

Analysis of Surface & Ground Water Quality and its Suitability for Drinking Purposes in Pulwama City

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Abstract

This study is an attempt to assess the physico-chemical characteristics of surface and sub-surface resources in Pulwama city. Water sample were collected from surface and Groundwater resources from 16 sampling locations in proximity of Pulwama for three continue month. The samplings were chosen to cover the entire radius of Pulwama and 20 km of Jhelum river and other three rivers such as ramshi, arapal and sasara river after preliminary survey of sampling area in and around Pulwama. The main focus is to assess various quality parameters like pH, DO, TDS, Turbidity, hardness, Ca²⁺, Mg²⁺ etc. In this study the value of all observed parameters shown in tables and represented in graphical format. pH, turbidity, conductivity, total dissolved solids, alkalinity, resistivity, salinity were analyzed using Systronic 9 parameter water analyzer, total hardness (TH), content of calcium (Ca²⁺), magnesium (Mg²⁺) were measured by EDTA titration method, total alkalinity (TA) was determined by titrimetric method, Fluoride (F⁻) was determined by using Systronic Spectrophotometer, DO, BOD and chloride (Cl⁻) by standard methods given by NEERI, APHA. In three months nearly 55 water samples were collected from different locations of Pulwama city. The samples were preserved in ice. It has been concluded from this dissertation work that in Pulwama city, source of surface water of Jhelum River, sasara river, arapal and romshi river water quality is suitable for drinking purpose. Similarly, groundwater quality is not suitable for drinking purpose at Town Hall, Fruit market and Railway station of Pulwama city. In this study, the Town Hall area found nitrate (55 mg/l) above the permissible limit, Fruit market area found dissolved oxygen (2.7 mg/l) below the range of permissible limit and in the railway station area found fluoride (4.30 mg/l) higher the permissible limit of IS: 10500 for the quality of drinking water.

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I. INTRODUCTION

Water is the most precious natural resources that comprise 70% of the earth's surface. It is the most essential for everything on our planet to grow and prosper and without which life on Earth would be impossible. Although we recognize this fact, we disregard it by polluting our rivers, lakes, and oceans. Subsequently, we are slowly but surely harming our planet to the point where organisms are dying at a very alarming rate. In addition to innocent

organisms dying off, our drinking water has become greatly affected as is our ability to use water for recreational purposes. The effects of water pollution are not only devastating to people but also to animals, fish and birds. Polluted water is unsuitable for drinking, recreation, agriculture, and industry. It diminishes the aesthetic quality of lakes and rivers. Water pollution has many sources. Routine uses of fertilizers and pesticides for agriculture and random disposal of industrial and domestic wastes are progressively more as significant sources of water

pollution. The most contaminated of them are the city sewage and industrial waste discharged into the rivers. The facilities to treat waste water are not adequate in any city in India. Currently, only about 10% of the Sewage generated is treated; the remaining is discharged as it is into our water bodies. When poisonous substances enter lakes, streams, rivers, oceans, and other water bodies, they get dissolved or lie suspended in water or get deposited on the bed. This results in the pollution of water where by the quality of the water destroys, affecting aquatic ecosystems. Pollutants can also leak down and affect the groundwater deposits.

II. STUDY AREA

Pulwama is a town and a notified area committee in Pulwama district in the Jammu and Kashmir. It is almost 28km from the Srinagar district. It is often called the Anand of Kashmir or Dudha-Kul of Kashmir because of its high milk production. The district is reported to be one of the pretty spots on the earth, because of its pleasant climate, innumerable springs, streams, waterfalls, fragrant flowers, delicious fruits and other natural sceneries. Besides district Pulwama is famous all over the world for saffron cultivation which is mainly grown in Karewa lands of Pampore, Kakapora and Pulwama.



Figure 2.1: Map of Pulwama

It is centrally located in the valley of Kashmir, situated between the geographical coordinates of 33°37' - 34°06' N latitude and 74°33' - 75°14' E

longitude. Pulwama has an average elevation of 1,630 m amsl and bounded by Srinagar in the north, in the west by Poonch and Budgam and in the east and south by Anantnag. This district was formed in 1979 by separation of Tehsil Pulwama, Shopian and Tral of the Anantnag district. This district consists of 550 villages, which until 2007 were grouped in five (5) Tehsils viz. Shopian, Pulwama, Tral, Pampore and Awantipora. In 2007, pulwama district has been divided in two parts viz. district Shopian and district Pulwama. Now there are there are eight tehsils, namely Pulwama, Tral, Awantipora, Pampore, Rajpora, Shahoora, Kakpora and Aripal. The total number of villages came down to 331 with four community block. The total area of the pulwama is 951 km². The administrative centre of the district is to be found at Pulwama which is about 28 kilometres from the Dalgate Srinagar.

III. MATERIAL AND METHODOLOGY

In this research work, sites were selected which are present at the populated areas of Pulwama city where the water is used for drinking by living things. Peoples are using water through main sources that are surface water of Jhelum River and other water bodies and groundwater of hand pump was collected. The most populated and densely populated areas where the sites have been selected to collect from the ground sources of water are Railway station area, Town Hall, Police line area, Shaheed park, X change colony circle, Fruit market, Murran – III, Dadoora area, Khidmat, Sirnoo, Masjid area and Themna. The site of surface sources of water is Jhelum River, Ramshi River, Sasara River and Arapal River. In my dissertation work, surface water and groundwater sample has been collected, the methodology used for sampling was grab at the time of sampling the temperature was 20oC to 35oC. The samples were preserved in ice. Then I determine and analysis the various quality parameters such as, pH, turbidity, conductivity, total dissolved solids, alkalinity, resistivity, salinity were analyzed using Systronic 9 parameter water

analyzer, total hardness (TH), content of calcium (Ca^{2+}), magnesium (Mg^{2+}) were measured by EDTA titration method, total alkalinity (TA) was determined by titrimetric method, Fluoride (F^-) was determined by using Systronic Spectrophotometer, DO, BOD and chloride (Cl^-) by standard methods given by NEERI, APHA



Figure 3.1: collection of ground water Sample

3.1 Groundwater Sampling

Sampling process of Ground water is, for water sampling one liter cane is used. At the time of water sampling it had been made sure that the cane are properly washed or rinsed to avoid contamination of dissolved as well as suspended impurities from outside. Groundwater samples have been collected from hand pumps which are used for drinking for public from twelve public places of different identified locations

3.2 Surface water Sampling

Sampling method of Surface water is, for water sampling one liter of plastic cane is used. At the time of water sampling it had been made sure that the bottle are properly washed or rinsed to avoid contamination of dissolved as well as suspended impurities from outside. Surface water samples have been collected from Jhelum River ,Arapal and other two rivers which is used for drinking for public from six points of different identified locations.

Table 1: Indian Standard Specifications of water quality for drinking water, IS: 10500

S. No.	Parameters	Desirable limit	Permissible limit
1	pH	6.5 – 8.5	No Relaxation
2	Turbidity (NTU)	5	10
3	Total Dissolved Solid (mg/l)	500	2000
4	Total Hardness (mg/l)	200	600
5	CaH (mg/l)	75	200
6	MgH (mg/l)	30	100
7	Dissolved Oxygen (mg/l)	6 - 8	4 – 5
8	Alkalinity (mg/l)	200	600
9	Chloride (mg/l)	250	1000
10	Fluoride (mg/l)	1	1.5
11	Nitrate (mg/l)	45	No Relaxation

IV. RESULT AND DISCUSSION

4.1: Graphical Representation of Ground Water Samples Analysis Result:

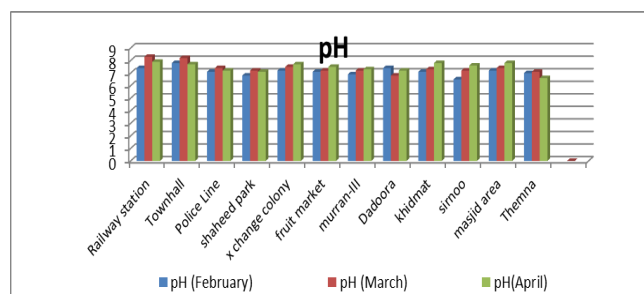


Figure 4.1: Above graph shows groundwater pH at different location of different months

The value of pH of different ground water samples lies between 6.5 to 8.3. The value of pH was found maximum in The Railway station area of pulwama where as it was minimum in sirnoo area of Pulwama city. The value of pH was measured for three months from february to april 2020. According to Indian standard the pH for drinking water lies between 6.5 to 8.5.

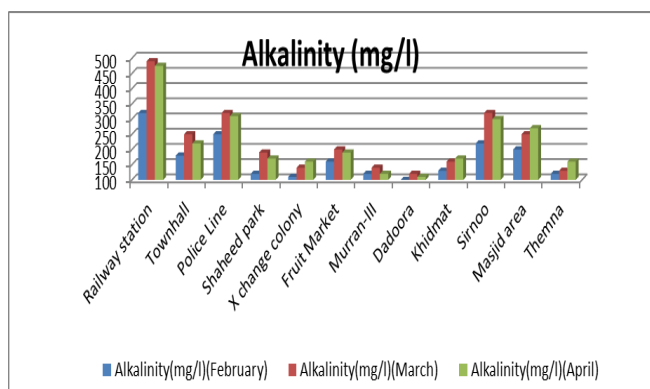


Figure 4.2: Above graph shows groundwater Alkalinity at different location of different months

The value of Alkalinity of different ground water samples lies between 100 to 490 mg/l. The value of Alkalinity was found maximum in the Railway station area of pulwama where as it was minimum in themna area of Pulwama city. The value of Alkalinity was measured for three months from february to april 2020.

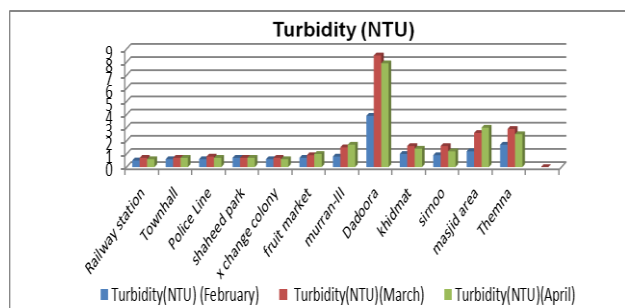


Figure 4.3: Above graph shows groundwater Turbidity at different location of different months

The value of ground water turbidity lies between 0.5 to 7.9 NTU. The value of Turbidity was found maximum in the

Dadoora area of pulwama where as it was minimum in Railway station area ,townhall area and in police line area of Pulwama city. The value of Turbidity was measured for three months from february to april 2020.

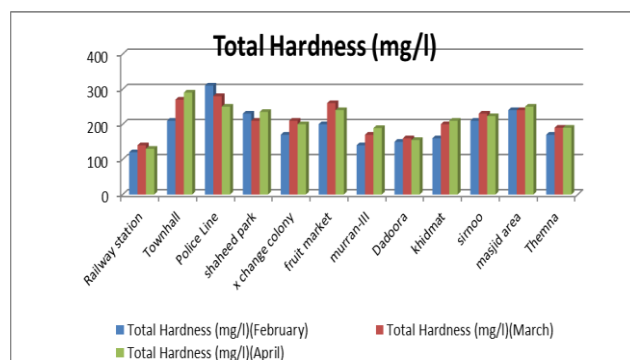


Figure 4.4: Above graph shows groundwater Total Hardness at different location of different months.

The value of Total hardness were lies between 120 to 310 mg/l. The value of Total Hardness was found maximum in the police line area of pulwama where as it was minimum in Railway station area of Pulwama city. The value of Total Hardness was measured three months from february to april 2020.

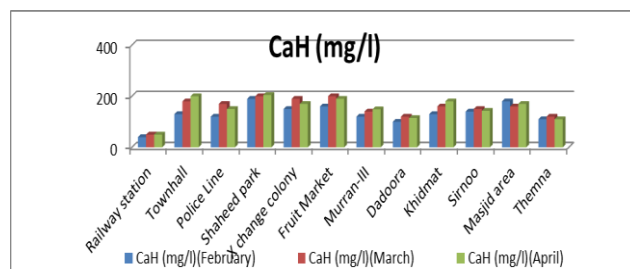


Figure 4.5: Above graph shows groundwater CaH at different location of different months

The value of calcium hardness in different area of ground water were lies between 40 to 205 mg/l. The value of calcium Hardness was found maximum in the shaheed park area of pulwama where as it was minimum in Railway station area of Pulwama city. The value of calcium Hardness was measured for three months from february to april 2020.

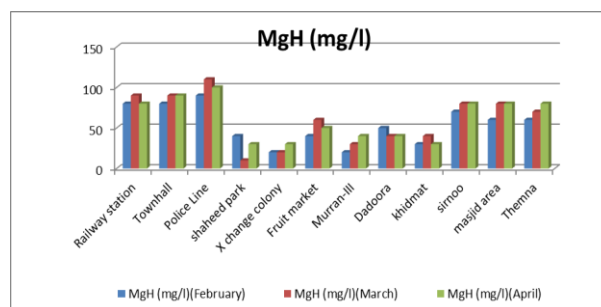


Figure 4.6: Above graph shows groundwater MgH at different location of different months.

The value of Magnesium hardness in different area of ground water were lies between 20 to 110 mg/l. The value of magnesium Hardness was found maximum in the police line area of pulwama where as it was minimum in X change colony and in murrin-III area of Pulwama city. The value of Magnesium Hardness was measured for three months from february to april 2020.

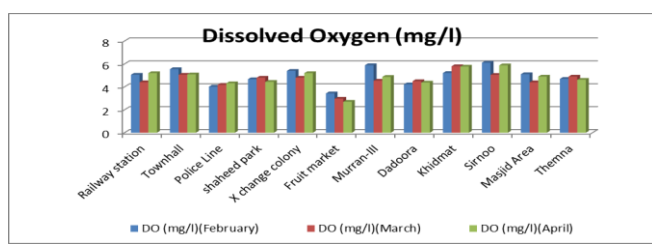


Figure 4.8: Above graph shows groundwater DO at different location of different months

The value of Dissolved oxygen in different area of ground water were lies between 2.7 to 5.88 mg/l. The value of Dissolved Oxygen was found maximum in the sirnoo area of pulwama where as it was minimum in Fruit market area of Pulwama city. The value of Dissolved Oxygen was measured for three months from february to april 2020.

The value of TDS in different area of ground water were lies between 310 to 1020 mg/l. The value of TDS was found maximum in the police line area of pulwama where as it was minimum in Dadoora area of Pulwama city. The value of TDS was measured for three months from february to april 2020.

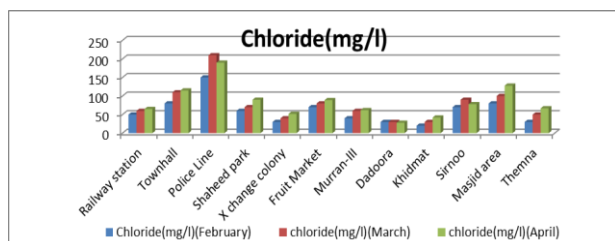


Figure 4.7: Above graph shows groundwater Chloride

The value of chloride in different area of ground water were lies between 20 to 190mg/l .the chloride was measured for threemonths

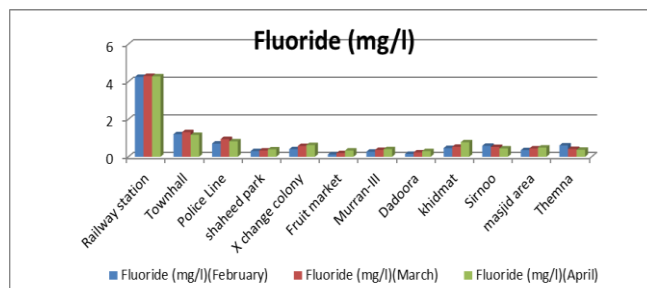


Figure 4.11: Above graph shows groundwater Fluoride at different location of different months

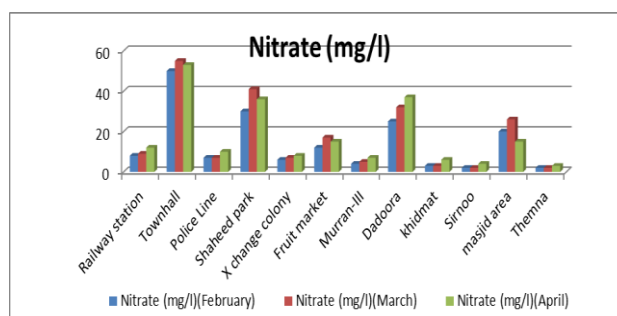


Figure 4.9: Above graph shows groundwater Nitrate at different location of different months

The value of Nitrate in different area of ground water were lies between 2 to 53 mg/l. The value of Nitrate was found maximum in the Townhall area of pulwama where as it was minimum in Sirnoo and themna area of Pulwama city. The value of Nitrate was measured for three months from february to april 2020.

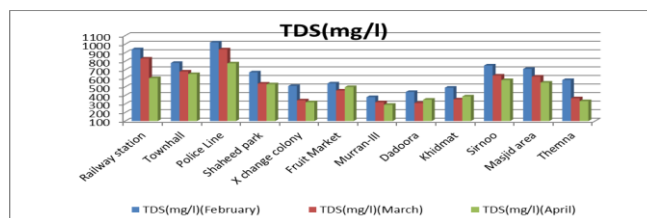


Figure 4.10: Above graph shows groundwater TDS at different location of different months

The value of Flouride in different area of ground water were lies between 0.12 to 4.30 mg/l. The value of Flouride was found maximum in the

Railway station area of pulwama where as it was minimum in Fruit market area of Pulwama city. The value of Flouride was measured for three months from february to april 2020.

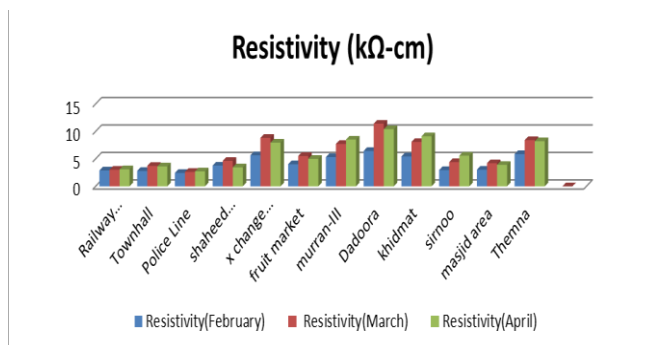


Figure 4.12: Above graph shows groundwater Resistivity at different location of different months

The value of Resistivity in different area of ground water were lies between 2.43 to 11.4 kΩ-cm. The value of Resistivity was found maximum in the Dadoora area of pulwama where as it was minimum in police line area of Pulwama city. The value of Resistivity was measured for three months from february to april 2020

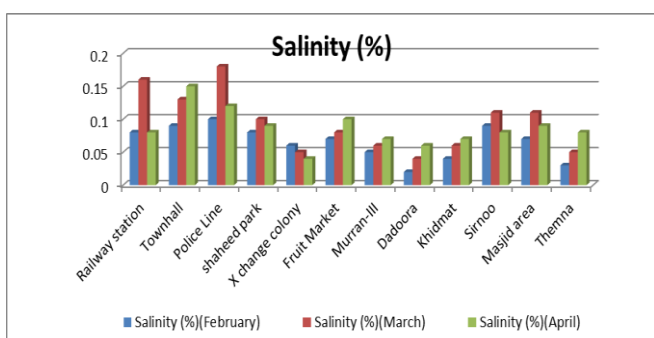


Figure 4.13: Above graph shows groundwater Salinity at different location of different months

The value of salinity in different area of ground water were lies between 0.02 to 0.18 percent. The value of salinity was found maximum in the police line area of pulwama where as it was minimum in Dadoora area of Pulwama city. The value of salinity was measured for three months from february to april 2020

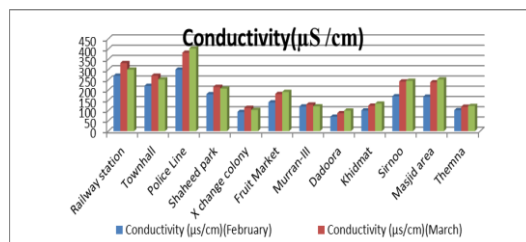


Figure 4.14: Above graph shows groundwater Conductivity at different location of different months

The value of Conductivity in different area of ground water were lies between 70.2 to 403 μS/cm. The value of conductivity was found maximum in the police line area of pulwama where as it was minimum in Dadoora area of Pulwama city. The value of Conductivity was measured for three months from february to april 2020

4.2 Graphical Representation of Surface Water Samples Analysis Result:

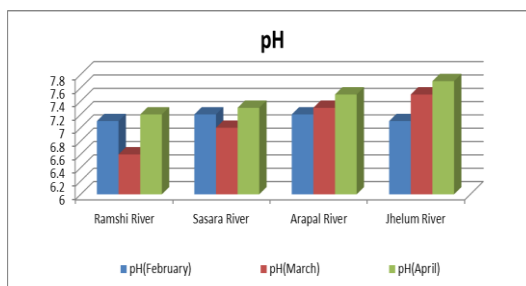


Figure 4.15: Above graph shows surface water pH at different location of different months

The pH values for different Surface water samples lies between 6.6 to 7.7. The value of pH was found maximum in the Jhelum river of pulwama where as it was minimum in Ramshi river of Pulwama city.

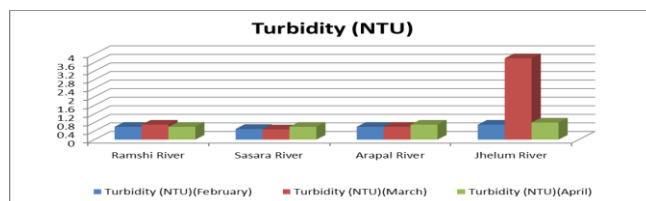


Figure 4.16: Above graph shows surface water Turbidity at different location of different months

The value of Surface water turbidity lies between 0.48 to 3.8 NTU. The value of Turbidity was found maximum in the Jhelum river of Pulwama where as it was minimum in Sasara river of Pulwama city.

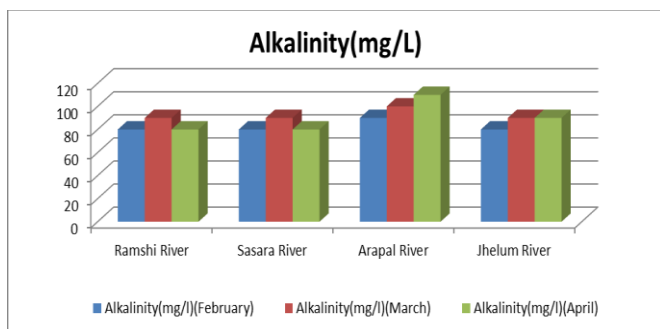


Figure 4.17: Above graph shows surface water Alkalinity at different location of different months

The value of Surface water Alkalinity were lies between 80 to 110 mg/l. The value of Alkalinity was found maximum in the Arapal river of Pulwama where as it was minimum in Ramshi and Sasara river of Pulwama city.

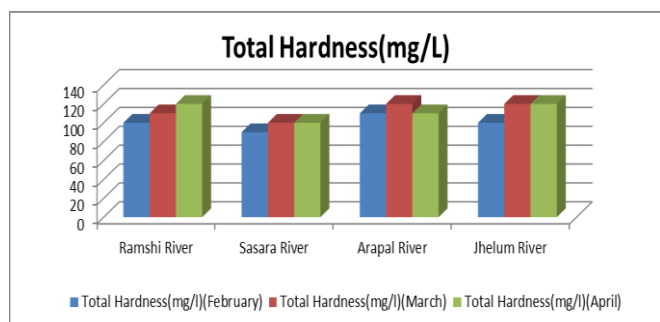


Figure 4.18: Above graph shows surface water Total Hardness at different location of different months

The value of Surface water Total hardness were lies between 80 to 110 mg/l. The value of Total Hardness was found maximum in the Jhelum river of Pulwama where as it was minimum in Sasara river of Pulwama city.

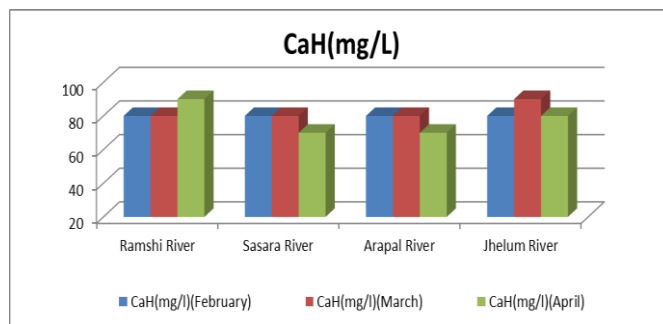


Figure 4.19: Above graph shows surface water CaH at different location of different months

The value of Surface water Calcium hardness were lies between 80 to 110 mg/l. The value of calcium hardness was found maximum in the Ramshi river of Pulwama where as it was minimum in Sasara river of Pulwama city.

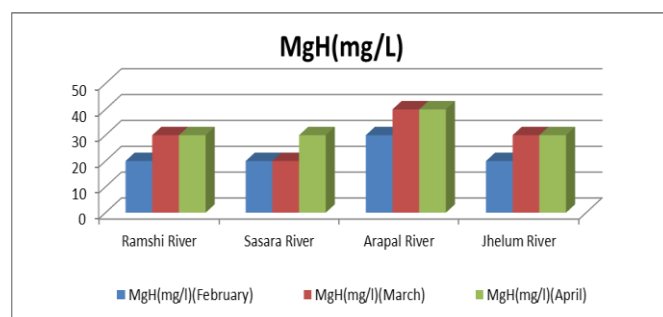


Figure 4.20: Above graph shows surface water MgH at different location of different months

The value of Surface water Magnesium hardness were lies between 80 to 110 mg/l. The value of Magnesium hardness was found maximum in the Arapal river of Pulwama where as it was minimum in Sasara river of Pulwama city.

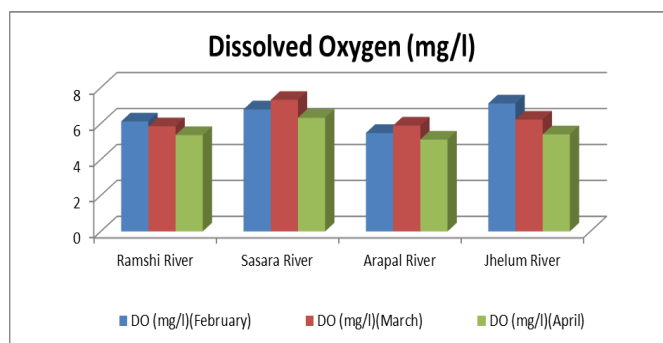


Figure 4.21: Above graph shows surface water DO at different location of different months

The value of Dissolved oxygen were lies between 5.11to 7.32 mg/l.The value of Dissolved oxygen was found maximum in the sasara river of pulwama where as it was minimum in Arapal river of Pulwama city.

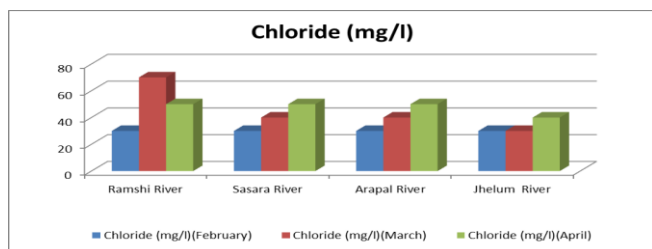


Figure 4.22: Above graph shows surface water Chloride at different location of different months

The value of chloride were lies between 30 to 70 mg/l.The value of chloride was found maximum in theRamshi river of pulwama where as it was minimum in jhelum river of Pulwama city.

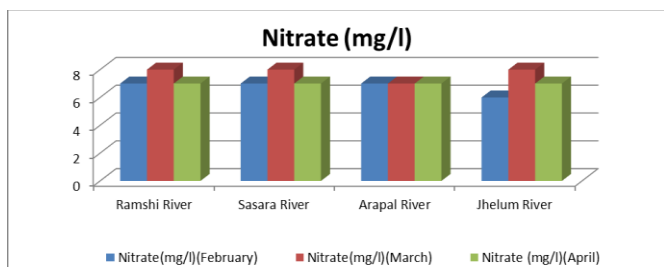


Figure 4.23: Above graph shows surface water Nitrate at different location of different months

The value of Nitrate were lies between 6 to 8 mg/l.The value of nitrate was found maximum in the Ramshi river of pulwama where as it was minimum in jhelum river of Pulwama city.

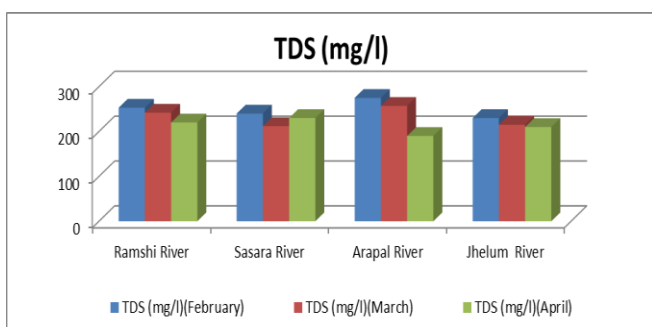


Figure 4.24: Above graph shows surface water TDS at different location of different months

The value of TDS were lies between 190 to 275 mg/l.The value of TDS was found maximum in the Arapal river of pulwama where as it was minimum in jhelum river of Pulwama city.

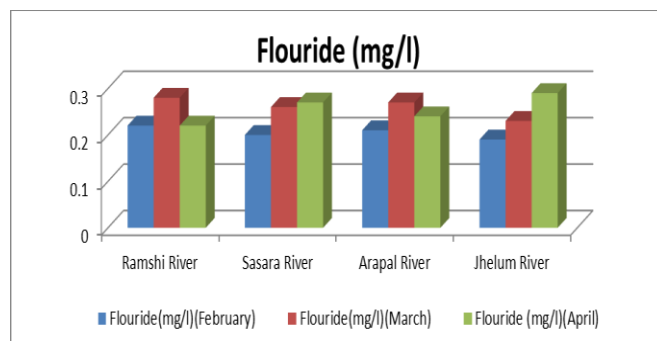


Figure 4.25: Above graph shows surface water Fluoride at different location of different months

The value of flouride were lies between 0.19 to 0.28 mg/l.The value of Flouride was found maximum in the Ramshil river of pulwama where as it was minimum in jhelum river of Pulwama city.

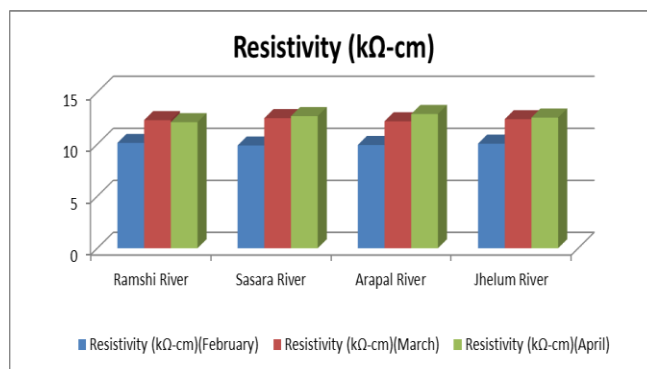


Figure 4.26: Above graph shows surface water Resistivity at different location of different months

The value of Resistivity were lies between 9.87 to 12.11 kΩ-cm.The value of Resistivity was found maximum in the Ramshil river of pulwama where as it was minimum in Sasara river of Pulwama city.

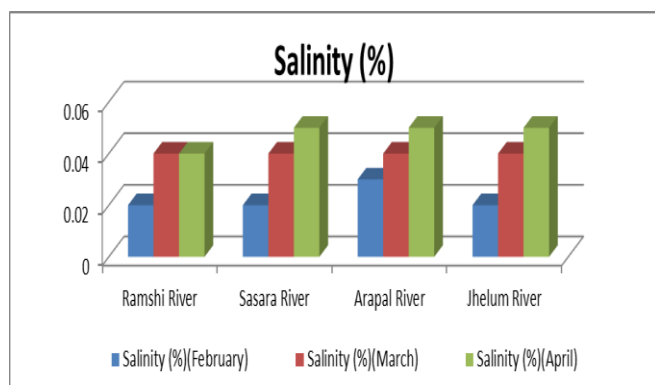


Figure 4.27: Above graph shows surface water Salinity at different location of different months

The value of Salinity were lies between 0.02 to 0.05 percent. The value of salinity was found maximum in the Jhelum river of pulwama where as it was minimum in Sasara river of Pulwama city.

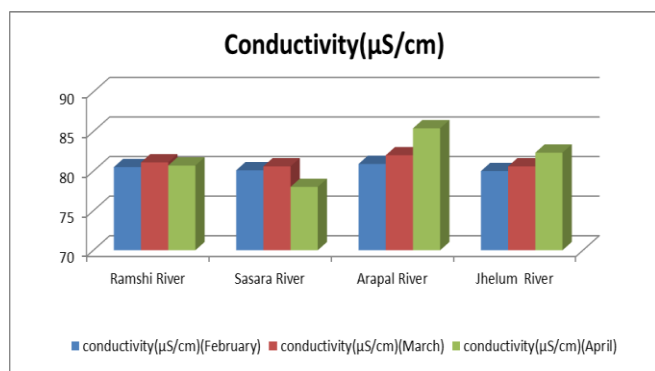


Figure 4.28: Above graph shows surface water Conductivity at different location of different months

The value of Conductivity were lies between 78 to 85.4. The value of Conductivity was found maximum in the Arapal river of pulwama where as it was minimum in Sasara river of Pulwama city.

V. DISCUSSION

The observation and analysis test result that has been carried out in these three months on physiochemical properties of groundwater and surface water in Pulwama city is classified below. Sample collected from Themna area is situated at the bank of Jhelum River in Pulwama city. In this area water parameters, like alkalinity, total hardness,

turbidity, chloride, nitrate, TDS and fluoride is below the acceptable limit where as other parameters such as calcium hardness, magnesium hardness are below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from Sirnoo is situated in the Pulwama city. In this area waters parameters, like turbidity, chloride, nitrate and fluoride is below the acceptable limit where as other parameters such as alkalinity, total hardness, calcium hardness, magnesium hardness, TDS are below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from Khidmat is situated in the Pulwama city. In this area water parameters, like alkalinity, total hardness, TDS, turbidity, chloride, nitrate and fluoride is below the acceptable limit where as other parameters such as calcium hardness, magnesium hardness are below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from Murran - III is situated in the PULWAMA city. In this area water parameters, like alkalinity, total hardness, turbidity, chloride, nitrate, fluoride and TDS is below the acceptable limit where as other parameters such as calcium hardness, magnesium hardness are below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from Shaheed park is situated in the PULWAMA city. In this area water parameters, like alkalinity, turbidity, total

hardness, chloride, nitrate and fluoride is below the acceptable limit where as other parameters such as magnesium hardness, TDS, calcium hardness are below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from X change colony is situated in the Pulwama city. In this area water parameters, like alkalinity, turbidity, total hardness, magnesium hardness, chloride, nitrate and fluoride are below the acceptable limit where as other parameters such as calcium hardness, TDS, dissolved oxygen are below the permissible limit and pH at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from Fruit market is situated in the PULWAMA city. In this area water parameters, like alkalinity, total hardness, turbidity, chloride, nitrate and fluoride is below the acceptable limit where as other parameters such as calcium hardness, magnesium hardness, TDS are below the permissible limit and pH at their permissible range but dissolved oxygen is not at the range. It is below permissible limit. The temperature and conductance do not affect water quality used for drinking purpose. So, this area groundwater is not suitable for drinking on the basis of obtained results. Fruit market area water is treating and increases dissolved oxygen before domestic use, especially for drinking. Sample collected from Town Hall is situated near to old bus stand of Pulwama city. In this area water parameters, like turbidity, chloride is below the acceptable limit where as other parameters such as alkalinity, total hardness, magnesium hardness, fluoride, calcium hardness and TDS are below the permissible limit. pH and dissolved oxygen at their permissible range. In this area nitrate found above the permissible limit. The temperature and conductance do not affect water quality used for

drinking purpose. This area groundwater is not suitable for drinking without treatment on the basis of obtained results. Sample of groundwater collected from Masjid area is situated in Pulwama city. In this area water parameters, like turbidity, chloride, nitrate and fluoride is below the acceptable limit where as other parameters such as calcium hardness, magnesium hardness, alkalinity, TDS and total hardness are below the permissible limit. pH and dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from Police line is situated in the Pulwama city. In this area water parameters, like turbidity, chloride, nitrate and fluoride is below the acceptable limit where as other parameters such as alkalinity, total hardness, calcium hardness, TDS, magnesium hardness are below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from Railway station area is situated near by railway station of the Pulwama city. In this area water parameters, like turbidity, total hardness, calcium hardness, chloride and nitrate is below the acceptable limit where as other parameters such as alkalinity, TDS, magnesium hardness are below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area fluoride found beyond the permissible limit. This area groundwater is not suitable for drinking on the basis of obtained results. So, this area water is not use in drinking and food, without treated the ground water.

Sample collected from Dadoora industrial area is situated next to the Pulwama national highway. In this area water parameters, like alkalinity, total

hardness, chloride, TDS and fluoride is below the acceptable limit where as other parameters such as turbidity, calcium hardness, magnesium hardness, nitrate are below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this area groundwater is suitable for drinking on the basis of obtained results. Sample collected from Jhelum River in the Pulwama city. In this location water parameters, like turbidity, alkalinity, total hardness, magnesium hardness, chloride, nitrate, fluoride and TDS is below the acceptable limit where as other parameters such as calcium hardness is below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this location point surface water is suitable for drinking on the basis of obtained results. Sample collected from Romshi River is situated in the Pulwama city. In this location water parameters, like turbidity, alkalinity, total hardness, magnesium hardness, chloride, nitrate, fluoride and TDS is below the acceptable limit where as other parameters such as calcium hardness is below the permissible limit. pH and dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this location point surface water is suitable for drinking on the basis of obtained results. Sample collected from Sasara river is situated in the Pulwama city. In this location water parameters, like turbidity, alkalinity, total hardness, magnesium hardness, chloride, nitrate, fluoride and TDS is below the acceptable limit where as other parameters such as calcium hardness is below the permissible limit. And pH, dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this location point surface water is suitable for drinking on the basis of obtained results. Sample collected from Arapal river is situated in the Pulwama city. In this location water parameters, like

alkalinity, turbidity, total hardness, chloride, TDS, fluoride and nitrate is below the acceptable limit where as other parameters such as calcium hardness and magnesium hardness below the permissible limit. pH and dissolved oxygen at their permissible range. The temperature and conductance do not affect water quality used for drinking purpose. In this location point surface water is suitable for drinking on the basis of obtained results.

VI. CONCLUSION

It has been concluded from this dissertation work that the physiochemical property of surface water and groundwater have been checked the quality of water, whether it is suitable for drinking purpose or not. The dissertation work have been carried out at four different locations in the Pulwama city through Jhelum River, Romshi River, Sasara river, Arapal river and twelve different areas of groundwater at Pulwama city that are Railway station, Police line, Town Hall, X change colony, Fruit market, Shaheed park, Khidmat, Sirnoo, Murran, Masjid area, Themna, Dadoora industrial area. In this dissertation work, parameters like pH, turbidity, resistivity, total hardness, calcium hardness, magnesium hardness, total dissolved solid, salinity, alkalinity, conductivity, chloride, nitrate, fluoride, dissolved oxygen of water have been analyzed in laboratory. It has been concluded from this dissertation work that in Pulwama city, source of surface water of Jhelum River, sasara river, arapal and romshi river water quality is suitable for drinking purpose. In the study of the samples collected at various months from different locations of Jhelum and other three rivers are come in the range of permissible limit. That of the groundwater quality is not suitable for drinking purpose at Town Hall, Fruit market and Railway station of Pulwama city. In this study, the Town Hall area found nitrate (55 mg/l) above the permissible limit, Fruit market area found dissolved oxygen (2.7 mg/l) below the range of permissible limit and in the railway station area found fluoride (4.30 mg/l) higher the permissible limit of IS: 10500 for the

quality of drinking water. The parameter should be in the range of permissible limit which is nitrate below 45 mg/l, dissolved oxygen is above 4 mg/l and fluoride is below 1.5 mg/l. Apart from the above listed location other than this groundwater is suitable for drinking purpose and the parameters limits are in their optimum range or within the permissible limit.

VII. SUGGESTIONS AND RECOMMENDATIONS

These days nearly 80% of diseases are water borne and it is suggested to the consumers that not to use water without treatment if the water is less or severely polluted it can cause harmful water borne diseases mostly in rainy season. Where the water is not suitable for drinking purpose we can adapt proper treatment techniques to remove impurities, if the water is severe and after treatment we are unable to remove desirable level of impurities then the water can be used for other purpose such as gardening, flushing, washing etc. It is suggested to the residents from the obtained observation to use surface water because all the parameters of surface water is in desirable limits and if there is no available source of surface then they can use ground water for their consumption because in some area groundwater is in desirable and at some places it is in permissible limit. If there is any source of pollution is accumulating in water body then proper mitigation measure should be taken and if possible, divert the source of pollution or reduce the harmful effect of the pollutants.

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