Hydrol Current Res
Volume 13:05 2022

Hydrology: Current Research

Research article

Open Access

Assessment of Water Quality Parameters Collected from Various Water Resources in Pampore Town (Kashmir), India

Mohd Adil Deva* **and Sushil Manderia**

School of Studies in Botany Jiwaji University, Gwalior, M.P, India

Abstract

Water is considered as an essential resource on earth and the sources of fresh water are depleting due to increasing demand of population and different pollution sources. The purpose of this study was to analyze the physiochemical parameters of water. The samples were collected from 5 different drinking water sources and have been analyzed for pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Hardness (TH), Nitrates (NO_3^{2-}) and Biological Oxygen Demand (BOD). The result showed that pH, EC, TDS, T. Hardness, (NO_3^{2-}) and B.O.D. were ranged from 7.3 to 7.77, 237.3 to 323.3 µSm-1,475.33 to 876.57 mg/L, 316.33 to 831 mg/L, 1.32 to 2.94 mg/L, 4.59 to 49.6 mg/L. All these parameters were analyzed by the standard methods of APHA and measured within the standard drinking water quality values of WHO. Among all these water samples, the water sample taken from bored well from the Karewa fields showed the best results and suitable for drinking purposes and the the present investigation found that the maximum parameters were within range and could be suitable for irrigation purposes. The sample collected from river Jehlum suggested that the rate of pollution is increasing day to day when compared with previous papers.

Keywords: Physiochemical parameters • Water • Karewa fields • Pampore

Introduction

The importance of water could be emanated from its judicious use in agriculture, industry, and residential sector [1]. Water quality is considered as environmental concern as availability of fresh water resources for human consumption is declining day to day [2]. Clean drinking water is now recognized as a fundamental right of human beings. It acts as an ingredient of animal and plant life [3]. Water quality and its accessibility are important determinants of the eminence of human environment. Rivers, lakes and streams, wells are some of the sources of fresh water which contain sufficient factors responsible for growth of various organisms in the aquatic body. The healthy aquatic ecosystem depends on the biological diversity and physico-chemical characteristics [4]. Without adequate quantity and quality of fresh water, sustainable development will not be possible [5]. Management of water resources and control of water pollution are equally important for the developing and developed societies [6]. The depletion of fresh water resources could create the resource crisis of the 21st Century bringing up agriculture, industrial, domestic as well as international conflicts [7]. The resource which makes availability of water in Kashmir possible is rainfall and snow. The major portion of that water was flow down in rivers and streams and the small proportion seeps into ground water. Mostly in Kashmir the surface water sources are reliant water resources for drinking purposes. Keeping the above views into consideration the present work focuses on to determine various parameters of various water resources of Pampore town, as one of the The best source of drinking water is located in a region known for its cultivation of saffron. one of the major objectives of water quality estimation is to determine the best sources within the locality and the impacts of human activities over these resources. In this study we have examined the physicochemical parameters of various water resources of Pampore town.

***Address for Correspondence:** Mohd Adil Deva, School of Studies in Botany Jiwaji University, Gwalior, M.P, India; E-mail: devaadil03@gmail.com*

Recieved:22-Dec-2021, Manuscript No. HYCR-21-001-PreQc-21; **Editor Assigned:** 28-Dec-2021, PreQC No. HYCR-21-001-PreQc-21; **Reviewed:** 14-Jan-2022, QC No. HYCR-21-001-PreQc-21; **Revised:** 26-Jul-2022; Manuscript No HYCR-22-001-PreQc-21; **Published:** 02-Aug-2022; DOI: 10.37421/2157-7587.2022.13.399.

Materials and Methods

Study area

Pampore is known as saffron town of Kashmir is situated on eastern side of river Jhelum. It almost 11 km away from Srinagar city located 1600-2100 masl. The water samples were collected at 5 different sites i.e. Jehlum River water (S1), 250 mts dwelled tube well at Karewa fields (S2), Stream flowing from Ladhoo to Kranchoo (S3), A well at Apple garden, (S4), water from Satisar wetland (S5). The samples were collected in the month of April 2018.

Collection of samples

The water samples were collected in PVC bottles of 1.2 L capacity. Before the collection of samples, the bottles were properly cleaned and rinsed thoroughly several times with distilled water and then samples were collected in triplicates from each sampling site.

Physicochemical analysis

Physico-chemical parameters i.e. pH and EC (Electrical Conductivity) were analysed by Digital analytical meter Total Dissolved Solids (TDS) were calculated by filtration, evaporation method. Total Hardness were calculated by EDTA titrimetric method [8]; Nitrates were calculated by Phenol Disulfonic method and Biological Oxygen Demand (BOD) were calculated by Modified Wrinklers method.

Results and Discussion

The results of physiochemical parameters of water samples were presented in below given Figures 1-3.

The pH values of all samples i.e. 7.3 to 7.77 is normal according to the standards of drinking water, whereas the EC values ranges from and 220 to 323.3 indicates that there is less amount of inorganic substances in ionized form [9].

The maximum EC was observed in S3 i.e., 332.33 ± 4.7 whereas the minimum conductance was observed in S5 i.e. 220.33 ± 1.76. The TDS concentration in S1 and S2 is within normal range i.e. 566 ± 7.37 and 475.33 ± 6.39 whereas the concentration of said parameters in S3, S4, and S5 which is 865 ± 10.41, 825 ± 7.64 and 876.67±8.82 lie above the WHO and NSDWQ limits.

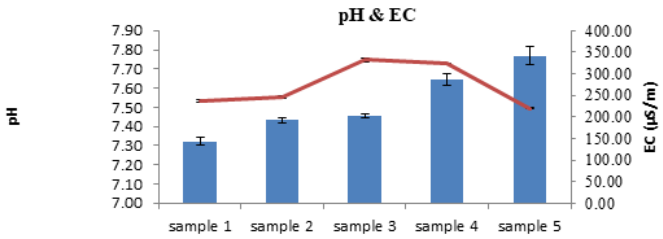

Figure 1. Physiochemical parameters of water samples were presented.

Note: (▬) pH, (—) EC.

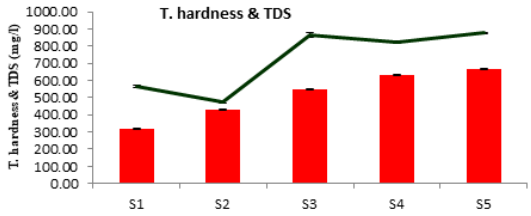

Figure 2. The pH values of all samples i.e. 7.3 to 7.77 are normal.

Note: (▬) T.hardness, (—) TDS.

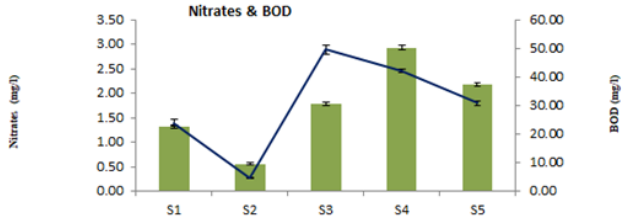

Figure 3. The maximum EC was observed in S3.

Note: (▬) Nitrates, (▬) B.O.D.

The ability of soap to produce leathering in water depends on hardness of water. The hardness affects the portability of drinking water and Calcium and Magnesium are the main cations responsible for the hardness of water. Maximum total hardness was found in S4 (831.33 ± 4.81) and minimum in S1 (316.33 ± 4.1) which depicts that the hardness of S1 is within the normal range of WHO and that of S1 is also slightly hard and in accordance to the permissible limits of WHO. BOD is the amount of O_2 required by living organisms to decompose or stabilize organic matter in water and it is considered as an important indicator of water pollution status. The S2 had showed not too much demand of Oxygen in comparison to other sites but there is a lot of demand of oxygen in S3 and S4 water samples i.e. 49.61±1.43 and 42.35 ± 0.57. The nitrates come from the oxidation of ammonia, nitrite to nitrate and from other forms of nitrogenous compounds [10]. The required concentration of nitrates are fulfilled by vegetables and other eatables when the concentration of nitrogen in drinking water is below 10 mg/l and when the concentration of nitrates in drinking water exceeds 50 mg/l, it becomes the main source of total nitrogen uptake [11]. The high level of this compound in drinking water is due to excess use of fertilizers, decayed organic farm wastes and domestic and industrial effluents. Excessive concentration of nitrates cause one of the serious disease i.e. Methemoglobinemia and in fish it causes brown blood disease. The concentrations were ranged from 0.54 mg/L ± 0.03 to 2.92±0.04, as the maximum concentration was found in S4 and minimum in S2.

Conclusion

In this study the water samples were collected from Pampore town for analysis of different physicochemical parameters. The result revealed that the sample from site 2 (S2) showed the parameters within the standard drinking water quality given by WHO, BIS and US-EPA, but the hardness of the water were of that sample were beyond the limit to some extent. The present investigation revealed that the maximum parameters of the remaining 4 sites showed that the water is not hygienic for drinking purposes and were at a level of pollution and may not cause harmful effect to the consumers. It is necessary to make public aware of drinking water quality and it is the responsibility of every citizen of the town to manage this precious natural liquid resource. For the welfare of the human being, water quality should be assessed on the regular basis.

One primary trend of Ca-Mg-HCO_3 or carbonate dissolution can be seen on the surface the principal ions and trace elements in the water samples are far below the levels recommended for drinking by the WHO and BIS. The water is classified as fresh, suitable for irrigation, and preferable for drinking based on its EC and TDS levels. The hardness classification of the water samples ranges from soft to hard, with 16.66% falling into the soft, 50% into moderately hard, and 33.33% into the hard categories. That exits the valley only at Baramulla, where it flows through a small gorge. The Valley is longitudinal, measuring roughly 135 km long, 32 km wide, and 15520.3 sq. kilometres in area. It is also located at a height of about 1700m above mean sea level. Some of the significant tributaries include the Dudganga, Shaliganga, Ramshu, Nishar, Rambiar, Bring, and Arial. Near Kakapur, the rivers Liddar and Vishav converge to form the Jehlum. Near the southern border of Damodar Karewas, the Shaliganga and Dudhganga rivers converge before flowing northward till they reach the Jehlum spill channel close to Brazil. The Jehlum and Dudganga's flood waters are diverted through a spill channel to Batmalu Nambal during their high water level. The aforementioned tributaries of the Jehlum River are fed by either springs or glacier meltwaters. There are also a few tiny valleys in this area, such as the Lolab valley, which is north of Baramulla and is 6 km long and 4.4 km broad. The Kashmir Valley is mainly a flood plain formed by the river Jhelum and its tributaries, rivulets, streams, and canals. All of the valley's lakes and the sizable surrounding marshes were crucial in preserving the river Jhelum's consistent flow patterns.

These lakes and marshes used to operate as sites for storage of excess water during the peak summers, whenever the river would flow high, and so prevented significant portions of the valley from flooding. About 104 tanks, ponds, and lakes, including 36 marshy areas, are contained within Kashmir Valley. This category's total mapped area was 195.67 sq. km. For the sake of building commercial complexes and parks, many of these historical ponds and tanks have been destroyed. Political instability and a lack of organization in the Kashmir Region have contributed to the towns' unplanned transformation as well.

References

1. Rogers, Peter. America's Water: Federal Roles and Responsibilities. Mit Press, 1996.
2. Krimsky, Sheldon, and Roger Paul Wrubel. Agricultural Biotechnology and the Environment: Science, Policy, and social issues. Champaign, Illinois, 1996.
3. Foley, Jonathan A, Navin Ramankutty, Kate A. Brauman and Emily S. Cassidy and James S. et al. "Solutions for a Cultivated Planet." *Nature* 478,(2011):342.
4. Thakur, Kailash. Environmental Protection Law and Policy in India. De, Publications, 1997.
5. Venkatesharaju, K, P. Ravi Kumar, R. K. Somashekar, and K. L. Prakash. "Physico-Chemical and Bacteriological Investigation on the River Cauvery of Kollegal Stretch in Karnataka." *KUSET* 6, (2010): 50-59.
6. M Qadir, M, Th M. Boers, Samuel Schubert, Abbas Ghafoor, and G. Murta. "Agricultural Water Management in Water-Starved Countries: Challenges and Opportunities." *Agric. Water Manag*. 62, (2003): 165-185.
7. Ongley, Edwin D. Control of Water Pollution from Agriculture 55. Food & Agriculture Org., 1996.
8. Gleick, Peter H. "Water and Conflict: Fresh Water Resources and International Security." *International security* 18, (1993): 79-112.
9. Wu, Changhua, Crescencia Maurer, Yi Wang, and Shouzheng Xue, et al. "Water Pollution and Human Health in China." *Env, Healt Pers*. 107, (1999): 251-256.
10. Ahmed, Nawaz, and Taseem Ahmed. "Problems of Water Resource Management in Kashmir Valley." *IOSR J. Humanit. Soc. Sci*.12 (2013): 76-82.
11. Wilson, Matthew A., and Stephen R. Carpenter. "Economic Valuation of Freshwater Ecosystem Services in the United States: 1971–1997." *Ecological applications* 9, (1999): 772-783.

How to cite this article: Deva, Mohd Adil and Sushil Manderia. "Assessment of Water Quality Parameters Collected from Various Water Resources in Pampore Town (Kashmir), India. *Hydrol Current Res*:13(05)2022:001