RESEARCH ARTICLE

Water quality assessment of Vishnupuri dam, in Nanded District, Maharashtra, India.

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ABSTRACT

Physico-chemical characters of Vishnupuri dam of Nanded District, Maharashtra have been studied. The water temperature varied between 21.0 to 36.0°C. The total alkalinity ranged between 80 to 260 mg/l. The total solids ranged between 260 to 405 mg/l. The total dissolved solids ranged between 187 to 280 mg/l. The total suspended ranged between 13 to 167 mg/l. Respectively. The study revealed that the Vishnupuri Dam water is suitable for fisheries, drinking water and agriculture.

Keyword: Vishnupuri dam, Water temperature, total alkalinity, total solids.

INTRODUCTION

In Marathwada region comprising the eight district. The Godavari river is the most important river in Marathwada region. It has the Source at Trimbakeshwar in Sahydries hills near Nashik, this river enters in Aurangabad district and flowing through Beed, Parbhani and Nanded District. The other river of Marathwada region are Purna Painganga, Dudna, Asna, Sindhphana Bindusara, which are used for drinking water, agriculture industries and fisheries purpose. The study of physico-chemical characteristics of Vishnupuri Dam includes the water temp. Total alkalinity, total solids, total dissolved solids and total suspended solid. The water is the most vital elements of the environments. It is being used for many purposes e.g. irrigation, drinking, propagation of fish and other aquatic system and generation of hydro-power plants. Water is the main source of energy and governs the evolution on the earth. In the ecosystem water is considered to be the most important component for the life. Water quality is the physical, chemical and biological characteristics of water. Water quality also affects the biodiversity of aquatic organisms. Water is essential for social-economic development and for maintaining healthy ecosystem. It is necessary to know the physico-chemical properties of water to study the rearing practices of the fish in water bodies. The Vishnupuri Dam is one of the major irrigation projects of Maharashtra State. The main scope of this dam is irrigation, fish culture and drinking purposes. Many researchers have done Studies on Assessment of Water Quality of River and Dam Water. Chandanshive (2013), Jagtap et. all; (2012), APHA (1992), D. Kar et. all; (2008), Lendhe and Yergi

(2004), Simpi et. all; (2011), Alka (2014), Meme et. all; (2014), Lubal et. all; (2012), Ramchandra (2010), Manjare et. all; (2010), Harney et. all; (2012).

MATERIAL AND METHODS

Study site

Nanded city receives its daily water supply from Vishnupuri dam situated near Asarjan village on the river. The command area of the dam is distributed in Nanded, Kandhar & Loha taluka of Nanded district. The dam has a live storage of about 80.79 million cubic meters, out of which 43.95 million cubic meters storage is reserved for drinking purpose for Nanded city and 10.26 million cubic meters storage is reserved for industrial applications.



Fig. 1: Vishnupuri Dam constructed on Godavari River in Nanded

The water samples were collected for physico-chemical analysis from four stations, (A, B, C and D) at the regular intervals of one month during the year June 2015 to May 2016. The samples are well mixed and stored in two liter plastic cans. Sample collection was usually completed during morning hours between 6:00 A.M. to 9:00 A.M. every for further analysis. The water temperature were estimated on the spot at the time of sampling while other parameters were estimated in the laboratory. Standard methods as prescribed APHA (1992), were followed for examination of various physical and chemical parameters of water.

RESULT AND DISCUSSION

Temperature of surface water :-

The fresh water environment best demonstrate rate the unique thermal properties of water. It is a factor of prime important in the physical environment of organisms. It regulates the self purification capacity of rivers. The surface water of Vishnupuri Dam ranged from 21.0 to 30.0°C. It is evident that the surface3 water temperature increased October and there after it gradually reduced quaintly the higher temperature observed in May. The significant correlation between ambient temperature and water temperature was observed by Ganpati (1943), and Verma (1967). Pointed out the seasonal changes were mainly dependent on water temperature in Gidigich reservoir.

Total Alkalinity

Water is said to be alkaline when the concentration of hydroxyl ion exceeds that of hydrogen ions. Chemically pure water is neutral having equal amount of hydrogen and hydroxyl ion. The total alkalinity of Vishnupuri Dam water varied between 88 to 260 mg/l. These values are without the desirable limit according to ICMR and BIS specification. Sakhre and Joshi (2003) found the alkalinity values varied from 672 to 1023 mg/l. in Papnas a minor wetland in Tuljapur Town, Maharashtra.

Total Solids, total dissolved solids and total Suspended Solids

The total solids ranged from 260 to 405 mg/*l*. The total dissolved solids ranged from 187 to 280 mg/*l*. The total suspended solids ranged from 13 to 167 mg/*l*. The high contents of total solids elevate the density of water and such a medium increases Osmoregulatory stress on aquatic biota. The excessive total dissolved solids generally affects palatability. In river total dissolved solids increase is attributed to pollution by effluents. The values of all water sample are within the permissible limits prescribed by WHO. Similar results were observed by Rekha Sharma (1997), Paka and Narsingrao (1997). The higher values of total solids during monsoon may be attributed to an increased load of soluble salts from the catchment areas due to the surface run off.

Parameters	Water Temp. ºC				Total Alkalinity (mg/l)				Total solids (mg/l)				Total Dissolved Solids (mg/l)				Total Suspended (mg/l)			
Station	Α	В	C	D	Α	В	C	D	Α	В	С	D	Α	В	C	D	Α	В	С	D
June	33	32	34	33.5	190	195	205	209	329	340	345	335	240	245	248	250	89	95	97	85
July	30	31	29	29.5	162	168	172	176	360	365	355	370	251	255	288	254	109	110	97	116
August	28	27	26	25.5	155	140	150	145	375	380	385	383	268	265	260	270	107	115	125	113
September	26	24	25	24.5	162	168	172	165	395	400	405	399	274	278	280	273	121	122	125	126
October	23	21.5	22	21	153	157	162	169	369	272	374	380	252	258	261	264	117	114	113	116
November	27	29	28	26	120	124	128	132	342	345	350	353	241	245	250	248	101	100	100	105
December	25	26	24	27	115	110	120	125	381	385	390	384	214	220	223	210	167	165	167	174
January	22	21.5	23	22.5	88	90	95	93	260	272	262	268	280	285	290	295	20	13	28	27
February	24	22	26	24.5	112	118	121	125	274	267	265	280	190	196	187	192	84	71	78	88
March	27	28	27.5	26	145	150	153	148	282	287	285	290	205	210	218	222	77	77	67	68
April	30	31	29.5	32	185	190	188	182	295	298	300	305	235	230	240	238	60	58	60	67
Мау	35	35.5	34	36	198	205	202	208	318	314	318	322	242	248	251	255	68	66	63	67

Table 1: Water Quality Assessment of Vishnupuri Dam, Year June 2015 to May 2016

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