Assessment of Drinking Water Quality at NH-21

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Abstract—**Present study aimed to assess and compare the ground water quality. Physio-chemical characteristics of ground water on N.H.-21 by taking water sample from different location (Bassi, Dyarampura, Kanota, Jamdoli) have taken under in present study. The study is carried out by collecting ground water sample (bore well and municipal) at each sample site. Data is collected based upon the requirement and laboratory analysis of water sample is carried out. Comparison of water quality is done among each areas by certain physical and chemical parameters such as (hardness, pH, alkalinity, chloride content, TDS, residual chlorine, turbidity, etc.). The results obtained are compared with the standards for providing better quality of drinking water.**

Keywords—Water Quality, parameter, etc)

I. INTRODUCTION

Water is a transparent and nearly colorless chemical substance that is the main constituent of earth's streams, lakes, and oceans, and the fluids of most living organisms. Water covers 71% of the earth's surface. The majority of water on earth is sea water. Water is also present in the atmosphere in solid, liquid, and vapor states. Water is the most common liquid on our planet, vital to all life forms. It is also an important component of the tissues of most other living things. Water is one of the nature's most important gifts to mankind. It is an essential element for survival of human being. One can survive for a month without food but cannot survive a few days in the absence of water. Quality of drinking water is important to be studied when the overall focus is sustainable development keeping human being at focal point.

Water is the dispersion medium for all biochemical reactions of the living process and takes part in many of these reactions.

Water works for us in many ways, making our lives easier and more enjoyable. Water is a basic necessity of life, not only for people but for every type of plant and animal as well. Water accounts for about 65% of our body weight. If we lost as little as 12% of it, we would soon die. Water is essential not only for survival but also contributes immeasurably to the quality of our lives. Water played – and continues to play – a special role in the growth of our nation. Water transportation is still the most efficient way to move bulk goods. Water is also the basis of cheap energy. We are now aware of limits to the reuse of water, when and where it is returned to nature diminished in quantity and quality. Therefore, we must learn to understand water use much better: where we use it, what to measure, what the main uses are, how they compete and interfere with each other, and how to manage the growing competition.

Water is one and whole, same by its name but it is different by its variable characteristics which are solely based on various factors which impact the quality of water. It is therefore necessary to check the quality of water to assess its further implication. Characteristics of water bodies influence the quality of water individually and in combination with various pollutants, thereby, affecting the living organisms present there.

This study considers and assessed the quality of different water bodies in Jaipur. Jaipur the capital of Rajasthan is situated at 27*00' N latitude and 75*50' E longitude. The climate of Jaipur is subtropical type, it receives over 650 millimeters of rainfall annually but most rains occur in the monsoon months between June and September, so the availability of water is scarce.

In this comparative study of the water quality on N.H-21 has been carried out. All these water bodies are of different nature and importance, as one of them is used for irrigation and drinking purpose on the other human consumption is called drinking water or potable water. Water that is not potable may be made potable by filtration or distillation, or by a range of other methods.

II. NECESSITY OF WATER

Water is used for drinking water production contains water molecules and a large variety of other substances. One of the properties of water is that it easily dissolves other substances. Water that falls to earth during rain showers dissolves substances, particles and gasses such as oxygen, which can be found in air. Contaminants that are present in air also dissolve in rain water. When surface water flows on earth it also dissolves several different substances, such as sand particles, organic matter, microorganisms and minerals. Water that settles into the ground and becomes groundwater often contains large amounts of dissolved minerals, as a result of contact with soils and rocks.

III. OBJECTIVES

Following are the objectives of the study: -

1. To collect the water samples from various sources at different areas.
2. To check the quality parameters of water.
3. Compare the data obtained with standards.
4. Give the suggestion and recommendations for improving quality of water.

IV. LITERATURE REVIEW

Water is most vital liquid for maintaining the life on the earth. About 97% water is exists in oceans that is not suitable for drinking and only 3% is fresh water wherein 2.97% is comprised by glaciers and ice caps and remaining little portion of 0.3% is available as a surface and ground water for human use. Safe drinking water is a basic need for good health and it is also a basic right of human. Fresh water is already a limiting resource in many parts of the world. In the next century, it will become even more limiting due to increased population, urbanization and climate change. Unfortunately, in developing countries the drinking quality of water is continuously being contaminated and hazardous for human use due to high growth of population, expansion in industries, throwing away of waste water and chemical effluents into canals and other water sources.

According to recent estimates, the quantity of available water in developing regions of south Asia, Middle East and Africa is decreasing sharply while quality of water is deteriorating rapidly due to fast urbanization, deforestation, land degradation etc. Many studies are done in past related to water analysis, some of them are highted here as below;

Namita Soni and Anju Bhatia in the year 2015 find out the quality of drinking water at household level in Jaipur city of Rajasthan. In, Jaipur the main sources of water supply is ground water. It is either supplied by the piped line by the public health and engineering department (PHED) or the households have their own personal bore-well at their premises. For the study 20 samples were collected from 10 randomly selected wards; one each from bore-well and piped water supply. Samples of water were collected from household for physic-chemical analysis and comparison was done with the standards.

M.J. Pawari, S.M. Gavande has been carried out the quality of water usually described according to its physical, chemical and biological characteristics. Hence it becomes necessary to find the suitability of water for drinking, irrigation and industry purpose. The groundwater quality based on sodium percent sodium absorption ratio and residual sodium carbonate will help to identify the suitability of water for irrigation purpose. Rapid industrialization and used of chemical fertilizers and pesticides in agriculture causes deterioration of water quality and depletion of aquatic life. Due to the use of contaminated water, human populations suffer from water borne diseases. Parameters that are tested include temperature, Ph, turbidity, salinity, nitrates, TDS.

Sandeep Mitharwal, R.D. Yadav and R.C. Angasaria are increasingly being sought as a source of drinking water due to the scarcity, non-availability and bacteriological pollution of surface water. Their work describes the important results of the Physico-chemical analysis of the ground water samples of the open wells, tube wells and hand pumps of the urban areas in Pilani, District – Jhunjhunu of Rajasthan State. The different parameters determined are pH, TDS, fluoride, chloride, nitrate, sulphate, total alkalinity and total hardness. It has been observed that nitrate values are higher compared to ICMR standards. Other parameters were found within desirable limits. The interesting fact is that the nitrate alone is making ground water unfit for drinking.

Ankita Mathur and Umesh Gupta have find out the assessment of water quality parameters of Jaipur, Rajasthan and to calculate water quality index. This has been determined by collecting ground water samples to a comprehensive physic-chemical analysis. In the present study seventy water samples are taken from different areas of Jaipur and 9 water quality parameters have been considered: pH, total hardness, chloride, fluoride, and TDS, calcium, alkalinity etc. The analysis reveals that the ground water of Jaipur needs some treatment before consumption and it is also needs to be protected from contamination.

V. DATA COLLECTION

The data has been collected from various locations at NH-21 and the source of water supply is taken as tube well. Some of the tube wells are government functioning and some are individual household. Table mentioned below shows the location, source of water sample and the values of each parameter which are considered for safe drinking purpose.

Test: - pH
Source of Water Supply:-Tube Well

Sr. No.	Location	pH Value
1	Kanota	8.34
2	Dayarampura	7.60
3	Bassi	7.74
4	Jamdoli	8.03

Table No.1 pH Value

Test: - Turbidity
Source of Water Supply:-Tube Well

Sr. No.	Location	Turbidity (NTU)
1	Kanota	3
2	Dayarampura	2
3	Bassi	5
4	Jamdoli	5

Table No.2 Turbidity Value

Test: - Hardness (mg/l)
Source of Water Supply:-Tube Well

Sr. No.	Location	Hardness (mg/l)
1	Kanota	300
2	Dayarampura	320
3	Bassi	270
4	Jamdoli	350

Table No.3 Hardness Value

Test: - Residue Chlorine (mg/l)
Source of Water Supply:-Tube Well

Sr. No.	Location	Chlorine (mg/l)
1	Kanota	6.2
2	Dayarampura	6.4
3	Bassi	5.9
4	Jamdoli	15.6

Table No. 4 Residual Chloride Value

Test: - Total Dissolved solids (mg/l)
Source of Water Supply:-Tube Well

Sr. No.	Location	TDS
1	Kanota	2170
2	Dayarampura	2870
3	Bassi	1470
4	Jamdoli	2380

Table No. 5 Total Dissolved Solids Value (mg/l)

Test: - Alkalinity
Source of Water Supply:-Tube Well

Sr. No.	Location	Alkalinity (mg/l)
1	Kanota	650
2	Dayarampura	710
3	Bassi	560
4	Jamdoli	990

Table No. 6 Alkalinity Value (mg/l)

Test: - Fluoride
Source of Water Supply:-Tube Well

Sr. No.	Location	Fluoride
1	Kanota	0.7
2	Dayarampura	0.8
3	Bassi	1.0
4	Jamdoli	1.6

Table No. 7 Acidity Value

Test: - Dissolved Oxygen (D.O.) (mg/l)
Source of Water Supply:-Tube Well

Sr. No.	Location	D.O. (mg/l)
1	Kanota	209.4
2	Dayarampura	203.6
3	Bassi	205.2
4	Jamdoli	213.5

Table No. 8 Dissolved Oxygen (D.O.) Value

VI. DATA ANALYSIS

Comparative analysis of data which is obtained from the various areas has been done.

Parameters	Kanota	Dayarampura	Bassi	Jamdoli
pH	8.34	7.60	7.74	8.03
Turbidity	3	2	5	5
Hardness	300	320	270	350
Residue Chlorine	6.2	6.4	5.9	15.6
TDS	2170	2870	1470	2380
Alkalinity	650	710	560	990
Acidity	2.5	4.4	1.8	2.8
DO	209.4	203.6	205.2	213.5

Table No. 9 Combined Tabular Format

The data obtained in tabular format is compared with the standard results and various recommendations & suggestions have been given according to the need.

Sr. no.	Parameters	Desirable limits mg/l	Permissible limits mg/l
1	pH	6.5-8.5	No
2	Turbidity	5	10
3	Hardness	300	600
4	Residue Chlorine	0.2	-
5	TDS	500	2000
6	Alkalinity	200	600
7	Fluoride	0.6	1.2

Table No. 10 Standard Tabular Format

VI. SUGGESTION & RECOMMENDATIONS

On the basis of above analysis, following suggestion & recommendations have been provided:

1. pH value was found to be in the range 6.5-8.5 in all the selected areas of work, hence it was suggested that the water can be directly used for drinking purpose.
2. The turbidity value was also much in the range as suggested by the BIS; hence the water was clear in all the areas.

3. Hardness value was found to be more in Jamdoli area as compared to the others, hence it is mostly seen that the areas are installed with the RO system in the houses.

4. It was also seen that no water treatment plant is installed in the nearby areas of NH-21, hence suggestion were given to installed the water treatment plant in the nearby areas.

5. Total dissolved solid indicate the salinity behavior of ground water .Water collected from kanota dayarampura show the more TDS

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