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A COMPARATIVE STUDY ON SOIL AND SURFACE WATER QUALITY AROUND KURICHI, UKKADAM AND SINGANALLUR LAKE IN COIMBATORE CITY

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Abstract:
Soil and surface water are the essential components for survial of oganism. Surface water quality contamination is one of the most important environmental issues in Tamil Nadu. Due to increase in the population and industrialization of Coimbatore and there is solid waste are generation. The effluent of these wastes are being disposed randomly on soils, river, lake and roadside without any treatment. It is also affected by industrial waste water, dumping household waste and other causes. In this study of Kuruchi, Ukkadam and Singanallur Lakes the physicochemical parameters of surface water and soil were tested. The parameters for surface water including pH, Electrical Conductivity, Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Chlorides, Sulphates, NO2, NO3, Carbonate, Bicarbonate, Sodium, Pottasium, Dissolved oxygen COD and BOD to determine the water quality of study area. The physico chemical parameters of soil including pH, Electrical Conductivity, Organic matter, Calcium, Magnesium, Phospurus, Nitrogen, Pottasium, Copper, Zinc, Iron and Manganese. Mostly all the physicochemical parameters were found above the prescribed limit as recommended by WHO (2011) and BIS (2010) drinking water quality. There may be suggested that conservation of fresh water lakes can be implemented and regular monitoring for management of good water quality needful for sustainable environment**.**

Key Words: Chemical Parameters, Ukkadam, Kurichi, Singanallur & Water Quality

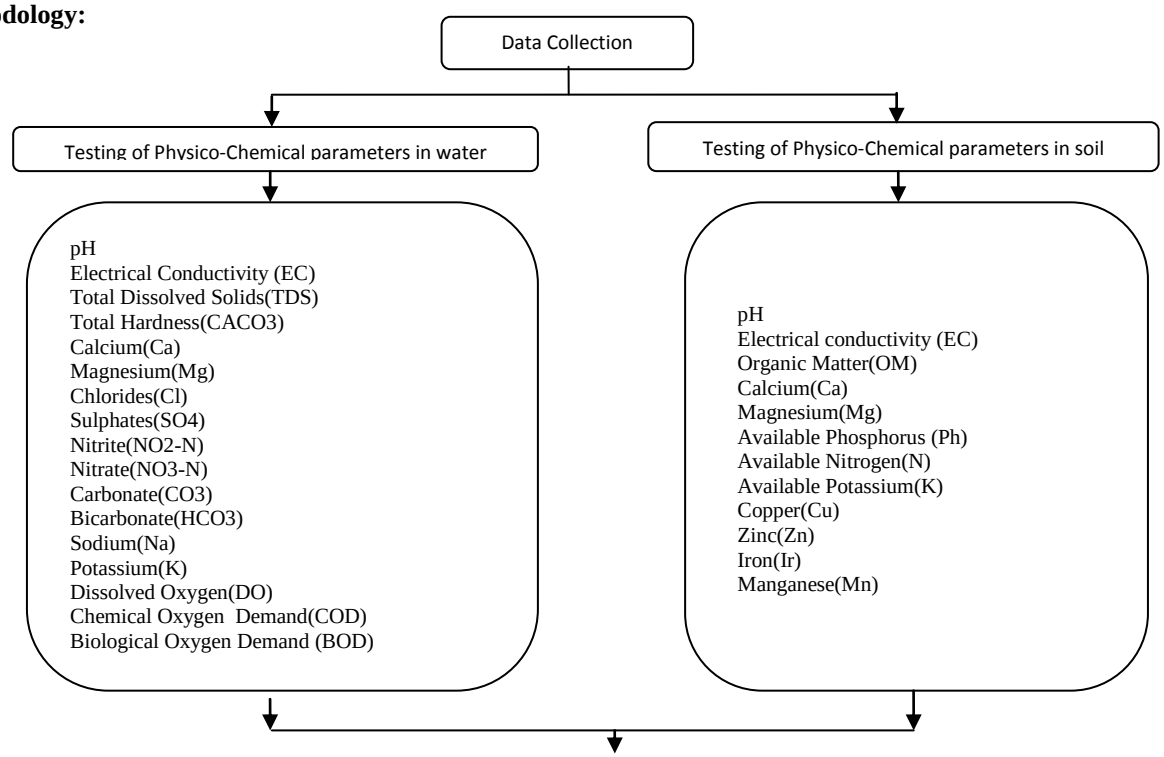
1. Introduction:

Coimbatore district is located in the western part of Tamilnadu. The city is also known as Manchester of South India. The city is located at 411m above mean sea level. The city is situated on the banks of river Noyyal. The city is also famous for textile spinning mills, wet grinders, pumps and motors industry sector. To cater the needs of above and to fabricate machineries for the factories, foundry and electroplating sector establishments are emerging. Even though it is a developing city, due to above activities the soil and surface water gets polluted. In this city many areas gets polluted by industries, sewage, tex-tiles etc. In this study majorly pollutant areas are Kurichi, Singanallur, Ukkadam lakes.

2. Objectives of the Study:

- ✓ To collect the samples of soil and surface water from the corresponding lakes.
- ✓ To analyze the chemical parameters of soil and surface water from lakes.
- ✓ To compare the results of surface water samples from lakes with BIS standards

3. Methodology:



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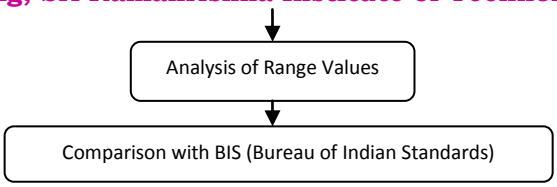

4. Data Used:

The soil and surface water samples were collected form the three lakes Kurichi, Ukkadam and Singanallur. The following Table I shows the location of samples collected.

Table 1: Location of Surface Water Samples

Water Samples		
Sample Code	Latitude	Longitude
K1	10.9697	76.9666
K2	10.9685	76.96643
K3	10.9676	76.9678
U1	10.97903	76.96016
U2	10.97846	76.9547
U3	10.97929	76.94593
S1	10.991	77.0257
S2	10.996	77.0259
S3	10.998	77.0197

Table 2: Location of Soil Samples

Soil Samples		
Sample Code	Latitude	Longitude
U1	10.97933	76.95014
U2	10.97937	76.94582
U3	10.98229	76.94582
K1	10.971	76.965
K2	10.96981	76.96448
K3	10.96902	76.96598
S1	10.993	77.0259
S2	10.997	77.0189
S3	10.991	77.0195

5. Results and Discussion:

5.1 Comparison With Surface Water Sample of Kurichi With BIS: The following table 3, 4 and 5 shows the comparison with surface water sample of Kurichi, Ukkadam and Singanallur lakes with BIS respectively. The samples values which were exceeds the BIS limits highlighted on the table for the corresponding lakes.

Table 3: Comparison with surface water sample of kurichi with BIS

Parameters	**Unit**	**BIS (Bureau of Indian Standard)**		**Kuruchi**		
		Min	**Max**	**K_1**	**K_2**	**K_3**
pH	-	6.5	8.5	8.65	8.72	8.5
Electrical Conductivity(EC)	mS/cm	1.6	2.4	1.86	1.86	1.92
Total Dissolved Solids(TDS)	mg/l	500	2000	1220	1210	1250
Total Hardness($CaCO_3$)	mg/l	300	600	323	327	363
Calcium(Ca)	mg/l	61	120	34	39	45
Magnesium(Mg)	mg/l	42	110	58	60	61
Chlorides(Cl)	mg/l	250	1000	466	460	468
Nitrite(NO_2-N)	mg/l	0.2	NIL	9	9.2	8.6
Nitrate(NO_3-N)	mg/l	45	NIL	1.6	1.2	1.4
Carbonate(CO_3)	mg/l	10	16	36	40	44
Bicarbonate(HCO_3)	mg/l	0	150	166	176	182
Sodium(Na)	mg/l	200	700	310	300	312
Potassium(K)	mg/l	30	70	28	24	28
Dissolved Oxygen(DO)	mg/l	5	12	8.8	13.1	5.8
Chemical Oxygen Demand(COD)	mg/l	200	500	254	234	242
Biological Oxygen Demand(BOD)	mg/l	40	90	24	32	29

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5.2 Comparison with Surface Water Sample of Ukkadam with BIS:

Table 4: Comparison with surface water sample of Ukkadam with BIS

Parameters	Unit	BIS (Bureau of Indian Standard)		Ukkadam		
		Min	Max	U_1	U_2	U_3
pH	-	6.5	8.5	8.38	8.59	8.82
Electrical Conductivity(EC)	mS/cm	1.6	2.4	3.05	3.15	6.45
Total Dissolved Solids(TDS)	mg/l	500	2000	2050	2050	4250
Total Hardness($CaCO_3$)	mg/l	300	600	278	266	371
Calcium(Ca)	mg/l	61	120	24	19.4	16.2
Magnesium(Mg)	mg/l	42	110	53	53	80.4
Chlorides(Cl)	mg/l	250	1000	616	616	1408
Nitrite(NO_2-N)	mg/l	0.2	NIL	16	14.2	21
Nitrate(NO_3-N)	mg/l	45	NIL	2.1	1.3	3.1
Carbonate(CO_3)	mg/l	10	16	104	80	128
Bicarbonate(HCO_3)	mg/l	0	150	436	496	668
Sodium(Na)	mg/l	200	700	423	416	928
Potassium(K)	mg/l	30	70	40	36	65
Dissolved Oxygen(DO)	mg/l	5	12	6.6	5.5	8.7
Chemical Oxygen Demand(COD)	mg/l	200	500	143	321	369
Biological Oxygen Demand(BOD)	mg/l	40	90	54	42	51

In that analysis shows comparing with BIS (Bureau of Indian Standard), Electrical conductivity, Total Dissolved solids, Nitrite, Carbonate and bicarbonate are exceeding the maximum limits.

5.3 Comparison with Surface Water Sample of Singanallur with BIS:

Table 5: Comparision with surface water sample of Singanallur with BIS

Parameters	Unit	BIS (Bureau of Indian Standard)		Singanallur		
		Min	Max	S_1	S_2	S_3
pH	-	6.5	8.5	7.43	7.61	7.86
Electrical Conductivity(EC)	mS/cm	1.6	2.4	2.1	2.25	2.2
Total Dissolved Solids(TDS)	mg/l	500	2000	1320	1479	1420
Total Hardness($CaCO_3$)	mg/l	300	600	399	548	500
Calcium(Ca)	mg/l	61	120	77.6	108	97
Magnesium(Mg)	mg/l	42	110	50	176	63
Chlorides(Cl)	mg/l	250	1000	280	308	306
Nitrite(NO_2-N)	mg/l	0.2	NIL	8.8	6.5	7
Nitrate(NO_3-N)	mg/l	45	NIL	1	1.1	1
Carbonate(CO_3)	mg/l	10	16	40	48	60
Bicarbonate(HCO_3)	mg/l	0	150	472	448	430
Sodium(Na)	mg/l	200	700	184	210	202
Potassium(K)	mg/l	30	70	14	16	15
Dissolved Oxygen(DO)	mg/l	5	12	0.6	0	1.5
Chemical Oxygen Demand(COD)	mg/l	200	500	52	95	64
Biological Oxygen Demand(BOD)	mg/l	40	90	12	12	6

5. Conclusions:

The surface water and soil sample for the corresponding lakes were collected. The chem-icals parameters of the sample were tested on laboratory. The results were analysed and compared with the BIS standards. According to BIS(Bureau of Indian Standard) the pH, Nitrite, Carbonate, Bicarbonate parameters of kurichi samples were exceeding the maxi-mum limits. The samples in ukkadam comparing with BIS(Bureau of Indian Standard), Electrical conductivity, Total Dissolved solids, Nitrite, Carbonate and bicarbonate pa-rameters were exceeding the maximum limits and the samples in Singanallur comparing with BIS(Bureau of Indian Standard), Nitrite, carbonate and bicarbonate parameters are exceeding the maximum limits.

6. References:

1. P. Shanthi," Physico-Chemical analysis of ground water near municipal solid waste dumping sites in coimbatore city"2250-3498(2012)
2. Santhosh. P, "Hydrogeochemical analysis of ground water parameters in coimbatore district, Tamilnadu" 2231-1040(2014)
3. A. Manivannan, "Study of Physico-Chemical properties and microbial around coimbatore, Tamilnadu, India".2319-1414(2013)

4. K. Jothivenkatachalam, "Correlation analysis of drinking water quality in and around perur block of coimbatore district, Tamilnadu, India"0974-1496(2010)
5. T. S Herene, "Assessment of ground water pollution using peizometer techniques in coimbatore, Tamilnadu, India" 135-140(2012)
6. Rajiv. P, "Comparative Physico-Chemical and microbial analysis of various pond waters in coimbatore, Tamilnadu, India 3533-3540 (2012)
7. M. Mahalakshmi, "Assessment of water contamination due to dyeing and bleaching effluents on noyyal river basin, Tamilnadu" 1335-1340(2014)
8. K. Murali, "Assessment of ground water vulnerability in coimbatore, Tamilnadu, India.2250-3153(2013)
9. R. Premsudha R. N. Uma, " Assessment of soil quality municipal solid waste dump site in coimbatore, Tamilnadu, India0976-3945 International journal of chemical science (2016)
10. Lognimimeviem, "Spatial distribution of soil heavy metals in the zaidamine based on geostatistical methods.337-349(2015)
11. R.Premsudha, "Assessment of soil characteristics around municipal solid waste dis-posal site in sulur block, coimbatore, TamilNadu, India" International journal of chemical science 2229-5518(2014)
12. A.Gandhimathi, "Spatial predication of heavy metal pollution for soils in coimbatore, TamilNadu, India"0976-3945(2011)
13. Pavithrapriya, "Pollution due to heavy metals in coimbatore wet lands, India"2320-6063(2015)
14. R.Manikandan, "Potential ecological assessment of sediment quality and heavy metals contamination in kurichi lake, TamilNadu, India"2028-2508(2014)
15. M.Malakodi, "Characterization of heavy conatminated soils of coimbatore, TamilNa-du"1812-5379(2007)
16. P.N.Sawant,"Physico-Chemical parameters for testing of water"0976-4402(2012)
17. P.Santhi " physicochemical Analysis of Ground water near municipal solid waste Dumping Sites in Coimbatore city" 2250-3498 (2012)
18. N.Balasundaram, Assistant Professor, Karpagam University, Dr. T. Meenambal, Professor, Government College of Technology, Coimbatore. "Physico Chemical Ananlysis Of Ground Water Near Municipal Solid Waste Dumping Sites In Coimbatore City" IRACST – Engineering Science and Technology: An International Journal (ESTIJ) ISSN : 2250-3498, Vol.2, No.5,Page No. 889-893, October 2012. Impact Factor -0.356
19. A.Babu & Dr. N. Balasundaram, June2016, "Environmental Impact of Singanallur Lake water", International Journal of Engineering Sciences & Research Technology, Vol.5(6), Impact Factor – 4.1