Study of Industrial Effluents from Industrial area, Latur, Maharashtra, India

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Abstract: In India rapid industrialization along with the other human activities has adversely effected to the environment. Major industries have insufficient effluent treatment facility. Its affected in environmental degradation. The present research work deals with the study of some important physico-chemical parameters of industrial waste water from Latur Industrial area old and additional industrial areaLatitude18° 24' 28.6452" N and Longitude 76° 34' 36.3612" E. Analysis of physico-chemical characteristics from industrial effluents samples were collected from industrialeffluent sites in Latur. Physico chemical parameterswere studied by month from June 2015 – May 2016 for one year.This study shows variation of monthly and seasonal of physic-chemical parameter. The parameters invented Temperature, pH, EC, DO, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Dissolved Solids (TDS), Chloride, Iron, Sulphate, Hardness, Alkalinity, Oil & Grease.. Results indicated that these are some parameter not permissible for most aquatic species. Its impact goes to loss of aquatic ecosystem. The study showed that most of the water parameters of the Industrial effluent are not able to mix the fresh water bodies.

Key words: Indian economy, Industrial effluents, Hazardous wastes, TDS, Sulphate.

I. Introduction

Industrialization is an important activity for growth and development of the Indian economy. Therefore, the industrial activity has expanded in all over India, State and Central Government announces and allot the land, water and electricity in all Taluka places for launching the industries Industrial Development policy of India (1948, 1956, 1977, 1985, 1991). Today, it has become a matter of major task in the debasement of the environment. Government release the facility and subsidy about establishing the industry the rate of industries was increased in last some decades. About installation of heavy pollution industries the pollution control board announce and declare the rules of control of pollution. But lot of industrialist not operate the pollution control system forever. In India effect of the rapid growth of industries the pollution of natural water by industrial waste water has increased tremendously Priyanka *et, al*,.(2015).

Major industries from India have treatment facilities for industrial effluents. But this treatment facility is established in on metro cities or very high cost industries it is not found in the case of small scale industries and small city industrial area. Some industries cannot manage excessive expenses in pollution control equipment as their business profit margin is very low. Subsequently, the water pollution problem particularly due to toxic metals has become threatening concern Varsharani & Nandan (2016).

Correspondingly in more industrial area from India there isacceptable information found inappropriatewith the omission of industrial wastes. More industries are left effluent in the common drainage and common drainage are left in the small river small rivers are connected to big rivers. In well-equipped industrial area also responsible for pollution in rainy season run off or flood run towards river with industrial waste.

Industrial water pollution is global issue. Industrial water pollution caused by factories and other industries can be the most severe predicament in an environment. Such types of pollution can lead reflective problem to human and animal health problems likewise widespread crushing to the natural world. This is anenormousworriment, and intermittently it can be so serious it'sinconceivable to effectivelyunblemishedSmt. Vasantaben (2014).

It is appear that one-third part of the water pollution participate from the total water pollution in India enterthrough industrial effluent discharge, solid wastes and other hazardous wastes are mixed in water. India has defeated in industrial water pollution management scenario. That's double percussion on Indian economy one side Government give facility and subsidy to launch industry and expense on recover environment disabled by industry example Ganga river is polluted by industry and it is repaired by Government of India.

Our present research areais the Latur industrial region, of Maharashtra,India. It is undergoing rapid urbanization and industrialization since last three decades. It has many Food processing, Textile and readymade garment, Engineering and Steel furniture, Paper, Printing press, Chemical, Plastic, Drinking water, Oil mill, Dall mill, and Electrical industries. Effluents rising from their industries and cause to pollute water resources, the present paper is intended to detail study of physico-chemical properties industrial effluents of Latur Industrial area.

Water is the most integral wealth for all kinds of life on the earth, but it is being negatively affected for all kinds of organisms. Today most of the rivers and fresh water bodies receive millions of litre sewage domestic waste and industrial effluents containing varying incharacteristics from simple nutrient to highly toxic substances. In recent years, increasing industrializationand developmental activities with the population explosion leads to generation of large amount of waste water from industries and other sources. Studies of water quality in various effluents revealed that manmade activities have an important negative impact on water quality in the downstream sections of the

major rivers and fresh water bodies. This is a result of cumulative effects from upstream development but also from inadequate or deficient wastewater treatment facilities Amit (2013).

Material and Method:

2.1. Study Area

The study was carried out at Latur from Maharashtra Industrial Development Corporation old and new territory. Latur Industrial area which is one of the most rapidly developing and slightly polluted area of Latur city. The old industrial area is spread over 263.26 hectors of land consisting of about 600 large and medium scale industries like engineering units, steel processing industries, chemical units, paints, textile, oil mill, dal mill, rice mill, bakery, food processing, scrap processing, marble and tiles, and battery industries etc. The new additional industrial area is spread over 1073.83 hectors of land consisting of about 350large and medium scale industries like dal mill, oil mill, cold storages, textile industries, drinking water, etc. The study area lies between latitude 18°34' 28.6452"N, longitudes 76° 34' 3612"E. Water from these industries is continuously disposed off into soilthrough industrial drainage.Surrounding populations are under risk of environmental pollution.

2.2 Industrial Effluent Sampling and Preservation

The industrial effluent samples were collected randomly month by month from June 2015 to May 2016in polythene cans for a period of fourmonths from different both industrial area are old industrial area and additional industrial area. The sample container cans were thoroughly cleaned with hydrochloric acid, cleaned with tap water for free of acid, washed with distilled water twice, again rinsed with the water sample to be collected and then filledup the cans with the sample leaving only a small air gap at the top. The sample cans were Stoppard and sealed. Each sample was labelled properly and brought back to the laboratory for the chemicalanalysis.

2.3. Physico-Chemical Study

The samples were collected and analysed for Temperature, pH, EC, DO, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Dissolved Solids (TDS), Chloride,Iron, Sulphate, Hardness, Alkalinity, Oil & Grease. The techniques and methods followed for collection, preservation and analysis aregiven by (APHA, 1995). Trivedy and Goyal (1998).

Result and Discussion

Table No. 1: Physico Chemical parameter results of Old Industrial area.

	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Temperature	28.9	29.4	29.3	29.1	28.7	28.6	28.7	28.5	29.2	30.6	31.5	31.9
pH	7.9	7.4	7.6	7.5	8.5	8.3	7.4	7.3	7.4	8.3	8.5	8.7
EC	1345	1338	1368	1242	1258	1272	1276	1020	1045	1248	1265	1294
DO	1.4	1.5	1.6	1.6	1.9	1.5	1.7	1.6	1.5	1.6	1.4	1.6
BOD	538	565	598	620	540	535	485	478	495	442	438	472
COD	780	795	775	755	782	785	776	834	855	875	873	832
TDS	1764	1746	1890	1946	2120	1960	1920	2160	2130	1980	1964	1930
Chloride	678	690	710	729	668	646	649	682	673	628	638	580
Iron	2.48	2.72	2.98	2.78	2.88	3.18	3.16	2.96	2.98	2.94	3.12	2.76
Sulphate	668	676	678	628	598	642	648	656	628	638	624	648
Hardness	1080	998	1046	1048	1180	1060	1070	1060	1070	1090	1040	1060
Alkalinity	1280	1370	1390	1316	1324	1372	928	1040	1020	1178	1150	1165
Oil & grease	38	42	56	48	42	52	56	64	66	54	56	46

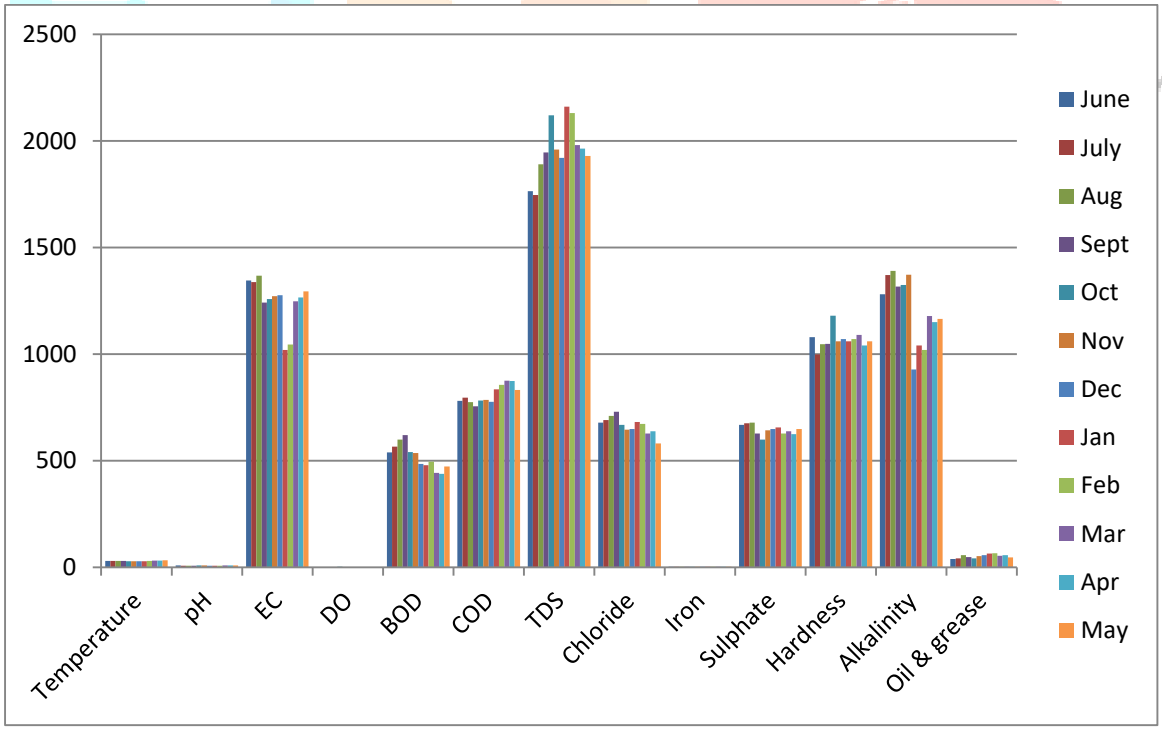

Fig. No. 1: Showing monthly variation of physico chemical parameter of old industrial area

Table No. 1: Physico Chemical parameter of Additional Industrial area

	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Temperature	28.5	29.2	29.4	29.1	28.2	28.1	28.2	28.5	29.2	29.8	31.5	31.9
pH	7.9	7.4	7.6	7.8	8.4	8.2	7.4	6.8	7.6	8.2	8.6	8.7
EC	1320	1340	1380	1230	1240	1280	1260	980	1060	1220	1240	1300
DO	1.5	1.6	1.7	1.6	1.8	1.7	1.6	1.8	1.7	1.4	1.3	1.5
BOD	520	560	610	650	510	520	480	486	470	420	436	460
COD	720	758	742	738	776	790	760	810	835	856	872	838
TDS	1045	1246	1690	1847	1980	1982	1938	2145	2115	1965	1751	1510
Chloride	570	590	610	629	615	622	632	640	638	624	618	580
Iron	2.38	2.60	2.90	2.80	2.85	3.10	3.12	2.90	2.96	2.92	3.10	2.80
Sulphate	670	660	620	592	590	640	650	610	632	628	614	604
Hardness	980	890	1030	1040	1160	1020	1030	980	980	1060	1030	1020
Alkalinity	1260	1320	1340	1345	1340	1360	870	1090	900	1150	1160	1175
Oil & grease	42	48	50	44	48	56	58	62	64	58	52	48

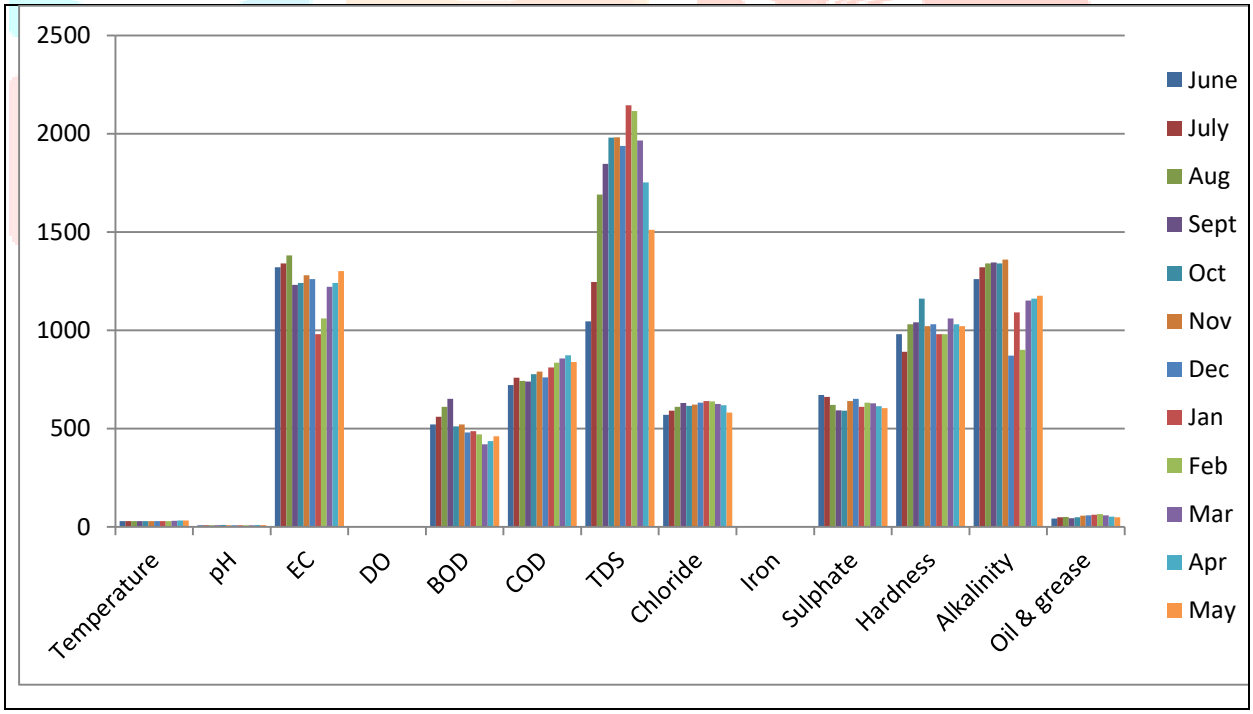

Fig. No.2: Showing monthly variation of physico chemical parameter of additional industrial area

Temperature ranged between 28.5℃ to 31.9℃ in old industrial area and 28.1℃ to 31.9℃ ranged in additional area similar reported by Md. Khorshed Ali *et, al,*. (2017) pH recorded between 7.3

to 8.9 in old industrial area and 6.8 to 8.7 in additional industrial area equal reported by Ipeaiyeda and Obaje (2017) . Electrical conductivity ranged between 1020uS/cm to 1368 uS/cmand 980uS/cm to 1380uS/cm in additional areaVikramjit Singh *et,al,*.(2016), Snehal and Bandela (2016). Dissolved oxygen ranged between 1.4 mg/lit to 1.9 mg/lit in old industrial area and 1.3 mg/lit to 1.8 mg/lit in additional area A.S. Kolheet,al, M.B. Likita*et,al,*. (2016). Biological oxygen demand recorded 438 mg/lit to 620 mg/lit in old industrial area and 420 mg/lit to 650 mg/lit in additional industrial area similar searched by KumudTanwar& Jaya Mathur (2016). Chemical oxygen demand was recorded in 755 mg/lit to 875 mg/lit in old industrial area and 720 mg/lit to 872 mg/lit in additional industrial area studied by Putaka*et, al,*.(2016), AnjuBhatnagar (2015). Total dissolved solids are 1746 mg/lit to 2160 mg/lit in old industrial area and 1045 mg/lit to 2145 mg/lit in additional industrial area reported by P. Manikandan*et,al,*. (2015). Chloride recorded 580 to 729 in old industrial area and 570 to 640 in additional areaNizzy&Kannan (2014). Iron ranged between 2.48 mg/lit to3.18 mg/lit in old industrial area and 2.38 mg/lit to 3.12 mg/lit in additional area M. Periyasamy& M.R. Ranan (2009). Sulphate showed 598 mg/lit to 678mg/lit in old industrial area and 590 mg/lit to 670 mg/lit in additional industrial area.Usha&Vikram (2012). Hardness recorded 998 mg/lit to 1180 mg/lit in old industrial area and 890 mg/lit to 1160 mg/lit in additional industrial area same reported by Vijay Sharma et, al,. (2014). Alkalinity showed 928 mg/lit to 1390 mg/lit in old industrial area and 870 mg/lit to 1360 mg/lit in additional industrial areaP.V.Tekade*et, al,*. (2011). Oil and grease reported 38 mg/lit to 66 mg/lit in old industrial area and 42 mg/lit to 64 mg/lit recorded in additional area same reported by Pore (2015).

Conclusion

Near the Industrial area the aquatic environment area was getting polluted over during study period of time due to increasing number of industries spreading around these areas. These industries ultimately dump the effluents in the surrounding environment. The present result of analysis from effluent samples clearly indicates gravely high level of all pollutants in the Latur industrial area. So it is need of find the solution to treat such samples and have a common policy applicable to all the industries so that the effluents will be free from such harmful content and the aquatic life run can be pollution free.

Suggestion

- Individual industries are control their own pollution by treatment plant.
- Government agency apply strict rule about Industrial pollution.
- Invent without pollution industry.
- Apply common Pollution control treatment plant for industrial area.

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