

STUDY OF SOME PHYSICO-CHEMICAL PARAMETERS OF UMA RIVER BASIN DIST- WASHIM (M.S.), INDIA

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Abstract:- Assessment of some physico-chemical parameters like water temperature, pH, turbidity, total dissolved solids, dissolved oxygen, and chlorides were taken. Finally it may be concluded that the water parameters are within permissible limit and support fish diversity in Uma River Basin Dist. Washim (M.S.). Water temperature ranges from 20.3 °C to 28.7 °C the minimum water temperature was recorded in the winter months and maximum in the summer months. It was observed that pH of water is minimum (7.2) during winter and higher (8.8) in summer season. Turbidity of river water result shows all the five stations had different values in all seasons. During study period the total dissolved salts (TDS) was maximum in rainy season (343.5 mg/l) and was maximum during summer (127.4 mg/l). It was observed that the value of D.O. fluctuates from 5.10 mg/l to 11.40 mg/l. The minimum values 11.40 mg/l was recorded in the month of December and maximum values 5.10 mg/l in the month of August. The maximum values of chlorides recorded during summer season while in winter less chloride content was detected.

KEYWORDS:- Uma River, pH, DO, Turbidity, Total dissolved solids.

INTRODUCTION:-

Water is unique component of nature and play an important role in the life from unicellular animals to man. The quality of water is described by its physical, chemical, and biological characteristics. Numerous man-made activities like addition of kitchen, bathrooms and toilet waste, industrial waste water, excess use of chemical fertilizers and pesticides has polluted environment of both surface and ground water. Increases

in urbanization, industrialization, agriculture activity are harmful for fresh water resources in the nature. Water of Uma River is basically utilized for domestic, agriculture and fisheries purpose. Many researchers (Wankhade et.al. 2012; Thirumala et.al. 2011; and Tambekar et.al. 2012) have done studies on physico-chemical properties of river water, dam and reservoir. However, no work has been carried out on water quality of Uma River Basin Dist. Washim (M.S.), hence present study was carried out. Also the objectives of the present study were to document the fish diversity in relation to physico-chemical characteristics of water and suggest appropriate conservation and management strategies.

MATERIALS AND METHODS:-

The water samples were collected from an Uma River Basin from five selected sites (A- Poha village, B- Kajaleshwar dam, C- Umari Arab Bridge, D- Dahatonda Bridge, E- Durgawada village) for a period of one year during the year Feb. 2016 to January 2017. The physical parameters such as river water temperature were recorded by using thermometer. The river water turbidity was measured by using secchi disc. The pH was determined by using Hanna pH meter. The chemical parameters of river water such as dissolved oxygen, and chlorides were determined by standard methods suggested by APHA (1995).

RESULTS AND DISCUSSION:-

Water samples from each station were collected in every month from various sites of five different stations from Uma River Basin. Result of physico-chemical parameters are given below:

Table 1: Uma River Water Analysis Year: 2016-17 Water temperature (°C):-

Sr. No.	Months	A	B	C	D	E	Mean
1	Feb. 16	20.5	20.3	20.6	20.7	20.7	20.56
2	Mar. 16	21.7	21.6	21.8	21.2	21.6	21.58
3	Apr. 16	27.3	27.4	27.8	27.8	27.6	27.58
4	May 16	28.2	28.4	28.3	28.1	28.7	28.34
5	June 16	28.3	28.6	28.5	28.4	27.9	28.54
6	July 16	24.5	24.9	25.0	25.4	25.4	25.04
7	August 16	24.6	25.3	25.0	24.9	24.8	24.92
8	Sept. 16	24.2	24.1	23.9	23.7	23.7	23.92
9	Oct. 16	21.6	21.7	21.8	21.3	21.5	21.58
10	Nov. 16	21.3	21.1	21.1	21.6	21.7	21.36
11	Dec. 16	21.1	21.5	21.3	21.7	21.3	21.38
12	Jan. 17	20.3	21.0	20.8	20.7	20.6	20.48

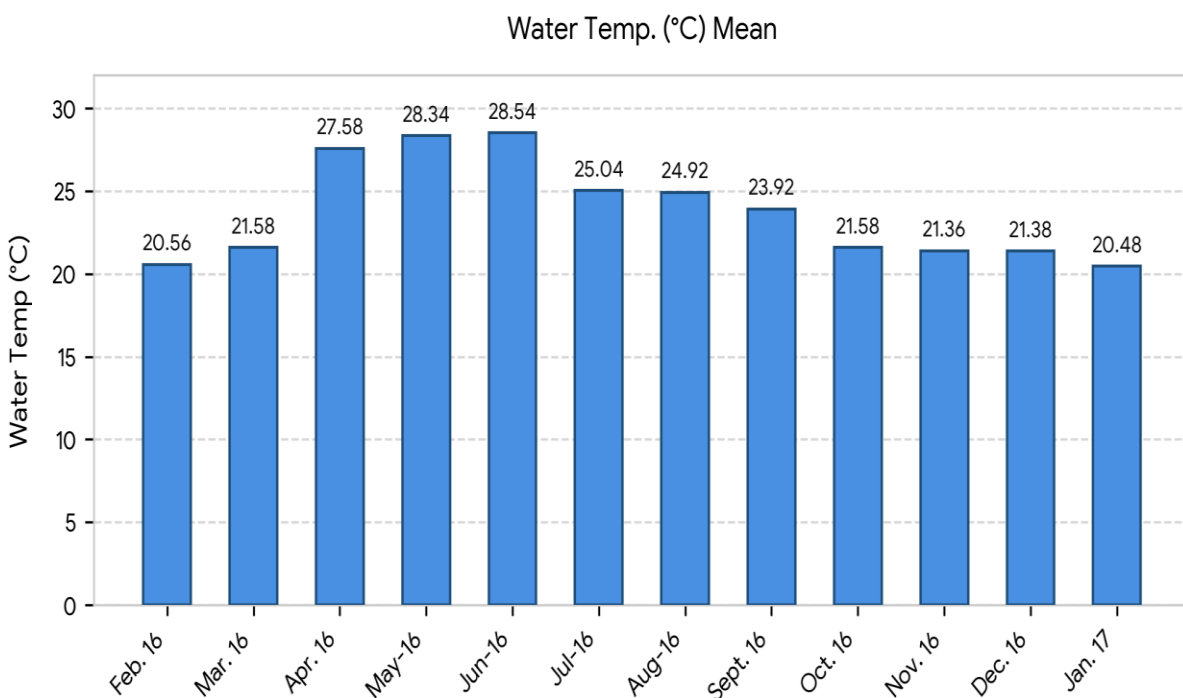


Fig 1: Water Temperature (°C) Monthly Mean Variation

Table 2: Uma River Water Analysis Year: 2016-17 pH:-

Sr.No.	Months	A	B	C	D	E	Mean
1	Feb. 16	8.2	8.6	8.4	8.4	8.3	8.38
2	Mar. 16	8.3	8.3	8.2	8.2	8.3	8.26
3	Apr. 16	8.4	8.4	8.8	8.8	8.8	8.64
4	May 16	8.8	8.6	8.8	8.6	8.8	8.72
5	June 16	8.6	8.6	8.8	8.8	8.5	8.66
6	July 16	8.3	8.3	8.6	8.5	8.1	8.36
7	August 16	8.1	8.3	8.3	8.4	8.3	8.28
8	Sept. 16	8.4	8.5	8.5	8.5	8.2	8.42
9	Oct. 16	7.9	7.3	7.2	7.3	7.6	7.46
10	Nov. 16	7.5	7.4	7.3	7.3	7.5	7.40
11	Dec. 16	7.6	7.6	7.8	7.9	7.8	7.74
12	Jan. 17	8.3	8.2	8.3	8.4	8.2	8.28

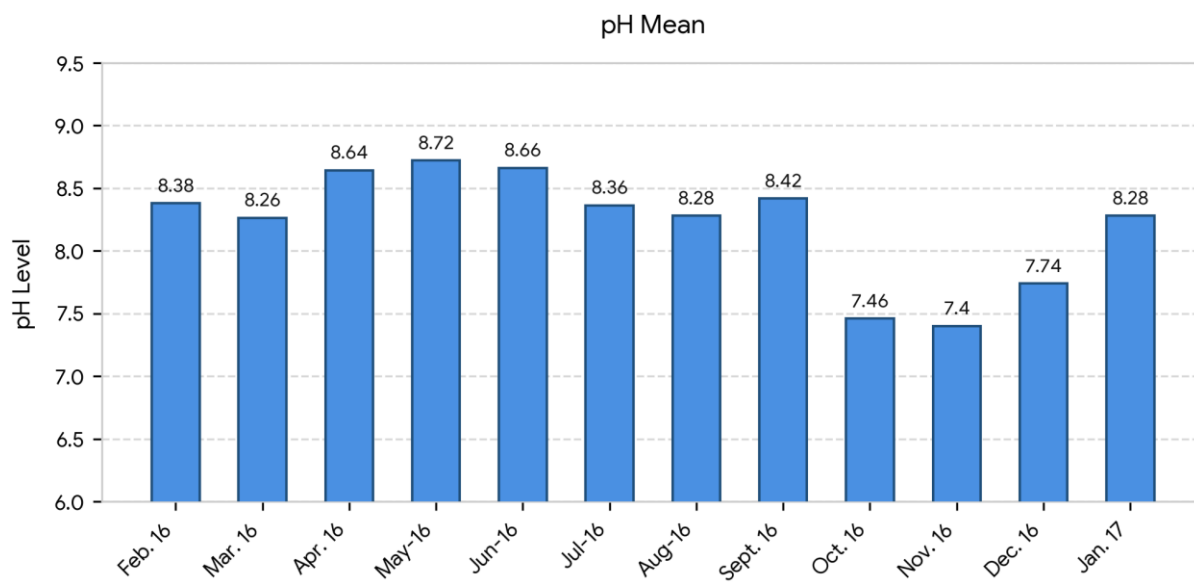


Fig 2: pH Monthly Mean Variation

Table 3: Uma River Water Analysis Year: 2016-17 Total Dissolved Solvents (mg/l):-

Sr.No.	Months	A	B	C	D	E	Mean
1	Feb. 16	222.5	226.5	245.3	240.5	238.9	234.74
2	Mar. 16	190.1	188.7	183.2	183.2	188.0	186.64
3	Apr. 16	165.9	163.3	168.3	165.5	170.5	166.70
4	May 16	135.3	127.4	127.4	135.0	138.0	132.62
5	June 16	160.5	170.3	175.0	175.0	178.5	171.86
6	July 16	290.5	295.0	290.6	293.5	310.0	295.92
7	August 16	325.5	320.5	343.5	343.5	335.5	333.70
8	Sept. 16	338.5	330.5	320.0	322.0	310.0	324.20
9	Oct. 16	230.0	240.6	270.3	280.1	265.5	257.30
10	Nov. 16	260.5	265.0	260.1	265.3	260.4	262.26
11	Dec. 16	228.1	230.0	228.0	238.1	228.0	229.82
12	Jan. 17	216.1	210.3	218.6	224.6	228.3	234.74

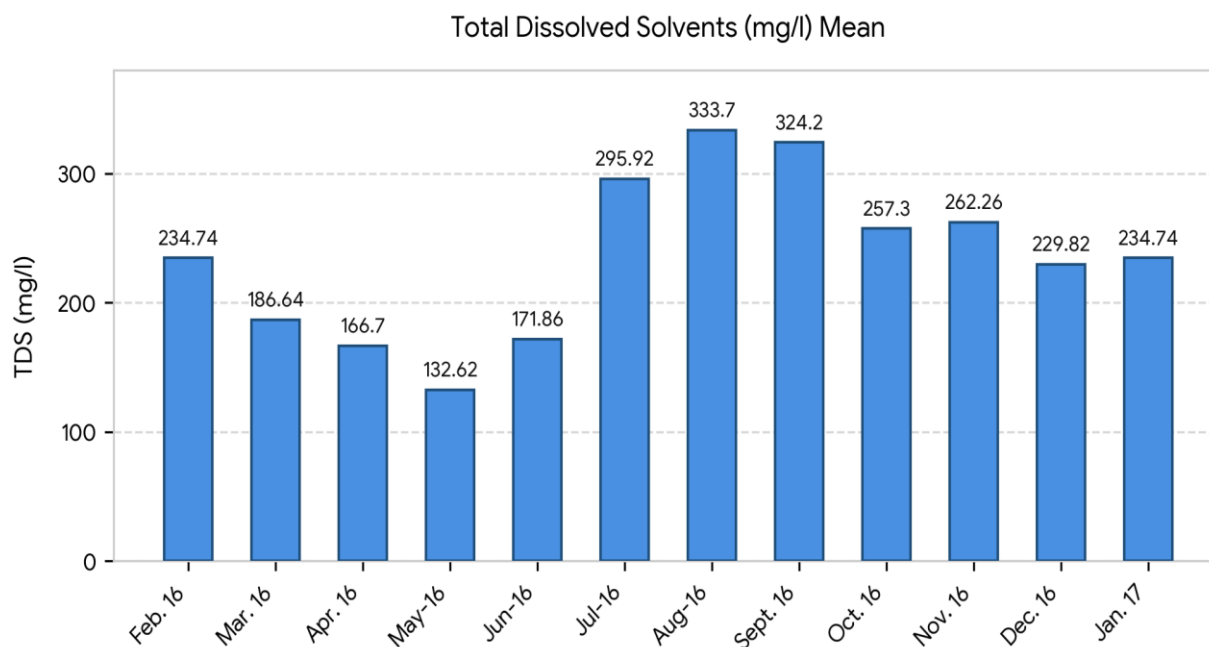


Fig 3: Total Dissolved Solvents (mg/l) Monthly Mean Variation

Table 4: Uma River Water Analysis Year: 2016-17 Dissolved Oxygen (mg/l):-

Sr.No.	Months	A	B	C	D	E	Mean
1	Feb. 16	7.30	7.20	7.25	7.25	7.20	7.24
2	Mar. 16	6.40	6.35	6.60	6.20	6.20	6.35
3	Apr. 16	6.30	6.10	6.25	6.15	6.25	6.21
4	May 16	6.60	6.60	6.15	6.25	6.30	6.38
5	June 16	6.20	6.20	6.40	6.45	6.35	6.36
6	July 16	5.60	5.45	5.50	5.40	5.60	5.51
7	August 16	5.10	5.15	5.25	5.20	5.20	5.18
8	Sept. 16	7.00	7.40	7.25	7.25	7.35	7.25
9	Oct. 16	7.30	7.25	7.15	7.35	7.35	7.28
10	Nov. 16	9.70	9.40	10.00	10.20	10.35	9.93
11	Dec. 16	11.30	11.40	11.35	11.40	11.30	11.35
12	Jan. 17	11.20	11.20	11.25	11.25	11.10	11.19

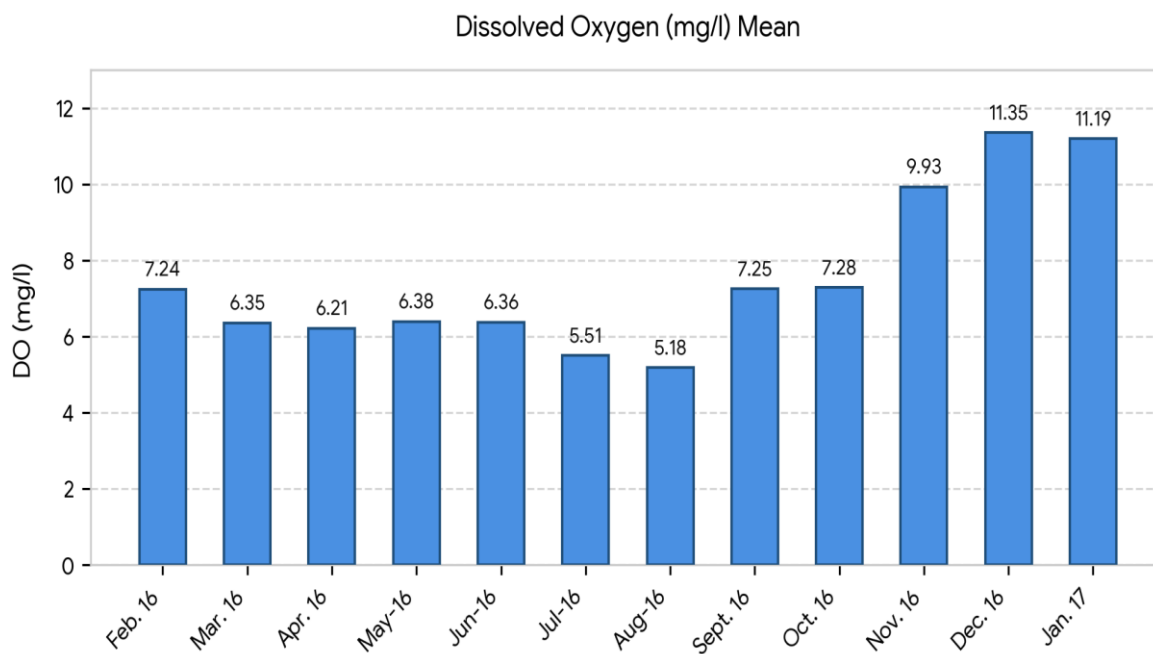


Fig 4: Dissolved Oxygen (mg/l) Monthly Mean Variation

Table 5: Uma River Water Analysis Year: 2016-17 Chlorides (mg/l):-

Sr.No.	Months	A	B	C	D	E	Mean
1	Feb. 16	11.4	11.7	11.9	11.6	11.3	11.58
2	Mar. 16	13.2	13.7	13.0	13.5	13.3	13.34
3	Apr. 16	13.8	13.6	13.6	13.5	12.9	13.48
4	May 16	14.7	14.3	14.2	14.5	14.9	14.52
5	June 16	12.8	12.7	12.3	12.3	12.7	12.56
6	July 16	12.7	12.7	12.6	12.5	12.1	12.52
7	August 16	12.8	12.6	12.4	12.3	12.7	12.56
8	Sept. 16	11.8	11.9	11.7	11.5	11.4	11.66
9	Oct. 16	10.2	10.6	10.4	10.4	10.3	10.38
10	Nov. 16	9.6	9.5	9.4	9.6	9.8	9.58
11	Dec. 16	9.4	9.6	9.8	9.8	9.7	9.66
12	Jan. 17	9.7	9.5	9.4	9.5	9.6	9.54

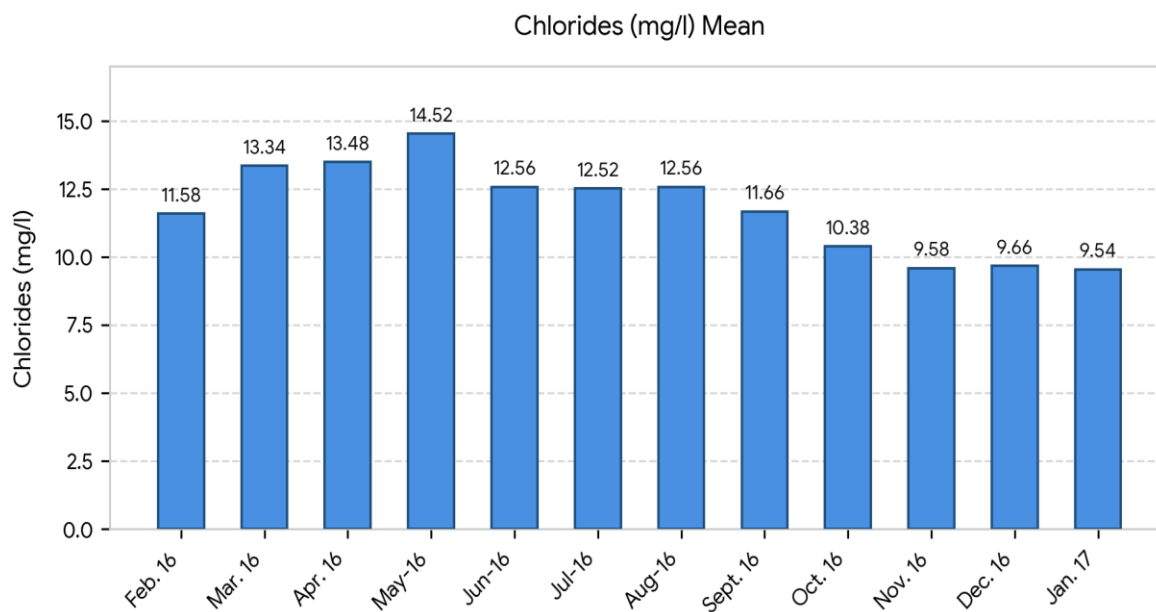


Fig 5: Chlorides (mg/l) Monthly Mean Variation

The variation in some physico-chemical parameters of Uma River Basin Dist. Washim (M.S.) during the period of Feb. 2016 to Jan. 2017 are represented in the table no. 1 to 5 and corresponding figures 1 to 5.

Water temperature: Water temperature is an important factor which influences the chemical, biochemical and biological characteristics of river water body. Water temperature ranges from 20.3 °C to 28.7 °C the

minimum water temperature was recorded in the winter months and maximum in the summer months. Similar results were reported by Wankhade et al (2012). Observed that, higher water temperature in summer and lowers in winter.

pH: It was observed that pH of water is maximum during winter and higher in summer season. Throughout the study period, no large difference was found in pH values between the stations A to E. Ubharhande et al (2012) were studied about the pH of Paintakli dam which shows similar results.

Turbidity: Turbidity of river water is caused by the suspended matter such as clay, silts finely divided organic and inorganic matter, plankton and other microscopic organisms. Silt gives the advantage that it gives advantage to check light penetration in water body. Result shows all the five stations show different values for turbidity in all seasons. Similar results were obtained to about turbidity (Tambekar et.al 2012).

TDS: During study period the total dissolved salts (TDS) was maximum in rainy season (343.5 mg/l) and was minimum during summer (127.4 mg/l). High value of TDS in rainy season may be due to water turbidity and copious quality rain water which brings down agricultural runoff. Similar results were obtained to Umadevi (2013), during investigation of limnological aspects in Karanja River, Karnataka.

D. O.: During the study period it was observed that the value of D.O. fluctuates from 5.10 mg/l to 11.40 mg/l. The maximum values 11.40 mg/l was recorded in the month of May (summer) and minimum values 5.10 mg/l in the month of August. The high D. O. in summer is due to increase in temperature and duration of bright sunlight has influence on the % of soluble gases (O₂ & CO₂). Similar results were obtained to Manjare et al (2010) during the period of 1st Jan 2009 to 31st Dec. 2009.

Chloride: During the period of investigation chlorides in the Uma River water ranged between 9.4 mg/l to 13.48 mg/l. the maximum values of chlorides recorded during summer season while in summer less chloride content

was detected. Thirumala et al. (2011) concluded in their observation that chloride values ranged between 9.0 to 14.03 mg/l Concentration of chloride were higher during summer season and minimum in rainy season.

CONCLUSION:-

A study of some physico-chemical parameters of Uma River Basin Dist. Washim was carried out by taking some important parameters like temperature, pH, turbidity, TDS, DO, and chlorine for a period of one year (Feb. 2016 to Jan 2017). In present investigation it was found that all parameters were within normal range. This indicates that Uma River Basin is non-polluted and river water can be used for domestic use and fish culture.

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