Godavari River Water Analysis at Paithan, District Aurangabad, Maharashtra, (India)

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ABSTRACT:
India is rich in water resources, being endowed with a network of rivers and blessed with snow covers in the Himalayas. Water is essential for sustainable development. The present result research attempt was made to analyze water quality. In which pH, DO, BOD, COD, TDS, Turbidity, Chlorides, Hardness, Calcium parameters were analyzed for water quality assessment. The average value of pH is observed is7.7. The average value of DO is 14.3. The average value of BOD is observed is 11.08. The average value of COD is 7.6.The average value of TDS is observed is 89.1. The average value of Turbidity is 3.4.The average value of chlorides is 17.4.The average value of hardness is 36.8. The average value of calcium is 20.5. Water is one of the most precious resources on planet for flora and fauna consumption, so it is need to be protected by all means. The collection and analysis of the river water samples were carried out at regular interval for a period of 12 months. Few samples were tested on the sample sites and remaining in the environmental lab. One of the very basic requirements for mankind is water. Not only for human being, but also water is most indispensable requirement needed for flora in the world. Water quality is the most important aspect need to be conserved for the purpose of human utilization.
Keywords: water, analysis, parameter, average.

I. INTRODUCTION

Water is the most common and crucial substance on the Earth and it is omnipresent. It is the most abundantly found constituent on the Earth. Life is considered to have evolved from liquid water. Water as rain continuously erodes the land surface, washing the soil into rivers. A riverine system is a natural water resource flow towards an ocean,alake,a sea or another river. One of the richest fresh water sources used to fulfill human demands and utilization is river water. Rivers play a vital role in meeting the demands of local water supplies, industries, agriculture(Soramanet al., 2016). Water is ecological and needed resource for the existence of life on the earth.But approximately 97% of the water present on Earth is sea water, which cannot be used directly because of high salt concentration and remaining approximately 3 % is available as the freshwater. Most of the freshwater is locked up in the ice and in ground, 1.2% of it is accessible to human beings for fullfill their demands (Olssan, 2005). It is universally accepted that the flora as suitable vegetation cover develop the quality of life as they absorb harmful pollutants from the environment(EPA,2000) .It is present in three physical forms e.g Solid , Liquid , Gaseous .It has many unique properties . It is the compound which becomes rarer on solidification . It finds extensive use in the field of agriculture ,hydro electric power generation and air conditioning(Prasad and Patil,2008) . Water is the largest common liquid of the Earth , very important to all life forms . Water has ability to dissolve organic as well as inorganic compounds in it ; hence water is called as universal solvent (Potadaret al., 2021; Jadhav 2017).

II. METHODOLOGY:

Aurangabad is one of the fast growing ,renowed industrial hub and which is best known for its industrial auto cluster and most of the brewery industries. The samling location covers the Aurangabad in between 74 to 76 degree east longitude and the longitude 19 to 20 degree north (Jogdand and Potadar 2021).Aurangabad district is an admistrative district in the state Maharashtra. Aurangabad lies at an main position on the deccan plateau (Tejankar and Chakraborty, 2019). Among all the types of environmental pollution ,water pollution is one of the serious threat to public health especially in development and under developed nations as drinking water quality in these countries is poorly managed (Mwegoha,

2008.,Hader,2011). For the present analysis of water quality parameters standard methods were used prescribed APHA. The chemical parameters were determined immediately in the lab as early as possible according to the geochemical methods of water examination given by Trivedi and Goel(1984). Generally chlorides measured by titrating a known volume of sample with standardized silver nitrate solution using potassium chromate solution in water or eosin / fluorescein solution in alcohol as indicator (Sharma et al.,2016). The analyzed final value where compared with the standards given by Bureau of Indian Standard (BIS ,1991) and World Health Organization(WHO,1993) for the proper understanding the its status .The collection and analysis of the river water samples was carried out at regular interval for a period of twelve months . A systematic sampling was carried out in and around Aurangabad for the study purpose. River contributes a main role in moulding and integrating the landscape and shaping the environmental surroundings of a basin. They are key in controlling the global water cycle and are the most dynamic agents of the transport in the hydrological cycle (Arimoro, 2008., Otieno et al., 2017).

Fig 1: Map showing study area of Aurangabad

III.   RESULTS AND DISCUSSION:

Present research work was carried out in Aurangabad city area to analyze the river water samples . The observed value has been tabulated in the table no.1 and graphically present in graph no 2 to graph no 11 .The recorded value from the analysis carried out in the present research and interpretated. The average temperature recorded from the study area was 23.3 .The maximum temperature recorded was 29.5 and minimum was 19.9. The average pH recorded from the study area was 7.7 . The maximum pH recorded was 9.3 and minimum was 6.1 . The average DO recorded from the study area was 14.3 . The maximum DO recorded was 17.9 and minimum was 11.8 . The average BOD recorded from the study area was 11.08 .The maximum BOD recorded was 16.5 and minimum was 8.1 . The average COD recorded from the study was 7.6 . The maximum COD recorded was 9.9 and minimum was 8.1. The average TDS recorded from the study area was 89.1. The maximum TDS recorded was 114.7 and minimum was 67.4. The average turbidity recorded from the study area was 3.4 . The maximum turbidity recorded was 4.9 and minimum 2.1 . The average chlorides recorded from the study area was 17.4 . The maximum chlorides recorded was 22.8 and minimum was 10.8 .The average hardness recorded from the study area was 36.8 . The maximum hardness recorded was 65.5 and minimum was 12.9 . The average calcium recorded from the study area 20.5 . The maximum calcium recorded was 26.8 and minimum was 15.3 .

Table :1 Estimated Results of Physico- chemical analysis of river water

	January	Feb.	March	April	May	June	July	August	September	October	November	December	Average	Max	Min
Temperature	29.5	21.5	22.3	19.9	22.9	20.6	24.1	25.6	24.4	21.1	23.7	24.2	23.3	29.5	19.9
pH	9.3	8.2	7.1	6.9	7.	7.	6.	6.1	8.5	8.6	7.9	8.8	7.76	9.3	6.

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DO	15.2	16.2	12.5	13.4	12.1	15.9	16.3	13.2	11.8	12.6	14.5	17.9	14.3	17.9	11.8
BOD	8.1	14.5	11.9	11.4	10.2	12.2	11.3	9.5	8.9	9.6	8.9	16.5	11.08	16.5	8.1
COD	5.5	9.9	6.4	5.3	7.8	9.7	9.1	6.5	6.3	7.4	9.2	8.4	7.6	9.9	5.3
TDS	67.4	114.7	68.3	67.9	78.5	79.4	82.1	86.6	100.9	113.5	111.4	99.2	89.1	114.7	67.4
Turbidity	2.2	4.7	2.7	3.2	4.9	2.1	3.5	4.2	3.8	3.1	2.2	4.5	3.42	4.9	2.1
Chlorides	10.8	22.8	12.7	11.4	17.8	15.9	14.2	20.6	22.4	21.7	20.3	19.3	17.4	22.8	10.8
Hardness	12.9	65.5	19.2	18.7	24.8	16.9	29.6	31.9	48.6	52.4	59.2	63	36.8	65.5	12.9
Calcium	15.3	26.8	18.1	20.3	26.7	22.4	16.2	17.4	20.7	21.3	21.9	18.9	20.5	26.8	15.3
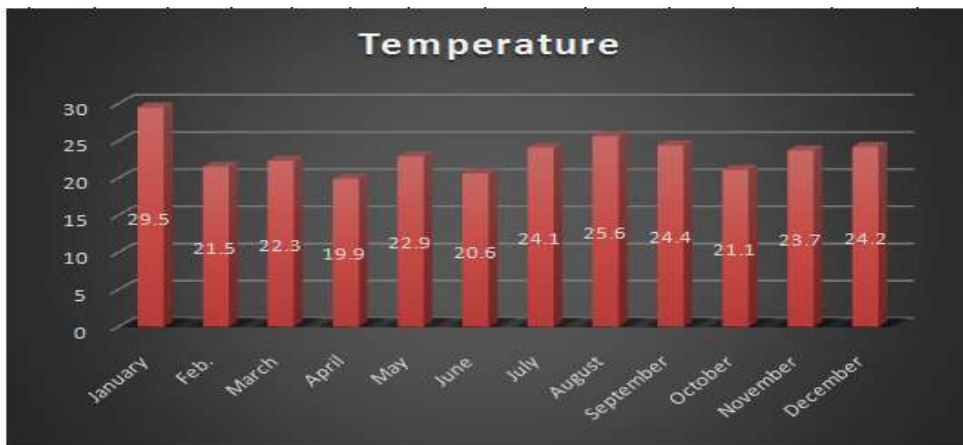
Fig no.1: Values in graph shows monthly variation in Temperature
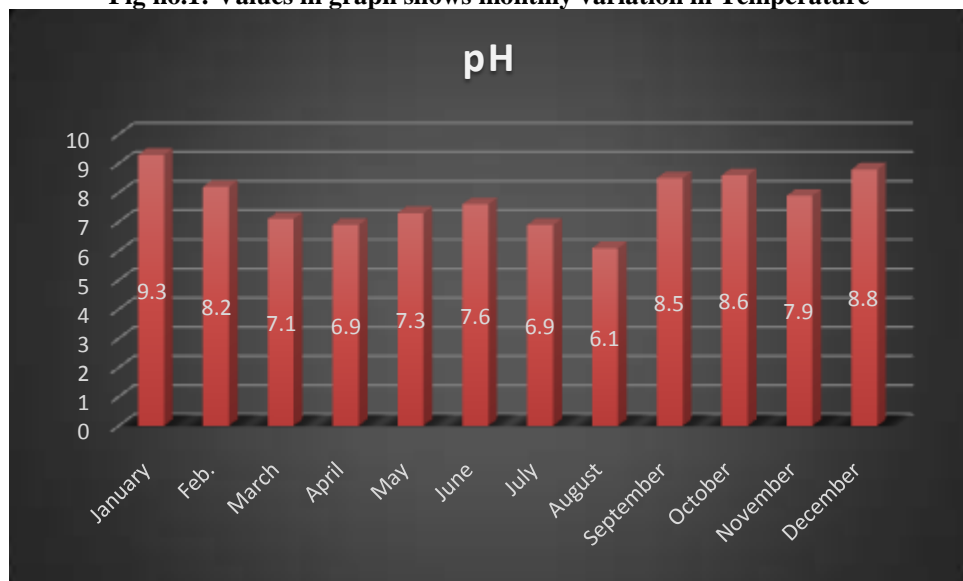

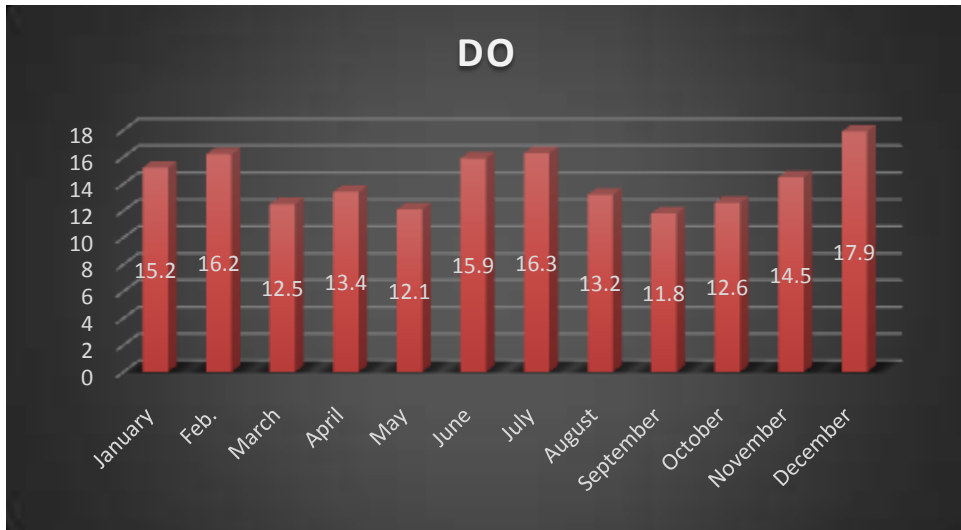**Fig no.2: Values in graph shows monthly variation in pH**
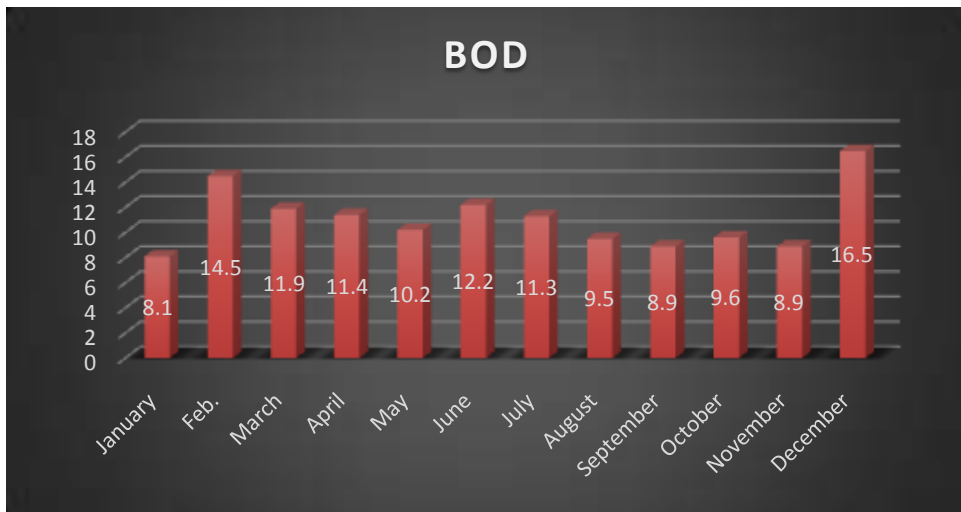
Fig no.3: Values in graph shows monthly variation in DO

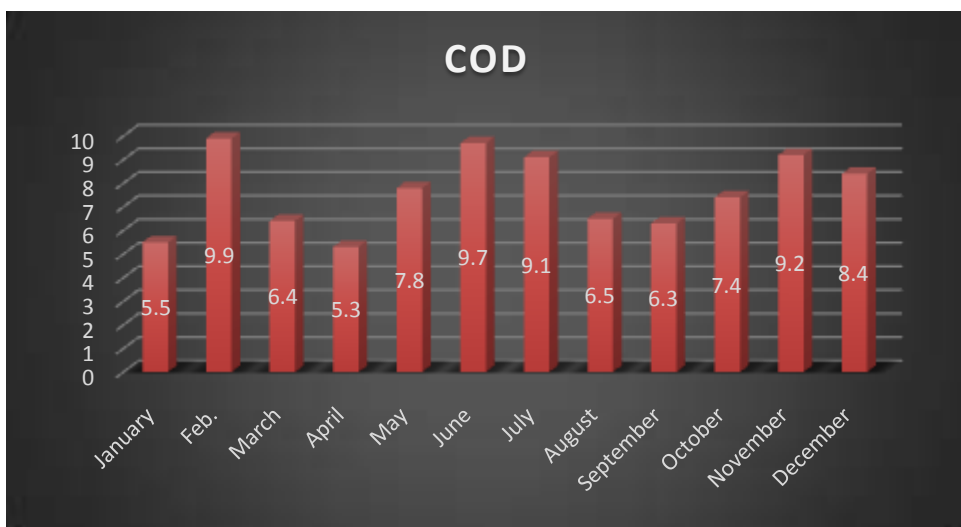**Fig no.4: Values in graph shows Graph shows monthly variation in BOD**
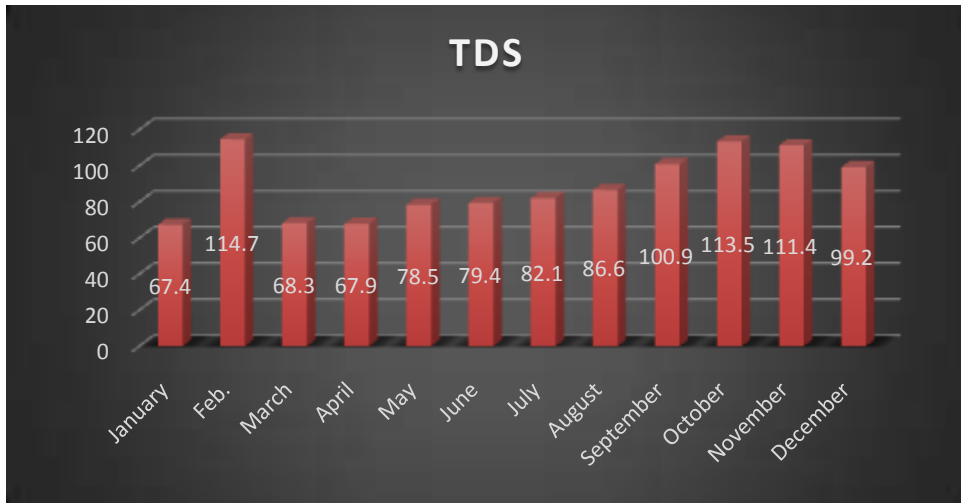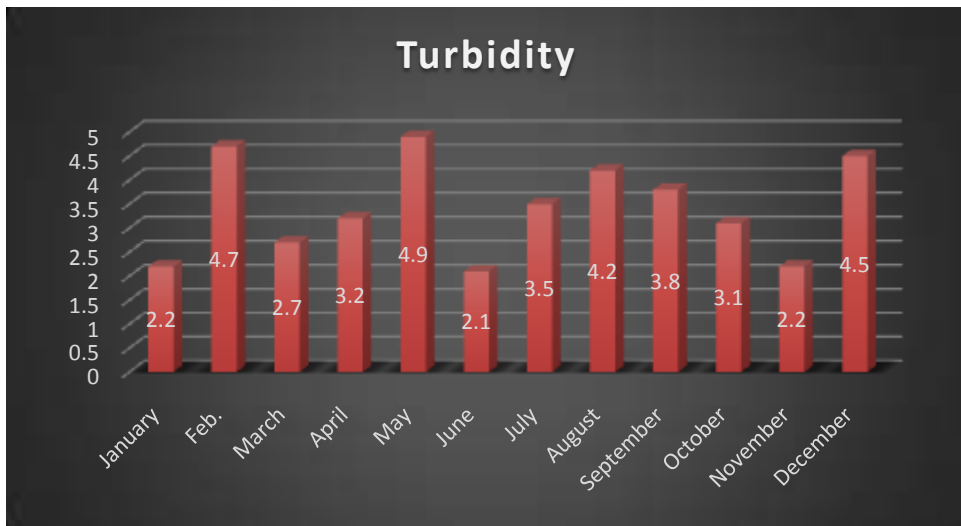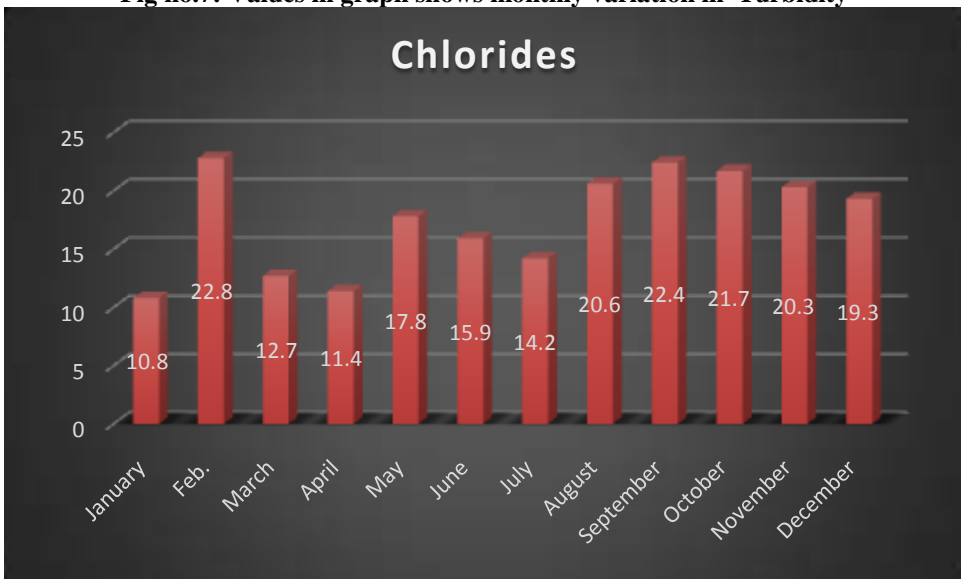

Fig no.5: Values in graph shows monthly variation in COD

Fig no.6: Values in graph shows monthly variation in TDS

Fig no.7: Values in graph shows monthly variation in Turbidity

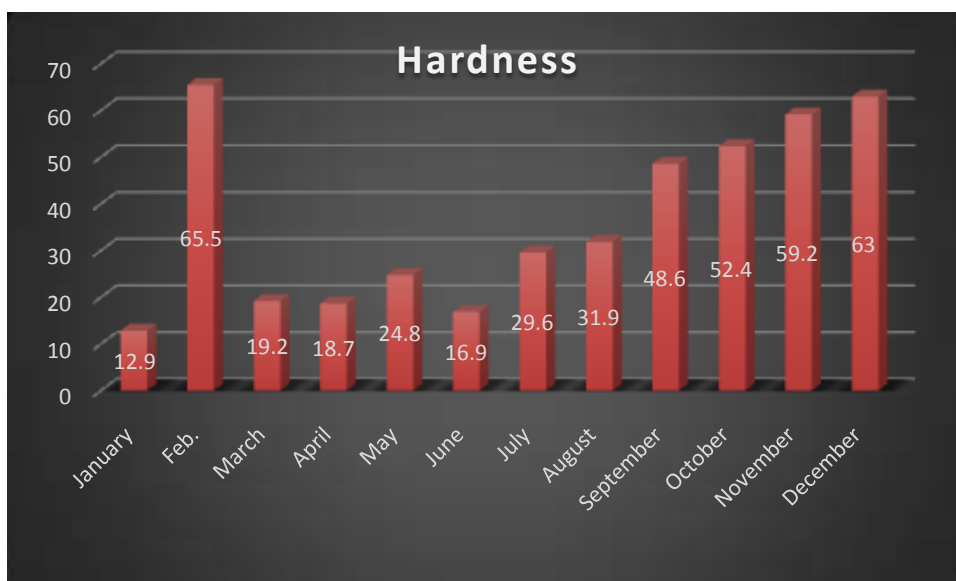**Fig no.8: Values in graph shows monthly variation in chlorides**

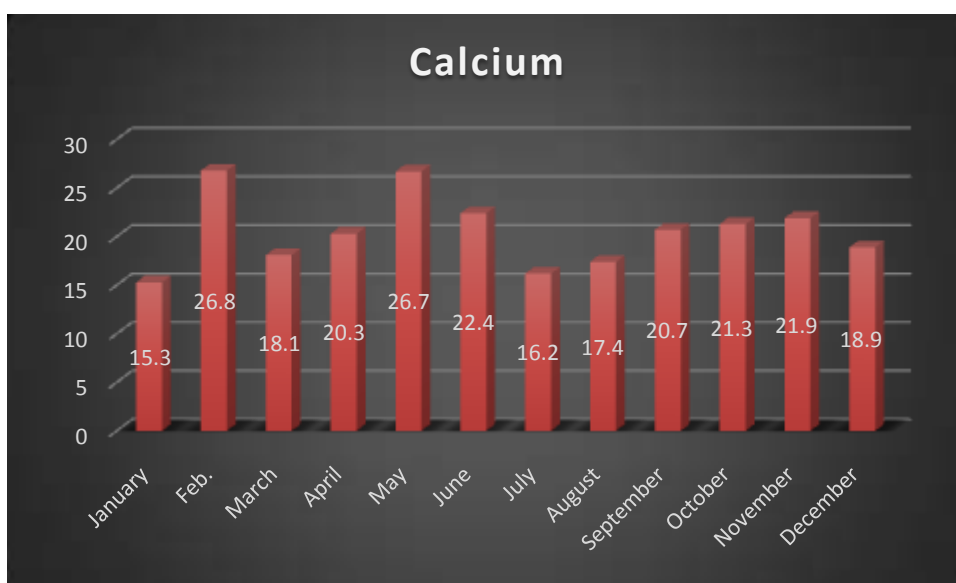**Fig no.9 Values in graph shows monthly variation in hardness**

Fig no.10: Values in graph shows monthly variation in calcium

Temperature is well explained as an established system. The water temperature controls the rate of all chemical reactions and affects fish growth, reproduction and immunity potential. Drastic temperature changes can be fatal to fish (Sharma et al., 2016). pH is most important in determining the corrosive nature of water .Lower the pH value higher the corrosive nature of water. pH positively correlates electric conductance and alkalinity (Gupta , 2009). DO is one of the most crucial parameter. Its correlation with water bodies gives direct and indirect data e.g bacterial activity, photosynthesis availability of nutrients,stratification etc.(Vikal,2009). BOD gives

a quantitative index of the degradable organic substance in the water and is used as a measure of waste strength. The low BOD value in all samples show good sanitary condition in the water. It is found that all the water supplied at the domestic levels should be within the permissible limit(Thorat and Patil, 2020). Chemical Oxygen Demand is the amount of oxygen consumed through the oxidation of oxidizable organic matter by a strong oxidizing agent potassium dichromate in the presence of sulphuric acid in determination of COD(Trivedi and Goel, 1986).TDS is the dissolved presence of substances according to drinking water standard, prescribed by USPHS(United States Public Health

Services ,1962). TDS should not excess 500mg/L beyond which they may influence heavy metal toxicity and organic compounds in the fish and other aquatic life (Mckeeand Wolf,1963).Turbidity shows how much clear the water is .The TSS in ground water may be due to the presence of various impurities carried out by the natural and artificial sources results into the turbid nature of liquid. TSS and conductivity may have correlations in terms of the conductivity .Conductivity expresses the ability of water to transfer electric current (Shinde et al., 2011). Hardness is one of the crucial parameter which indicates the presence of calcium and magnesium salts in water. Calcium is an important component of natural water and is produced from stones and soil (Munde et al., 2021).Higher calcium levels are direct attributes of the calcium rich rocks (Hynes, 1971).

IV. CONCLUSION:

Water undoubtedly the most vital element among the natural resources on the Earth. Water quality is one of the critical factor in well being of any area. A systematic sampling was carried out in and around Aurangabad for the study purpose. The collection and analysis of the river water samples were carried out at regular interval for a period of twelve months in 2021. For the present analysis of water quality parameters standard methods were used prescribed APHA. The average temperature recorded from the study area was 23.3 ^{O} C, pH was 7.7, DO was 14.3, BOD was11.08, COD was 7.6, TDS was 89.1. turbidity was 3.4. chlorides was 17.49. hardness was 36.8 and calcium was 20.5 . It is concluded the water quality of river water is partially suitable for drinking purposes. A river is a natural resources flows towards an ocean , a lake,a sea or another river. India is rich in water resources. It is concluded that water quality of river water sample was not suitable for drinking purpose. Further it is suggested that water used for river water samples need to be treated and may be used.

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