

# A Case Study on Surface Water Analysis

Asadhari Sheikh<sup>1</sup>, Nikhil Sachdev<sup>2</sup>, Shanthkumar Hallikhede<sup>3</sup>

<sup>1,2,3</sup>MBA PCM, MIT ADT University, Pune, India

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**Abstract** - The quality and quantity of water the most important source in this world, is decreasing as per today's scenario, due to increase in pollution and population. In this research paper, alternative surface water sources of Jaipur will be studied and compared with standard water sample readings. To check quality of water some standard test like turbidity, acidity, hardness, total solids, PH value, alkalinity, chloride content etc. are carried out. In Jaipur the ground water table from last 10 years has sunk to 25metres which has hence risen the need to find alternatives for future water resources.

**Keywords**—pH, Turbidity, Hardness, Jaipur

## 1. INTRODUCTION

One of the major differences that makes earth unique is the presence of water, 70% of earth is covered with water. Water is essential for human survival and also other living organisms. 2% of water on earth surface is glacier, it can be processed and used but the source is not within the human range, less than 1% is available for human usage, the remaining 97% is not potable and to process it into drinkable form is an expensive one.

The world is currently focussing on urbanisation, rapid growth which result in the excessive usage of the available natural resource, depleting them on higher rate and water being one of them, and thus ignoring the fact that no water will lead to no life on the planet. Global warming the major issue faced by planet, is leading to melting of the glaciers, and increasing the sea water level, thus the fact that there will be increase in salty water and decrease in level of fresh water.

Surface water is the water on planet surface such as rivers, lakes, wetland, oceans, creeks etc. It can be contrasted with ground water and atmospheric water. Non-saline surface water uses is replenished by precipitation and recruitment via ground water. It is lost through evaporation seepage into the ground where it becomes your ground water. In India main source of surface water are Indus, Ganga, Yamuna, Brahmaputra, Mahanadi etc [8]. But according to today's scenario the Ganga and Yamuna ranked among the world's 10 most polluted rivers.

About Rajasthan which is in western part of India. It is the largest state of India which covers 342,236 km<sup>2</sup> areas.

Rajasthan is known for its hot and dry climate, Here we found the Great Indian Desert – Thar Desert is one of the oldest mountain range known as Aravali range. Chambal, Banas, luni rivers are the main sources of water available

to the Rajasthan. Jaipur is the capital of Rajasthan which is also the largest city of the state, the main source of potable water available to Jaipur is through Ramgarh lake situated

35km away from the city but is currently facing decrease in water level due to shortage of rainfall. Along with the issue of the scarcity of water, Jaipur and Rajasthan also faces the problem of decrease in quality of water and this paper focuses on dealing with these issues, finding alternative resources of surface water in places like Amber Fort, Jal Mahal and Galta kund. Water samples from these places will be tested under basic parameters and after evaluation of the problems feasible solutions for the betterment of the water will be chalked out.

## 2. METHODOLOGY

The parameters on which we are going to test our water samples are Turbidity, PH Value, Hardness, Acidity, Alkalinity, Chloride Content, Total solid, Fluoride, Nitrate etc.

Turbidity of water helps us to determine presence of suspended particle in water. It is performed with the help of nepheloturbidity meter. The maximum permissible limit of turbidity is <10 NTU for potable water. The nature of water whether it is acidic, basic, neutral is determined with the help of pH value, measured by pHmeter.

The value should lie between 6.5-8.5 for drinking water. Hardness of water helps us to determine whether the water is hard or soft. It can be determined by the process of titration. The maximum permissible limit of total hardness is <200 ppm for drinking water. Acidity of water helps us to determine base neutralizing capacity of water. Alkalinity of water helps us to determine neutralizing capacity of water which is also been determined by the titration process.

The maximum permissible limit of alkalinity is <200 mg/l for drinking water. By High Furnace method, Total solid in water can determine by the value of dissolved and suspended solid in water. The maximum permissible limit of total solids is <2000 mg/l for potable water. Chlorine content of the water can be determined with help of titration. The maximum permissible limit of chlorine is <250 mg/l for drinking water. With the help of Ion-Selective Electrode (ISE) method fluoride and content in water can be determined.

## 3. RESULT AND DISCUSSION

Now after comparing the readings of all locations (shown in table 1) with the standards we found that acidity, nitrate, alkalinity and ph are in the permissible

limit, except for some places where the samples do not fall under standards. The chloride content that found in the sample of Jal Mahal and Amber fort are 887.5 mg/l and 1597.5 mg/l respectively, which is far high when compared to the permissible limits of chloride content in water. Galta kund reading is 31.60 mg/l, is the lowest compared to other readings and also in the permissible limits and same is the case with fluoride content readings. The quantity of fluoride content in Jal Mahal and Amber Fort is high that is 1.3 mg/l and 1 mg/l respectively. The fluoride content in Galta Kund water sample is in permissible limit that is .311 mg/l.

Now considering total hardness, water sample reading of Amber Fort and Galta Kund is 455.55 mg/l and 490 mg/l respectively. It is higher as compared to permissible limit of total hardness in water on other hand the water sample reading of Jal Mahal is 23.33 mg/l and is very much in permissible limit of total hardness in water. The value of Total Solid in jal mahal water sample is high which is 2500 mg/l and not in the permissible limit of total solid in water whereas the water sample reading of Amber Fort and Galta Kund are 1500 mg/l and 980 mg/l and it is in permissible limit of total solid in water.

Considering turbidity where the value of turbidity is high in the water sample reading of Jal Mahal it is 42 NTU and is not under permissible limits. The water sample reading of Amber Fort and Galta Kund is 7 NTU and 6 NTU respectively and is also not under the permissible limits.

So in order to make water at Jal Mahal potable the chloride, fluoride, total solid and turbidity present should be minimised. Amber Fort one should minimise chloride, fluoride and total hardness present in it and Galta Kund minimise total hardness present in water.

#### 4. CONCLUSIONS

To conclude, some of the parameters do not fall under permissible limit to note total hardness, total solid, turbidity, chlorine content and fluoride and rest are much into the limits.

These non-permissible are harmful for the body and entry in living body results into breathing, swelling, or skin problem may occur. For the purpose of dechlorinating, and reverse osmosis are used to control over that. Filtration process is used to treat Turbidity.

There are two ways to control total hardness i.e. use a package water softener or use mechanical water softening unit. Filtration, coagulant and sedimentation process is used to control total solid present in water.

#### REFERENCES

- <http://www.yourarticlelibrary.com/water/surface-water-resources-in-major-river-basins-of-india/20884/>

- <http://www.indiawaterportal.org/articles/atleast-70-jaipur-receives-water-high-concentration-tds-or-contaminated-bacteria-or-both>
- [https://www.fcwa.org/story\\_of\\_water/html/earth.htm](https://www.fcwa.org/story_of_water/html/earth.htm)
- <http://www.yourarticlelibrary.com/environment/the-importance-of-natural-resources-of-planet-earth/9914/>
- <http://www.mariekesartofliving.com/Header/Jaipur-Party/General-Information-about-Rajasthan>
- <http://www.laleva.cc/environment/water.html>