

Study of Physico-Chemical Parameters of Bhima River: Review

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Abstract:

River is the most important resource for freshwater. The river water is used for many purposes like agriculture, industries as well as daily need of water for human. In India many cities are placed on bank of River. Day by day the pollution of river water is a serious problem in our country. Many things are create pollution but civilization is mostly effect on aquatic ecosystem. The waste water from industries, sewage water and domestic water are directly mixed in river water. These pollutant are create pollution of river water .The growing problem of water degradation, most of the rivers are covered with aquatic weeds ,these all problems are need to studies and control all over India. The river Bhima in khed tahasil is one of the polluted rive in Pune district the river is covered with aquatic weeds and the ecosystem of the river are in danger zone. In given study review the effect of pollution on Bhima River.

Keywords- Bhima River, Physico-chemical and biological parameter. Literature review, Characteristic

I. INTRODUCTION

A. General

Water is essential for the survival of all forms of life. Though 80% of earth's surface is covered by water; the fresh water supply has increasingly become a limiting factor because of various reasons. The expansion of industrialization and exploding population are the major once. Acute short fall of heavy rains, poor water shed management, abundant use of water for household and agricultural purposes have

led to the overexploitation of the surface water sources especially from the river bodies. Many perpetual rivers become short-lived and even dried up.

Water quality characteristics of aquatic environments arise from massive amount of physical, chemical and biological interactions. The water bodies such as rivers, lakes and estuaries are continuously subjected to a dynamic state of change with respect to their geological age and geo chemical characteristics. This dynamic balance in the aquatic ecosystem is upset by human activities results in pollution which in turn manifests dramatically as fish kill, bad taste of drinking water, offensive odors and unchecked growth of aquatic weeds etc. Quality of water is now a great concern for environmentalists as well as the common publics in all parts of the world. There are numerous sources of pollutants that could deteriorate the quality of water resources.

The surface water bodies become the dumping source for industrial effluent and domestic wastes. As a result, the naturally existing dynamic equilibrium among the environmental segments get affected leading to the state of polluted rivers. According to World Health Organization's (WHO) decision, water for the consumers should be free from pathogenic organisms and toxic substances. In spite of vast water resources in lakes and rivers and good monsoon, India faces perennial problems of floods and droughts and high pollution of freshwater resources.

B. Bhima River

It is a fact that good water quality produces healthier humans and one with poor water quality. Bhima River is life line of Khed city and its water is used for domestic and agriculture purposes. Therefore, effective maintenance of water quality is required through appropriate measurements. Physicochemical and micro-biological characteristics may describe the quality of water. Therefore, this study was carried out for the actual status of Bhima River from literature survey. In addition with increasing number of industries and stakeholders of the river, the concern over the quality has also grown up and hence warranted for the present investigation. The Bhima River originates from the Bhīma Shankar, Flowing up to Usani dam .On Bhima River Chaskaman dam are constructed in 1970, and Chaskaman is 1,329 m (4,360 ft.) long and 42.37 m (139 ft.) high, with a gross storage capacity of 30,500 km³.

For this study the area is confined to stretch of Bhīma River. Bhima River is the one which is more concerned with industrial effluents from small and large scale industries. Besides that, receives large amount of domestic sewage from municipality sewers and slum areas. This study is only aimed to know about the Physico-Chemical characteristics of River, therefore study the Bhima river area in detailed. They studied and analyzed the Bhima River for understanding the quality of water. In Bhima river samples were taken from four places, First one from Kēdareshwar temple ghat, second one from Chandoli Bridge, third one from Kiwane and fourth one from KP Bandhara area. Physico chemical characters are studied by using standard literature like APHA, Edmondson's etc. and also collected data are biostatistical analyses .

IV Result and Discussion

The reading obtained from testing is given in table no.-I and graphical comparisons shown in figure no.-I. Values for statistical analysis are also taken with mean values; standard deviation and coefficient of variation are given below. in figure no.-I. Values for statistical analysis are also taken with mean values; standard deviation and coefficient of variation are given below.

Table No. I.

	Kedareswar Ghat	Chandoli Bridge	Kiwane gaon	KP Bandhara	Mean	Median	Std. Deviation	Minimum	Maximum	Coefficient of Variation
p H *	8 . 1	7 . 9	7 . 7	7 . 4	7 . 8	7 . 8	0 . 3	7 . 4	8 . 1	3 . 9
D O	4 . 8	3 . 2	5 . 2	1 . 6	3 . 4	4 . 0	1 . 7	7 . 4	5 . 2	49 . 0
B O D	33 . 8	16 . 2	51 . 2	35 . 1	40 . 9	40 . 7	8 . 5	33 . 8	51 . 2	20 . 8
C O D	107 . 0	105 . 0	114 . 0	120 . 0	111 . 3	110 . 5	6 . 9	33 . 8	120 . 0	6 . 2
Hardness	58 . 0	72 . 6	86 . 0	111 . 2	79 . 7	79 . 3	22 . 6	58 . 0	111 . 2	28 . 4
E C	130 . 4	164 . 1	249 . 3	408 . 1	216 . 0	206 . 7	124 . 0	58 . 0	408 . 1	57 . 4
Alkalinity	72 . 0	64 . 0	118 . 0	216 . 0	117 . 0	130 . 0	78 . 3	64 . 0	216 . 0	66 . 9
T D S	65 . 1	82 . 1	124 . 3	195 . 6	106 . 8	103 . 2	58 . 1	64 . 0	195 . 6	54 . 4
Phosphate	17 . 9	20 . 8	7 . 4	10 . 5	13 . 0	14 . 2	6 . 3	7 . 4	20 . 8	48 . 1

II. LITERATURE REVIEW

A Physico- Chemical monitoring of major rivers in punewasdone during the month of January 2012 by Mane A. V., Pardeshir. G., Gore V. R., Walave R. L., Manjrekar S. S. and Sutar G.N. In Pune city there are three major rivers named Mula, Mutha and Pavana. For this assessment four sampling points were selected from Kivalega onto Kalewadiphata of Pavana River and the samples were collected along the course of rivers. The analysis was carried out for the parameters namely pH, DO, BOD, COD, TDS, EC, Alkalinity, Free CO₂, Hardness, Phosphorous as Phosphate. In many places the continuous discharge of industrial effluents and sewage are being discharged into the rivers, which probably exceeds the assimilative capacity of environment, leads to accumulation of pollutants on ground water and soils. The results obtained in this investigations revealed that the discharge of untreated industrial effluents and sewage have contributed considerable pollution in the river Pavana hence the water of river is unsafe for consumption or human use and needs preventive action. A major area of interest in studies of stream water quality is the evaluation of trends over time in certain constituent concentrations that can be attributed to human activities. Many causes of water pollution including sewage and fertilizers contain nutrients, (such as nitrites, Sulphate, and phosphates). If added in excess levels, nutrients over stimulate the growth of aquatic plants and algae. Excessive growth of these types of organisms consequently clogs our waterways. Pollution is also caused when silt and other suspended solids, such as soil, wash of plowed, construction and logging sites, urban areas and eroded riverbanks when it rains. Pollution in the form of organic matter enters waterways in many different ways as sewage, leaves and grass clipping. When natural bacteria and protozoan in the water break down this organic material, they begin to use up the oxygen dissolved in the water. Many types of fish and bottom dwelling animals cannot survive when dissolved oxygen drops below 4 parts per million. When this occurs, it kills aquatic organisms in large numbers to disruptions in the food chain causing "Eutrophication."

III Material and Method

sample. Lead (Pb) is highly toxic to humans and was also observed to be present in some samples. The parameters DO, COD, BOD, Alkalinity, Total Hardness, Total Phosphorous and Free CO₂ were varying significantly due to different environmental conditions and wastewater receiving sites located at the bank of river.

Sediments collected from four different sites also showed higher levels of heavy metals and is the clear indication of contamination. Sources of wastewater from industries and residential areas, washing clothes, cars and dumping of garbage was observed on these sites. It was also observed that the natural quality of water resources is getting deteriorated at faster rate. Ground water of this area showed higher values of hardness content as compared to surface water range (58 to 111.2 mg/l). The higher value of TDS (195.6 mg/l) in one area of water and in other site 65.12 mg/l. COD was observed by value of 120mg/l at surface water at one site, 33.8 mg/l at other site. D.O. is the important parameter in assessing water quality and reflects the physical and biological processes, prevailing in the water. Good water should have the solubility of oxygen. Oxygen saturated water have pleasant taste. The DO of Bhima River ranges from 1.6 to 5.2 mg/l. further studies are needed with an extensive and continuous study for other priority pollutants and monitoring the area of influence. More representative samples should be used to go beyond preliminary assessment as reported in the present study and thereby making appropriate recommendations. At last literature is also recommend that the surface and ground water monitoring should be carried out on planned basis and frequently by respective government departments. Such type of monitoring studies should go beyond nominal water parameters and should have a standard list of parameters as suggested by international agencies like World Health Organization including heavy metals, various group of pesticides and micro pollutants of special importance to ecosystems.

V. CONCLUSION

The Bhima river besides domestic sewage; receives enormous amount of industrial wastes with a high Physico-Chemical characteristics, which makes it to be another polluted river next to Purna river. According to review of literature paper from 2017, it is also observed that there is need to analyze the

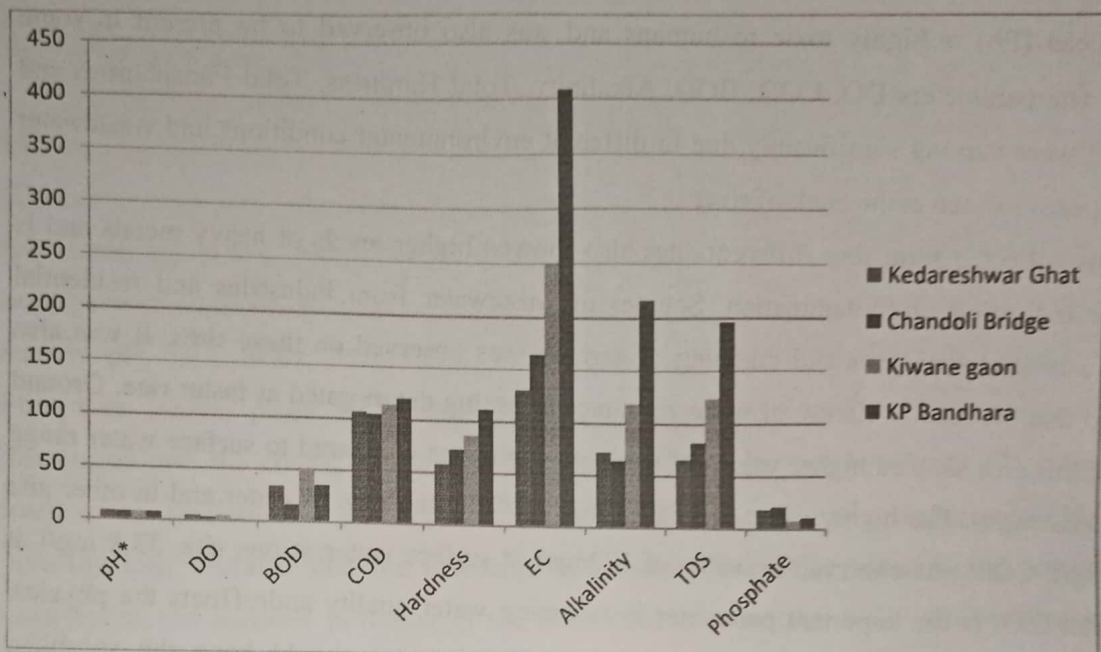


Figure No. I

The water samples were collected in the month of January 2017. Samples were tested using the standard procedure in accordance with the standard method of American Public Health Association (1995). The results obtained at the abovementioned sampling stations are given in the observation table. In the present study of literature investigation, an attempt has been made to assess water quality with reference to physicochemical properties, heavy metals, sediment and weed analysis of the riverine area of Bhima. Khed is a major industrial hub and hosts one of the biggest industrial zones in Khed tahasil. This town is home to the Indian operations of major automobile companies, several industries, manufacturing units etc. leading to various kinds of pollution. The site Kiwanenand site K P Bandhara was observed to be polluted because of industries around and their discharges. The site KP Bandhara was highly polluted in relation with higher free CO₂ and alkalinity as compared to site Kiwane. Higher values of TDS, EC also indicate more pollution at site Kiwane. The concentration of heavy metals was also observed to be higher at site KP Bandhara and site Kiwane as compared to other two sites (i.e. Kedareshwar ghat and Chandoli bridge site) indicating pollution of surface, ground water, sediment and weed

- v. PHYSICOCHEMICAL ANALYSIS OF MULA MUTHARIVER PUNE Pali Sahu¹, SonaliKarad, SagarChavan and SourabhKhandelwalAsst.Prof. Environmental Engineering, CivilDepartment, VIIT, Pune, India U.G. Student, Civil Department, VIIT,Pune, India.
- vi. Dr. RoohollahBehzad Department of EnvironmentalScience. University of Pune Dr. Ravindra G. Jaynhaye Professor of the Department of Geography. University of Pune Dr. Praveen G.Saptarshi Retired Professor of the Department of Environmental.University of Pune Assessment of Water Quality in ManasLake (Pune-India) With Reference to the Human Impact.
- vii. Hydrobiological Study of Algae of an Urban FreshwaterRiver JAFARI, N G; GUNALE, V RDepartment of Environmental Sciences, University of Pune, India.Department of Botany, Universityof Pune, India.
- viii. Water quality and sediment analysis at selected locations ofPavana river of Pune district, Maharashtra Mane A. V., Pardeshi R.G., Gore V. R., Walave R. L., Manjrekar S. S. and Sutar G. N.Department of Environmental Sciences, Fergusson College, PuneFergusson College, PuneDepartment of Chemistry, FergussonCollege, Pune. (Journal of Chemical and Pharmaceutical Research,2013, 5(8):91-102 Research Article ISSN : 0975-7384 CODEN(USA) :JCPRC5)
- ix. Comparative Review of Physicochemical Assessment of Pavana River RiverNidhi Jain,2R.K.Shrivastava Department of Science and Humanity, Genba-SopanraoMoze Institute of Technology, Pune University, IndiaP.G.Department of Environmental Science, Government ModelScience College, Center of Excellence (NAAC Accredited („A“ Grade,Jabalpur (M.P.), India. (IOSR Journal of Environmental Science Toxicology and Food Technology (IOSR-

present status of Bhima River with respect to present condition of population, industrial development and pollution by the same.

REFERENCES

i. Research Journal of Animal, Veterinary and Fishery Sciences Vol. 1(1), 11-16, February (2013) Res. J. Animal, Veterinary

& Fishery Sci. The Seasonal Fluctuation of Physico-Chemical International Journal of Engineering Research ISSN:2319-6890 (online),2347-5013(print)Volume No.6, Issue No.4, pp :216-219 1 April. 2017DOI : 10.5958/2319-6890.2017.00005.8 Page 219parameters of River Mula- Mutha at Pune, India and their Impact on Fish Biodiversity ChandanshiveNavnathEknath Zoology Department,Fergusson College, Pune, MS, INDIA

ii. International Journal of Innovative Research in Science,Engineering and Technology (An ISO 3297: 2007 Certified

Organization) Vol. 2, Issue 9, September 2013 Copyright to IJIRSETwww.ijirset.com 4349 Physico-chemical characteristics of river water of ganga in middle ganga plains Dr. LeenaSingh& Prof. (Dr.) S.KChoudhary Assistant Professor, Department of Chemistry, GalgotiasCollege of Engineering. & Technology, Greater Noida, U.P, IndiaDepartment of Botany T.M. Bhagalpur University, Bhagalpur, Bihar,India.

iii. Physico-chemical assessment of water quality of river Chambal in kota city area of Rajasthan state (India) Nitin Gupta,

S.M.Nafees, M.K.Jain and S. Kalpana Environmental Chemistry Laboratory, P.G. Department of Chemistry, Govt. College, Kota, Rajasthan.

iv. Qualitative analysis of surface water of panchganga river(ms), indiaSanindharShreedharGaikwad and NitinAnandraoKambleDepartment of Zoology, Shivaji University, Kolhapur- 416 004, (MS)India.

JESTFT) e-ISSN: 2319-2402,p- ISSN: 2319-2399. Volume 8, Issue 6 Ver. III (Jun. 2014), PP25-30).

x. D.G.Kanase, S.D.Jadhav, R.W.Jawale, M.S.Kadam, A study on some physicochemical characteristics of flowing water of Major River in Pune city.

xi. Patil. P.N, Sawant.D.V, Deshmukh. R.N “ Physico-chemical parameters for testing of water – A review” International Journal of Environmental Sciences Volume 3, No 3, 2012

xii. Inderdeep Kaur and Deen Dayal Verma, “Physicochemical and Microbiological Study of River Water of Ganga and Yamuna in Allahabad” Asian Journal of Science and Technology ISSN: 0976-3376 Vol. 5, Issue 11, pp.669-673, November, 2014

xiii. Manohar G. Gavit, Mohd. Shahnawaz, Manish K. Sangale, Halimabi A. Kureshi and Avinash Bade, (2013), International Journal of Current Research 5(02), Page 232-235.

xiv. APHA 2012 EDITION.