Physico-chemical analysis of water samples

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ABSTRACT

*The water quality is determined in five blocks (*water samples taken from Urban and rural locations of Bangalore(HAL 3rd stage (Kaveri water), HRBR lay out (kaveri water mixed with Bore well water), Borewell water (Srinivasapura,Kolar District)and Mineral water samples).

where from each block water samples are under studied for Physico- chemical status of

water samples. In Physico-chemical analysis , various quality parameter are measured including pH, Specific conductivity(SP) , total dissolved solids (TDS),total hardness,

compared with WHO standards of water quality; also in present research paper classification of water samples of five blocks was investigation on the basis of TDS, anions, cations and TH. .T he pH of all water samples were found almost neutral . The TDS, conductance, hardness increased towards the urban water as compared to rural wate All Parameters were within the permissible limits. The results indicated and discussed.

Keywords: water samples, physico-chemical analysis, TH, TDS, COD,BOD, TDS, BOD, Nutrients and Total Hardness.

INTRODUCTION

Water plays an essential role in human life**.** Although statistics, the WHO reports that approximately 36% of urban and 65% of rural Indian were without access to safe drinking water [1].Fresh water is one of the most important resources crucial for the survival of all the living beings. It is even more important for the human being as they depend upon it for food production, industrial and waste disposal, as well as cultural requirement [2]. Human and ecological use of ground water depends upon ambient water quality. Human alteration of the landscape has an extensive influence on watershed hydrology Gurunathan, 2006 [3]. Ground water plugs a vital role in human life .The consequences of urbanization and industrialization leads to spoil the water for agricultural purposes ground water is explored in rural especially in

those areas where other sources of water like dam and river or a canal is not considerable. During last decade, this is observed that ground water get polluted drastically because of increased human activities . Consequently number of cases of water borne diseases has been seen which a cause of health hazards. An understanding of water chemistry is the bases of the knowledge of the multidimensional aspect of aquatic environmental chemistry which involves the source, composition, reactions and transportation of water. The quality of water is of vital concern for the mankind since it is directly linked with human welfare .It is a matter of history that facial pollution of drinking water caused water-borne diseases .

MATERIALS AND METHODS

The Water Samples were collected from four Different places in the Morning Hours between 9 to 11am, in Polythene Bottles. The Water samples were immediately brought in to Laboratory for the Estimation of various Physico-chemical Parameters like Water Temperature, pH were recorded by using Thermometer and Digital pH Meter. (Systronics).Specific conductivities were measured by using digital conductivity meter. The TDS values were measured by using TDS meter. While other Parameters Such as Hardness, Sodium, and potassium by Flame photometry .Manganeese , Calcium & Magnesium Chloride, Sulphate and Nitrate were Estimated in the Laboratory By using Standard laboratory methods. Present Study involves the Analysis of Water Quality in Terms of Physico-chemical methods. (Trivedy and Goel,1986, APHA 1985)[4)

Table 1: Physical parameters of water samples, Bangalore Urban and Rural, Karnataka

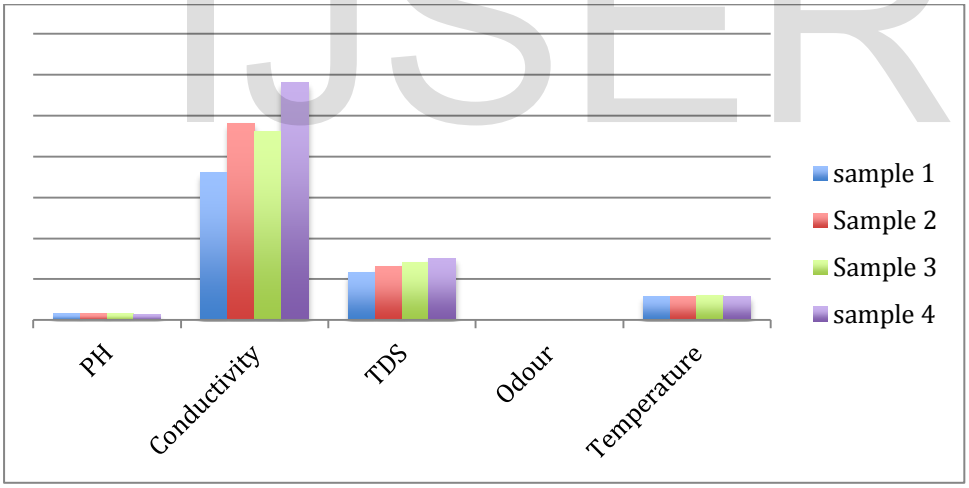
	PH	Conductivity	TDS	Odour	Temperature
sample 1	7.2	180	58	0	29
Sample 2	7.3	240	65	0	29
Sample 3	7.5	230	70	0	30
sample 4	6.9	290	75	0	29

Table 2: Chemical properties (mg/L)of water samples, Bangalore Urban and Rural, Karnataka with reference to WHO standards.

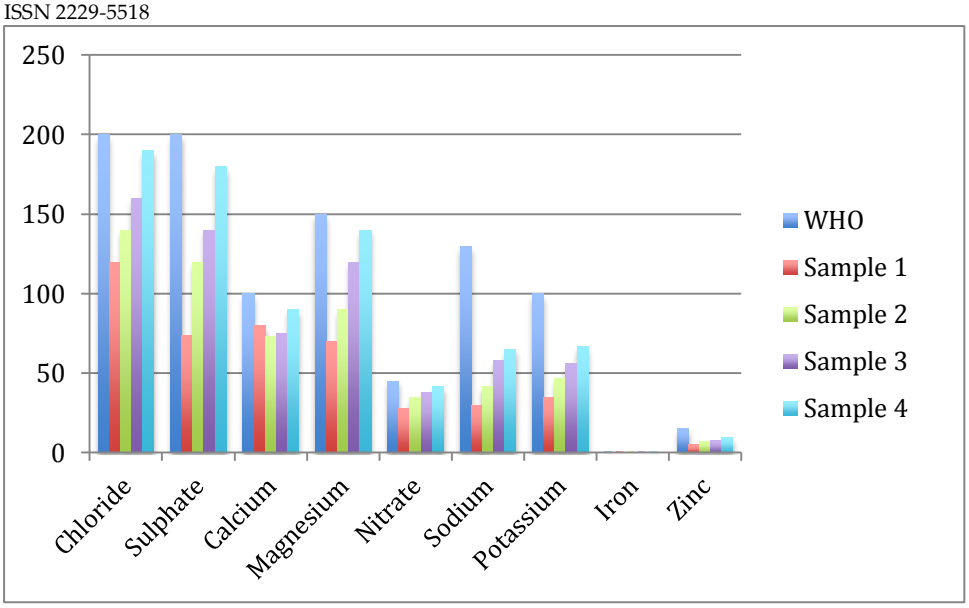
Chemical property (mg/L)	**WHO**	**Sample 1**	**Sample 2**	**Sample 3**	**Sample 4**
Chloride	**200**	**120**	**140**	**160**	**190**

Sulphate	**200**	**74**	**120**	**140**	**180**
Calcium	**100**	**80**	**73**	**75**	**90**
Magnesium	**150**	**70**	**90**	**120**	**140**
Nitrate	**45**	**28**	**35**	**38**	**42**
Sodium	**130**	**30**	**42**	**58**	**65**
Potassium	**100**	**35**	**47**	**56**	**67**
Iron	**1.0**	**0.75**	**0.83**	**0.85**	**0.97**
Zinc	**15**	**5**	**7**	**7.5**	**9.5**

Bio –stastical representation of Physical properties



Bio –stastical representation of chemical properties



RESULTS AND DISCUSSION:-

The Variation in Physico-chemical Parameters is Presented in Table.

Sample 1:Srnivasa pura (Bangalore Rural)drinking water.

Sample 2:HRBR Layout (Bangalore Urban) Drinking water

Sample 3:HAL3rd Stage (Bangalore Urban(BWSSB)

Sample 4: Mineral water

There was no significant change in the pH value during the observation period; the observed values were in the range 6.9 to 7.5 Total hardness, salinity, conductance and turbidity increased in the similar direction, i.e., from Sample-1 to Sample-4. Concentration of nutrients like Chloride,Sulphate was within the permissible limits for Sample-3&4. BOD remained less than 3 in all cases, showing normal microbial activity. Physico-chemical parameters affected the primary production in different Areas. The physico-chemical of chemical characteristics of water samples in the study area suggested that there was no harmful chemical contamination. The sample 3&4 were found to be more free from various micro gram positive bacterial activities .The sample -4 is more healthier in the long run.

Conclusions:

Amounts of minerals such as Na,Ca, and Mg were present below than WHO recommended level but water from Urban regions of Bangalore contain more amounts of these minerals than Rural place of Bangalore, indicates that the required minerals are available in reasonable amounts in Bangalore Urban supply than Bangalore Rural supply]. The amounts of various elements in this study characterization of the physiochemical parameters of water from different locations in Bangalore Rural and Urban area was carried out as studies carrier out by [5,6,7,8,9,10] To assess the quality of water each parameter was compared with the standard desirable limits prescribed by World health organization (WHO) [11,12,13]From the study it can be concluded that Bangalore Urban water is safe for drinking purposes from the point of view of levels of pH, EC, TDS, Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, Cl^{-} ,NO_3^{-} SO_4^{2-} ,Fe^{-+2},Zn^{+2} But the total hardness varied in between 70 to 80 mg/L which indicates that water in the Rural Bangalore is moderately hard. So, it is suggested to the Urban localities is much often softer water as indicated by Pandey(14),Trivedy(15) and kedar(16) and similar results are reported by Jayabhave(17),Salve(18),Khan(19),Kadam(20).Further research can be carried out for detailed mapping and hydrological studies for existing water sources to show flow lines and hydro-geochemical survey in that area. It is also necessary to find out the source of contaminants which is due to soil types, industrialization, water chemistry and other human activities. This study gave us an insight that urban water is less harder and containing more dissolved ions

Than rural water collected in Kolar district ,Karnataka,India.

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