrs)		
		SO2	Nox	SPM	SO2	Nox	SPM	SO2	Nox	SPM
1	17-7-2005	11.68	27.21	81.04	11.22	24.2	27.29	10.79	26.2	88.33
2	18-8-2005	11.22	25.48	102.7	10.35	23.84	64.79	10.93	27.53	101.66
3	19-8-2005	11.22	24.35	77.91	10.79	27.5	77.91	10,64	23.12	71.66

**AMBIENT AIR MONITORING DURING
AASHADI WARI (I.e. on 17th - 19th July, 2005) - ST STAND - PANDHARPUR**

Sr.No.	Date	PARAMETERS			PARAMETERS			PARAMETERS		
		(6.00 to 14.00 hrs)			(14.00 to 22.00 hrs)			(22.00 to 06.00 hrs)		
		SO2	Nox	SPM	SO2	Nox	SPM	SO2	Nox	SPM
1	17-7-2005	11.14	26.05	235	12.39	28.87	312.7	11.37	28.45	285.33
2	18-8-2005	9.18	21.72	185.42	15.01	35.6	531.04	12.83	30.74	201.66
3	19-8-2005	17.2	36.55	527.91	16.18	37.67	513.54	12.1	28.3	283.12

**AMBIENT AIR MONITORING DURING
AASHADI WARI (I.e. on 17th - 19th July, 2005) - BHIMA RIVER BANK, (WALWANT) PANDHARPUR**

Sr.No.	Date	PARAMETERS			PARAMETERS			PARAMETERS		
		(6.00 to 14.00 hrs)			(14.00 to 22.00 hrs)			(22.00 to 06.00 hrs)		
		SO ₂	Nox	SPM	SO ₂	Nox	SPM	SO ₂	Nox	SPM
1	17-7-2005	13.26	31.2	264.79	14.43	34.92	318.5	11.95	28.75	145.83
2	18-8-2005	11.87	28.42	142.29	12.83	26.64	197.9	12.54	29.35	216.87
3	19-8-2005	12.97	29.9	183.33	12.24	30.95	146.9	18.08	38.05	703.95

Monitoring noise was also done along with the air and water analysis. As expected there is an increase in the levels of noise. Since large number of people are gathers in a relatively small area and also due very heavy to vehicular traffic during these days.

NOISE MONITORING IN PANDHARPUR DURING ASHADI YATRA

Sr. No.	Place	Date:- 17/7/2005		Date:- 18/7/2005		Date:- 19/7/2005	
		At A.M.	At P.M.	At A.M.	At P.M.	At A.M.	At P.M.
1	Near ST Stand	95.8db	81.2 db	94.5 db	92.3 db	80.3 db	81.4 db
2	Near Shivaji Chowk	82.3 db	78.2 db	90.2 db	89.1 db	84.2 db	83.3 db
3	Near Vithoba Mandir	80.4 db	94.2 db	77.6 db	77.4 db	78.4 db	75.1 db
4	At Pundlic Temple	83.8 db	82.1 db	80.2 db	76.9 db	80.4 db	82.3 db

In addition to the air, water and noise level monitoring, officials from MPCB also took mass scale campaign to educate the people to maintain the sanitation and hygienic conditions. Officials distributed leaflets in Marathi and explained them about the importance of water quality, sanitation and disposal of solid waste.

A need for Sustainable Development:

In view of large number of people visiting the area every year during four important Yatra festivals such as Chaitra, Ashadi, Kartik and Magh there is need to plan the city with infrastructure to take the shock of lodging, vehicular traffic, sewage effluent and solid waste so as to maintain the sanitation and hygienic conditions.

River bank development:

Development of the bathing Ghats along the river banks so as to facilitate the holy baths and rituals. This will also help to keep the banks clean and reduce the erosion. This could be done using construction with stones and then followed by vegetation zone. Development of green belt will help to rest people during summer months and take a pleasure of looking various temples along the river banks.

Road development and Camp sites:

Roads entering the town from all the direction need widening taking into consideration the flow of people and vehicles. The thematic diagram (enclosed) is shown as one of the option suggested for smooth flow of vehicles without disturbing the people walking. The points considered for such development includes a separate road for vehicles and walking. Along the roads provide seating benches, dustbins and separate toilets for men and women. The outlets of these toilets could be connected to vegetation belt in order to reduce the smell and maintain the hygienic conditions. Just before the outer limit of the town few camp sites needs to be developed which are equipped with sanitation, bathing facilities. Again here the waste generated could be treated with decentralized wastewater treatment units such as advanced septic tanks. The outlets of these tanks can be released in the vegetation zone specially prepared along the camp sites. Or alternative to these units sewage generated could be transported using sewerage lines, which are then connected to main effluent treatment plant. Such facilities could be in multiple numbers especially along the roads entering the town.

Drinking water facilities:

Camp sites, along the roads entering the town and banks of the rivers there is need to supply potable water in order to ensure good water quality is made easily available.

Nalla Development:

The town has number of Nallas (streams), which are sites for solid waste disposal and carries wastewater need priority to develop in order to, avoid the stagnant conditions. Such

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sites are the potential breeding ground for the mosquito. Area along the Nalla needs further inputs such as channelizing the flow, stabilization of banks and afforestation.

Developing Parking Spaces:

In order to avoid congestion and reduce the exposure of people to air and noise pollution there is need to develop parking spaces at least few kilometers away from the main town.

Similarly a good public transport having easy access to the common man is of great significance. Since it is observed that old people are more in number and use public transport.

