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Water Pollution Spread by the Industries, Sri Ganganagar (Raj.)

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Abstract – Pollution is defined as solid liquid or gases substance in such concentrate as may be injurious to our environment. The life of the people residing near by the sugar industry area is miserable it is summery that the effluent was high.

Keywords – Effluent, litigation, liquids, gases solids and unfit for the health.

I. Introduction

Environmental pollution is a worldwide phenomenon. The problem is accentuated by rapid Industrialization, which is transforming air, water and soil into big natural reservoirs of dangerous pollutants (Hodges, L. 1973). Environment etymologically means surroundings. It is the sum total of external factors, substances and conditions, which influence organisms without becoming their intrinsic part. In addition to various environmental issues, there is one very important issue, 'Environmental Pollution' which has received worldwide attention. These days it is quite common to see labels pasted on walls issuing such warnings as 'Air unfit for breathing', 'water unfit for drinking', 'Do not eat fish caught here' etc.

The developed countries are in a mad rush to exploit every bit of the natural resources to convert them into finished products for their comforts and export to needy developing countries. The industrialized countries dump lot of materials in their environment which became heavily polluted. This disturbs ecological balance and creates international problems. At Stockholm conference, Dr. Russell Paterson of U.S. told that Pollution has been exported' to developing poor countries.

II. Water Quality and Water Pollution

A water pollutants can be defined as a physical, chemical or biological factor causing aesthetic or deter mental effects on aquatic life and on those who consume water. Majority of water pollutants are, however, in the form of chemicals which remain dissolved or suspended in water.

Many chemicals do not occur in the nature , and pollution caused them is entirely man-made , for example , synthesis of various pesticides surfactants, radio nuclides , plastics and petro chemicals has introduced a large number of chemicals in the environment that has created severe environmental problems.

Pollution is an undesirable change in the physical, chemical or biological charactstics of the air, water and land that may harmfully affect human life, industrial progress, living conditions and cultural assets, or that may waste or deteriorate our raw material resources. Pollutants are residues of things we make use and throw away. These are by products of man's actions. They are resultants of the technological society with high standards of living

III. Effects of Water Pollution

The effects of water pollution can broadly be classified into physic chemical, biological, toxic and pathogenic.

A large number of pollutants can impart color, tastes and odors to the receiving waters, thus, making them unaesthetic and even unfit for domestic consumption. The changes in oxygen, temperature and pH affect the chemistry of waters often triggering chemical reactions resulting in the formation of unwanted products. The addition of organic matter results in depletion of oxygen with concomitant increase in CO_2 growing to bacterial.

IV. Review of Literature

The effluent water of sugar factory, alcohol industry reported to have good fertilizer value. The pollutant, a waste is a problem for environment was suggested to be a source of energy, fertilizers and nutrients as Bajpai and Dua, (1972). Maguire, (1973) reported that higher concentration of distillery effluent (10%) decrease the enzyme activity which is one of the biochemical changes disturbing the germination and seedling growth. Jadav and Savant (1975) studied the manurial value of the spent wash and suggested that it was profitably be used as supplement to fertilizer when used along with irrigation water after proper dilution.

V. Summary

Amongst various environmental issues the environmental pollution is an important issue, which has received world-wide attention. Pollution is an undesirable change in the physical, chemical or biological characteristics of air, water and land that may or will harmfully affect human life. Environmental pollution means the presence of any pollutant in the environment.

A pollutant is defined as solid, liquid or gaseous substances present in such concentrations as may be injurious to environment. The water and soil pollution due to industrialization is a cosmopolitan

problem creating acute health hazards as well as affecting the crops, when waste water is used for irrigation. Out of thirty two districts of Rajasthan, Sri Ganganagar is one of the most important districts from agricultural point of view. At present there are many cotton, ginning and pressing mills, sugar mill, distillery etc. Working in the city; Ganganagar is in a grip of pollution to a great extent due to waste materials produced by the sugar mill. The life of the people residing near by the sugar mill area is miserable. Therefore, there is a great necessity to study the pollution and its major causes.

The main objectives of the present study are:-

1. Physico-chemical study of effluent water coming out of distillery.
2. Biological study of effluent water.
3. Ground water study, including chemical and bacteriological study.
4. Soil analyses for macronutrient and micronutrient.
5. Health Survey.

The physico-chemical study of effluent water coming out of distillery shows various results. pH value of the spent wash was highly acidic (3.6 to 4.20) whereas treated effluent water has the normal value.

The electrical conductivity of the spent wash ranges between 4.8 to 5.35 millimhos/cm. whereas the treated effluent has the value between 1.280 to 1.690 millimhos/cm. It is little higher as compared to control value (0.22 millimhos/cm). The BOD of the spent wash, and the treated effluent water has higher value and was observed throughout the study. The COD value of the spent wash and treated effluent is also higher in all the months.

The total solids, total dissolved solids and total suspended solid are higher in the spent wash and final treated effluent. Na, Mg, Ca, K and Chloride were worked out. It was observed that sodium content in spent wash varied from 0.0925% to 0.2025% and in effluent (Final) 0.1000% to 0.1800% in different months. Magnesium shows higher value, both in spent wash (6.4 me/I) and treated effluent (9.14 me/I) as compared to control value, (0.76 me/I). The calcium in spent wash shows the highest value (10.600 me/I in Feb.) while treated effluent also shows higher value i.e. 12.500 me/I in August., when compared to control value (1.28 me/I).

The Limnological study of effluent water shows the presence of both zoo and phytoplankton population. The zooplankton is represented by protozoa, Rotifera and Crustacean The phytoplankton is represented by protozoa, Rotifera and Crustacean The phytoplankton belonging to Cyanophyceae, Euglenophyceae and Bacillariophyceae families were found in the effluent at different stations.

Among the protozoan, *Trinema* spp and *enchlys*, *T. lineare*, *Diffugia* spp, *D. urceolata*, *D. lebes*, *D. tuberculata*, *D. corona* and *D. bacillifera* were found. The Rotifers are represented by *Branchionus* B. *plicatilis* B. *angular* and *B. quadridenlata*. In the Crustaceans, viz., *Cyclops sternus*. And *Nauplius* was observed.

The phytoplankton is represented by *Oscillatoria* spp., (*O. foreani*, *O. annae*, *O. proposcidea*). *Anabaena cicadae* in Cyanophyceae, *Chlorella vulgaris* and *scendesmus* spp, (*S. obliquus*, *S. dimorphus*, *S. quadricauda* and *S. denticulatus*) in Chlorophyceae and *Nitzschia sigmoidea* and *Navicula viridula* in

Bacillariopyceae and Euglena polymorpha in Euglinophyceae were detected. All the planktons are the biological indicators of polluted water.

Chemical and bacteriological study was also carried out for different parameters, viz., pH, total hardness, sulphate and fluoride content. The ground water study shows highly acidic nature pH (5.28 to 6.0) in the sugar mill colony. The total hardness of water is more than permissible limit in both the sugar mill colony and master colony. The fluoride content during the winter month is found to be higher as compared to summers in sugar mill colony and master colony. In bacteriological examination no bacteria was detected in ground water.

The effect of the effluent water on cultivated soil has been studied to know the utilization of it for irrigation purposes.

The soil of Vishnu garden was analyzed for macronutrients like, phosphours, potash and organic carbon. The phosphorus and potash contents were present higher in amount. Micronutrients i.e., Zinc, Copper, Iron and Manganese content were low. Higher the macronutrients shows the infertility of the soil whereas, lower the micronutrients has the adverse affect on the seedling germination and growth of the vegetation.

Health survey of Gurunanak Basti, Sugar Colony and Baspunagar showed that the intensity of various diseases viz., asthma, heart diseases, skin diseases and T.B. varied in workers with a working period of 4 to 20 years. Gurunank Basti, Sugar Colony and Bapunagar suffered from asthma, heart disease, skin disease and TB and the diseases percentage was observed.

From the study of various parameters, it is summarized that the effluent was highly acidic and with high Electrical Conductivity. It also had high BOD, COD, Total Solids, Total Dissolved Solid, Total Suspended Solids and calcium, magnesium, chlorides sulphate and posphase ions, which make made useable only after proper dilution with canal water to protect the environment and the corps. The acidic nature of the water is also harmful and hazardous to those who use it. It must be neglected and avoided both for irrigation and domestic use. Further it is recommended that the industry must use the secondary treatment plant, so that the above parameters can be brought down to permissible limit. Recently Supreme Court of India ordered to Delhi Government to shift all the industry away from the residential area. Therefore it is also suggested that the 1945 made factory should be shifted outside the vicinity of Sri Gangangar residential area.

VI. Conclusion

The present study has been carried out on physic chemical and Biological properties of Distillery effluent of sugar Industry. The study was done for the period of two years. Various parameters were used. The irrigation water (canal water) was used as a control. The spent wash, primary treated water & control water were compared, so as to know the suitability for the environment. The final conclusions were drawn as follows.

1. The EC for the both spent wash & primary treated water shows high tolerant capacity. This water is useful for saline soil. The soil of surrounding area is alkaline. Both the water is harmful for the environment.
2. The BOD value is spent wash and primary treated water is very high. The plankton population was few. Thus water is not suitable for environmental use.

3. The COD, Total solids, soluble solids were high in both spent wash & Primary Treated water. The Plankton population was not detected. It is polluted water.
4. The polluted water gets absorbed by the soil. The nearby hand pump water shows the effect of water quality. The hardness, pH, EC, Soluble Solids were high as compared to ISI, MINAS, BIS standard. The hand pump water is not suitable for drinking purpose.
5. The water lagoon shows the presence of pathogenic bacteria. It may affect the food chain.

VII. Reference

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