



**WATER QUALITY ASSESSMENT OF DRINKING WATER OF SELECTED
ZILLA PARISHAD PRIMARY SCHOOLS NEARBY GADCHIROLI CITY,
MAHARASHTRA**

Suresh B. Rewatkar

Mohsinbhai Zaweri College, Desaiganj (Wadsa), M.S., India.

Corresponding author Email : sbrewatkar@gmail.com

Abstract:

The ground water is considered to be the most ancient source of water. It is one of the major source of drinking water in the villages. Generally in Maharashtra bore well water is major source of drinking water for the students of Zilla Parishad Primary Schools. The age of these Zilla Parishad Primary School students are in the age between six to ten years. Thus they should get good quality of water for drinking purpose. By considering this fact, the physico chemical analysis of water samples from ten different Zilla Parishad Primary Schools nearby Gadchiroli city are collected in last week of January 2014. These samples are analysed for physico-chemical parameters like pH, electrical conductivity (EC), total dissolved solids (TDS), dissolved oxygen (DO), chemical oxygen demand (COD), total alkalinity (TA), total hardness (TH), chloride (Cl⁻), sulphate (SO₄^{- -}) and nitrate (NO₃⁻). Further the results are compared with standards prescribed by WHO. On comparing, it is found that maximum water samples are potable for students.

Keywords:

Water quality assessment, Zilla Parishad Primary Schools, pollution study, drinking water.

Introduction:

Zilla Parishad Primary School children are the future of the nation. The quality of water is vital concern for children because it directly linked with human health. Water sources are polluted by domestic wastage in rural areas whereas industrial wastages discharged into natural water sources in urban areas. 1,2,3,4 Ground water is a precious natural resource used for both domestic and industrial purposes. Apart from water supplied by the utility board, many have dug either boreholes or wells in their homes and industries in order to have adequate supply of water. In 1997, the World Health Organization (WHO)





reported that 40 % of deaths in developing nations occur due to infections from water related diseases. Diseases contacted through drinking water kill about 5 million children annually and make one-sixth of the world population,⁵ and an estimated 500 million cases of diarrhea, occur every year in children below 5 years in parts of Asia, Africa and Latin America.⁶ The addition of various kinds of pollutants and nutrients through the agency sewage, industrial effluents characteristics of water, which have been the subject of several investigations. Fresh water resource is becoming day by day at the faster rate of deterioration of the water quality is now a global problem.⁷ The present work is an attempt to measure the water quality of ten Zilla Parishad Primary Schools of nearby villages around Gadchiroli city , Dist. Gadchiroli, M.S. (India)

Material and Method:

- i) Sampling & Collection of water samples: In present investigation ten water samples from ten different Zilla Parishad Primary Schools of various villages around Gadchiroli city, Dist. Gadchiroli, are collected in polythene bottles which were cleaned with acid and water, followed by rinsing twice with distilled water. The water samples are chemically analyzed using the standard methods ⁸.
- ii) Methodology : The pH, conductivity and dissolved solids of the water samples are determined on the spot using a pH meter, conductometer and TDS meter respectively. The physico-chemical analysis of samples of drinking water are carried out according to standard methods.

Result and Discussion:

It is very essential and important to test the water before used for drinking purpose. Water must be tested with different Physico-Chemical parameters. Total ten water samples from Zilla Parishad Primary Schools are analysed for physico-chemical parameters like pH, EC, TDS, TA, TH, DO, COD, Cl⁻, SO₄⁻ and NO₃⁻ .The aim of the study is to evaluate drinking water quality available in above Zilla Parishad Primary Schools nearby Gadchiroli city, Maharashtra,





India. pH is most important in determining the corrosive nature of water. Lower the pH value, higher is the corrosive nature of water. pH was positively correlated with electrical conductance & total alkalinity.⁹ The pH value varies between 6.4 to 7.8. EC Electrical conductivity (EC) is a measurement of water current and is directly related to the concentration of ionized substances in the water. Levels affected by the EC of water are a direct function of its total dissolved solids, organic compounds and temperature.¹⁰ EC value varies from 336 to 1125 micro-siemens, which reveals that EC values for S5 sample are comparatively higher value than other. TDS Total dissolved solids (TDS) indicates the general nature of water quality. In present investigation TDS value varies from 161 to 586 mg/l. DO Dissolve oxygen (DO) is one of the most important parameter in water quality assessment and reflects the physical and biological processes prevailing in the water. In present investigation DO values varies from 5.6 to 7.2 mg/l. COD Chemical Oxygen Demand (COD) provides a measure of the oxygen equivalent of that portion of the organic matter in a water sample that is susceptible to oxidation under test condition.¹¹ In present study, COD values varies from 1.6 to 2.6 mg/l. TA Total alkalinity (TA) of water is measure of its capacity to neutralized acids. It has no direct adverse effect on health but a low value below 4.0 gives sour taste & higher value above 8.5 shows alkaline taste.¹² In the present study, the pH value varies between 96 to 118 mg/l. TH Total Hardness (TH) is the property of water which prevents the lather formation with soap and increases the boiling points of water.¹³ Hardness of water mainly depends upon the amount of calcium or magnesium salt or both. In present study TH value varies from 72 to 414 mg/l. Cl⁻ Chloride is a natural substance present in all portable water as well as sewage effluents as metallic salts. The Chloride value varies from 11 to 164 mg/l. High chloride ion concentration indicates organic pollution in water. SO₄⁻⁻ Sulphate is one of the least toxic anions for drinking water. But it is important due to its cathartic effect in some human when present in excessive amount. Sulphate may occur due to industrial discharge, contaminant from mines, paper mills etc. The





values of sulphate varies from 15 to 72 mg/l. NO₃- The measure source of accumulated nitrates & nitrites in water include breakdown of organic matter through mineralization, hydrolysis, microbial action & nitrogen fixation. Nitrate value varies from 0.09 to 0.38 mg/l.

Table 1 : Sampling sites & places

| Sampling sites | Place |
|-----------------------|--|
| S ₁ | Zilla Parishad Primary School, Gogaon, Dist. Gadchiroli. |
| S ₂ | Zilla Parishad Primary School, Adpalli, , Dist. Gadchiroli. |
| S ₃ | Zilla Parishad Primary School, Shivani, Dist. Gadchiroli. |
| S ₄ | Zilla Parishad Primary School, Bodali , Dist. Gadchiroli. |
| S ₅ | Zilla Parishad Primary School, Mendha, Dist. Gadchiroli. |
| S ₆ | Zilla Parishad Primary School, Murkhala , Dist. Gadchiroli. |
| S ₇ | Zilla Parishad Primary School, Mudza , Dist. Gadchiroli. |
| S ₈ | Zilla Parishad Primary School, Kaneri , Dist. Gadchiroli. |
| S ₉ | Zilla Parishad Primary School, Pardi , Dist. Gadchiroli. |
| S ₁₀ | Zilla Parishad Primary School, Guruwala Dist. Gadchiroli. |

Conclusion:

The drinking water from different Zilla Parishad Primary Schools nearby Gadchiroli city are analysed. The analysis report suggested that the water quality parameters lie within the maximum permissible limit prescribed by





WHO. Hence as per this report drinking water in maximum Zilla Parishad Primary School nearby Gadchiroli city, Dist. Gadchiroli are suitable for drinking purpose.

Reference:

De,A.K. (1994): 'Environmental Chemistry', 3rd Ed, New Age International (p) Limited, Publishers, New Delhi.

Sayyad J.A. and Bhosle A.B. (2010): Der Chemica Sinica, 1(2)Pp104.

Ogbonna O., Jinoh W.L., Awagu E.F. and Bamishaiye E.I.(2011): Advances in Applied Science Research2 (2) Pp 62

Bukowski J, Somers G, Bryanton J (2001): Agricultural contamination of ground water as a possible risk factor for growth restriction or prematurity.J.Occup.Environ.Med.43 Pp 377.

World Health Organization (2004): Water sanitation and Health Programme. Managing water in the home : Accelerated health gains from improved water sources. World Health Organization www.who.int

World Health Organization (2011): Guidelines for Drinking water Quality 4th Ed, WHO press, Pp 564.

Mahananda H.B., Mahananda M.R., and Mohanty B.P. (2005): "Studies on the physico-chemical and biological parameters of a Fresh Water Pond Ecosystem as an Indicator of Water Pollution". Ecol.Env and Cons.11 (3-4), Pp 537-541.

American Public Health Association. (1992): 'Standard Methods of Examination of Water and Waste Water,' 18th Ed,(Eds.Greenberg, Clesceri and Eaton), U.S.A. 2340,

Gupta, D.P., Sunita and Saharan J.P., (2009): Physiochemical Analysis of Ground Water of Selected Area of Kaithal City (Haryana) India, Researcher, 1(2), pp 1-5.





Jayalakshmi V, Lakshmi N, SingaraCharya MA. (2011): Assessment of Physico-chemical Parameters of Water and Waste Water in and around Vijayawada. Int.J.of Res.in Pharm.and Biomed.Sci.,2(3),Pp1040-1046

Trivedy R.K. and Goel P.K. (1986): Chemical & Biological method for water pollution studies, Environmental Publication, Karad.

Mohamed Hanipha M. and Zahir Hussain A. (2013); Study of Ground water quality at Dindigul Town, Tamilnadu, India , Int.Res. J.Environment Sci., 2(1) Pp 68-73.

Duffus J.(1996): Comments to Editor, Chemistry International, News Magazine of International Union of Pure and Applied Chemistry(IUPAC), 18 (6) Pp 252-253.

