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CASE STUDY-WATER POLLUTION IN SANGLI- MIRAJ-KUPWAD MUNICIPAL CORPORATION AREA

Sanmati Bedage[1], Sharad Giramkar[2] and Balkrishna Zaware[3]

1. PDEA's Baburajj Gholap College Sangvi, Pune,
2. PDEA's Annasaheb Magar Mahavidyalaya Hadpsar, Pune,
3. PDEA's Mamasaheb Mohol College, Erandwana, Pune.

Email: sanmati024@gmail.com

ABSTRACT:

Sangli Miraj Kupwad Muncipal Corporation is largest municipal corporation in South Maharashtra and serves a population of 0.65 million with Geographical Area 118.18 Sq.km and tropical climate. We can observe different types of pollution over this study area like water, air, soil, noise pollution as one of the growing cities surrounded with agricultural land. The major water bodies selected for study purpose were lake near RTO office, Bharat Nagar Talav, Miraj Odha, Ganesh talav, Kali khan, Krishna River. The major causes of water pollution to these selected water bodies were identified. The pollution sources for these water bodies are sewage, agricultural runoff, solid waste disposal etc. The literature survey provided numerous evidences of health hazards of polluted water bodies on human. The Sewage treatment plant of 27MLD with primary and secondary treatment is proposed in the study area. As on today, the municipal corporation implementing sewage treatment plant in study area and implementation work of this plan is in progress.

Keywords: sewage treatment plant**,** primary treatment, secondary treatment.

INTRODUCTION:

Water is one of the vital components required for existence of any life form. Rapid increase in demand of water due to population growth, urbanization and changing lifestyle has created a considerable gap in demand and supply. This has posed serious challenges to water security (S. Gaikwad & N. Kamble 2016).

When toxic substances enter lakes, streams, rivers, oceans and other water bodies, they get dissolved or lie suspended in water. This result in pollution of water. Due to pollution the quality of the water deteriorates, affecting aquatic ecosystems. These pollutants can also seep down and affect the groundwater deposits (A. B. Sarwade et al., 2015)

The most polluting source of water is the city sewage and industrial waste, agricultural runoff or the water from the fields that drains into river is another major water pollutant as it contains fertilizers and pesticides. Such water which ultimately ends up in our household is often highly contaminated and carries disease causing microbes (P. Pawar & S. Bhosale,2015)

In this research, we focused on water pollution of Sangli- Miraj- Kupwad Municipal corporation area and impact of water pollution oncommunity and Agricultural industry

STUDY AREA:

Location selected for study is Sangli Miraj Kupwad municipal corporation (16°51'55.01"N, 74°36'46.00"E) Established on 9th February, 1998

Population 4,36,639 (as per 2001 Census) Geographical Area 118.18 Sq.km. This is the largest municipal corporation in South

Maharashtra and serves a population of 0.65 million (http://www.smkc.gov.in).

2.1 Selected water bodies from study area:

1. Lake near RTO office: (16°52'19.83"N, 74°38'18.63"E)

Information obtained from local people-In summer time very little water available in lake.

2. Miraj Odha: (16°50'53.10"N, 74°39'13.30"E)

Water body polluted because of sewage and some amount of industrial wastewater.

3. Kali khan: (16°51'27.11"N, 74°34'49.57"E)

Initially it was a mining site, latter natural springs found and converted to lake. Sometimes dead fish are observed in the water body. Government is trying to revive the lake.

4. Krishna river:

Krishna river is polluted due to disposal of solid waste, industrial effluent, and untreated sewage.

A Sheri nala(16°50'54.01"N, 74°39'12.87"E)is one of the prominent source of pollution to Krishna river which carries wastewater from residential and industrial area.

5. Bharat Nagar Talav:

(16°50'21.69"N,74°38'35.39"E)

Initially it was a mining site, latter natural springs found and converted to lake. Before 10-15 year the local people were using water for drinking purpose but now a days after observing floating death fish, government asked to stop usage of water for drinking.

6. Ganesh talav: (16°49'47.21"N, 74°38'57.75"E)

This natural water body used for "Ganpati Visarjan", Government cleans water body regularly. Sometimes dead fish floating on surface is observed. To add oxygen to water body, fountains are made in lake.

2.2 CAUSES OF WATER POLLUTION IN SELECTED AREA-

The rapid rate of industrialization, construction, and conversion of agricultural land for other developmental purposes has caused haphazard growth of Sangli city.

There are no sufficient facilities for wastewater collection, treatment and disposal.

The disposal of sewage in river through gutters is a threat for the pollution of shallow aquifers.

1) Sewage:

The wastewater is either disposed on the ground surface or open drains from where they percolate, resulting groundwater pollution.

Unsewered area is one of the most important environmental issues for the Sangli city.

In Sangli city sewage treatment plant is of inadequate capacity, hence sewage from different parts of city is disposed off in Krishna River as it is.

2) Agricultural runoff:

In the agriculture sector around Sangli city, the uncontrolled and unscientific use of land fertilizers, herbicide and pesticides is also one of the major reasons for water pollution.

3) Disposal of solid waste:

The generation of municipal solid waste and its improper disposal is also a reason for the water contamination.

4) Industrial effluent:

Most of the small-scale industries such as cotton processing, fabrication units and foundries discharge their untreated or partially treated wastewater into Krishna River through Sherinala, J.J. Marutinala, Haripur nala resulting in water pollution.

KRISHNA RIVER POLLUTION

Major drains contributing to pollution:

1) Sheri Nalla, Sangli.

2) Sidharth Nagar Nalla, Sangli.

3) Haripur Nalla, Sangli.

4) Miraj Nalla, Miraj

(REPORT ON ACTION PLAN FOR CLEAN-UP OF POLLUTED STRETCH OF KRISHNA RIVER June 2019)

2.3 EFFECTS OF WATER POLLUTION WITHIN STUDY AREA:

Health effects:

In the recent study it was observed that, 9% household suffering from cholera,13% from jaundice,64% from gastro entitrius 14% from typhoid disease within the sherinala basin of sangli district(A.S. Yadav & P T Sawant, 2016)

Effect on biodiversity:

To study the effect environmental variables on Diversity of Molluscan Fauna from Freshwater Bodies. Three sampling location like Khanderajuri Lake, Mhaishal Lake and Krishna River are selected to study Diversity of Molluscan Fauna from Freshwater Bodies. Khanderajuri lake showed maximum diversity of 23%, Krishna River 8% and Mhaishal lake with lowest diversity of 3%. Lowest diversity was observed at Mhaishal lake site as due to moderately polluted lake (A.B. Sarwade et al., 2015)

EXISTING TREATMENT PLANTS:

The municipal authority of Sangli Mirajco operation has provided 10 oxidation ponds to treat 12.76 MLD waste water. Treated effluent is partly used for irrigation purpose. Due to urbanization irrigation land is reduced and partly treated / untreated effluent mixing into Krishna river through Sheri Nalla and Haripur Nalla. Presently Sheri Nalla which meets river Krishna is plugged and effluent coming in Sheri Nalla is pumped and disposed at the D/s of K. T. weir Sangli (Wagh C.H.& Kamat R.S., 2012)

Maharashtra Jeevan Pradhikaran is the authority has prepared scheme for collection, treatment and disposal of waste water from Sangli city Under National River Conservation Plan for abatement of Krishna river pollution.

The sewage treatment plant commissioned at Dhulgaon Tal. Tasgaon Dist. Sangli. Sangli city is divided into 4 zones. Entire sewage collected from these zones will be pumped in two stages to STP at Dhulgaon (Wagh C.H.&Kamat R.S., 2012)

CASE STUDY-1

R.V. Kupwade and A.D. Langade (2013) studied pre and post monsoon study of physico-chemical characteristics of ground water (bore well and dug well) in region near Kupwad MIDC is done, to know its suitability for domestic use and irrigation. Water samples were collected from twelve different Sites covering borderline area of MIDC and neighbouring village downstream to it.

Two litters of groundwater samples were collected in a clean polyethylene bottles from all 12, sampling locations in dug wells and bore wells from the study area. The samples collected were characterized by different parameters such as pH, conductivity, TDS, total alkalinity, total hardness, Calcium, Magnesium, Chloride, Nitrate, Sulphate, Phosphate, Sodium, potassium, DO, free CO2 etc. The temperature, pH is recorded by pH meter (Model No. EQ-610 Equiptronics), conductance is measured by conductivity bridge (Model No. EQ-660, Equiptronics). The other parameters are determined by using standard methods.

Analysis of samples clearly reveals that water from all sites except B10 is moderately or highly polluted. Only B10 water sample is suitable for drinking and domestic use. Other sites such as W2, W6, W8, W9, W11 and W12 are moderately polluted; water from these sites can be used for domestic and irrigation purpose after proper treatment.B1, W3, W4, B5, B7 these sites are highly polluted, water from these sites require proper treatment and

management to make its suitability for domestic and agricultural use.

CASE STUDY-2

Ravindra V. Kupwade (2017) studied ground water quality in savali village in March 2012 and after Five years in March 2017 re-investigation of water quality for comparative study is done.

Water samples were collected from twelve different sites in Savali village covering borderline area of Kupwad MIDC. Comparative study of physico-chemical parameters analyzed in March 2012 and March 2017 discloses that B1, W3, W4, B5, B7 sites are highly polluted and extent of pollution is increased in last Five years. Same is the case for all remaining sites which are better or moderately polluted. Only B10 water sample is suitable for drinking and domestic use.

Overall observation reveals that the groundwater quality of Savali village is slowly declining. This is mainly due to industrial effluent, which is percolated through ground as well as mixed with water stream throughout the year causing deterioration of water resources.

CASE STUDY-3

Wagh C.H, Kamat R.S (2012) studied Waste Water Characteristics and its pollution for the stretch of Krishna River from Sanglito Haripur.

River water samples were collected from the monitoring locations at a depth of 30 cm from the water surface for physico – chemical analysis. The river water and waste water samples were collected for a period of September 2008- April, 2009.The frequency of sample collection was decided twice in the month. Additional water and waste water samples were also taken to study effect of occasional changes in flow conditions.

During monsoon period, the pollution in the study stretch was found not exceeding the prescribed limits, Due to sufficient dilution of waste water. In the post monsoon period, Due to the pollution in the study stretch DO was found depleted below the prescribed limits due to insufficient dilution. The lowest DO value once was 4.5 mg/l. In the winter season, due to the pollution in the study stretch DO was found depleted below the prescribed limits due to insufficient dilution. The lowest DO value once was 1.9 mg/l.

During summer season the river flow was minimum (0.25 m3/s). It was found that DO values were lower than prescribed limits for the whole period. The stretch was suffering from pollution for the whole period. The presence of chlorides in the river water stretch indicates that river pollution is due to mixing of untreated sewage to some extent. The maximum flow of waste water was observed in Haripur nalla. The higher concentration of waste water was in Hripurnalla comparatively sherinalla and Marutimandir nalla.

CASE STUDY-4:

Pournima R Pawar and Shrikant. M. Bhosale (2015) studied Ground Water Pollution in Sangli- Miraj- Kupwad Corporation Industrial Area – Remedial Treatment, Prevention and Management.

The sample was collected from Kupwad and Miraj MIDC contaminated Zone at different location , namely as KS1, KS2 KS3 KS4 KS5 KS6 KS7 KS8, and MS1, MS2 MS3 MS4 MS5 MS6 MS7, MS8, Drain1, Drain2, Drain3,Drain4 in sterilize plastic bottles of 1 liter and stored at temperature 40 C in

refrigerator. The paramenters like pH, Ele. condutivity, TDS, Chlorides, Sulphates, Nitrates, BOD, COD, Copper, ferrous, zinc, cadmium, mercury, lead, Arsenic, Total hardness are estimated for collected samples as per standard procedures

It conclude that Values of EC TDS chloride sulphate BOD COD Copper Mercury Lead Arsenic Total Hardness exceeding BIS Standard limits. The contains of industrial effluent further on percolation in soil may mix with the ground water aquifer causing contamination of ground water.

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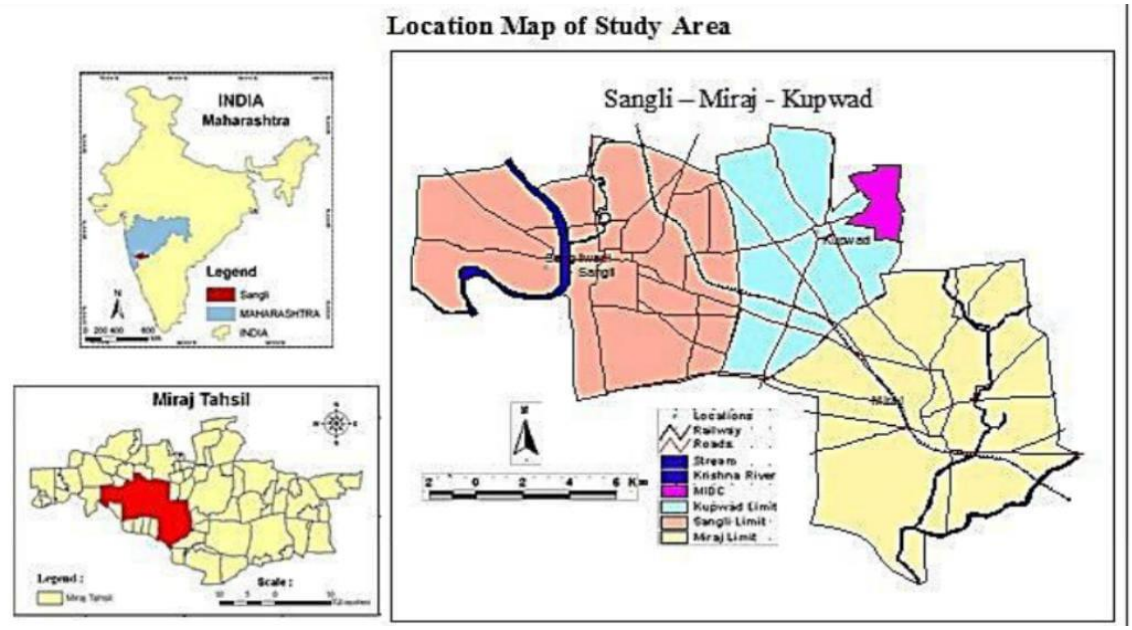
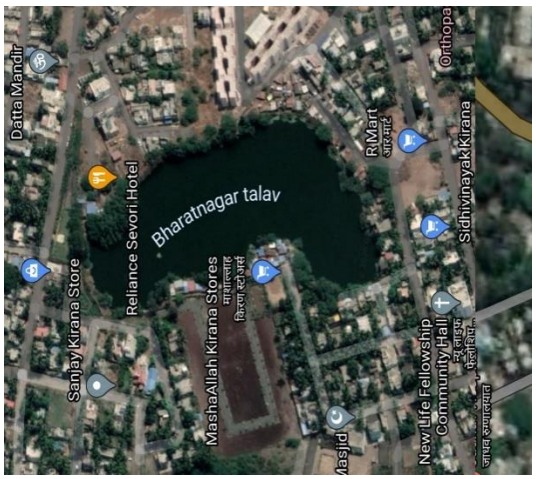


	Maximum	Minimum
Temperature Range Summer:	430C	38.50C
Temperature Range Winter:	250C	12.80C
Latitude:	180 15 ' to 190 55'	
Longitude:	770' to 780 25'	
Climate:	Tropical	

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