



## Studies on the Reuse and Recycle of Waste Waters for Agricultural Purpose in Coimbatore District, Tamilnadu, India

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### Abstract

Water is the elixir of life, a precious life of nature to mankind and millions of other species living on earth. The total water resource available in India is 1850 km<sup>3</sup>, which is roughly 4% of the world's fresh water resources. Unfortunately in many countries around the world some drinking water supplies have become contaminated which has imparted on the health and economic status of the pollution. Today the requirement of water to all living organisms from micro-organisms to man is a serious challenge because all water resource are polluted due to unplanned urbanization and industrialization. The major problems affecting standing water bodies have been recognized for atleast two decades but their quantification and classification of environmental managers, researches has recently described the condition of Indian fresh water resources and their management as a prominent environmental problems with nutrition, enrichment, acidification domestic waste, sewage, agricultural and industrial effluents contamination by toxic substances identified as major impacts. The water analysis of physico-chemical and biological parameters is very important for public health studies and also main part of pollution studies in the environment.

**Keywords:** elixir, pollution, urbanization, industrialization, sewage, toxic substance.

### 1. Introduction

Water is the biggest menace of urbanization, industrialization and modern agricultural practices. It leads to alteration in Physical, Chemical, Biochemical properties of bodies as well as that of the environment. It directly or indirectly affects the life processes of flora and fauna of the water body, surrounded by chemical toxicants (kumari et al., 2006; Indira and sivaji,2006,Krishnan et al.,2007). Effluent irrigation has been practiced for centuries throughout the

world (shuval et al., 1986; Tripathi et al.,2011). It provides farmers with a nutrient enriched water supply and society with a reliable and inexpensive system wastewater treatment and disposal (Feigin et al., 1991).

In India farmer apply cheap source of irrigation as this water to their field. Rapid industrialization, population explosion and more urbanization in India have created enormous problems of environmental pollution in terms of generating the variable quantity and quality of solid and liquid wastes. The Sewage water are used as potential source of irrigation for raising vegetables, fodder and crops around the sewage disposal sides which are directly and indirectly consumed by human beings. The problem associated with sewage disposal has become a major problem of the urban world due to increase in human population and urbanization. Consequently, domestic waste-water discharges are considered one of the most significant threats of the coastal environments worldwide (GPA 2001). Pathogens transmitted by Human faeces are most commonly involved and the discharge of sewage polluted by human and animal pathogens into the sea represents the main source of bacterial pollution.

## 2. Materials and Methods

For the present, a part of river Bhavani located near Mettupalayam Bleaching Factory was selected for the study of Physico-chemical and Biological Characteristics of the sewage-effluent habitat. Three Stations were selected and represented as Station I, Station II and Station III.



**Figure 1:** United Bleaching Factory Effluent at Mettupalayam Bhavani River (At the point of mixing)

## 3. Results and Discussion

To study the seasonal variation in physico-chemical and Biological characters, two stations of river were selected. Water quality study is essential for setting base line conditions and standards. Against these standard results further studies can be evaluated. The results obtained by each physico-chemical and biological characteristics of water samples listed in the following tables.

**Table 1:** Seasonal Variations in the Physical Parameters of the Station- I before Mixing of the United Bleaching Factory Effluent at Mettupalayam for the Period of 5 Months (Sep 2013-Jan2014)

S.No	Months	Temperature (°C)	Colour (visual)	Suspended Solids (mg/l)	Dissolved solids (mg/l)	Total Solids (mg/l)	Electrical Conductivity (mMho)	Light Penetration (cms)
1	SEP	28.0	Brownish	17.01	7.01	240.02	170.00	70.02
2	OCT	20.2	Brownish	187.04	78.02	265.24	265.24	73.00
3	NOV	19.4	Brownish	200.01	85.04	285.41	285.41	78.06
4	DEC	21.3	Brownish	210.05	90.02	300.07	300.07	80.01
5	JAN	20.5	Brownish	188.08	80.05	268.07	268.07	76.08

**Table 2:** Seasonal Variations in the Physical Parameters of the Station- II at the Point of Mixing of the United Bleaching Effluent at Mettupalayam for The Period of 5 Months (SEP 2013-JAN2014)

S. No	Months	Temperature (°C)	Colour (visual)	Suspended Solids (mg/l)	Dissolved solids (mg/l)	Total Solids (mg/l)	Electrical Conductivity (mMho)	Light Penetration (cms)
1	SEP	29.0	Brownish	180.02	80.01	260.03	175.00	60.02
2	OCT	25.2	Brownish	190.04	81.02	271.06	186.32	63.00
3	NOV	20.4	Brownish	212.01	87.04	299.05	194.08	68.06
4	DEC	22.3	Brownish	215.05	93.02	308.07	197.07	70.01
5	JAN	22.6	Brownish	205.08	90.05	295.13	188.06	66.08

**Table 3:** Seasonal Variations in the Physical Parameters of the Station- III after the Mixing of the United Bleaching Effluent At Mettupalayam for The Period of 5 Months (SEP 2013-JAN2014)

S. No	Months	Temperature (°C)	Colour (visual)	Suspended Solids (mg/l)	Dissolved solids (mg/l)	Total Solids (mg/l)	Electrical Conductivity (mMho)	Light Penetration (cms)
1	SEP	25.1	Brownish	178.02	78.05	256.07	172.01	59.01
2	OCT	22.0	Brownish	180.04	80.03	260.07	180.30	61.02
3	NOV	19.0	Brownish	200.01	85.01	285.02	190.01	68.01
4	DEC	20.5	Brownish	198.05	90.4	288.09	191.01	69.01
5	JAN	21.2	Brownish	196.08	88.02	284.1	182.01	61.02

**Table 4:** Seasonal Variatios in the Chemical Parameters of the Station- I before Mixing of the United Bleaching Factory Effluent at Mettupalayam for the Period of 5 Months (SEP 2013-JAN2014)

S. No	Months	pH	Salinity (mg/l)	Total Alkalinity(mg/l)	Dissolved Oxygen(mg/l)	Dissolved Co <sub>2</sub> (mg/l)	BOD
1	SEP	7.4	700.00	700.00	6.2	462	162.42
2	OCT	7.5	685.10	685.10	6.3	391	160.40
3	NOV	7.5	693.10	693.10	6.4	429	157.84
4	DEC	7.9	706.06	706.06	6.1	465	168.43
5	JAN	8.0	700.0	700.00	6.0	454	164.52

**Table 5:** Seasonal Variatios in the Chemical Parameters of The Station- II at the Point of Mixing of the United Bleaching Effluent at Mettupalayam for the Period of 5 Months (SEP 2013-JAN2014)

S. No	Months	pH	Total Alkalinity(mg/l)	Dissolved Oxygen(mg/l)	Dissolved Co <sub>2</sub> (mg/l)	BOD (mg/l)
1	SEP	8.1	1045	5.5	1430	164.43
2	OCT	8.2	1032	5.6	1201	162.41
3	NOV	8.1	996	5.7	1345	159.82
4	DEC	9.1	1049	5.2	1193	170.40
5	JAN	9.2	1038	5.1	1432	167.61

**Table 6:** Seasonal Variatios in the Chemical Parameters of the Station- III after Mixing of the United Bleaching factory Effluent at Mettupalayam for The Period of 5 Months (SEP 2013-JAN2014)

S. No	Months	pH	Total Alkalinity(mg/l)	Dissolved Oxygen(mg/l)	Dissolved Co <sub>2</sub> (mg/l)	BOD (mg/l)
1	SEP	9	1038	4.5	1428	161.40
2	OCT	9	1036	4.2	1190	158.36
3	NOV	9	990	4.4	1332	160.79
4	DEC	8	1041	5.1	1181	162.32
5	JAN	9	1035	5.2	1429	159.52

**Table 7:** Seasonal Variatios in the Nutrients of the Station- I Before Mixing of the United Bleaching factory Effluent at Mettupalayam for the Period of 5 Months (SEP 2013-JAN2014)

S. No	Months	Phosphate (mg/)	Nitrae (mg/l)	Calcium (mg/l)	Magnesium (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
1	SEP	3.09	123	125	70.00	28.4	121.94
2	OCT	2.99	137	120	69.31	25.36	120.57
3	NOV	3.10	119	110	70.28	23.39	121.82
4	DEC	2.85	120	115	68.94	27.99	121.68
5	JAN	2.99	127	139	71.16	28.29	120.43

**Table 8:** Seasonal Variations in the Nutrients of The Station- II at the Point of Mixing of the United Bleaching Effluent at Mettupalayam for the Period of 5 Months (SEP 2013-JAN2014)

S. No	Months	Phosphate (mg/)	Nitrate (mg/l)	Calcium (mg/l)	Magnesium (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
1	SEP	3.09	123	125	70	28.4	121.94
2	OCT	2.99	137	120	69.31	25.36	120.57
3	NOV	3.10	119	110	70.28	23.39	121.82
4	DEC	2.85	120	115	68.94	27.99	121.68
5	JAN	2.99	127	139	71.16	28.29	120.43

**Table 9:** Seasonal Variations in the Nutrients of the Station- III after the Point of Mixing of the United Bleaching Effluent at Mettupalayam for the Period of 5 Months (SEP 2013-JAN2014)

S. No	Months	Phosphate (mg/)	Nitrate (mg/l)	Calcium (mg/l)	Magnesium (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
1	SEP	3.07	119	120	63	25.2	119.92
2	OCT	2.89	132	118	70.29	21.25	124.33
3	NOV	3.11	128	109	68.19	20.32	112.80
4	DEC	2.84	115	104	62.81	26.82	119.59
5	JAN	2.98	112	123	65.12	24.21	122.40

#### 4. Conclusion

In the present study the station II (at the point of mixing of United Bleaching factory effluent) shows more pollution load than station I and station III. The station I less polluted than station II and III.

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