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Review the Impact of Bhoramdeo Sugar Mill Effluent on Environment

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Abstract: ***Industrial pollution became a major factor causing the degradation of environment, which affects water, our surrounding air we breathe and the soil in which we live. The continues growth of industries are consuming areas of agriculture lands as well as, generating serious environmental problems to soil. Water discharges from various industries are finding their place in useful lands. The challenges are properly incorporate the disposal of the wastes in best management programmed. So that the applied industrial solid wastes won't contribute problem of pollution for soil, soil microbes and environment. The purpose of this paper is to know the effect of sugar mill factory on environment.***

In these days each and every production of any product having some criteria of damaging of environment. This statement is basically applied for the criteria for food products. Today each person needs variety of food products, various kinds of cloths etc., which ultimately harm the environment in some extent. The purpose of my paper is to know the effect of sugar cane factory on our ecosystem and know various laws to reduce this.

Keywords: Sugar Industries, Environment Pollution

I. INTRODUCTION

A. Cane Agriculture

There are various types of cane cultivated in India as well as in world, which may be some special type of species and hybrids, which belongs to various families of cane. Basically, this industry plays an important role in economy of India by creating employment as well as farming. The byproducts of this factory are also used in various industries as a row material, but this harms the environment in a great extent. In all various effects, the sugar mill factory specially affects the water. It's effluent basically creates the odor nuisance during their decomposition. The main chemical composition of the effluent of this sugar factory, which is basically their Biological Oxygen Demand (BOD) and the Chemical Oxygen Demand (COD), which degrades the water in which it gets discharged. This type of chemically full water became dangerous for the aquatic life and creates so may other septic conditions, its generating hydrogen sulfide gas smell, which turns into black in color and became dangerous for fishes and other species of aqua. Highly dark color water limits the light penetration, reduces the phytoplankton development and fish life because of lack of oxygen. Some time it might be possible that the temperature of the effluent is so high, so that the dissolved oxygen in the water get reduces which creates problem for aquatic species. Sometimes it may happen that the pH value of the effluent is may be highly acidic or may be highly basic in nature, which creates imbalance in water components. It changes the ecological balance of the aquatic systems, may affects the skull of the species. One special feature of sugar cane is, its high production capacity. It has theoretically near about 400t/ha. The basic reason behind its high productivity is, its high photosynthesis efficiency, so that it is able to use the solar energy for its growth and it also utilizes maximum CO2 of atmosphere.

Cane agriculture is basically may be use minimum consumption of chemical fertilizers, which may result the zero harm of environment with soil also. The main issue rises always is that the burning of foliage for other harvesting. This issue is not only creating problem in air pollution but also in the soil productivity or fertilization.

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B. Sugar Cane and Energy

As we know that the sugar cane has high photosynthesis capacity, so it became an important source of energy. The ratio between the harvesting and the cultivation is 20:1 basically in the case of sugar cane production, so in these days this crop became valuable in a economic picture. Some other most valuable scene is that, it now became the alternate of the fossil fuels for production of energy in plants. Sugar industries have their own fuel, bagasse, which may be use for the production of electricity through turbogenerator and became economical beneficiary.

The furnaces in which this waste(bagasse) has burned for steam, for the production of electricity, are near about 60-65% in efficiency, which might be possible to increase this range up to 90%. For increasing the capacity of this traditional furnace, we should design the furnace with high heat-recovery designs by steam consumption must be reduced in the process, simultaneously improve the furnace efficiency, with steam generation pressure should be increased. Noe a new technology also developing , which is based on the gasification of biomass, with use of gas turbines and combined cycles, which may be useful for the increment of generating potential of the sugar industries.

C. Environmental Standards and Legislations

There are so many global and domestic legislations are there for the controlling of different environmental issues. There are basically two types of policies which are aimed to correcting the failure to comply with environmental legislations: first those using incentives, which are based on market operations, in which taxes and charges are collected by them who pollute the environment and secondly those which do not have this flexibility, calling for quantitively restrictions.

The present status of legislation of environment presents wide range with many features like, many nations have their own Constitution, have their own ministries, secretaries or various institution for that. Some have their legislations in state level, having least provisions of standard laws for applicability on sugar agroindustry and others are in the level of preparing legislative bills. India also trying continuously to reduce the harm to environment by making various laws and standards, apart from that, India also trying to aware their citizens about the value of healthy environment by different ways. As well as India also promoted various researches for the development of eco-friendly projects like electric bikes etc. with the balance of economy.

Mostly the comprehensive legislations are trying to tell about all quantitative and qualitative issues, which shows about the parameters to be evaluated, the methods which should be analyzed, about the benchmarks, frequency of sampling, quality criteria and penalties etc. Apart from this it also included citizens right to a healthy and ecologically balanced atmosphere and the criteria to claim redress of damages caused Law provides the methods for determining liability and penalties.

Within the nearby sphere, our nations have followed complete multilateral and bilateral units referring to the surroundings; on the worldwide level, conventions at the surroundings and herbal sources had been entered into, which can be covered in felony ordinances of nations. To an ever-growing extent, ecological troubles are being meditated in worldwide treaties, including in investment initiatives and worldwide co-operation initiatives. The nearby sugar agroindustry is adopting measures aimed in a few instances at going through the needs of environmental regulation in effect; and in others, at making ready for approaching truth of implementation withinside the respective international locations of requirements and controls to save you environmental pollution.

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II. AREA OF STUDY

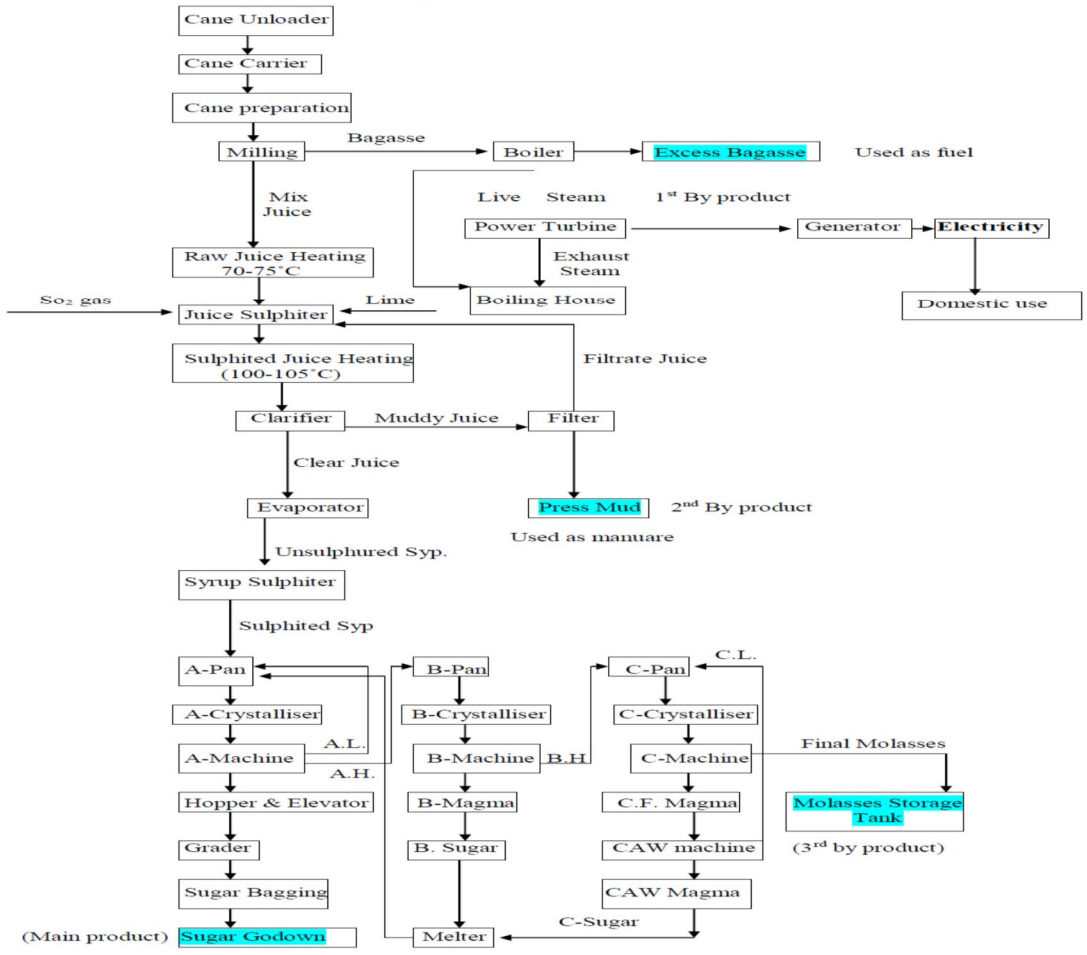
A. *Source of Effluents*

Following are the sources of the waste water generated from various process:

1) *Mill House:* The cleaning water from the mill section, which is basically used to clean the floor of mill which is responsible to be changed by spills. Cleaning is very necessary because it prevents the growth of various bacteria on the juice which spread into the floor. This cleaning water is also added in the effluent.
2) *Boiling House Waste Water:* The waste water from boiling house may come from pipelines, through leakage from pumps, washing of evaporators, juice heaters etc. With this cooling of various pumps are also added to the effluent.
3) *Waste Water From Boiler Blow Down:* Basically, the water used in boiler contain various insoluble and soluble solids like Ca (Calcium), Mg (Magnesium), Na (Sodium), salts etc. These salts get accumulated after use of water in generation steam. These solids must be removed time to time through simple water or through solving chemicals.
4) *Excess Condenser Water:* Generally, it not contains any pollutant so may be used for boiler feed water and for washing. But some time it contains juice due to entrainment of carrying solids.
5) *Condenser Cooling Water:* This water may be recirculating until it may contain juice, which may be possible because of defective entrainment separators, or by faulty operations This volume of water is also increased by additional condensation of vapors.
6) *Soda and Acid Wastes:* Caustic Soda and HCL acid are normally used for the cleaning of heat exchangers and other auxiliaries. These chemicals are also added to the effluents.

III. PROCESS FLOW DIAGRAM

Flow diagram of double sulphitation process for the manufacture of white plantation sugar



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A. Effect of Effluent

If we directly put this effluent in irrigation then it surely disturbs the basic properties of the soil, like its pH etc. which directly affects the growth of the plants and the seeds germination. This effluent reduces the rate of seed germination of crops and distress the soil. Actually, by the effect of this effluent the helpful bacteria and fungi of soil became deteriorates. It basically hinders the germination of the seeds, their growth, their enzymatic activity and the distribution of micro -macro nutrients in plant tissues, transpiration rate and so many other activities.

IV. RESULT

Physio -Chemical values of the effluent

Parameter	Unit	Standard	Mill Effluent
pH	-	6-9	7.5
BOD	mg/L	50	30
COD	mg/L	200	250
TDS	mg/L	2100	927
TEMP.	‘C	40	70
Na+	mg/L	6.3	22.5
K+	mg/L	2.3	96
Mg 2+	mg/L	4.1	55
Ca2+	mg/L	15	160
Cl-	mg/L	7.8	23

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V. CONCLUSION

Bhoramdeo Sugar Mill is one of the largest industries among all biomass industries in Chhattisgarh State. So, it's really much helpful to increase government revenue and employment opportunities in here, but the various discharges causing severe environment degradation. By the analysis of the physio-chemical characteristics of its effluent, it has been concluded that it doesn't always maintain DoE standard for industrial effluent.

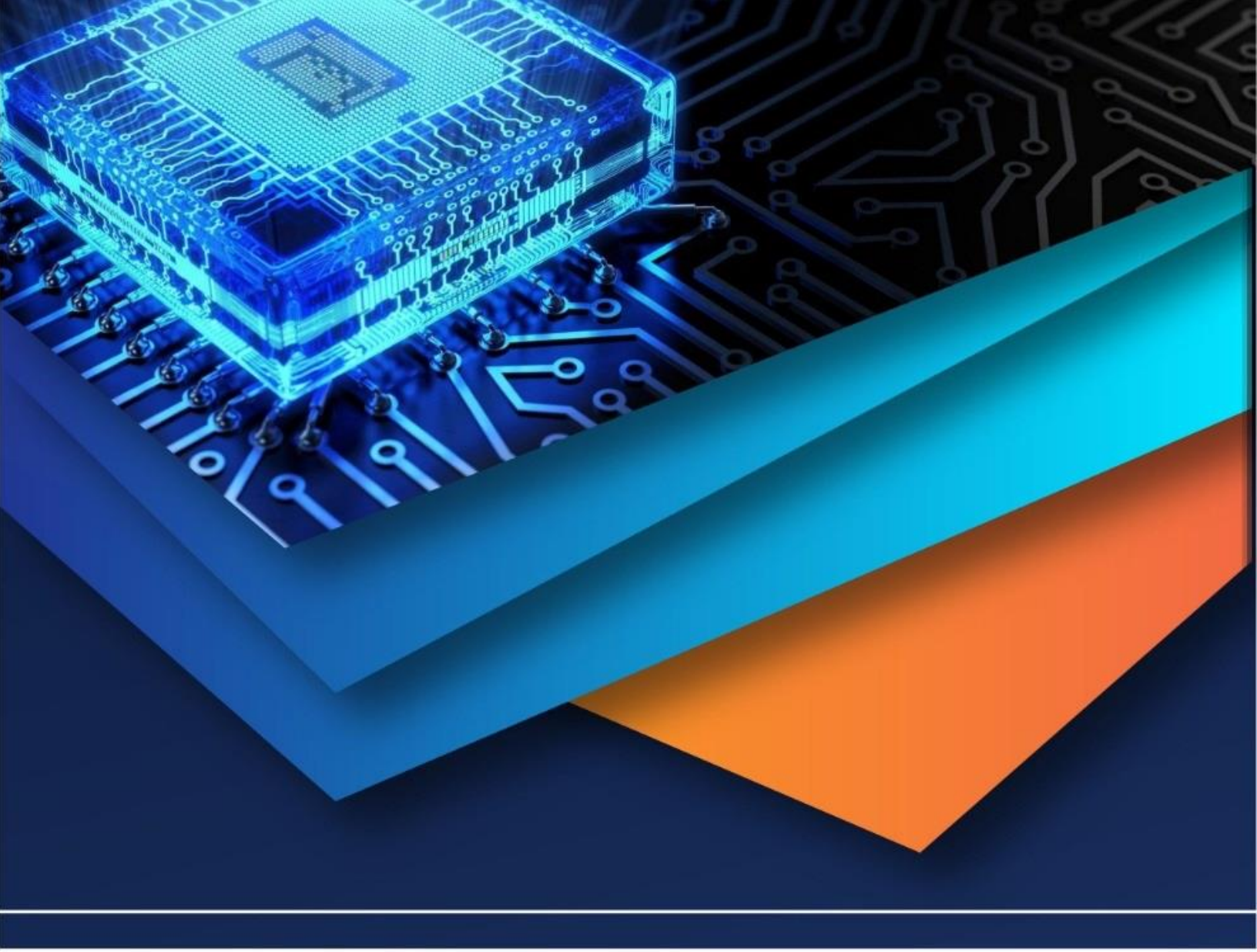
So many Legislations are developed for the improvement of the discharge of industries, but due to lack of proper monitoring all laws are only in the paper. For our healthy and secure environment, it is necessary to understand all citizen of any country the value of environment.

REFERENCES

[1] P. Saranraj and D. Stella Impact of Sugar Mill Effluent to Environment and Bioremediation: A Review World Applied Sciences Journal 30 (3): 299-316, 2014 ISSN 1818-4952 © IDOSI Publications, 2014 DOI: 10.5829/idosi.wasj.2014.30.03.1656

[2] [1]A. Latha, [2] Mahisha Vardhini.V, [3] R. Monisha,[4] Bala Shobika. B. S. Environmental Impacts of Sugarcane Industry – A Case Study on Kurungulam Mills in Thanjavur, India International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 PECTEAM - 2K18 Conference Proceedings

[3] M. SALEQUZZAMAN[1], S. M. TARIQUL ISLAM[2], A. TASNUVA[2], M. A. KASHEM[2] AND M. MAHEDI AL MASUD[3] ENVIRONMENTAL IMPACT OF SUGAR INDUSTRY - A CASE STUDY ON KUSHTIA SUGAR MILLS IN BANGLADESH j. innov.dev.strategy. 2(3): 31-35 (November 2008)



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