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Analysis of physical and chemical parameters of Shivna Lawhali-Takli (medium project) Dam Water Tq.-Kannad, District-aurangabad, State-Maharashtra India

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ABSTRACT

The village Lawhali-Takli is situated 18 km from the world famous ELLORA CAVES in Tq. kannad District-Aurangabad Maharashtra state. In this recent article a detailed study of physical and chemical parameters of Shivna lawhali-takli (medium project) dam water has been discussed. In this brief research area we are studying Total dissolved solids, Total solids, Transparencies of water, Total suspended solids, potentiometric and conductivity results of Shivna lawhali-takli (medium project) dam water were investigated properly. All these physico-chemical parameters were discussed during year 2013-2015. Above all the parameters shows inherent path that water potentiometric, total solid, total dissolved solid, total suspended solid, were obtained as possible as in the seasonal sessions (months) of monsoon season such as conductivity and transparencies of water was observed maximum in the months of february., march, april, may and june. Seasonal variations in summer, winter and near about rainy season were recorded.

Keywords: Physical and chemical parameters, Shivna lawhali-takli (medium project) dam water

INTRODUCTION

The health of lakes and their biological diversity are directly related to health. In freshwater bodies, nutrients play a major role as their excesses lead to eutrophication. Excessive macrophytic vegetation is indicative of the eutrophication status of any water body[1]. Studied the physico- chemical characteristics of flowing water of major rivers in Pune city. The results they obtained in the investigations revealed that the discharge of untreated industrial effluent and sewage have contributed considerable pollution, hence the water of these rivers is unsafe for consumption or human use [2]. Sinha and Saxena (2007); showed that the drinking water at Hosanpur, J.P. Nagar India is found to be highly contaminated with reference to most of the physico- chemical parameters studied[3]. Physico-chemical analysis is the prime consideration to assess the quality of water for its better utilization like drinking, fisheries, irrigation, and industrial use and helpful in to know the complex processes, interaction between the environmental and biological processes in the water. The inter relation between the physico-chemical parameters and plankton production of water and its relation with fluctuation of zooplankton are great importance and basically essential in fish culture[4]. Water is a main life supporting factor on the planet Earth. India having very rich sources of inland water in the form of lakes, reservoirs and rivers. By impounding the river system, reservoirs are constructed for effective utilization of water for irrigation power generation and flood control[5]. The physico-chemical parameters such as pH, Conductivity, Alkalinity, Calcium, Magnesium, Chloride, Total Hardness, Fluoride, Nitrite, Do and COD were determined using standard method [6-9]. Aquatic ecosystem is the most diverse ecosystem in the world. The first life originated in the water and first organisms were also aquatic where water was the principal external as well as internal medium for organism. Reservoirs are formed or modified by human activity for specific purposes, in order to provide a reliable and controllable resource. Reservoirs are usually found in areas

of water scarcity or excess, or where there are agricultural or technological reasons to have controlled water resources [10]. Expanding human population brought about by the opportunities of good water supply, irrigation, fish production recreation and navigation offered by Dam has put enormous pressure and stress on the quality of water impounded by the dam. The impact of human activities in and around the dam is felt on the unique physical and chemical properties of water on which the sustenance of fish that inhabit the reservoir is built as well as to the functions of the reservoir. Water quality is determined by the physical and chemical limnology of a reservoir [11]. Water quality deterioration in reservoirs usually comes from excessive nutrient inputs, eutrophication, acidification, heavy metal contamination, organic pollution and obnoxious fishing practices. The effects of these “imports” into the reservoir do not only affect the socio-economic functions of the reservoir negatively, but also bring loss of structural biodiversity of the reservoir have used the physico-chemical properties of water to assess the water quality of a reservoir [12-13].

MATERIALS AND METHODS

We know that to obtain the desired results the samples were selectively collected from both sites such as Shivna (A) and Shivna (B) of Shivna lawhali-takli (medium project) dam water in seasonal ratio monthly in the bottles of polythene material during the years of Feb-June 2013, Feb. 2014 and June 2014 to get the excellent results of analysis of varieties of physical and chemical parameters.

Preparation of water samples:

The samples of water were collected in polythene bottles of capacity 2 liter in the month early in the morning and during the sunset time (evening). The samples from dam water sites were collected from canal water of lawhali village. These samples were collected from approximately 20-25 cm below the water surface. After collecting these samples were protected from direct heat and dust particles also maintained under suitable conditions.

RESULTS AND DISCUSSION

The Shivna lawhali-takli (medium project) dam water is the largest medium project, the dam has maximum six doors in Tq. kannad District-aurangabad maharashtra. The stagned water has multipurpose utility options such as for farming, local area water supply, fishery and scientific study etc.

As we know the bodies and antibodies are present in the stagned water such as suspended chemical matters. Total solid are the residues includes both suspended and dissolved solids. It contains different varieties of nutrients, minerals and ores. The total suspended solids are nothing but they are waste materials such as turbid matter.

The physical and chemical parameters of dam water were discussed during year 2013-2014. Conductometric titration results were obtained in case of inorganic materials present in stagned water. According to the hydrogen ion concentration of stagned i.e., dam water we may observe easily pH values through potentiometer.

Table: Monthly physico-chemical parameters in Shivna lawhali-takli (medium project) dam water.

Seasonal Months	Potentiometric value		Total solids value mg/L		TDS value mg/L		TSS value mg/L		Transparency of water Value in cm		Conductometric Value ms/cm	
	Shivna (A)	Shivna (B)	Shivna (A)	Shivna (B)	Shivna (A)	Shivna (B)	Shivna (A)	Shivna (B)	Shivna (A)	Shivna (B)	Shivna (A)	Shivna (B)
Feb. 2013	8.4	8.8	524	526	431	378	94	183	36.9	56.2	0.047	0.066
Mar. 2013	9.6	8.14	510	494	460	444	101	199	42.9	60.8	0.058	0.069
Apr. 2013	9.8	9.36	496	478	474	477	200	189	39	44.6	0.034	0.049
May. 2013	9.5	9.35	488	477	461	473	212	156	46.8	62	0.039	0.045
June. 2013	9.19	9.12	523	490	382	366	224	177	58.7	68	0.045	0.053
Feb. 2014	9.14	9.7	333	301	364	396	130	93	66	71	0.049	0.059
Mar 2014	9.10	9.5	341	366	396	480	104	98	88.9	83	0.046	0.061
Apr. 2014	8.7	8.9	346	378	413	400	135	140	94	107	0.061	0.088
May 2014	8.8	8.18	366	355	390	393	96	106	97.6	98.9	0.094	0.097
June 2014	8.5	8.20	363	343	413	407	99	121	98.9	116	0.101	0.108

Transparency:

The settlement of sand, silt and clay causes in a degree of transparency from the definite time of reaching a maximum range. The water transparency values were found to be ranged between 36.9 to 98.9 in cm at Shivna (A) column and 44.6 to 116 cm at Shivna (B) column. as these above results found explains that the water transparency values were found in increasing order during the months from february 2013 to june 2014 both Shivna (A) and Shivna (B) column respectively. All above these values were compared found up to 118.00 Yadav Janeshwar1, Pathak R.K.2 and Khan Eliyas2 (2013)¹⁷.

pH:

According to the potentiometric results the values were obtained in the ranges between 8.4 to 9.14 at Shivna (A) and 8.8 to 9.36 at Shivna (B) column, as these above results found explains that the increasing order from february 2013 to march 2014, While in decreasing order in months april to june 2014 in both Shivna (A) and Shivna (B) column. parallel pH values were recorded by S. A. Manjare et al. in the year of 2010¹⁵ and Gaddamwar A.G., Rajput P.R 2012¹⁶.

Total suspended solids:

The total suspended solid values were found to be ranged between 94 to 224 mg\L at Shivna (A) column and 93 to 199 mg\L at Shivna (B) column. as these above results found explains that total suspended solid values were maximum from month february to june 2013 and minimum in february to june 2014 in Shivna (A) column; while in Shivna (B) column february 2013 to june 2014 in decreasing order respectively these values were compared with International Journal of Innovations in Bio-Sciences 2012.

Total Solids:

The total solid values mostly recorded in the winter month of february were found to be ranged between 333 to 524 mg\L at Shivna (A) and 301 to 526 mg\L at Shivna (B) column. The desired results explains that the lower total solid values were in the month of feb. to june 2014 and maximum values in february to june 2013. All above ranged values were compared with Rankhamb S. V. and K.S. Raut 2012¹⁸

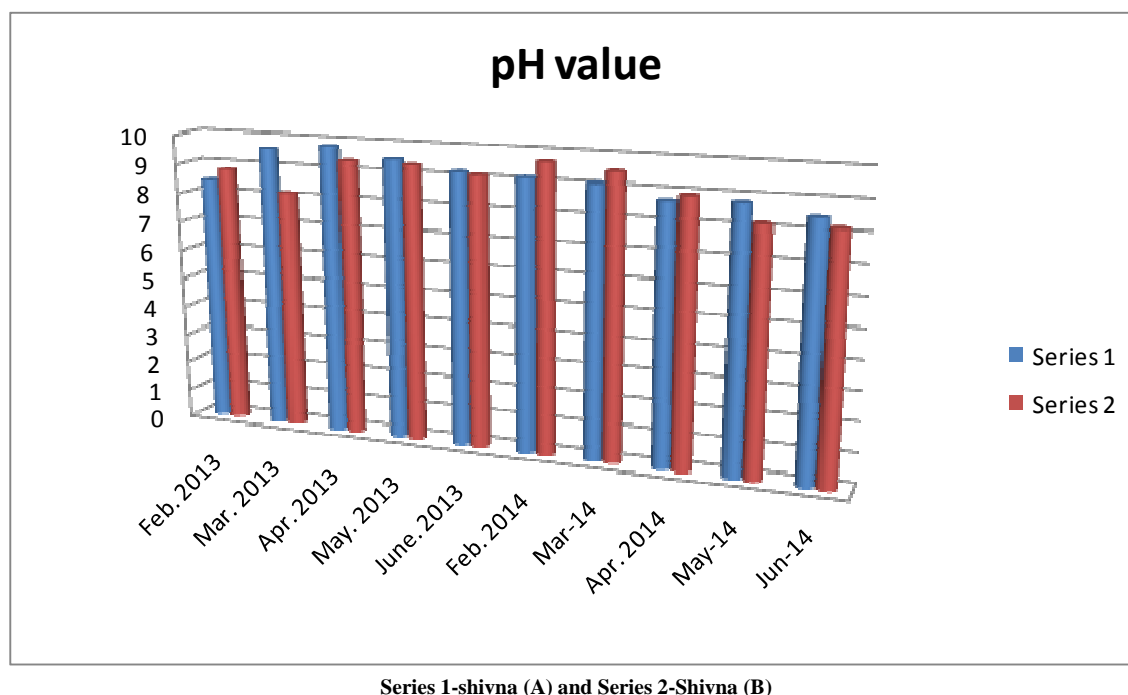
Total dissolved solids:

The total dissolved solid values were recorded in near about rainy season, found to be in the range between 364 to 474 mg\L at Shivna (A) column and 366 to 474 mg\L at Shivna (B) column. as these above results found explains that total dissolved solid values were maximum during months of february to may 2013 and lower values in march to june in the year of 2014. Parallel results were compared with Ajit M. Kalwale *et al* 2012¹⁴.

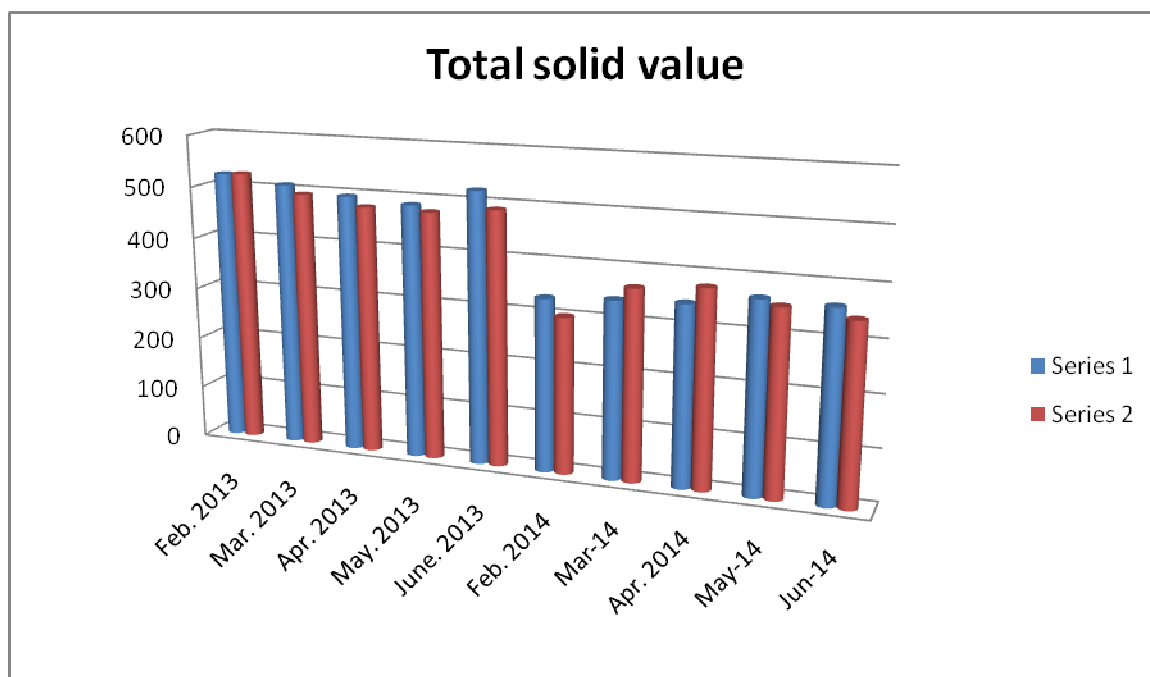
Conductance:

The conductance always depends on the concentration of total dissolved solids. The conductivity values were found to be ranged between 0.034 to 0.101 mg\cm at Shivna (A) column and 0.045 to 0.108 mg\cm at Shivna (B) column. As these above results found explains that the conductometric results were found in decreasing order from the months of february 2013 to march 2014 in both Shivna (A) and Shivna (B) columns respectively; and found to be in increasing order from the months of april 2014 to june 2014 in both Shivna (A) and Shivna (B) row. All above mentioned values of conductivities were compared with R.K. Jain, G.K. Jais, 2012¹⁹. The graphical presentation we may see as shown below,

Graph No. – 1: Seasonal monthly potentiometric values of Shivna lawhali-takli (medium project) dam water

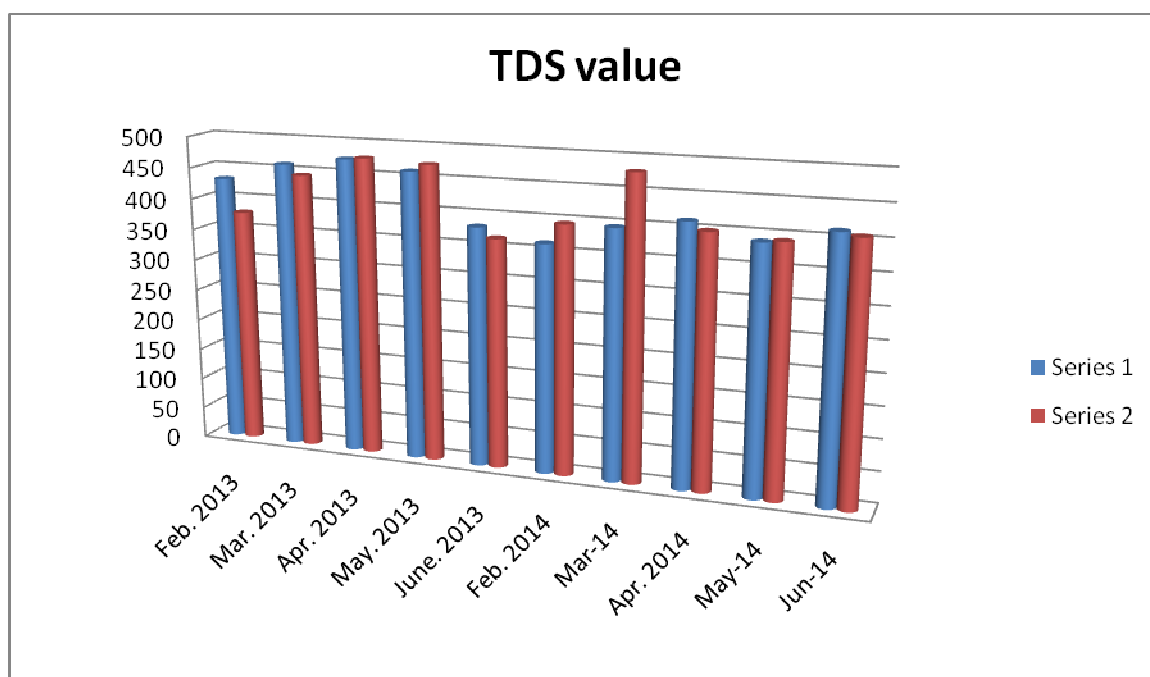


Graph No. – 2: Seasonal monthly Total solid values of Shivna lawhali-takli (medium project) dam water



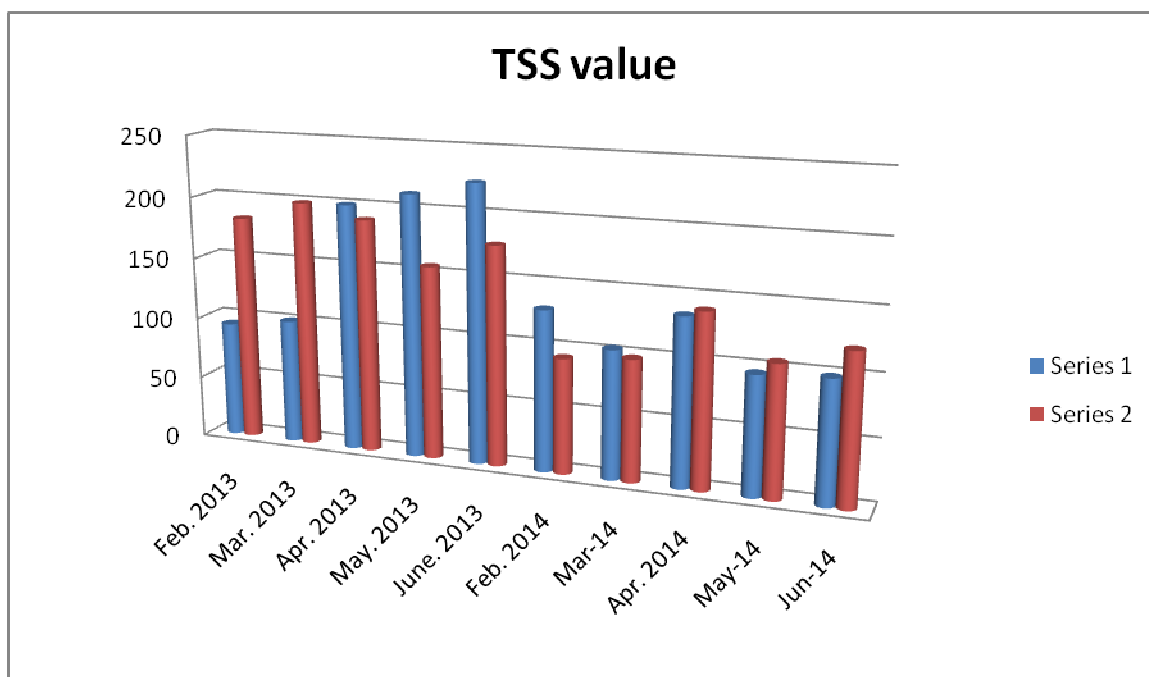
Series 1-shivna (A) and Series 2-Shivna (B)

Graph No. – 3: Seasonal monthly total dissolved solid values of Shivna lawhali-takli (medium project) dam water



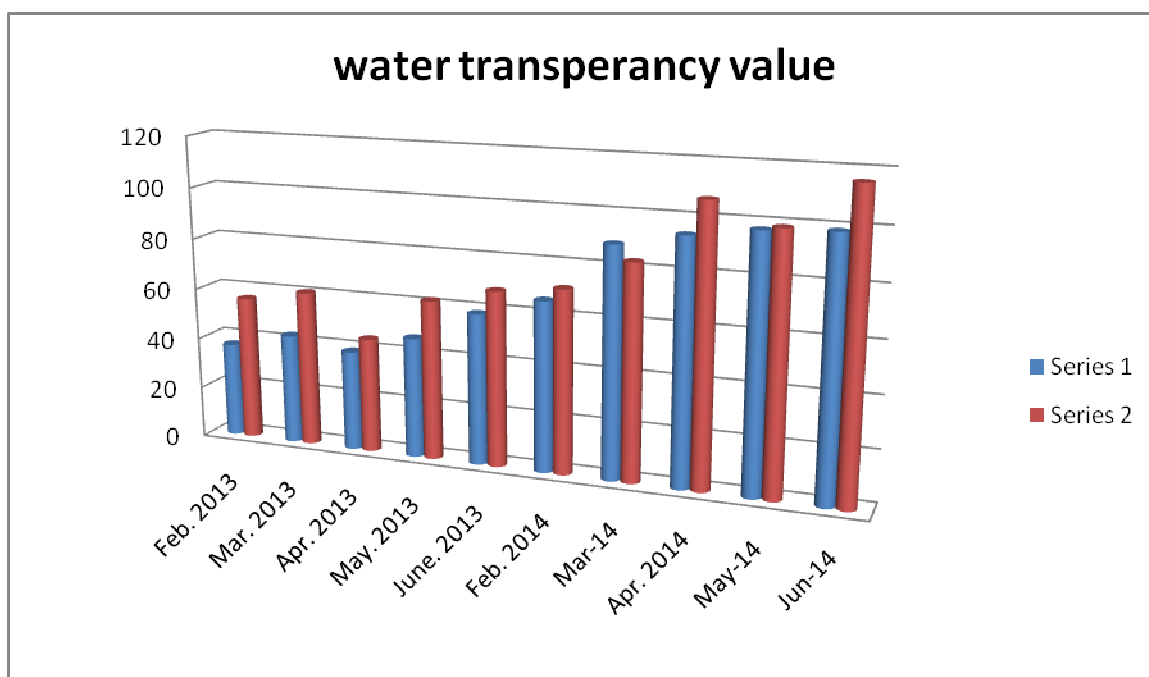
Series 1-shivna (A) and Series 2-Shivna (B)

Graph No. – 4: Seasonal monthly total suspended solid values of Shivna lawhali-takli (medium project) dam water



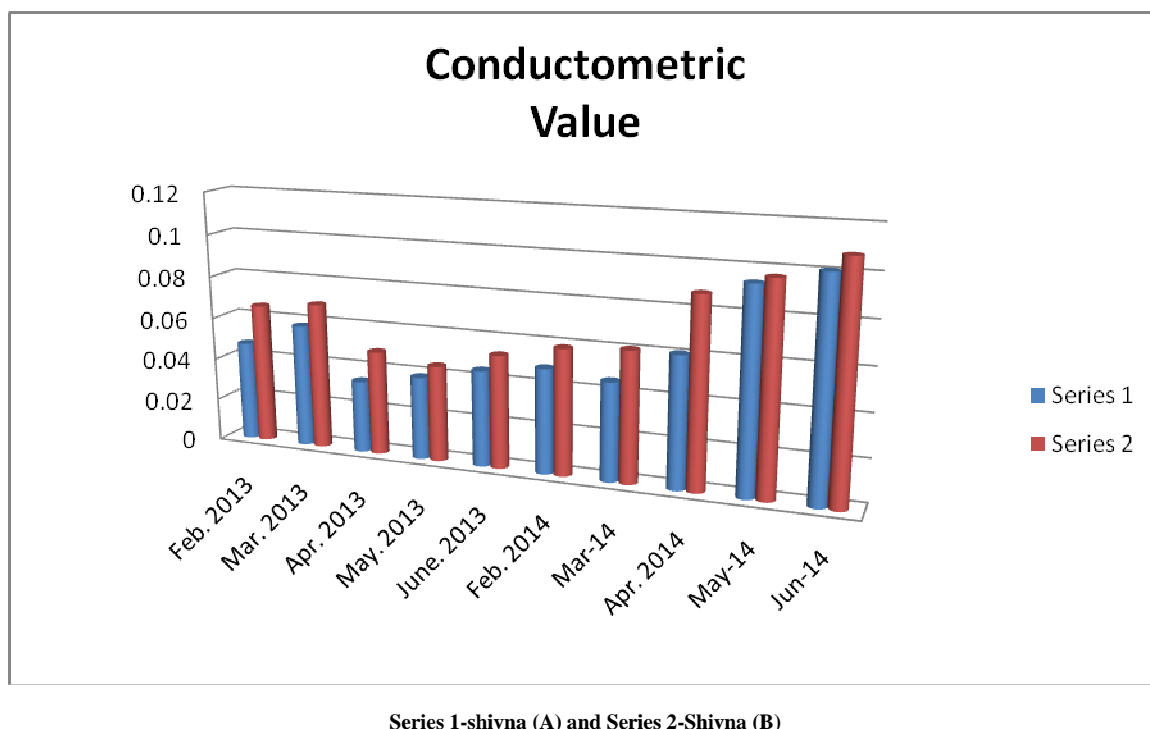
Series 1-shivna (A) and Series 2-Shivna (B)

Graph No. – 5: Seasonal monthly water transparency values of Shivna lawhali-takli (medium project) dam water



Series 1-shivna (A) and Series 2-Shivna (B)

Graph No. – 6: Seasonal monthly conductivity values of Shivna lawhali-takli (medium project) dam water



CONCLUSION

After detailed study of this dam water we may easily conclude that it has mesotrophic water revolutions. According to the international standards and world health organization the typical values we found matches near about. Total dissolved solids, Total solids, Transparencies of water, Total suspended solids, potentiometric and conductivity all these parameters passes the quality tests for drinking water for human health.

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