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The Impact of Industrial Waste on the Water Quality of Kharun River, Raipur (Chhattisgarh).

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Abstract: *The analysis was done of five water sample collected from study area during february 2019 to july 2019, This was done by comprehensive physicochemical analysis using APHA standard methods of analysis. Due to industrial waste , human waste , domestic waste etc, the kharun river got polluted with many heavy/toxic metals, so it can not be used for any other purpose. By the investigation we found many contaminants in river water so it has suggested to implant sewage water treatment plant (STP) near the river kharun so that we can maintain water quality of river.*
The river contamination has had negative health impact on the village and the urban residents. Water-borne diseases like jaundice and typhoid are very common here. As per a report by Business Standard in 2014, 67 people died that year from jaundice in Raipur district. "The industrial sewage network of Raipur is linked to Kharun through eight big canals, and almost all the industrial effluents flows into the river without any treatment," reported Patrika in 2016.
The results of the analysis when compared with World Health Organization (WHO) and Nigerian Industrial Standard (NIS) permissible limit indicated that the river was polluted and so the water is not safe for domestic use and would need further treatment.

Keywords: *APHA, Industrial Waste, domestic waste, toxic metal, sewage, WHO, NIS, STP.*

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I. Introduction

Water is an important part of our environment. All the living creatures depend upon water in one way or other. Water is the most vital resource for the existence of life on earth. No other natural resource has had such an overwhelming influence on human history. But this most precious resource is getting deteriorated. Human activities have played a prominent role in degrading air, water and soil. The air we breathe, the water we drink, the soil we stand and the food we eat are polluted. Civilization itself cannot survive if the natural environment collapses and man must balance the resources of the planet if he wants to survive.

The waste is nothing but nutrients, which find their way into the nearby water sources. Domestic, industrial and agricultural, waste water and solid waste (mainly domestic) contribute to the pollution of the sources of water. They reach the surface water sources by rain and ultimately reach the ground water sources.

A complex phenomenon involving physico-chemical (sedimentation, dilution etc.) and biological (microbes, phytoplankton, zooplankton, macrophytes, fishes etc.) factors are capable of removing polluting substances and are responsible for the purification of waste water flowing in the river.

The waste water generated by various industries and human population is being drained into the nearby rivers or water bodies.

River "KHARUN" is one of the main river of Chhattisgarh and its water is used for, irrigation industries and drinking purposes.

II. Materials And Medoths

AREA OF STUDY

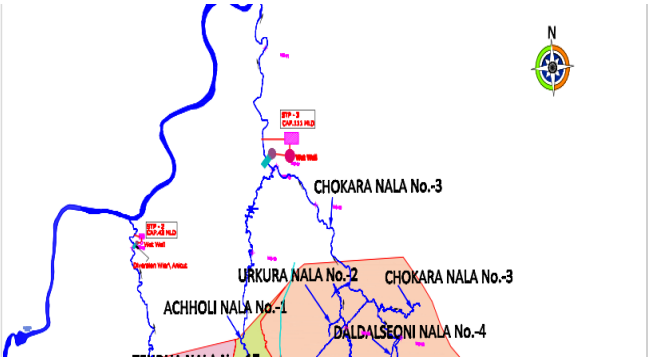
The kharun river located in the west side of the Raipur city. The industrial effluents and the domestic waste-water of "RAIPUR" area is collected by Many nallah, and is discharged into the kharun river and polluting it. The stretch of this study area is approximately 10 km i.e. mainly near the industrial areas of the raipur town. For the investigation of the waste water quality the following five study sites have been selected.

Table-1 Sample Collection Points

P1 - Acchholi Nala	P3 – Chokara Nala
P2 – Urkura Nala	P4 – Daldalseoni Nala

Generally water contains Ca, Fe, Mg, Mn, Si, fluoride, nitrate, phosphates, sulphates and chlorides. When the quantity of these parts increases they affect the body systems and cause destruction of health. Many

more disease like cancer, loss of memory, eye disease, liver and lung problem etc. caused from drinking polluted water.
The water quality will be monitored from the abouve four nalah..



III. Methods

The physico-chemical studies of the following 18 parameters of the waste water of all the study sites.

Table-2 Parameters

1. Water temperature	7. Conductivity	13. Ammonical
2. Color	8. Alkanity	14. Nitrate Nitrogen
3. Odor	9. TSS	15. DO
4. Turbidity	10. EC	16. BOD
5. Sulphate	11. TDS	17. COD
6. Phosphorous	12. Ph	18. Total Hardness

Analytical techniques like "HANA METER"," TITRATION METHOD", "SPECTROMETRY", "AAS" , "FLAME PHOTOMETER", "IC" has used for the measurement of water constituents. The following test has been done of the industrial waste water collected from table no 1 ON THE DATE 22.02.2019.

IV. Result And Discussion

The water samples are collected from 4 different nallah mentioned above in Table no -1 and analyzed for different water quality parameters. The results are shown in tables-3.

It was found that the water quality of point no 2 urkura nallah is highly affected from industrial waste and it shows high value of Ammonical Nitrogen, Turbidity and low value of DO.

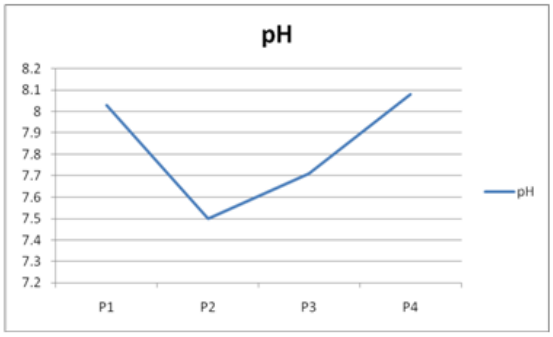
The sample collected from Daldalseoni nallah is having better quality then urkura nallah. It shows high value of value of DO.

Turbidity is widely concerned as an important parameter for assessing the water quality. It is a measure of the relative clarity or cloudiness of water. The highest value 17.9NTU is found in P2.

Table-3 Concentrations of water quality parameters

Sr. No.	Parameters					Min	Max	Mean
		P1	P2	P3	P4			
1	pH	8.03	7.5	7.71	8.08	7.5	8.08	5.8225
2	EC (µS/cm)	527	1376	559.4	589.2	527	527	131.75
3	TDS (mg/L)	77.9	433	281.3	295	295	433	182
4	Alkalinity (mg/L as CaCO3)	85	357	187.7	143.9	85	357	110.5
5	Hardness(mg/L as CaCO3)	143	276	183.1	183.5	143	276	104.75
6	COD (mg/L)	12	88	43	21	12	88	41
7	BOD (mg/L)	9.3	43.3	28.3	9.8	9.3	43.3	22.675
8	DO (mg/L)	8.1	1.7	6.9	10.7	1.7	10.7	6.85
9	Sulphate (mg/L)	1.3	4.9	7.7	23.4	1.3	23.4	9.325
10	Ammonical Nitrogen(mg/L)	1.66	24.4	2.2	1.9	1.9	24.4	7.125
11	Nitrate Nitrogen (mg/L)	1.9	9.3	3.6	1.5	1.5	9.3	4.075
12	Phosphorous (mg/L)	3.56	0.4	2.81	1.13	0.4	2.81	1.085
13	Turbidity (NTU)	3.77	17.9	0.7	5.1	0.7	17.9	5.925

Table 3.1



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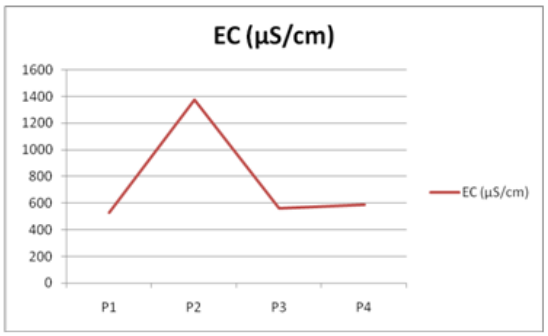

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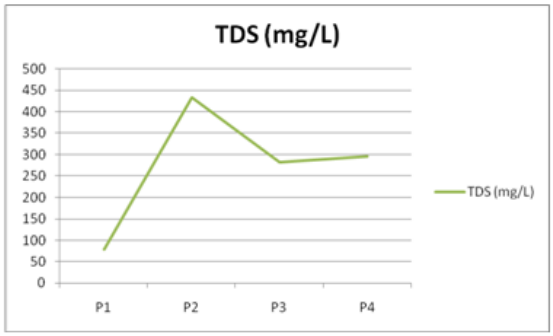

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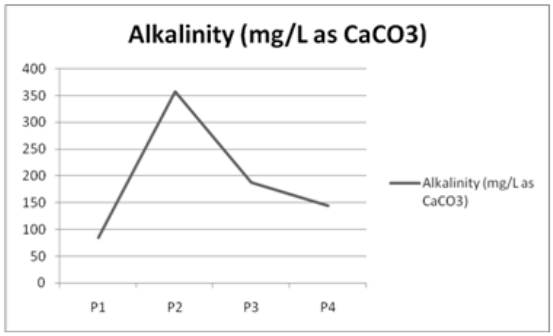

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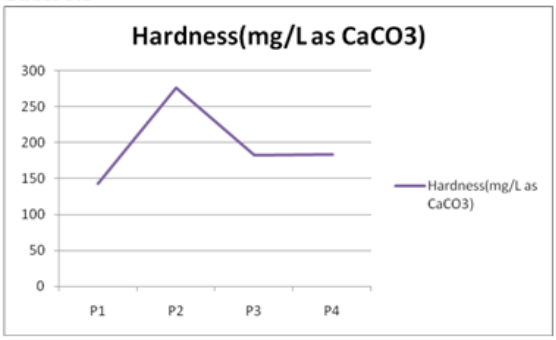

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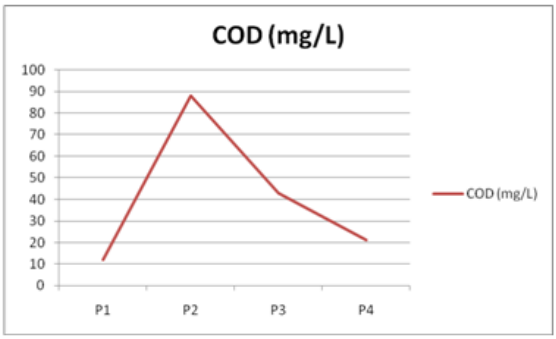

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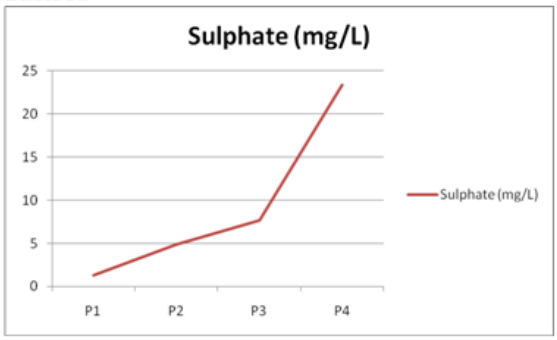

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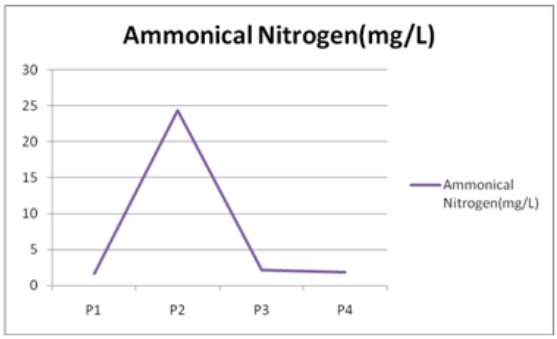

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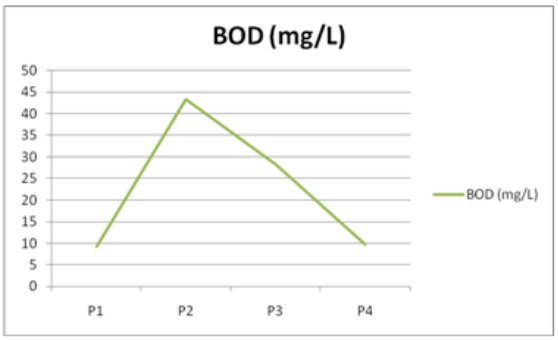

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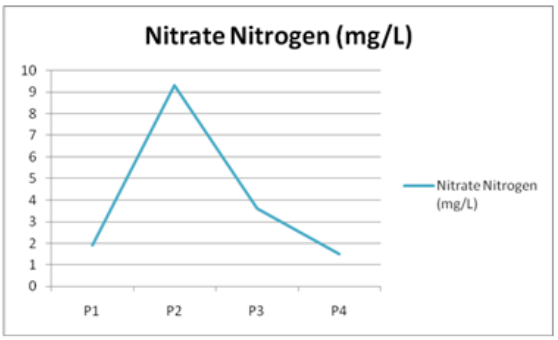

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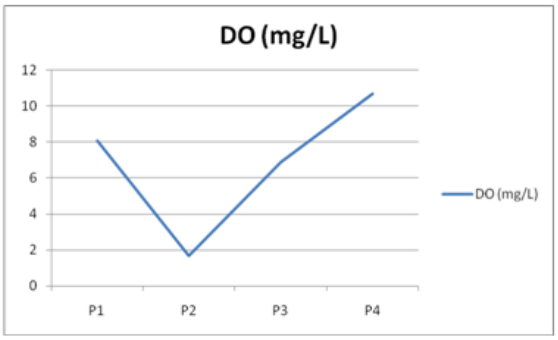

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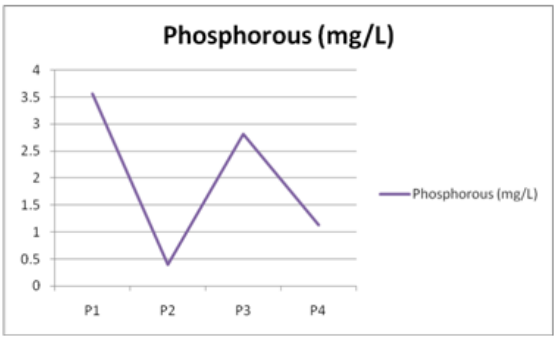

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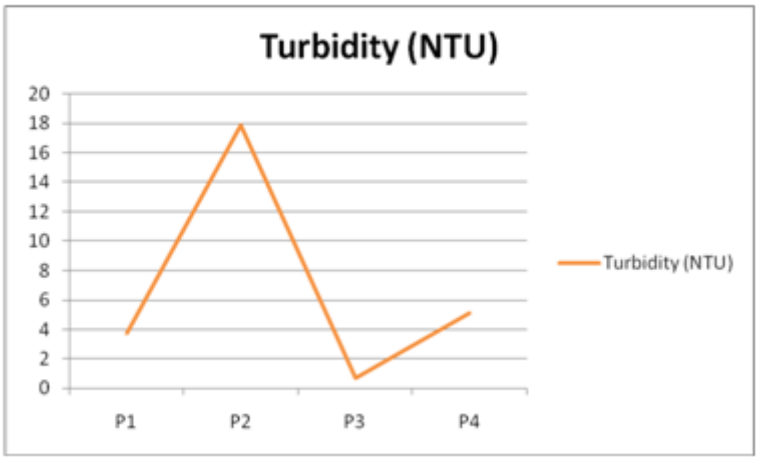

V. Conclusions

It was concluded that the nallah which is close to the industrial region is highly affected from industrial waste. This is the reason to suggest any treatment plant between kharun river and industrial area.

Highly affected water can cause many more disease like tumor so it has been suggested to purity the water quality before it used.

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