

STATUS OF WATER QUALITY OF SELECTED DAMS OF YAVATMAL DISTRICT, MAHARASHTRA.

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ABSTRACT

The water quality of eighteen water resources (dams) of Yavatmal district, Maharashtra, was analyzed for suitability for irrigation and drinking purposes. The results revealed that the range of variations were: pH ranged between 7.7 to 8.7, turbidity 400 to 850 NTU/JTU, transparency between 2.7 to 5.5, alkalinity between 96 to 198 mg/l, hardness between 97 to 190 mg/l, TDS between 360 to 730 mg/l, DO between 4.6 to 7.2 mg/l, CO₂ between 1.7 to 5.5 mg/l and conductivity between 6 to 1.2 mho. The parameters in majority of water samples were within permissible limits as per the APHA (1995). The water is used for all the purposes but for drinking it is used after proper treatment.

Introduction

Water is necessary factor sustenance of life on our planet, ground water or dam water is an important component of the water system for consumption like drinking, agriculture, livestock and industry. Today the dam water is gradually getting polluted due to ever increasing population, industrialization, urbanization and various other anthropogenic activities. It is the fact that most of the rural, towns and cities do not have access to safe drinking water despite investment from governing bodies and private organization in an effort to reduce pollution load and enhance quality of water. The assessment of water quality parameters in and around Yavatmal district has not been undertaken previously. However there is also no systematic study on the overall quality of water in this region has so far been undertaken that would provide a qualitative and quantitative results indicating the suitability of water for human consumption. Present study is focused on as such as 18 dams of Yavatmal District, i.e.

Adarpus, Goki, Waghadi, Saikheda, Arunavati, Borgaon, Zola, Umerda, Sighandov, Ghoti, Pimpulkhuti, karanji, Shivni, Kumbharkinhi, Devgaon, khandni, Nignur and Mudana. The parameters studied are temperature, pH, turbidity, transparency, alkalinity, hardness, TDS, DO, CO₂ and conductivity.

Materials and Methods

The water samples were collected in two liters sterilized polythene bottles in the early hours of the day. Eighteen days were required for the collection of water samples. Every day only one water sample had been collected and analyzed. Temperatures, pH, TDS, hardness, DO, conductivity were measured at the dams' sites by using Standard digital kit. Transparency was measured by using Secchi disc; remaining parameters like alkalinity, CO₂, and turbidity were measured as per the procedure described by Kodarkar (1992) and also guidelines given by APHA (1995).

Results

Turbidity-NTU/JTU, Transparency – (STD), Alkalinity, Hardness, TDS, DO, CO2-mg/l. Conductivity-M mhos.

Name of the dam	Temp.	pH	Turbidity	Transparency	Alkalinity	Hardness	TDS	DO	CO2	Conductivity
Adharpus	27 ⁰ c	7.7	750	3.0	109	115	370	6.8	4.1	.6
Goki	25 ⁰ c	8.3	750	3.0	112	120	570	5.0	1.7	.7
Waghadi	24 ⁰ c	8.1	700	2.8	154	143	430	7.1	2.8	1.0
Saikheda	26 ⁰ c	8.6	650	3.5	187	173	480	6.3	5.5	1.0
Arunawati	25 ⁰ c	7.8	650	3.5	122	115	360	5.8	3.1	.6
Borgaon	27 ⁰ c	8.3	750	3.0	153	175	730	5.6	4.2	.9
Zola	27 ⁰ c	8.4	400	5.5	191	177	530	7.2	2.7	.6
Umerda	25 ⁰ c	8.0	750	3.0	180	180	470	5.4	3.2	.7
Sighandov	25 ⁰ c	7.8	550	4.0	145	150	540	5.0	3.7	.6
Ghoti	23 ⁰ c	8.0	750	3.0	198	187	620	5.8	4.6	1.1
Pimpalkhuti	28 ⁰ c	8.3	500	4.5	171	151	560	5.1	3.0	1.2
Karanji	26 ⁰ c	8.5	750	3.0	182	160	730	5.2	3.7	1.0
Shivani	25 ⁰ c	8.3	750	3.0	155	154	440	4.6	3.9	1.2
Kumbharkinh	25 ⁰ c	8.7	850	2.7	96	97	430	6.7	2.6	.6
Devgaon	25 ⁰ c	8.1	650	3.5	125	114	370	6.2	2.9	.6
Khadni	26 ⁰ c	8.2	650	3.5	196	190	560	4.9	5.2	.7
Nignur	26 ⁰ c	7.7	570	3.7	152	160	530	5.1	2.6	.6
Mudana	27 ⁰ c	8.4	650	3.5	139	148	550	7.1	3.9	.6

Table-1

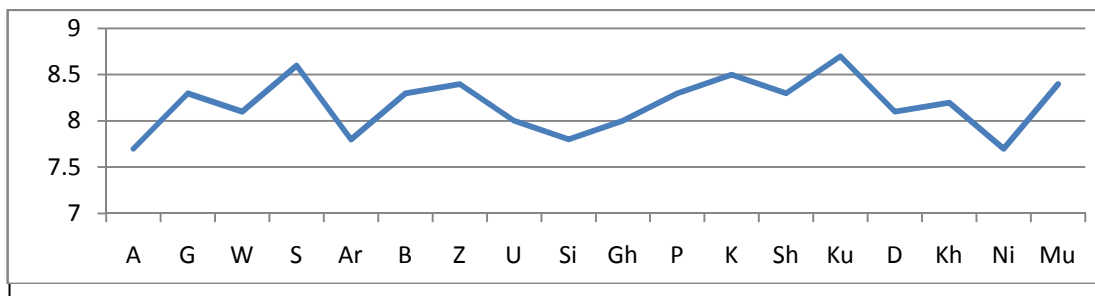


Figure 1

pH values

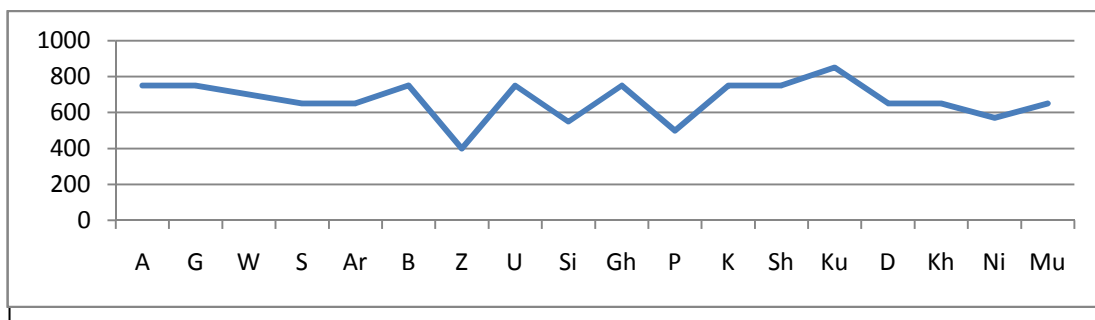


Figure 2

Turbidity values

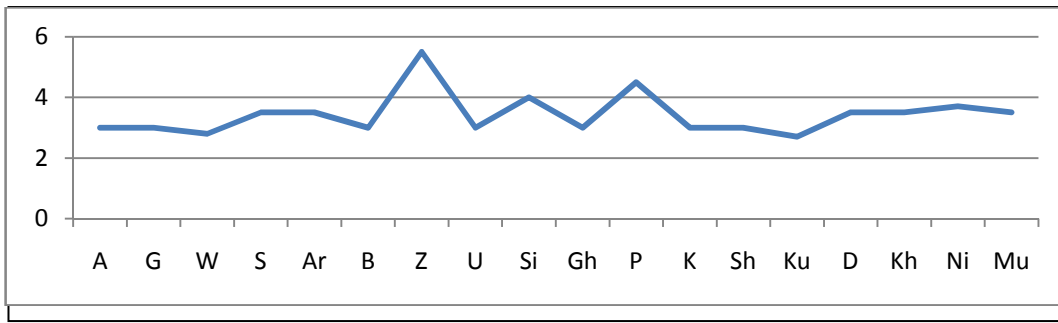


Figure 3 Transparency values

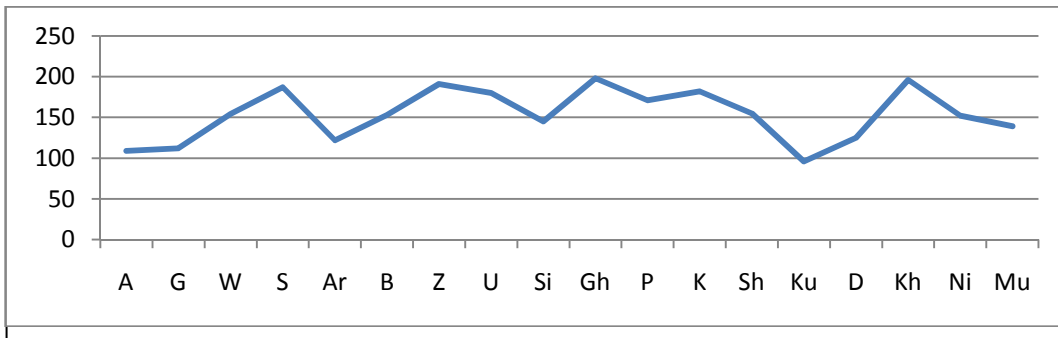


Figure 3 Alkalinity values

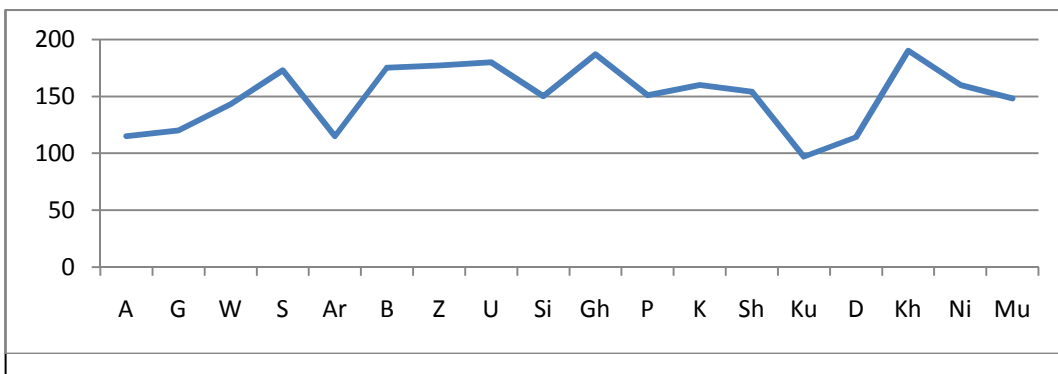


Figure 4 Hardness values

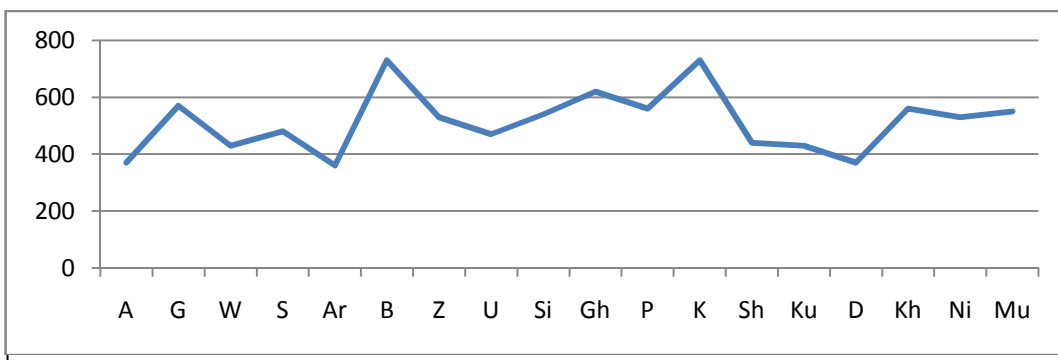


Figure 5 TDS values

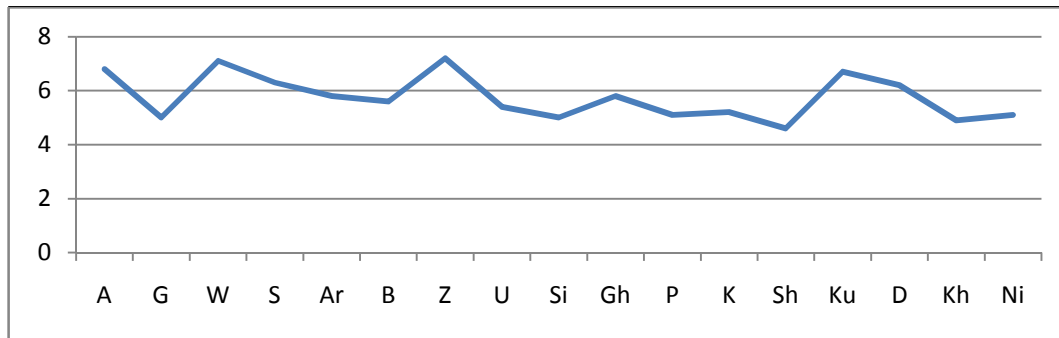


Figure 6 DO values

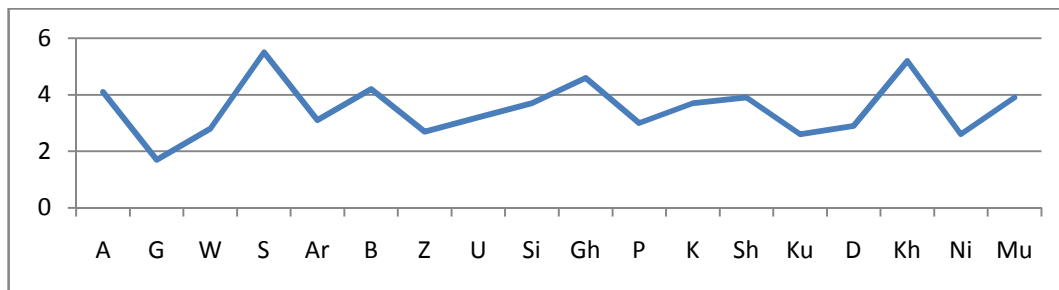


Figure 7 CO2 values

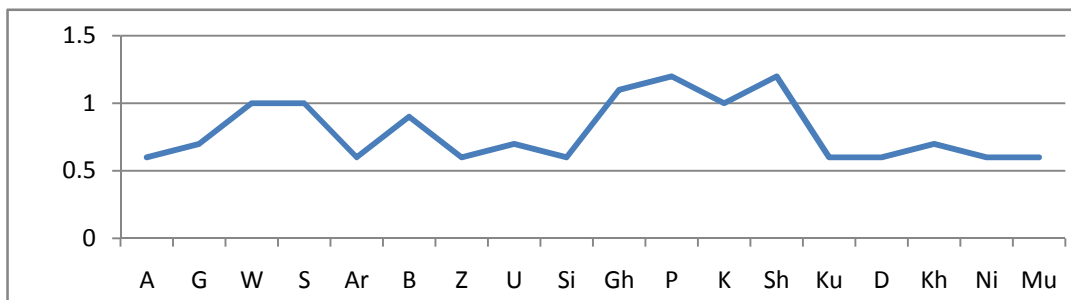


Figure-9 Conductivity value

pH values ranged betⁿ 7.7 to 8.7. The lowest value recorded i.e. 7.7 was for Nignur and highest value for Kumbharkinhi is 8.7. The water is potable when the pH ranges betn 6.5 to 8.5, so except Kumbharkinhi and Saikheda all the other dams can be used as resources for drinking. It means values with all dams provide water suitable for agriculture and industry as it shows a pH within permissible limits.(Figure1)

Turbidity: The readings of turbidity are fluctuates betⁿ 400 to 850. Four hundred is the value of Zola dam and the highest value is 850 of Kumbharkinhi dam. All

the values are within the permissible limits for all the purposes.(Figure2)

Transparency: The values of transparency range betn 2.7 to 5.5. The lowest value of Kumbharkinhi is 2.7 and highest value of Zola is 5.5. There is direct relation betn transparency and turbidity. Turbidity value is inversely proportional to transparency value.(Figure3)

Alkalinity: Compare to all the highest reading of alkalinity is 198 of Ghoti dam and the lowest reading is 96 of Kumbharkinhi. The alkalinities of all the dams are within the permissible limits.

The water of all the dams is used for all purposes.(Figure4)

Hardness: The results of hardness range betn 97 to 190. The hardness value of Kumbharkinhi is 97 and the value of Khandni is 190. For drinking the water is potable and safe for all the purposes.(Figure5)

TDS : Total dissolve solids results are ranges betn 370 to 730. Compare to all parameters the TDS values shows more fluctuation. The water is safe to use for all the purposes.(Figure6)

DO: Dissolve Oxygen is one of the most important parameters their range is betn 4.9 to 7.2. 4.9 is the reading of Khandni and 7.2 is the value of Zola dam. There are no any permissible limits regarding DO but the highest value show water is in good condition and the water body consider as a healthy ecosystem.(Figure7)

CO₂: The CO₂ values range betn 1.7 to 5.5. 1.7 is the CO₂ reading of Goki and the 5.5 is the CO₂ value of Saikheda.(Figure8)

Conductivity: The reading ranges betn .6 to 1.2. .6 is the value of many dams and 1.2 is the highest reading of Pimpulkhuti.(Figure9)

Discussion

On the basis of observation table and plotted graph it is clearly indicated that the dams water will be use for all purposes like drinking, agriculture and industry but for drinking it should be filtered and then use. The agriculture and industry purposes it can be use directly.

Acknowledgments

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