Journal of Wildlife and Ecology. (2019). 3(1):28-34

Research Paper **Open Access**

Drinking Water Quality Assessment of Union Council Thub, Bagh, Azad Jammu and Kashmir

Misbakh-Un-Nisa[1] and Syed Mubashar Hussain Gardazi[1*]

1. Department of Botany, Women University of Azad Jammu and Kashmir, Bagh, Pakistan

*Corresponding Author: mbshrgardazi945@gmail.com

Peer Reviewed

Citation: Misbakh-Un-Nisa, S.M.H. Gardazi. 2019. Drinking Water Quality Assessment of Union Council Thub, Bagh, Azad Jammu and Kashmir. Journal of Wildlife and Ecology. 3: 28-34.

Received: 10, 01, 2019
Accepted: 03, 02, 2019
Published: 01, 03, 2019

Competing interests: The authors have declared that no competing interests exist.

Funding: Authors have no source of funding for this work.

Availability of data: Authors have included all data in the manuscript that were collected during the field survey.

ABSTRACT

Water is the majority essential liquor for sustaining the life on the world. About 97% water is present in the oceans that is not for drinking as well as only three percent is fresh water in which 2.97 percent is contained by ice caps as well as glaciers while remaining small part of 0.3 percent is available as a ground water for human being use. Pure and fresh drinking water is a fundamental requirement for better human health and it is also a main right of living creatures. Fresh and pure water is previously a limiting reserve in lots of areas of the earth. In the after that era, it would become even more warning due to greater than before population, and urbanization. The main objectives of the study are to identify the main drinking water resources, study the health effects associated with the using up of hazardous drinking water, and to examine the hardness, chlorides and pH of drinking water samples from union council Thub. The pH is an important water quality parameter and may types of pollutant affect the pH of water. The pH of water was found to be in the range of 6.5 to 8.5 is considered safe for human consumption. In this survey hardness of all water samples were found to lie within the acceptable limit as per mentioned in WHO and national standard guidelines for drinking water quality parameters. According to the drinking water standard for maximum limit of the chloride is 250 mg/L that should be present in water. The current analysis did not show high concentration of chloride in water samples collected from different places of village. The data obtained from chemical analysis of water samples were within national standard and WHO guideline. Majority of the water samples collected and analyzed found to be fit for drinking purpose.

Key words: Water, Thub, pH, WHO

INTRODUCTION

Water is our most precious resource. There is no substitute for it and there is only so much of it to go round. Fresh and secure water is a supreme need for health and life. The water quality supplied is essential in formative the health of human and entire communities. Lot of cities in Asia facing enhance in organic material in water due to the release of unprocessed industrial and domestic water into these resources. Condition is more provoked in Asia, wherever more than 0.5 million fatalities of Childs occurred every year with other health threats due to bad water quality (Annachhatre, 2006).

Water is the majority essential liquor for sustaining the life on the world. About 97% water is present in the oceans that is not for drinking as well as only three percent is fresh water in which 2.97 percent is contained by ice caps as well as glaciers while remaining small part of 0.3 percent is available as a ground water for human being use (Miller, 1997). Pure and fresh drinking water is a fundamental requirement for better human health and it is also a main right of living creatures. Fresh and pure water is previously a limiting reserve in lots of areas of the earth. In the after that era, it would become even more warning due to greater than before population, and urbanization (Miller, 1997; Gleick, 1998, 2000). The main objectives of the study are to identify the main drinking water resources, study the health effects associated with the using up of hazardous drinking water, and to examine the hardness, chlorides and pH of drinking water samples from union council Thub.

Table 1: Standards for Quality of Drinking Water in Pakistan.

Parameters /Properties Physical	**WHO Guidelines**	**Standard values for Pakistan**
Turbidity	<NTU	<5NTU
Total hardness as CaCo3	…	<500 mg /l
TDS	<1000	<1000
pH	6.5-8.5	6.5-8.5
Odor	Non objectionable/ Acceptable	Non objectionable/ Acceptable
Color	≤ 15 TCU	≤ 15 TCU
Taste	Non objectionable/ Acceptable	Non objectionable/ Acceptable

Table 2: Standards for Quality of Drinking Water.

Parameters /Properties Chemical	**WHO Guidelines**	**Standard values for Pakistan**
Essential Inorganic	mg/Liter	mg/Liter
Aluminum Mg/l	0.2	≤0.2
Antimony(Sb)	0.02	<0.005(P)
Arsenic(As)	0.01	≤0.05(P)
Barium (Ba)	0.7	0.7
Boron	0.3	0.3
Calcium(Cd)	0.003	0.01
Chloride(Cl)	250	<250
Chromium(Cr)	0.05	≤0.05
Copper(Cu)	2	2

Table 3: Standards for Quality of Drinking Water.

Parameters /Properties	**WHO Guidelines**	**Standard values for Pakistan**
Toxic Inorganic	Mg/Liter	Mg/Liter
Cyanide(CN)	0.07	≤ 0.05
Fluoride(F)	1.5	≤ 1.5
Lead (Pb)	0.01	≤ 0.05
Manganese (Mn)	0.5	≤ 0.5
Mercury (Hg)	0.001	≤ 0.001
Nickel (Ni)	0.02	≤ 0.02
Nitrate (NO3)	50	≤ 50
Nitrite (NO2)	3	≤ 3 (P)
Selenium (Se)	0.01	0.01 (P)
Zinc (Zn)	3	5.0

MATERIALS AND METHODS

Sampling sites: The study was conducted in union council Thub. It is situated in north of district Bagh Azad Kashmir. It is primarily a peri-urban area with hard use to pure water. An preliminary survey was conceded out in order to examine the performs of the native human population concerning water managing and to collect knowledge on environmental and sanitary aspects. Five samples were collected from different places of village and, pH, chlorides and total hardness were analyzed. In this village people were using different type of sources for water. It means that human livelihood in the village can utilize both good and bad quality sources, which may have various health effects.

Determination of the pH value of water*:* Prepare buffer solutions as per information, being vigilant that tablets remain intact until utilize. Put 30 ml of buffer solution and of sample in separate 50 ml beakers. Put electrodes from the pH meter into the buffer solutions in turn. If required regulate instrument to pH of exacting solution. Place the electrodes into sample and noted pH shown on meter.

Chloride Determination in the Water Sample of study area: Water sample + potassium chromate + Titration with silver nitrate solution (N/50), Red brown precipitate Ag_2CrO_4 formed (ensure no more chloride ions to react with Ag). More specific procedure is to add the following in the conical flask, 50 ml of sample, 3-4 drops of potassium chromate**,** titrate with $AgNO_3$ and the Red brown color will appear and consumption of silver nitrate is to be noted

$$\text{Chlorides}\frac{\text{mg}}{\text{L}}=\frac{\text{V}\times\text{C}\times 35.5\times 1000}{\text{ml of sample}}$$

Whereas, V is the total volume of the silver nitrate utilized (ml), C is concentration of silver nitrate solution (mole/L). 35.5 is the molecular weight of chloride ion.

The hardness of water of study area: The addition of Water sample + Ammonical buffer solution + indicator EBT (Erichrome black T) in the flask (The wine-red color will be established due to the formation of metal indicator complex in the sample solution). The addition of EDTA (Ethylenediamminetetraacetic acid) in the sample solution until its color is changed to permanent blue (metal EDTA complex). More specific procedure is to add the following in the conical flask, 50 ml of sample water, 1 ml buffer solution, EBT (4-5 drops), Titration with EDTA (0.01 M), Wine red will change to blue, Buffer solution will be made by using ammonium chloride (NH_4Cl) 16.9 g in 143 ml Conc., Ammonium Hydro oxide (NH_4OH). (5.90 g for 50 ml), Indicator will be made a) 0.5 g EBT b) 100 mL of 80 % ethyl alcohol (0.25 for 50 ml), EDTA 0.01 M; 3.723 g of sodium salt of EDTA for 0.01 mole.

Standard calcium solution: Weigh "1.000 g anhydrous CaCO3" powder into a "500-mL Erlenmeyer flask". Place the funnel in flask neck and add, a small at a time, "1 + 1 HCL" until all "$CaCO_3$" has dissolved. Add "200 mL" distilled water and boil for a little time to expel CO_2. Cool it and add a some drops of "methyl red indicator", and adjust to intermediate orange color by adding "3N NH_4OH" or

"1 + 1 HCl", as required. Transfer quantitatively and dilute to "1000 mL" with the distilled water; "1 mL = 1.00 mg CaCO3".

EDTA hardness as the mg $CaCO_3$/L= AxBx1000/ml sample

A= ml titration for the sample while,

B= mg $CaCO_3$ equal to 1 ml EDTA titrant.

RESULT AND DISCUSSION

Total five numbers of water samples were noted as guideline of international standards for fulfillment to healthy for drinking use in the presented situation. The samples examined were collected from the different drinking water supply system in the study areas of Thub, district Bagh (Blangh, Chnari, Mitgali, Gavaldara, H/S Thub). Springs were the main source of drinking and using water in these hilly areas. Mostly drinking and using water resources were noted healthy.

The pH is an important water quality parameter and may types of pollutant affect the pH of water. The pH of water was found to be in the range of 6.5 to 8.5 is considered safe for human consumption. The pH of the analyzed five samples in the examined area was in range of WHO parameters i.e. 6.8, 7.4, 7.8, 7.2 and 6.8 (Figure 1) hence the water in these areas was mostly neutral and suitable for drinking purpose. Water of the pH greater than 7 is called basic.

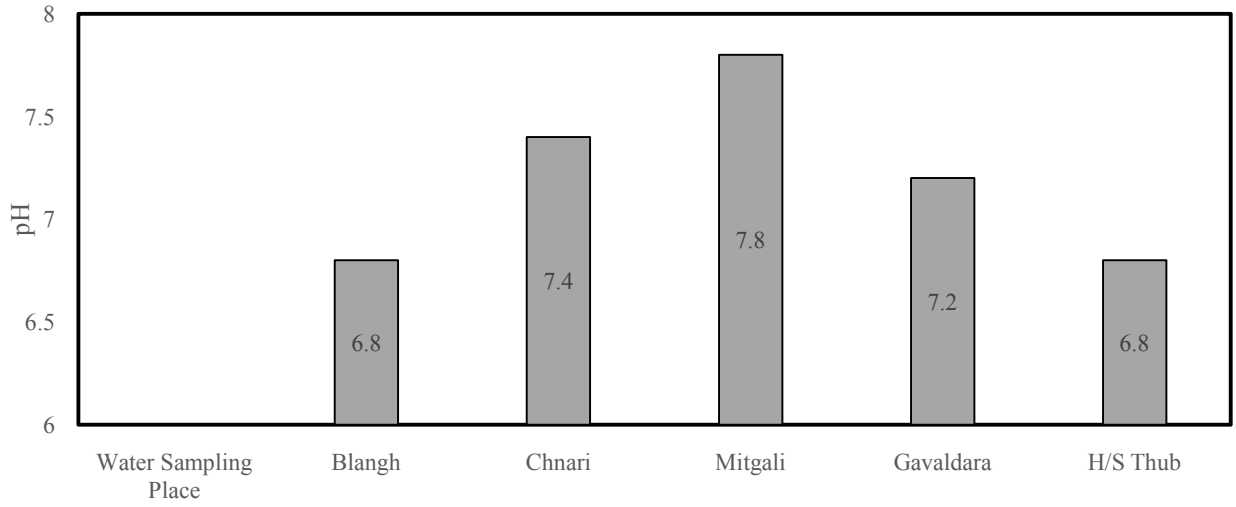

Figure 1 pH of water samples collected from study area.

Hardness is the most usually explained as milligrams of the calcium carbonate equal per liter. Hardness of water is caused due to calcium carbonate and magnesium when dissolved in water. Hence the higher hardness is due to more calcium and magnesium present in water samples due to natural and anthropogenic interferences at water resources. Sewage and industrial wastes are also important natural sources of calcium and magnesium. Hardness of water is considered fine if its between 190 and 410. In this survey hardness of all water

samples were found to lie within the acceptable limit as per mentioned in WHO and national standard guidelines for drinking water quality parameters.

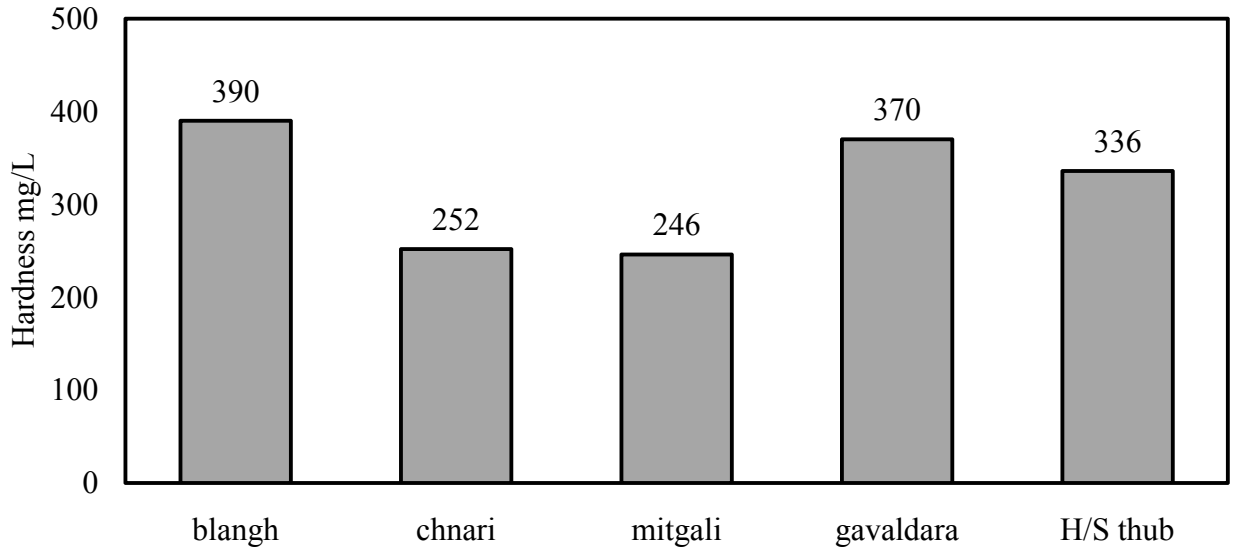

Figure 2 Hardness of water samples collected from study area.

Chloride is an important indicator of water pollution. Chloride in drinking water originates from natural sources. Usually high concentration of chloride in combination with nitrate or ammonium shows that the water is contaminated by domestic natural sources. According to the drinking water standard for maximum limit of the chloride is 250 mg/L that should be present in water. The current analysis did not show high concentration of chloride in water samples collected from different places of village.

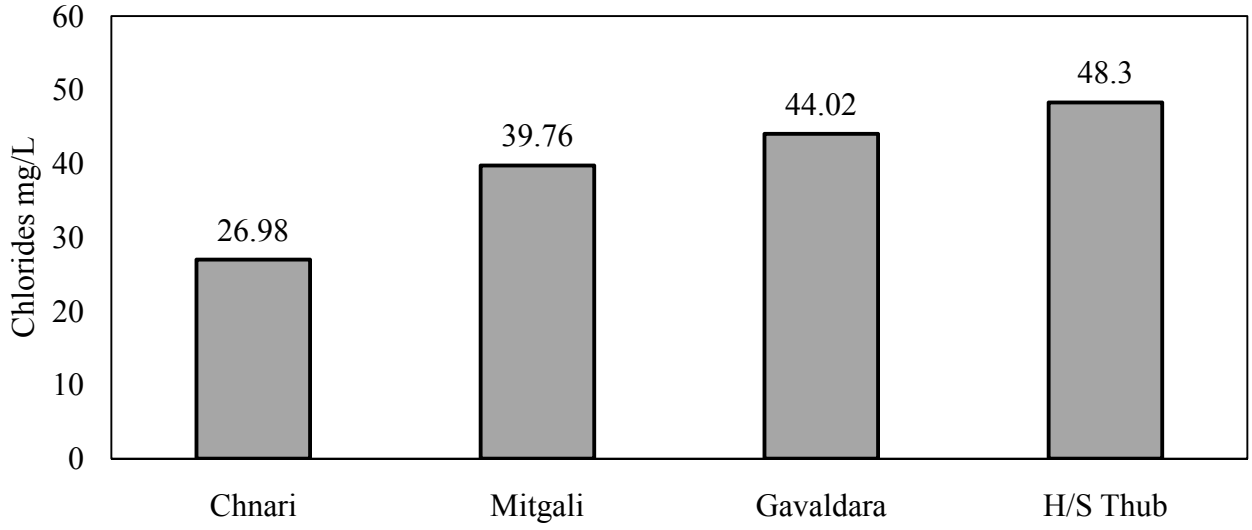

Figure 3 Chlorides of water samples collected from study area.

Conclusions: The data obtained from chemical analysis of water samples were within national standard and WHO guideline. Majority of the water samples collected and analyzed found to be fit for drinking purpose. It has been concluded that there is a need of proper analysis of water and prior treatment. Protection of drinking water sources is necessary to prevent the spread of waterborne diseases.

Acknowledgements: The all authors are thankful for help of Thub, Bagh.

Authors' contributions: Misbakh-Un-Nisa has designed project, collected data and written this article; while Gardazi supervised and critically analysis this article and approved as final.

REFERENCES

Annachhatre, A. P. 2006. Water Quality and Wastewater Management. In J. K. Routray and A. Mohanty (Eds.), Environmental Management Tools: A Training Manual, pp. 125-129, United Nations Environment Program (UNEP) & Asian Institute of Technology (AIT), Thailand: School of Environment, Resources and Development.

Miller, G. T. Jr. 1997. Environmental Science: Working with the Earth. (6th Ed.). California: Wadsworth Publishing Company, (Chapter 11).

Gleick, P.H., 2000. A look at twenty-first century water resources development. Water international, 25(1):127-138.

Gleick, P. H. 1998. The world's water 1998-1999: the biennial report on freshwater resources. Island Press.