

Assessment of Physico-Chemical Characteristics of Chambal River near Kota District, Rajasthan

Abstract

Water sample collected from Chambal river in Kota for pre monsoon. The month of Jan-Mar were considered as pre monsoon. The recent work were carried out to evaluate the magnitude of the Physico-chemical parameter of Chambal river. This work to analyzed different physico-chemical parameter like Total Dissolved solids, Bio-chemical oxygen demand, fluoride, Total hardness, Dissolved oxygen content and coliforms bacteria. The result obtained in the present investigation show that the concentration of fluoride is minimum but in same sample of Raw water were found coliforms bacteria as much as 2400 MPN/ 100ml. The Presence of coliforms bacteria indicates presence of absence of pathogenic bacteria.

Keywords: Chambal, Kota, River.

Introduction

Water is mostly used for industrial and municipal purposes. Today pollution of water resources have been most exploited due to increasing pollution, Industrialization, Urbanization, increasing living standards and broad spheres of human activities. The Chambal river originates at Manpura, south of Mhow town, near Indor, on the south slope of the Vindhya Range in Madhya Pradesh Chambal play vital role in Irrigation and electricity generation in south east Rajasthan with four main Dams on Chambal in Rajasthan and Madhya Pradesh. Ancient name of Chambal is said to be Charmanyavati, which may be in reference to the story of King Rantideva sacrificing several cows on its banks.

Rajasthan has the largest catchment area of the Chambal river at 79,401 square Km, which is 57.86 percent of the total catchment of the river. The Chambal river is the only perennial river of Rajasthan state. There are four major dam on Chambal river. Kota Barrage is the fourth in the series of Chambal vally project, located about 0-8 km. up stream of Kota city in Rajasthan. Kota barrage is used only for irrigation, Power generation is not done here. Kota barrage water is used for irrigation in Rajasthan and Madhya Pradesh through two canel. Kota Barrage stretches for a catchment area of 27,332 Sq. Km. in total. The Barrage operater through 19 gates to control the flow of water.

Aim of the Study

Rivers are the most dynamic water resource of the earth's ecosystem. Their major function being the transportation of water. Good quality water is inadequate even for the normal living and is getting polluted due to numerous discharges. River pollution can be caused by several effluents and their effects are of great concern to health. Disposal of water generated from municipal and industrial sources with little or no treatment prior to discharged is a common practice in many developing countries including India. Rivers play a major role in assimilating or carrying off industrial and municipal waste water manure discharge run off from agricultural field, road ways and streets. Which are responsible for river pollution. Major Indian rivers are severely polluted. There are 26 different Nullohas that drain into the river Chambal within the municipal expanse. Hot water discharge from Kota super thermal power station is also adding to pollution. These pollution become decrease water quality of river. The suspended solids odors and turbidity get increased in rainy seasons.

Experimental

The water sample was collected from morning hours for which air tight bottles used. The temperature was measured by mercury thermometer graduated up to 100^oc at regular intervals. The study of

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present year data of chemical and Bacteriological examination of Raw water upstream of the river Chambal.

Table
Physico-Chemical Parameters of Kota Barrage Dam

1.	Total dissolved solids	148 to 380 mg/liter
2	pH	7.6 to 8.5
3	Bio-chemical oxygen Demand	Nil to 0.3
4	Fluoride	0.1 to 0.2 mg/l.
5	Total Hardness	80 to 150 mg/l.
6	Dissolved oxygen	4.0 to 6.5 mg/l
7	coliforms bacteria (MNP)	2400 MPN/ 100ml.

Result and Discussion

There are 26 different Nullahas that drain into the river Chambal within the municipal expanse. Hot water discharged from Kota super thermal power station is also adding to pollution. There is temperature gradient [difference in temperature between river water & out fall of thermal power station] of approximately 7-10⁰c causing possible damage to aquatic life. In fact very few higher organism can tolerate temperature above 35 to 40 degree centigrade moreover, with the rise in temperature the solubility of oxygen decreases where as salt increase. Decay of organic matter and other oxidation processer accure more rapidly in warm water. Change in habitat brings changes in the species composition of aquatic-biota. The Dissolved oxygen content is hovering near threshold limit of 5 PPM. Fluoride concentration in Chambal ranges from 0.1 to 0.3 PPM According to UNESCO (1963) & california state water pollution control Board (1952) fluoride concentration in drinking water less than 0.5 PPM can lead to higher incidence of dental carries, fewer cavities in the teeth of children.

Califorms in some samples of Raw water were found as much as 2400 MPN/ 100ml. Coliforms which in themselves are harmless organism but their presence or absence indicate presence/ absence of pathogens bacteria. Water is consider safe if no coliform are present in it.

Conclusion

Near the Kota city surface water quality of Chambal river is very poor because of 26 different Nullahas that drain in to the river within the municipal expanse. Water pollution is indeed a very serious concern because it not only has. impact on human health and also aquatic biota. Waste from thermal

power plants municipal expanse, agriculture effluents are affecting the productivity of many rivers.

It is therefore highly important to devise methods to reduced the level of water pollution that we are currently facing. Many river banks are artificially constructed. They causes an important biological corridor to be lost as well as the water clearing function of the vegetation.

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