

WATER QUALITY ASSESSMENT OF KISHORSAGAR POND, CHHATARPUR (M.P.)

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Abstract- The Kishor Sagar pond is the famous pond of Chhatarpur district, M.P. monitoring of physico-chemical analysis of water was carried out monthly during January 2012 to June 2012. The parameters investigated Depth Colour, Odour, water temperature, pH, Electrical conductivity, Total dissolved solid, alkalinity, D.O, Total hardness, Calcium hardness, Magnesium hardness. The water samples were analyzed using standard methods for examination of water and waste water (APHA, AWWA, 1995). The present study indicates that the Kishor Sagar pond is not good. The unmanaged and unwanted activities of surrounding population of the area are deteriorating the pond water quality continuously.

KEYWORDS- Water quality, Kishor Sagar pond.

I. INTRODUCTION-

Life originated in water and during the course of evolution life became dependent on water. Thus, it is rightly said that water is the liquid of life. Water is essential for life. Water is a liquid at ambient conditions, but it often co-exists on earth with its solids state, ice and gaseous state, water vapour or steam.

Chhatarpur district is a district of Madhya Pradesh state of central India. The town of Chhatarpur is a district headquarters. Chhatarpur district located at 24.06° & 25.20°N 78.59° & 80.26 °E respectively. Kishor Sagar is situated near Prajapati Brahma kumari Ishwariya Vishva Vidhyalaya. This pond is located in top sheet Khasra No. 3087/1. The Area on this pond is 3.160 hectare. Kishor Sagar lies at latitude 24°54'41" N and longitude 79°35'3" N, the pond was constructed by Maharaja Kishor Singh in 18th century A.D. It is decorated with beautiful Ghats. The catchment area of this pond is in square shape.

Its base is manmade boundary, which have height stairs. Initially its water has been used even for drinking but presently the same is used only for domestic and bathing purpose by the people nearby locality, also dumping of the household waste on the sides of pond is making the pond water polluted.

The physico-chemical monitoring of aforesaid pond water was carried out. In recent times, water quality has deteriorated in many of the river due to rapid industrialization population growth and intensive agriculture as they generate increasing quantity of industrial waste water and agricultural run offs respectively. Pathogenic water pollution due to domestic and human waste is the root cause of many water borne diseases. Water quality degradation is increasingly becoming a source of conflict among upstream and downstream users (Krishna Gopal et al. 2008).

Expanding human population brought about by the opportunities of good water supply, irrigation, fish production recreation and navigation offered by pond has put enormous pressure and stress on the quality of water impounded by the ponds. The impact of human activities in and around the pond is felt on the unique physical and chemical properties of water on which the sustenance of fish that inhabit the pond is built as well as to the functions of the pond. Water quality is determined by the physical and chemical limnology of a reservoir (Sidnei et al., 1992) and includes all physical, chemical and biological factors of water that influence the beneficial use of the water. Water quality is important in drinking water supply, irrigation, fish production, recreation and other purposes to which the water must have been impounded.

The provision of potable water to the rural and urban population is necessary to prevent water born disease

(Nikoladze and Akastal, 1989; Iemo, 2002). Before water can be described as a potable, it has to comply with certain physical, chemical, and microbiological standards, which are designed to ensure that the water is potable and safe for drinking (Tebutt, 1983). Potable water is defined as the water which is free from disease producing microorganism and chemical substance that deleterious to health (Ikehoronye and Ngoddy, 1985). Water can be obtained from a number of sources, among which are; streams, lakes, rivers, ponds, spring and wells (Linsely and Frazini 1979; kolade 1982). Unfortunately, clean, pure and safe water only exist briefly in nature and immediately polluted by prevailing environmental factor and human activities



The KishorSagarPond,Chhatarpur (M.P)

II. MATERIAL AND METHODS–

Physico-chemical analysis of kishorSagarwater was carried out during January 2012 to June 2012. For the present investigation of the ponds water and sample collected from the sampling station.the sampling was done monthly basis, for physico-chemical analysis of water,sample was collected of the water bottles of twoliter capacity from the surface layer.Some of the parameters including temperature, odour, depth, D.O, Alkalinity done on the spot. All samples were immediately transported to the laboratory, they analyzed within 24 hours. Entire analysis was carried out using standard methods for examination of water and waste water (APHA, AWWA, 1995).

III. RESULT AND DISSCUSSION-

In the present investigation, the depth ranged from 5.5 f to 2. the maximum depths 5.5 f was recorded in the month of January and the minimum depth 2 feet was recorded in the month of June.

During the present investigation water temperature at kishorSagar pond 15°C to 42°C. The increase in atmospheric temperature caused increase in evaporation rate resulting in the water depth. This type of observation for shallow water bodies is in conformity with the earlier findings (Malhotra et al., 1986).

The TDS value has been found at in the range of 399 to 525 mg/l. the total dissolved solids have been found to be of moderate nature of KishorSagarpond.

The colour was found greenish. The greenish colouring was because of algae species and micro-organism. The odour, That is of the pond water was found dependent on its pH .the present of nitrogen, phosphorus and other organic compounds also create the odour. The presence of sewage and other organic waste was the major cause of odour in the pond.

The value of pH was found in the range of 8.9 to 7.5. The pH recorded during the present investigation was generally of near slightly alkaline. Slightly alkaline range suggesting that the ponds water was well buffered throughout the period. The pH value (towards alkaline side) beneficial to enhancement of photosynthetic rate. Similar results were observed in Benisagar Dam, Chhatarpur (M.P.), India by Shukla et. al. (2013).

Total hardness value was found in the range of 272 to 335 mg/l. In the present investigation of total hardness increase due to the high evaporation rate, so TDS value is increase.

The D.O were observed 5.6 to 2mg/l. sewage effluent also responsible for eutrophication because they increase pond fertility and responsible for decrease in D.O and increase dissolved CO₂ this cause us increase of alkalinity is responsible for creation of high alkaline pH. Present observations are also in agreement with the findings of Moundiotiya et al (2004), Rani et al (2004), Thakur and Bais (2006),

Mishra et al (2008), Sharma and Capoor (2010) and Arya et al (2011).

Table No. 1 Monthly variation of water Quality of KishorSagar pond Chhatarpur M.P.

Water Quality Parameter	Month 2012					
	Jan.	Feb.	March	April	May	June
Depth	5.5 f	5.4 f	5 f	4 f	3.8 f	2 f
Water temperature.(°C)	15°C	17°C	30 °C	37° C	40° C	42 °C
pH	8.9	8	7.4	7.3	7.4	7.5
Elect.cond. (µmhos/c.m)	614	456	759	751	759	760
TDS(mg/l)	399	493	510	516	518	525
Alkalinity(ml/l)	216	219	224	238	242	248
D.O(mg/l)	5.6	4.8	3.9	2	2.2	2
Total hardness (mg/l)	272	282	293	304	308	335
Calcium hard. (mg/l)	176	181	186	192	198	211
Magnesium hard.(mg/l)	96	101	107	112	116	128

IV. CONCLUSION-

The present study indicates that the KishorSagar pond is not good. The unmanaged and unwanted activities of surrounding population of the area are deteriorating the pond water quality continuously. Uniform distribution of total dissolved solid have been found at both the sites of these ponds. The total dissolved solids have been found to be of moderate nature in KishorSagar pond. The conductivity values were recorded to be moderate range in the present system. There were not much difference between bottom and surface conductivity value of kishorSagar pond. Due to the increase in environmental temperature and accumulation of sewage these are two main factors which are responsible for creation and problem of eutrophic condition of kishorSagar pond.

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