

Surface Water Analysis-A Case Study of Lakes Around Jaipur City

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Abstract– Water is one of the most important sources in this world, but as per today's scenario it's quality and quantity decreasing day by day due to increase in pollution and population [1]. In Jaipur 90% of water comes from ground water sources and only 10% of water comes from surface water sources [2]. But from last 10 years ground water table of Jaipur sinks 25 meters that's why we need to think about some alternatives for future water resources in Jaipur [3]. So, in this research paper we are going to study about alternative surface water sources of Jaipur and comparing it with standard water sample readings to find out the problems associated with it and their remedies. To check quality of water we do some standard test like turbidity, acidity, hardness, total solids, PH value, alkalinity, chloride content etc.

Keywords—pH, Turbidity, Hardness, Total solids, Acidity.

I. INTRODUCTION

Importance of water is understood by that it comes in elements of Panchatavta where water stands for life. Water is important for each and every thing on earth because it covers 70 % part of our earth and body. One of the main factors due to which earth is different from other planet of universe is water [4].

On water each living organism's life depends and for human life availability of fresh water is very important. On our earth surface 97% of water is salt water which cannot be drinkable for humans although it can have treated to make it drinkable for human but the process will be very expensive. 2% of water on earth is in the form of glacier ice, the ice is fresh water and it can use by melting it but this resource is very far from human range and it can't usable. Only less than 1% of water is in the form of fresh water which we use in many purposes like drinking, heating, transportation, and industries etc [4], [5].

Due to rapid increase in Urban Development, Pesticides, Industries, Sewage Water, Population and Solid Waste the quality as well as quantity of water decreasing day by day. Now the world only focusing on technology and how to do rapid growth in every field but we are forgetting about natural recourses! Which are available in fix amount on earth and they are decreasing as the same speed in which we are developing and water is also one of them [6].

Now the world faces the problem of water pollution and subsiding source of water. Global warming is also a major point of concern today because due to global warming glacier are melting and the water level of sea increasing day by day. It means the level of salty sea increasing and the level of

fresh water is decreasing. In past time, we didn't face this kind of problem because of simple life-style as well as industrialization. Surface water is one of the most important sources for drinking purpose. Surface water is available in creek, lakes and stream. Surface water found above the earth surface and it can contaminate by many sources like untreated industrial waste, agricultural waste etc [5]. In India main source of surface water are Indus, Ganga, Yamuna, Brahmaputra, Mahanadi etc. 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 km² areas. Here we find the Great Indian Desert – Thar Desert and one of the oldest mountain range known as Aravali range. Rajasthan is known for its hot and dry climate and main source of surface water are Chambal, Banas, luni rivers etc. [7], [8]. The all rivers in Rajasthan are intermittent rivers. The capital of Rajasthan is Jaipur which also a largest city of Rajasthan. The main source of surface water in Jaipur is Ramgarh Lake situated 35 km away from the city and due to lack of rainfall it's water level decreasing every year. Rajasthan and Jaipur already have scarcity of water after that quality of water decreasing regularly [2]. In our research, we are going to study about future alternative resource of surface water in Jaipur like Amber Fort, Jal Mahal and Galta kund. By analyzing of water of these places, we can find out the quality and modes of application for human society.

II. 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 can be done by with the help of nephelometric turbidity-meter. The maximum permissible limit of turbidity is <10 NTU for drinking water. PH of water helps us to determine the nature of water whether it is acidic, basic or neutral. It can be determining with the help of pH meter. Drinking water pH should be lies in the range of 6.5-8.5. Hardness of water helps us to determine whether the water is hard or soft. It can be determining by the process of soap 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. It can determine by the process of titration. Alkalinity of water

helps us to determine neutralizing capacity of water. It can determine by the process of titration. The maximum permissible limit of alkalinity is <200 mg/l for drinking water. Total solid in water can determine by the value of dissolved and suspended solid in water. It can done by high furnace method. The maximum permissible limit of total solids is <2000 mg/l for drinking water. With the help of titration chlorine content in water can be determine. 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 determine. The maximum permissible limit of fluoride is <1 mg/l nitrate is <45 mg/l for drinking water. By the help of titration chlorine content in water can be determine. The maximum permissible limit of chlorine is <250 mg/l for drinking water.

TABLE 1 -WATER SAMPLE READINGS

PARAMETERS/LOCATION	ACIDITY (mg/l)	ALKALINITY (mg/l)	PH VALUE	CHLORINE (mg/l)	FLOURIDE (mg/l)	NITRATE (mg/l)	TOTAL HARDNESS (mg/l)	TOTAL SOLID (mg/l)	TURBIDITY (NTU)
JAL MAHAL	25	40	8.4	887.5	1.3	2.4	23.33	2500	42
AMBER FORT	35	17.5	7.8	1597.5	1	2.1	455.55	1500	7
GALTA KUND	36	56	8.2	31.60	.311	2.3	490	980	6

III. RESULT AND DISCUSSION

Now after analyzing the data of all locations (shown in table 1) with the standard data, we found that acidity, nitrate, alkalinity and ph are in the permissible limit. But on some standards the sample of different places are not in permissible limit. The chloride content that found in the sample of Jal Mahal and Amber fort is 887.5 mg/l and 1597.5 mg/l respectively. That is very high in compare to permissible limit of chloride content in water, The water sample reading of Galta Kund is 31.60 mg/l that in the permissible limit and also very low compare to others. The same case can be seen in the compare of fluoride content. 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 in the case of total hardness, The water sample reading of Amber Fort and Galta Kund is 455.55 mg/l and 490 mg/l respectively. It is large as compare to permissible limit of total hardness in water. Where as the water sample reading of Jal Mahal is 23.33 mg/l and it is 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. Where as 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. One can see in the case of turbidity where the value turbidity is high in the water sample reading of Jal Mahal it is 42 NTU. so, It is not in permissible limit of turbidity in water. where as the water sample reading of Amber Fort and Galta Kund is 7 NTU and 6 NTU respectively and it is not in permissible limit of turbidity in water.

So after comparing one can conclude that if anyone want to make the water drinkable of Jal Mahal then one should minimise the chloride, fluoride, total solid and turbidity present in it. For Amber Fort one should minimise chloride, fluoride and total hardness present in it and For Galta Kund one should minimise total hardness present in it.

IV. CONCLUSION

At last one can conclude that some of the parameters are not in the permissible limit like total hardness, total solid, turbidity, chlorine content and fluoride and rest of these Parameters are in permissible limit. When these parameters enter in living body as a result breathing, swelling, or skin problem may occur. Our aim is to make it drinkable so to overcome on these parameters we have to take it in permissible limit.

For chlorine dechlorination and reverse osmosis are used to control over that. Turbidity is commonly treated by using either a setting or filtration process. 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.

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