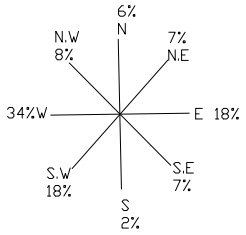
ENVIRONMENT

Environmental considerations play a vital role in the health and sustainability of the settlement. The interaction of natural and artificial elements amongst each other and the life cycle path, through which each of them passes, affects the overall health of the settlement in its complete entity. It is in this context, the waste and effluents generated through human activities have to be channelised to form a symbiotic system.

7.1 WIND

Winds are light to moderate except in the rainy season (south west monsoon season). The predominant wind direction is westward, constituting about 34% of the total. The other significant wind direction is south west ward accounting for 18% of the total.



7.2 WATER

River Krishna flowing adjacent to Sangli-Sangalwadi and Miraj settlements in the eastern and southern part of SMKMC forms the most significant surface water body in the area. This is also the source for water supply systems for Sangli and Miraj and is perennial.
The highest flood level recorded at Irwin Bridge during 1997-2000 was 541.23m, with a discharge of 4146 cusecs in 1997. This lasted for 10 days and the areas flooded were as follows:

1) Magarmach colony
2) Sheri nalla (Slum areas)
3) Padma talkies (Backyard)
4) Sangalwadi
5) Cattle market
6) Ganpati Mandir
7) Sangli Islampur road

In the subsequent years the discharge has reduced, possibly due to storage at Dhom and Koyna reservoirs.

Table 7.1: H.F.L recorded at Irwin Bridge, Sangli.

	Year	Highest Flood Level	Depth (m)	Discharge in cusecs	Date of achievement
1	1997	541.23m (46'9'')	14.2	4146	26.08.97
2	1998	534.89m (25'9'')	7.8	1289	10.7.98
3	1999	537.7m (33'6")	10.2	1975	29.7.99
4	2000	533.61m (21'6")	6.6	982.18	14.7.2000

Source: Irrigation deptt. Sangli

The qualitative analysis of the water sample indicates slightly high values of B.O.D levels for safe drinking water. Bacteriological characteristics also ought to be investigated to arrive at conclusive indication of water quality for potable purposes.

Table 7.2: Analysis of surface water samples

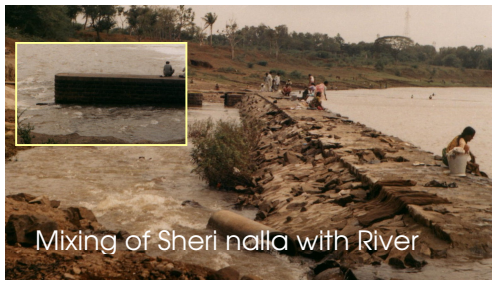
S. No	Parameter	Krishna River (Near Ganpati Temple)	Krishna River (d/s)	Krishna River (u/s)	Krishna River (avg)
1.	pH	7.53	7.45	7.4	7.46
2.	C.O.D (mg/l)	16	24	20	20
3.	B.O.D (3 days at 27° C) (mg/l)	5	8	8	7
4.	Total Solids (mg/l)	120	160	140	140
5.	Total Dissolved Solids (mg/l)	120	160	140	140
6.	Suspended Solids (mg/l)	Nil	Nil	Nil	Nil
7.	Chlorides (mg/l)	20	22	20	20.7
8.	Oil & grease				

Source: Environmental Status Report, SMKMC 2002


Sheri nalla, Sangli

7.2.1 Sources of pollution

The major source of pollution to the River is Sheri Nallah discharging into it. Although this is a natural nallah, it carries pollutants from unauthorized sewerage discharges and industrial wastes. Although in the recent years extent of industrial wastes discharged into it has reduced, lowering the Chemical Oxygen demand (260mg/l in 1999 to 88mg/l in July 2002), and the Biological Oxygen Demand. (90mg/l in 1999 to 22 mg/l in 2002). The Environment (Protection) Act 1986 stipulates a maximum B.O.D of 10mg/l ingress of effluent into inland surface water and 100mg/l for disposal on land for irrigation. Also B.O.D for effluents discharging into a source of drinking water supply source (which happens the case in Sangli, though there is a protection in the form of low height weir) should not be more than 30 mg/l. The figures available for 2002hitherto indicate lower values, but are to be treaded with caution as the sample was collected from only one location and the testing was during monsoon. Hence it is vital to evaluate the extent of pollutants in the nalla at the point of entry into the river Krishna and also at other points in different seasons.


Mixing of Sheri nalla with River


Marshy land, Sheri Nalla, Sangli

Although the effluent from Oxidation Pond irrigated earlier 900 acres of land, now it is not possible, as these agricultural lands have been converted into built up area. Hence there is a problem of effluent disposal. The oxidation pond is functional only to a small extent. Hence the sewage is directly disposed off into a nallah near Haripur road crossing and ultimately discharged into river.

Proper disposal facilities expected in the new Sewerage Management scheme being developed by SMKMC under the aegis of USAID.

Table 7.3: Qualitative analysis of water samples from Sheri Nalla and Haripur Nalla

S. No	Parameter	Sangli Sherinalla 15-12-1999	Sangli Sherinalla (Near Karnal Naaka) 2002	Haripur Nalla 2002
1.	pH	7.2	7.58	7.25
2.	C.O.D (mg/l)	260	88	64
3.	B.O.D (3 days at 27° C) (mg/l)	90	30	15
4.	Total Solids (mg/l)	1924	720	640
5.	Total Dissolved Solids (mg/l)	1794	680	620
6.	Suspended Solids (mg/l)	130	40	20
7.	Chlorides (mg/l)	380	215	105
8.	Sulphates (mg/l)	444		
9.	Oil & grease		Traces	Traces

Source: Environmental Status Report 2000-2001,2001-2002

Table 7.4: Analysis of sub surface water samples (2002)

S No	Parameter	Bore well Water (Miraj Market)	Bore well Water (Dr Nitwe, Sangli)	Bore well Water Jain Basti, Kupwad)
1.	Color	Colorless	Colorless	Colorless
2.	Color	Odorless	Odorless	Odorless
3.	pH	7.5	8.65	6.84
4.	Alkalinity (mg/l)	350	165	620
5.	Chlorides (mg/l)	100	50	265
6.	Hardness (mg/l)	200	100	480
7.	Calcium (mg/l)	52	28	108
8.	Magnesium (mg/l)	17	8	51
9.	Turbidity	0.3	0.2	0.6
10.	Conductivity, (micro mhos/cm)	700	250	1233
11.	MPN/100ml	> 2400	> 2400	4

As indicated from the above analysis, water from subsurface sources is hard water. While the prescribed limits of hardness ranges between 75-115 mg/l, the sample analysis values range between 100-480 mg/l. The bacterial load indicated by MPN value is also high, but is unusual for sub surface water unless contaminated by sewer/other pollutant sources. Hence this needs to be further investigated.

7.3 CONSERVATION AND REJUVENATION OF NALLAHS

Although the old revenue maps and the Survey of India toposheets based on surveys in 1982 indicate an intricate network of natural streams/nallahs, the existing conditions reveal otherwise. The rampant construction activities especially the proliferations of Gunthewari settlement have filled up these nallahs. The Satellite imagery too indicate numerous nallahs which have been constructed over/flow-width reduced.

Suitable measures such as identification of the nallahs, which can be revived, creation of buffer zones, evaluation of protection measures during sanctioning of building plans needs to be taken up on priority basis.

7.4 AIR QUALITY

The Ambient Air Quality Monitoring conducted by Maharashtra Pollution Control Board during December 1998 indicate the pollutants except Suspended Particulate Matter to be within the permissible levels. Similar reports of MPCB for monitoring conducted during Jan- March 2001 also indicate higher levels of Respirable Suspended Particulate Matter (RSPM). The level of RSPM at Chakan Mills in Kupwad was 109 μg/cu.m and that at Vasant Dada Shetkari Sakahar Karkhana was 111 μg/cu.m. The permissible levels stipulated under the The Environment (Protection) Act 1986 are 100 μg/cu.m (24 hours and 60 μg/cu.m in case of annual average) for residential areas. The surrounding areas of Sugar mill face problems due to high levels of Suspended Particulate Matter during the peak- sugar cane crushing season during October- January.

7.5 NOISE POLLUTION

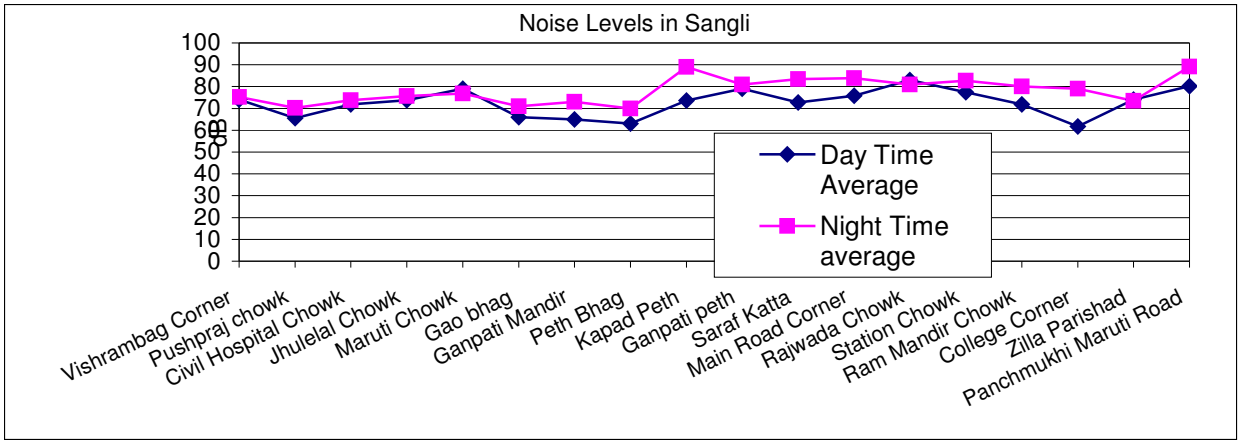
The figures on average noise levels monitored during 25.10.02 to 29.10.02 depict the noise to vary between 61-95dB, which is higher than the limits specified by Bureau of Indian Standards for residential areas under City limits.
Rajwada Chowk has the highest average noise levels during daytime, followed by Ganpati Peth and Panchmukhi Maruti Road Chowk. During night hours the noise levels are highest at Kapad Peth and Panch Mukhi Maruti Road Chowk. Also the average noise levels at all the monitoring locations were higher during night hours. The movement of heavy vehicles on these roads during night could be one of the reasons attributed for this.

At present no data is available for Kupwad, and Miraj, which needs to be monitored.

Table 7.5: Average noise levels in various spots in Sangli

S No	Location	Day Time Average 25.10.2000-29.10.2000	Night Time average 25.10.2000-29.10.2000
1.	Vishrambag Corner	74	75.2
2.	Pushpraj chowk	65.6	70.2
3.	Civil Hospital Chowk	71.8	73.8
4.	Jhulelal Chowk	73.8	75.6
5.	Maruti Chowk	79	76.8
6.	Gao bhag	66	71
7.	Ganpati Mandir	65	73
8.	Peth Bhag	63	70
9.	Kapad Peth	73.6	89
10.	Ganpati peth	79	81
11.	Saraf Katta	72.8	83.4
12.	Main Road Corner	75.8	83.8
13.	Rajwada Chowk	83	81
14.	Station Chowk	77.4	82.7
15.	Ram Mandir Chowk	71.8	80
16.	College Corner	61.8	79
17.	Zilla Parishad	74	73.4
18.	Panchmukhi Maruti Road	80.2	89.2

Source: Environmental Status Report 2000-2001



7.6 SOLID WASTE

About 190 tonnes of solid waste is generated within the SMKMC area, of which about 175 tonnes is collected. Disposal is by means of land filling.

Bio medical waste: Around 1426kg per day of bio medical wastes are generated by about 447 hospitals in SMKMC. Facility of an incinerator with an installed capacity of handling 1500kg per day exists at the land fill site at Arag-Bedag road near Miraj.

7.7 SLUMS

There are 29 notified slum settlements in SMKMC occupying 16.6 Ha of land and inhabiting 30000 persons in 4572 dwelling units. (Estimates by NGOs instituted by SMKMC for study of slums report 99 slums housing 52865 persons and 10573 D.U.). Thus the Slum population accounts for almost 12% of the total population in SMKMC. Only one fifth of these have toilet facilities. It is essential to equip these settlements with basic physical infrastructure facilities, which can be resorted by self-help measures too.(as was demonstrated by recent experiences by shelter group under the aegis of SMKMC)

7.8 GUNTHEWARI SETTLEMENTS


Effluent pond, Sakhar Kharkana

Gunthewari settlements house significant proportion of population with about 17000 dwelling units and 15000 open plots, thus accommodating about 80000 persons. Gunthewari areas cover approx. 990 Ha of land, (i.e one fourth of the total developed area and about 8.8% of total SMKMC area). These settlements are devoid of physical infrastructure facilities such as drainage and sewerage facilities. This would lead to accumulation of effluent in the surrounding as already visible in some of the older settlements, posing a grave health threat to not only the inhabitants of Gunthewari settlements but also those of the surrounding settlements.

7.9 OTHER ASPECTS

There is extensive farming of sugarcane in and around Sangli. While this has resulted in short term gains for farmers, there are possibilities of terrible side effects like soil quality deterioration, water logging, excess salinity, ground water quality deterioration due to excessive irrigation and application of fertilizers. Hence this needs to be investigated through appropriate tests and analysis.

7.10 TO SUMMARIZE

1. The qualitative analysis of the water sample from River Krishna indicates slightly high values of B.O.D levels for safe drinking water. Bacteriological characteristics also ought to be investigated to arrive at conclusive indication of water quality for potable purposes.

2. The major source of pollution to the River is Sheri Nallah discharging into it.

3. Water from sub surface sources is hard water. The bacterial load indicated by MPN value is also high, but is abnormal for sub surface water unless contaminated by sewer/other pollutant sources. Hence this needs to be further investigated.

4. Although in the recent years extent of industrial wastes discharged into it has reduced, lowering the Chemical Oxygen demand (260 mg/l in 1999 to 88 mg/l in July 2002), and the Biological Oxygen Demand. (90 mg/l in 1999 to 22 mg/l in 2002). The Environment (Protection) Act 1986 stipulates a maximum B.O.D. of 10mg/l ingress of effluent into inland surface water and 100mg/l for disposal on land for irrigation. Also B.O.D. for effluents discharging into a source of drinking water supply source (Which happens the case in sangli, through there is a protection in the from of low height weir) should not be more than 30mg/l.

5. Although the old revenue maps and the Survey of India top sheets based on surveys in 1982 indicate an intricate network of natural streams/nallahs, the existing conditions reveal otherwise. The rampant construction activities especially the proliferation of Gunthewari settlement has filled up many of these nallahs.

6. The Ambient Air Quality Monitoring conducted by Maharashtra Pollution Control Board during December 1998 indicate the pollutants except suspended Particulate Matter to be within the permissible levels.

7. The figure on average noise levels monitored during 25.10.02 to 29.10.02 depict the noise to vary between 61-95dB, which is higher than the limits specified by Bureau of India standards for residential areas in City limits.

8. About 190 tonnes of solid waste is generated within the SMKMC area, of which about 175 tonnes is collected. Disposal is by means of land filling.

9. Around 142 kg per day of bio medical wastes are generated by about 447 hospitals in SMKMC, which is disposed off by incineration.

10. The absence of basic infrastructure facilities in the slum and gunthewari settlements also needs immediate attention for improvement of status of the city.