

A Tap Water Quality Assessment of Seven Places in Dehradun

Muchkund Pant
Department of Civil Engineering,
Uttanchal University, Dehradun

Vinay Purohit
Department of Civil Engineering,
Tula institute, Utrakhand Technical University

Abstract:- Water is very important for the survival of human beings. But the rapid industrialisation and increasing level of pollutants in water resources has degraded the water quality. Water carries with it, different constituents such as gases, ions, organic and inorganic compounds when the amount of these constituents increase from their desired levels, it pollutes the water and make it unfit for human consumptions. As the amount of potable water is very less in earth, it is an uphill task to provide the safe drinking water to everyone. The present study is about the water quality assessment of seven places in Dehradun. Various tests were conducted to check the water quality of seven places. The pH, hardness, total dissolve solids, chloride content, and dissolve oxygen was within the permissible limits and acceptable limits at maximum places.

1.0 INTRODUCTION

Dehradun is a capital of uttarakhand. Doon valley is surrounded by the hills of Mussoorie. The latitude of Dehradun is 30.318°N and longitude 78.029°E. The main source of water in Dehradun is Tons and some other perennial rivers, which flows at the outer periphery of city. The rapid increase in the population of city has increased the water demand. In summers the water demand reaches in its peaks. This is the main challenge in front of water department of city to provide the clean drinking water to the city inhabitants. Most of the people in city are dependent on tap water for full filling in their daily water requirement. To check the suitability of water, various tests are performed in the water. Some of the name of these tests are: PH test, total dissolve solids, turbidity, alkalinity, chloride taste and odour, hardness etc. IS10500:2012 provides the drinking water specifications to check the suitability of water for drinking purposes. PH test used to determine the acidity or basicity of water. This scale varies from 0 to 14. Total dissolve solids in water is the combination of suspended solids and dissolve solids. It has a psychological effect and makes the water aesthetically displeasing. Turbidity is the measure of extent to which light either absorbed or scattered by water sample. Alkalinity is the measure of quantity of ions present in the water that are capable of neutralising the hydronium ion. Hardness is the concentration of multivalent cations present in water. Chloride content signifies the pollution due to industrial waste and sewage. The taste and odour in water comes from dissolve gases, dissolve organic matter, and inorganic salts.

2.0 METHODOLOGY

Methodology involves following steps:

- 1) Collection of water samples:** The tap water samples were collected from the seven different locations in Dehradun. The names of these places are as follow: UIT, Premnagar, Ballupur, Balliwala, ISBT, Clement Town, Clock Tower.
- 2) Testing of water samples:** Various tests were performed on tap water samples which were taken. The tests were PH, Hardness, dissolve oxygen, Total dissolve solids, chloride ion test.
- 3) Permissible limits according IS 10500-2012:** The permissible limits of the different tests for the water quality tests are as follow:

Test	Permissible limit	Acceptable limit
pH	-	6.5 - 8.5
Hardness	600	300
DO	4	-
TDS	2000	500
Cl ⁻	1000	250

Table 2.1 Limits of different tests for the water quality tests

3.0 OBSERVATION OF TESTS CONDUCTED:

The observation table of different tests, which were conducted on the different tap water samples are as follow:

Place	PH	Hardness	DO	TDS	Cl ⁻
UIT	7.2	312	4.35	315	241
Premnagar	6.5	266	4.96	360	102
Ballupur	7.5	296	3.94	294	130
Balliwala	6.89	392	4.27	367	225
ISBT	6.24	295	4.65	348	168
Clement Town	7.32	356	4.38	318	238
Clock Tower	6.95	420	4.92	376	145

Table 3.1 Observation table of different tests

4.0 RESULTS AND CONCLUSION:

We can draw following conclusion from the above observation table:

- 1) **PH value:** The PH value of the seven places lies in between 6.5 to 7.5. The Highest PH value was obtained in the sample of Ballupur area 7.5. The minimum PH value was obtained around 6.24 at ISBT. The acceptable PH value is 6.5 to 8.5. All the values of PH are within the acceptable limits. The graph showing variation of PH at different places are as follow:

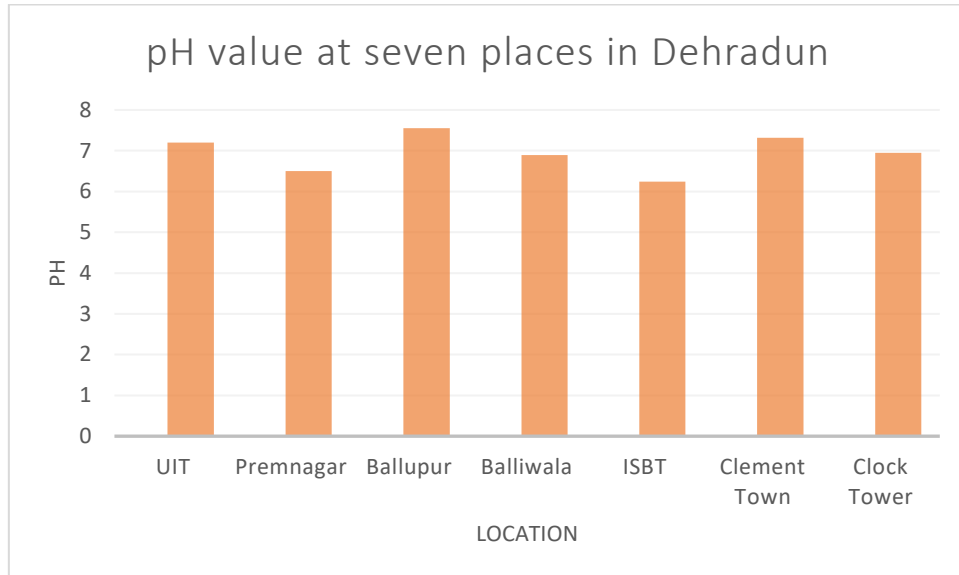


Table 4.1 values of pH at seven places in Dehradun

- 2) **Hardness:** The hardness varies between 266 mg/l to 420 mg/l in seven place's tap water. The maximum hardness was obtained at the clock tower 420 mg/l whereas the minimum hardness 266 mg/l was obtained in premnagar. The permissible limits of hardness is 600mg/l whereas acceptable limit is 300mg/l. The value of hardness at four places clock tower, celement town, balliwala, and UIT is under the permissible limits whereas the value of hardness at premnagar, ballupur, and isbt breaches the acceptable limts. The graph showing variation is as follow.

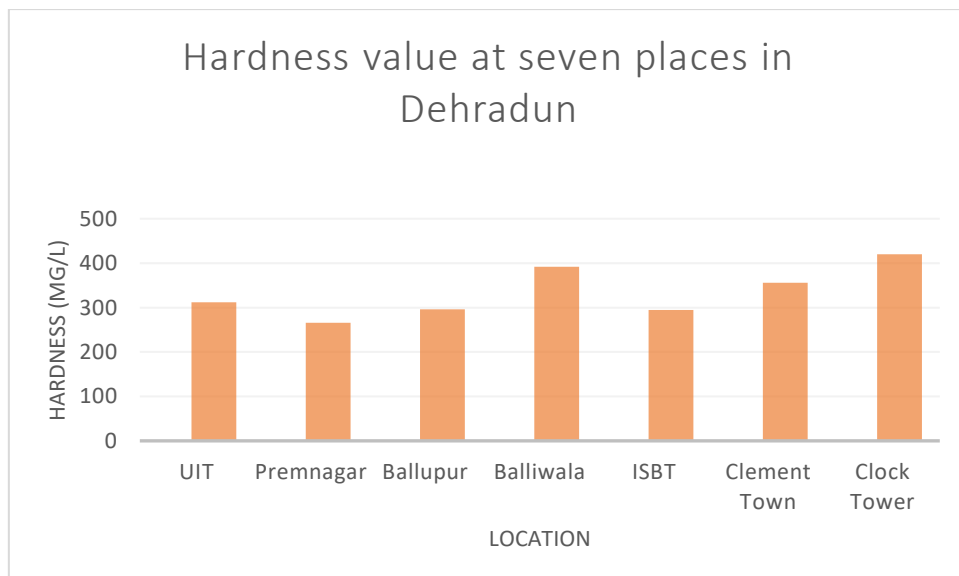


Table 4.2 values of Hardness at seven places in Dehradun

- 3) **Dissolve Oxygen:** The value of dissolve oxygen lies in between 3.94 and 4.96. The heights value 4.96 was obtained at premnagar whereas the minimum value 3.94 was obtained at balliwala. The minimum amount of dissolve which have to be present for survival of aquatic species is 4ppm. Balliwala has a low value of dissolve oxygen.

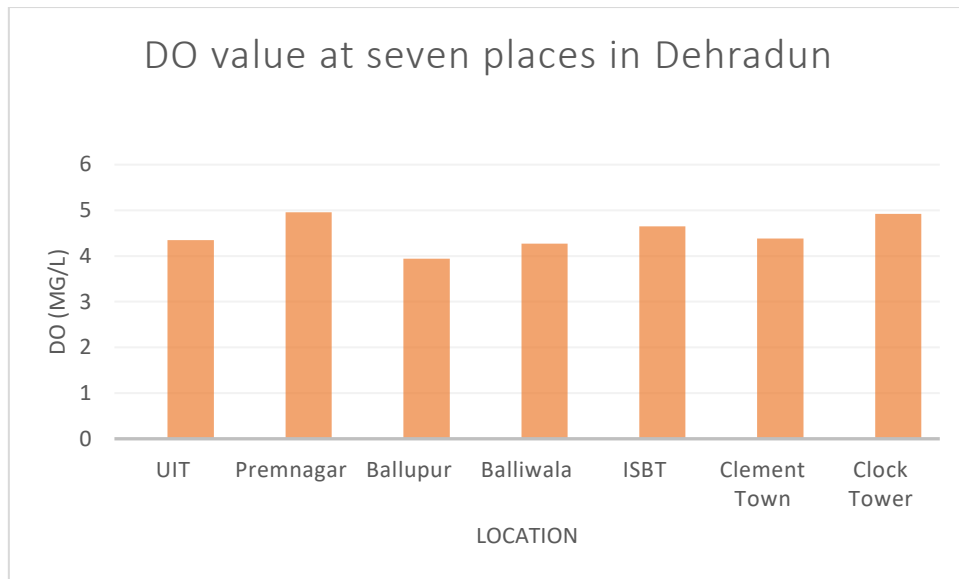


Table 4.3 values of DO at seven places in Dehradun

- 4) **Total Dissolve Solids:** The amount of total dissolve solids lies in between 376 mg/l to 294 mg/l. The highest value 376 mg/l was obtained at clock tower and minimum value 294mg/l was obtained at Ballupur. The permissible limit is 2000mg/l whereas acceptable limit is 500mg/l. All the values breaches the prescribed limits in the code. The amount of total dissolve solids is very less in the tap water of Dehradun.

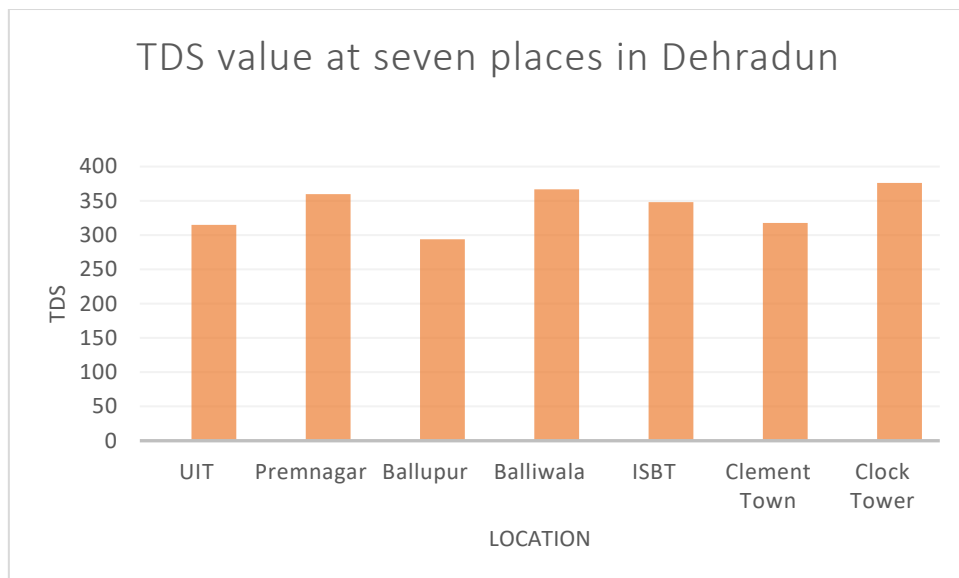


Table 4.4 values of TDS at seven places in Dehradun

- 5) **Chloride ion:** The amount of chloride ion varied between 102mg/l to 241mg/l in seven different palces. The maximum value 241mg/l was obtained at UIT ,whereas minimum value 102mg/l was obtained at Premnagar. The permissible limit for chloride ion is 1000mg/l whereas acceptable limit is 250mg/l. The graph of showing values is as follow:

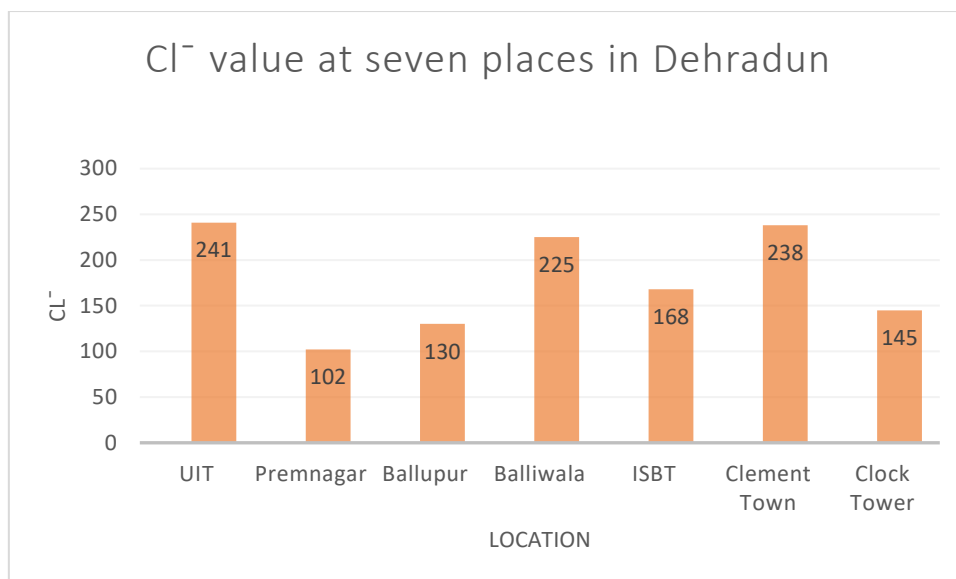


Table 4.5 values of Chloride ion at seven places in Dehradun

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