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Exploration of Waste Water in Different Open Drains of Kota City

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Abstract:

In Kota city very small area has been covered by sewerage line. Mainly domestic sewage is treated in septic tank. The effluent of septic tank is discharged into open drains. There are many small and medium scale industries, Commercial center, Coaching Institutions etc.; discharging the waste water into various open drains. At present as the present sewerage system is not operating; the waste water from these open drains is discharged into Chambal River. In this project the analysis of waste water was done to examine the probable pollution caused by the high B.O.D. and C.O.D. in waste water. Some samples of drinking water from tube wells were also analyzed to detect the probable pollution from seepage of surface water into ground water. Average value of the B.O.D. Calculated for the Waste water taken from 20 readings is 388.25 and the maximum B.O.D. was in the waste water of Raipura drain (512)

Key Words: C.O.D., B.O.D., D.O., pH, Estimated relationship.

I. INTRODUCTION

Rivers play a major role in integrating and organizing the landscape, and molding the ecological settingof a basin. They are the prime factors controlling the global water cycle and in the hydrological cycle, they are the most dynamic agents of transport. People along the river use water for many purposes. However, the surface water quality is deteriorating due to anthropogenic activities, industrialization, farming, activities, transportation, urbanization, animal and human excretion and domestic wastes. Variation in the quality and quantity of river water due to natural and anthropogenic activities is widely studied in the case of several world rivers. Water is the commonest fluid in nature. Water is also a vital resource for agriculture, manufacturing and other human activities. In urban areas, the careless disposal of industrial effluents and other wastes in rivers & lacks may contribute greatly to the poor quality of river water. Most of the rivers in the urban countries experiencing rapid industrialgrowth and this makeenvironmental conservation a difficult task. The quality of ground water is the resultant of all the processes and reactions that act on the water from the moment it condensed in the atmosphere to the time it is discharged by a well desirable limit of water quality parameters in drinking water prescribe by different agencies.

In Kota industrialization and urbanization have major impact on river water environment. Both surface and subsurface water sources are getting polluted due to developmental activities. The effluents from the drainage system of Kota city greatly distress the geochemistry of the soil. The discharged chemicals interact with river water and alter the pH and other water quality parameters the social relevance of the problem has encouraged us in carrying out this work.

The major factors which result in higher B.O.D., C.O.D. and D.O. in cities are improper disposal of waste water.

II. OBJECTIVE & SCOPE

City of Kota is located in South-East of Rajasthan (25.18°N 75.83°E). It has a population of 10,01,365 as per census of 2011 and the area of the city is 221.36 sq. km. Population density in the city is 4524 per sq. km. Kota is the third largest city in Rajasthan, after Jaipur (30,73,350) and Jodhpur (10,33,918), in terms of population. Mostly black soil is present in the region of the city. Since there is no proper drainage system present in the city, most of the drainage is open and produces unhealthy and unhygienic conditions which is a major problem for such a huge population of the city

This study aims at measuring the B.O.D., C.O.D., D.O. and PH for the waste water as well for the water which is used for drinking purpose through boring.

The main reason behind pollution of the underground water is seepage through soil. Places where large drains are present and the places likely to have standing water suffer from the seepage most.

III. METHODOLOGY

A simple method was used for taking the readings. Readings were taken into two sections depending upon the source of water i.e. Waste water and Tube well water across the city.

After collecting the samples the values of B.O.D., C.O.D., D.O., and PH were determined respectively. All the tests were carried in the laboratory of M.A.C.E.T. with proper precautions. All the readings were crosschecked by determining the readings more than one time of the same sample and then the readings were used up to the two decimal places. All the major places were covered with the best of the efforts so that the readings from major drains which are directly or indirectly connected to the population of the city can be determined.

Field Data Collection

Readings considered in the study were taken from 15.01.2015 to 10.02.2015. In total 74 readings were taken on 20 days out of total period of 27 days. On any given day readings were taken in one direction only. Readings are divided on the basis of the source into two parts. Following are the locations where readings were taken:

Waste Water Areas:

1. Sajidhera drain (Near Saint Paul School).
2. Ranpur drain (Near R.N. Modi).
3. Nayapura drain.
4. Ladpura Drain.
5. Sudha hospital (Nearest drain).
6. Raipura drain (D.C.M. effluent).
7. Waste water of soya plant.
8. Waste water of Station area.
9. Waste water of Bajrangnagar.
10. Anantpura drain.
11. Mahaveernagar drain.
12. Kansua drain.
13. Drain near Godavari dham&Adharsheela.
14. Waste water of Thekranala.
15. Waste water of Jawaharnagar.
16. Waste water of Kunadi.
17. Waste water of Indira Gandhi nagar.
18. Waste water of Chawani.

Water readings from the Tube well & Chambal River:

1. Bajrang Nagar
2. Pragati Nagar
3. Kunahdi
4. Borkhera
5. Chambal River (Upstream)
6. Chambal River (Downstream)

Data collection

The following table shows the measured pollution data in M.A.I.I.T. laboratory. The D.O. was calculated by Wrinkler's titration method.

Table 1: For waste water

S.No	Places in the city	PH	B.O.D.	C.O.D.	C.O.D./B.O.D
1.	Sajidhera Drain	9.50	410	1025	2.50
2.	RanpurDrain	11.0	395	1066	2.69
3.	NayapuraDrain	10.5	447	1162	2.59
4.	Ladpura Drain	10.7	478	1195	2.50
5.	Sudha Hospital (Nearest Drain)	12.0	504	1310	2.59
6.	RaipuraDrain	12.0	512	1327	2.59
7.	Waste water of soya plant	11.6	137	356	2.59

8.	Waste water of Station area	11.5	432	1123	2.59
9.	Waste water of BajrangNagar	10.8	469	1232	2.62
10.	AnantpuraDrain	11.2	490	1287	2.62
11.	MahaveerNagarDrain	10.5	433	1244	2.87
12.	Kansua Drain	11.0	413	1125	2.72
13.	Drain near Godavari dham & Adharsheela	10.6	478	1209	2.52
14.	Waste water of Thekranala	8.90	368	1097	2.98
15.	Waste water of Jawahar Nagar	9.20	470	1155	2.45
16.	Waste water of Kunadi	9.80	398	1217	3.05
17.	Waste water of Indira Gandhi Nagar	10.5	439	1258	2.86
18.	Waste water of Chawni	11.0	492	1279	2.59

Table 2: For Tube well water & Chambal River

S.No	**Places in the city**	**PH**	**B.O.D**	**C.O.D.**	**D.O**
1.	Bajrang Nagar	7.8	4.5	10.0	6.2
2.	Pragati Nagar	7.9	5.2	12.0	5.5
3.	Kunadi	7.5	3.5	8.00	6.5
4.	Borkhera	7.7	4.0	8.50	6.2
5.	Chambal river(Upstream)	7.5	1.5	8.20	7.8
6.	Chambal river (Down-stream)	7.9	7.6	32.0	5.0

IV. RESULTS & DISCUSSION

The Values of B.O.D., C.O.D. and D.O. were calculated for different samples. The maximum B.O.D. & C.O.D. are present in the Industrial areas or the area where urban population is more. If the proper Drainage system is provided with the proper planning, it could contribute to decrease the pollution in water.

The maximum values of B.O.D. & C.O.D. were 512 (Raipura drain)& 1310 (Raipura drain) respectively. Whereas the maximum C.O.D./ B.O.D. ratio is3.05 of the waste water of Kunadi and the minimum C.O.D./ B.O.D. ratio is 2.45 of the waste water of Jawahar nagar.

The C.O.D./ B.O.D. ratio varies from 2.45 to 3.05.

V. CONCLUSION

The conclusion of this experiment is that a large amount of pollutants are present not only in the waste water of the city but in the water used for drinkingas well. Proper remedial measures should be taken against this problem so that Environment could be saved which will be beneficial for Humans and for the Natureas well.

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