



COMPARATIVE ANALYSIS OF PHYSICOCHEMICAL VARIABLES OF WATER IN RIVER NARMADA AT MANDLESHWAR AND KHEDIGHAT (M.P.), INDIA

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Abstract: Water is the most important source for every living being on earth. Rivers are the major source for fulfilling useful purpose like drinking, washing & irrigation etc. River Narmada is also known as life line of Madhya Pradesh for its huge contribution to the state of M.P. In the present study two sample stations were selected named Mandleshwar (S-I) & Khedighat (S-II) to collect samples. Water sample of River Narmada from these two stations has been collected to evaluate its suitability for drinking, irrigation & all domestic purposes. The important physical and chemical variables like pH, Temperature, conductivity, Turbidity, Total dissolved solid (TDS), Suspended solid, Alkalinity, Total hardness, Ca, Mg, Chloride, Fluoride, Nitrate, Dissolved Oxygen, BOD, COD were examined in the laboratory. Standard method APHA (2002) was used during the analysis. After analysing variables in the lab it was concluded that the quality of water is safe and suitable for all useful domestic & agricultural purposes.

Key words: River Narmada, Mandleshwar, Khedighat, Khargone, Physicochemical variables, Quality of water.

Introduction-

Water is most valuable resource on the earth. It is one of the natural and precious resources which is important for human survival and for industrial purposes. 97% of the water on the earth is salt water and only 3% is fresh water. The humans require fresh water. The rivers play an important role in providing fresh water. The main river of Madhya Pradesh is River Narmada. Narmada River flows through the three states named Gujarat, Maharashtra and Madhya Pradesh (MP). It is also called the Reva. It is the biggest flowing river to the west. It is the 5th Longest in the Indian subcontinent. River Narmada is known as "Life Line of Madhya Pradesh". It provides the clean water for domestic and irrigation purposes to Madhya Pradesh.

Mandleshwar is a town in the Khargone district of Madhya Pradesh. It is situated on the bank of River Narmada. It is an ancient town so it is called Pavitra Nagari by the government of Madhya Pradesh.

Khedi Ghat is a small village situated in Khargone District of Madhya Pradesh. It belongs to Indore Division. It is also situated on the bank of River Narmada. It is surrounded by Maheshwar Tehsil towards west, Mhow Tehsil towards North, Punasa Tehsil towards East, Bhikangaon Tehsil towards South. The Narmada river also called Reva and previously also known as Narbada is largest flowing river of state of M.P. It is major source of drinking water, irrigation and hydroelectricity for M.P.

Physicochemical variables of water maintain the water quality for different purposes but in polluted water their ratio is disturbed in water and water get polluted and not suitable for useful purposes.

Present study compares the quantity of physicochemical variables in water of two sampling stations i.e. Mandleshwar & Khedighat and to check water is suitable or not suitable for drinking and irrigation purposes. In India many researchers have done work on these variable at different zone of River Narmada. Also many studies have done on fresh water sources.

Material & Methods-

The Water samples were collected in August 2021 from the sampling sites at Mandleshwar (S-I) and Khedighat (S-II), Madhya Pradesh, India. In the analysis of physicochemical variables of water, standard methods approved in available literature were used. The Physicochemical variables of water were determined as per standard methods of APHA (2002). The sample had been stored in the refrigerator in order to minimize the changes in the characteristics of river water sample since it may vary from day to day.

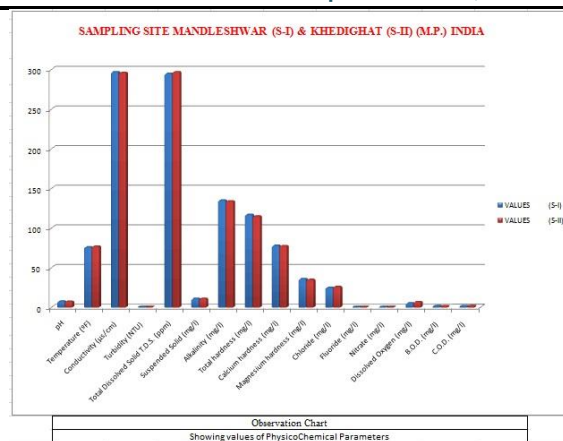
Different methods & tools were used for analyzing physicochemical variables in the laboratory.

No	Physicochemical Variables	Measurement tool used
1	pH	pH meter
2	Temperature	Thermometer
3	Turbidity	Turbidity meter
4	Conductivity	Electrical conductivity meter (EC meter)
5	Total Dissolved Solid	TDS meter
6	Suspended Solids	Filtration
7	Alkalinity	Titration/pH meter
8	Total hardness	Colorimetric titration with an EDTA solution
9	Calcium Hardness	colorimetric titration with an EDTA solution
10	Magnesium Hardness	colorimetric titration with an EDTA solution
11	Chloride	Titration
12	Fluoride	SPADNS method
13	Nitrate	Spectrophotometric method
14	Dissolved Oxygen	Winkler method
15	B.O.D	BOD meter OxiDirect
16	C.O.D.	Spectrophotometer

Results & Discussion-

The results of comparative study have been reported in the given table. The values of all the variables at both stations S-I & S-II were found to be within the limits. The pH values were observed in S-I and S-II 7.7 & 7.5 respectively. Values of temperature in sampling water were observed 76.1 & 77 respectively. Turbidity values observed same at both the station was 0.14 NTU. Total dissolved solids (TDS) were observed 295ppm & 297ppm respectively. Suspended solids were observed 11.2mg/l & 11.1 mg/l respectively. Alkalinity was recorded at both the sampling stations were 135mg/l & 134mg/l respectively. Total hardness in sampling water was 117mg/l & 115mg/l respectively. Calcium hardness was recorded 78mg/l & 77.5mg/l respectively. Magnesium hardness was recorded 36mg/l & 35mg/l respectively. Chloride, Fluoride And Nitrate in sampling water were observed 25mg/l & 26mg/l, 0.11mg/l & 0.12mg/l and 0.006 & 0.005 respectively. Dissolved oxygen (DO) was observed at both the stations were 5.5mg/l & 7mg/l respectively. B.O.D. & C.O.D. were observed at both the sampling stations were 1.6mg/l & 1.5mg/l and 1.6mg/l & 1.5mg/l respectively.

Observation Table		
SAMPLING SITE		
MANDLESHWAR (S-I) & KHEDIGHAT (S-II) (M.P.) INDIA		
PHYSICOCHEMICAL VARIABLES	VALUES (S-I)	VALUES (S-II)
pH	7.7	7.5
Temperature (°F)	76.1	77
Conductivity (µs/cm)	297	296
Turbidity (NTU)	0.14	0.14
Total Dissolved Solid T.D.S. (ppm)	295	297
Suspended Solid (mg/l)	11.2	11.1
Alkalinity (mg/l)	135	134
Total hardness (mg/l)	117	115
Calcium hardness (mg/l)	78	77.5
Magnesium hardness (mg/l)	36	35
Chloride (mg/l)	25	26
Fluoride (mg/l)	0.11	0.12
Nitrate (mg/l)	0.006	0.005
Dissolved Oxygen (mg/l)	5.5	7
B.O.D. (mg/l)	1.6	1.5
C.O.D. (mg/l)	1.5	1.6



Conclusion:

All Physicochemical variables of river Narmada water were examined in the laboratory & observed that all variables are in range at both the sampling stations Mandleshwar (S-I) & Khedighat (S-II) is in limit so we can conclude that water of Narmada river at both the sampling stations Mandleshwar (S-I) & Khedighat (S-II) is suitable for drinking, irrigation and all other useful purposes.

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