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A CASE STUDY ON QUALITY OF DRINKING WATER SUPPIED FROM TWO DIFFERENT SOURCES IN ANANTNAG J&K

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ABSTRACT

In the water sector during the last several decades, one of the most significant concerns has been the quality of the water that may be consumed. Changes in the water's physical state, its chemical composition, or its microbial makeup might bring to its degradation as it travels through the distribution system. The quality of the water that is being delivered may also be impacted by factors such as the material of the pipes and the breakdown of a disinfection chemical. In this study we have taken the water samples from various locations throughout the distribution system and were checked for the all physical, chemical and biological characteristics. All the tests were carried out according to WHO standards .After all the tests were carried out then the results are compared with the WHO standards and were found safe.

INDEX-TERMS:– Pipe Distribution System , Pipe Materials , Chemical Parameters , Physical Parameters , Biological Parameters , Sampling , Setting

1. INTRODUCTION

As 783 million people throughout the world still lack access to clean drinking water, providing drinkable water is one of the most significant millennium development objectives established by the United Nations (UN, 2012). Despite the fact that certain communities have easy access to improved water supply through piped supply systems, the quality of such water is sometimes inadequate, especially in developing nations. Microbiological quality is one of the most significant characteristics to consider among the various potable water quality parameters. Various disinfectants are used to maintain the microbiological purity of pipe-borne drinking water. Chlorine and chloramines are widely used for disinfection in areas where more costly non-chemical disinfection procedures, like as ionization, or UV treatments, are difficult to implement. Free chlorine is the most widely used disinfectant on the planet due to its cheap cost, consistency, and efficacy. Chlorine and chloramines, on the other hand, may degrade

when treated water travels via distribution networks.

2. PLACE OF WORK

- Damjan water supply ,Anantnag.
- K.P Road Anantnag.
- Mir Bazar Anantnag.
- NIT Srinagar
- .Govt.Degree College Anantnag.

3. OBJECTIVES OF THE STUDY

1. To determine the characteristics of water flowing from two different sources.
2. To check the health conditions of both the distribution systems.
3. Examine the differences in microbiological water quality between different sources.

4. METHODOLOGY

Setting: - The distribution pipe network of Dhamjan treatment plant and Bumzoo water supply treatment plant serves as the setting for this research work that is being carried out. The entire area of the Dhamjan Water Work and Bumzoo treatment plant was sampled by collecting water samples at six distinct points or locations spread out across the facility and were compared. We have chosen these location in order to concentrate our attention on determining whether or not it is still possible to extract potable water from pipes that were installed in 1972 and 1990 and have already outlived their thirty-year design lifespan.

Sampling:- Careful and conscientious collection of water samples for laboratory examination was carried out. The tap water from throughout the service area was used for the sample, while the water from the treatment plant was used for the control sample. Each sample was obtained using a white airtight container that held 2 liters of liquid. After letting the water from the tap run for a while, the container that will be sampled was given two thorough washings with the help of the sample that will be collected. Under the cover, there was a gap that was left open for air.
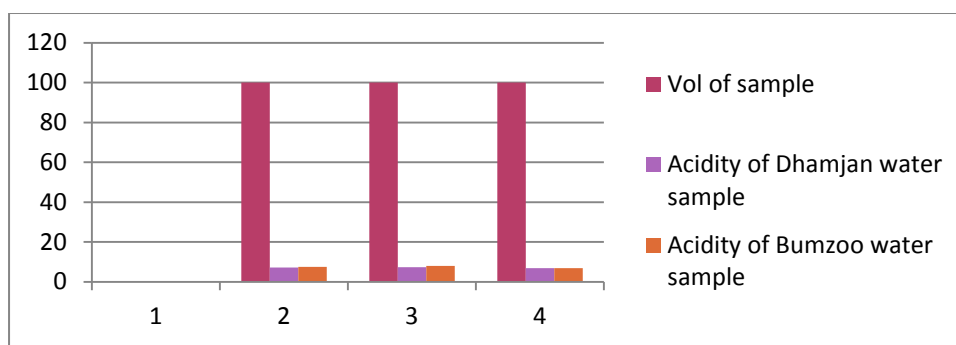
CHEMICAL PARAMETERS

1.   **pH of Rainwater Samples**
The pH value of water sample taken from Dhamjan treatment plant. **7.3**
The pH value of water sample taken from Bumzoo treatment plant **7.9**
2.   **Analysis of Acidity**

Description	Vol of sample	Burette Reading		Volume of NaOH(ML)	Acidity
		Initial	Final		
Sample from Dhamjan	100	23.1	22.4	0.72	7.2
	100	23.9	23.2	0.73	7.3
	100	24.6	23.9	0.69	6.9
Sample from Bumzoo	100	31.5	30.75	0.75	7.5
	100	40.6	39.80	0.80	8
	100	39.80	39.15	0.68	6.8

Graph No 1:- comparison of Acidity

Result:-

Acidity in mg/L as $CaCO_3$ of water sample taken from Dhamjan treatment plant **7.1   mg/l**

Acidity in mg/l as $CaCO_3$ of water sample taken from Bumzoo treatment plant **7.43 mg/l**

3. Alkalinity:

| Description	Vol. of Sample(ML)	Burette Reading		Volume of H_2SO_4(ML)	Alkalinity
		Initial reading	Final reading		
Sample from Dhamjan	20	18.6	18.00	0.60	30
	20	19.5	18.70	0.80	40
	20	38.5	39.30	0.80	40
Sample from Bumzoo	20	39.30	40.20	0.90	45
	20	38.30	39.20	1.00	50
	20	39.10	37.65	1.45	72.5
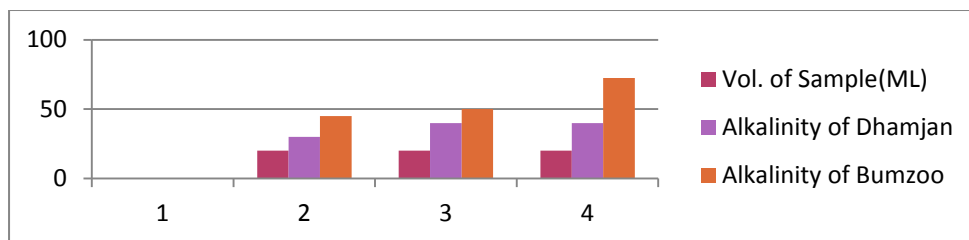
Graph No 2:- comparison of Alkalinity

Result:-

a. The average alkalinity of water samples taken from Dhamjan treatment plant **36.67 mg/l.**

b. The average alkalinity of water samples taken from Bumzoo treatment plant **55.83 mg/l**

4. Chloride Content

Description	Vol. of Sample	Burette Reading		Volume of silver Nitrate(ML)	Chloride in mg/L
		Initial	Final		
Sample from Dhamjan	20	14.20	7.00	7.20	180
	20	26.20	19.20	7.00	174.94
	20	33.40	26.20	7.20	180.00
Sample from Bumzoo	20	24.20	16.10	8.10	202.44
	20	32.20	24.20	8.00	200.00
	20	24.20	16.7	7.5	187.5
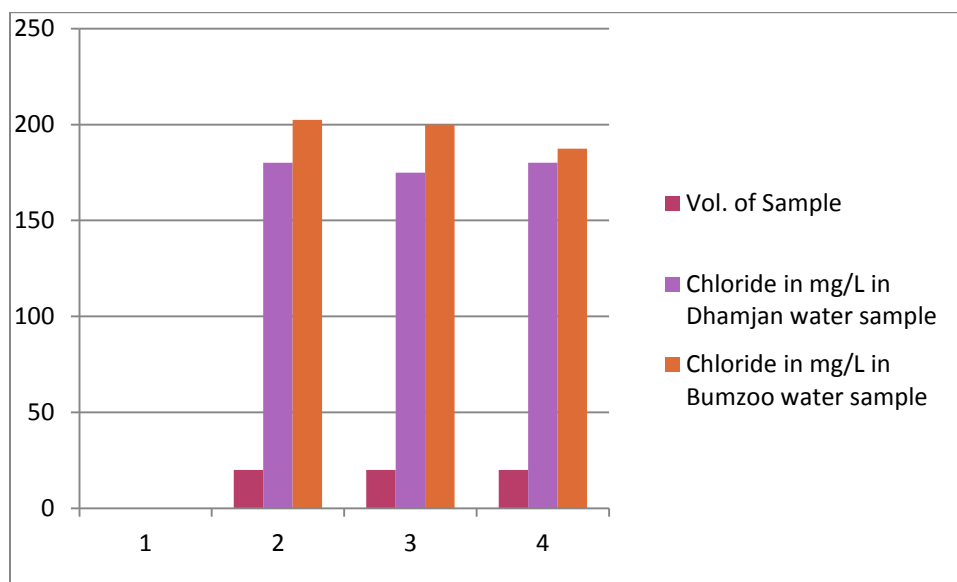
Graph No. 3:- Comparison of Chloride Content

Result:-

The amount of chloride that is present in the water sample of Dhamjan treatment plant   **187.46 mg/l**

The amount of chloride that is present in the water sample of Bumzoo treatment plant **196.48 mg/l**

5. Examination of the water sample for the presence of hardness

S. No.	Volume of sample (ml)	Burette reading		Vol. of titrant used (EDTA)	Hardness
		Initial (ml)	Final (ml)		
1	20	3.45	1.5	2.45	126.17
2	20	5.3	3	2.3	118.45
3	20	7.9	5.5	2.4	123.6
4	20	11.4	9	2.4	123.6
5	20	9	7	2	100
6	20	6	3.2	2.8	140
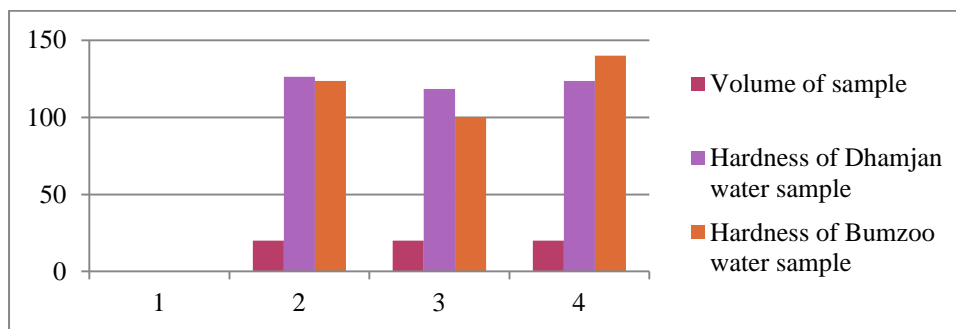
Graph No.4:- Comparison of Hardness

Results:-

1. The total hardness of sample taken from Dhamjan treatment plant **122.74 mg/l.**
2. The total hardness of sample taken from Bumzoo treatment plant **121.2 mg/l.**

PHYSICAL PRAMETERS

1. **suspended solids**

(a) Dissolved   solids of sample taken from water sample of Dhamjan water treatment is   **440 mg/l.**

(b) Dissolved   solids of sample taken from water sample of Dhamjan water treatment is   **400 mg/l.**

2. Turbidity

The Level of Cloudiness in the Selected Water Sample of Dhamjan treatment plant **0.02NTU.**

The Level of Cloudiness in the Selected Water Sample of Dhamjan treatment plant **0.01NTU.**

3. Color

The word "color" refers to the real color of water that has had the turbidity removed. The true color of water comes from dissolved matter, whereas the apparent color comes from suspended matter and compounds in solution

Results:-

The color of the water sample taken from Dhamjan water treatment plant **3 TCU**

The color of the water sample taken from Bumzoo water treatment plant **1 TCU**

4. Temperature

Results :-

1. The temperature of the water sample that has been collected from Dhamjan treatment plant was **15 degrees Celsius**
2. The temperature of the water sample that has been collected from Bumzoo treatment plant was **15 degrees Celsius**

CONCLUSION AND FUTURE SCOPE

Conclusion:-

1. It was found that Dhamjan water supply treatment plant is older treatment plant than Bumzoo treatment plant. So because of the design period , the properties of water gets changed.
2. It was also found that there is increase in Iron Content in Dhamjan water supply plant , because the pipes laid were corroded due to chemical reactions of oxygen and Chlorine present in water.
3. The result of tests for both the sources were compared and were found safe according to WHO standards.
4. The properties of Bumzoo treatment were more accurate than that of Dhamjan treatment plant.

Future Scope: - The properties of both the sources were studied and researched in order that which treatment plant needs to be redesigned as the city of Anantnag is dependent on these water treatment plants.

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