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An Overview of Air and Noise Pollution Generating from Sugar Industries

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ABSTRACT

Industrial pollution is considered as the result of the manufacturing process or production of energy by burning gas, coal waste or the like. In recent years, environmental degradation has become a problematic concern worldwide. It includes soil erosion, desertification, air pollution, shrinking of ozone layer, global warming and deforestation etc. Today, sugar industry is at the cross roads due to huge environmental pollution worldwide. Brazil is at the top in the production of sugar cane. Major Sugar manufacturers are China, India, Thailand, Pakistan and Mexico. The Indian sugar industry is considered as a key driver of rural development and boosts up the India's economic growth. To compete with the developed countries regarding the development of economy is a big challenge before us. Along with it, to maintain the qualities of water, air and land /soil through the various treatment strategies to different kinds of pollutions generating from sugar industries also a big problem. This paper pinpoints on the complete picture of sugar industries, dealing with air and noise pollution and their treatment strategies.

Keywords :- Air and Noise Pollution; Sugar Industries

I. INTRODUCTION

Sugar industry is seasonal/ periodic in nature ie 4-5 months' functioning period per year/ in a season. Air and water pollution due to sugar cane industries can easily be assessed through recoding the data during crushing and non-crushing periods of sugar mills. Sugar factories release a large amount of gases and affect the human and animal population along with the plants near about the sugar production factory area. The construction of irrigation sites, roads and the levelling of land cause higher dust storms in the air and always have an unhealthy effect on labour class in sugar production factory and people living nearby areas of sugar industries.

Large amount of water is used in the sugar industries as a result, sugar industries discharge large amount of waste water containing different chemicals which are normally mixed during the processing. Waste water is usually generated through different process in sugar industries during its crushing period from different sections like mill house, boiling house water, waste water from boiler blow down, excess condensate water, condenser cooling water, soda and acid wastes. The waste water and gaseous effluents produced from sugar industry have adverse impact on the eco-system and environment due to their high BOD load and toxic constituents and have an adverse impact on environment through the loss of natural habitats, heavy use of agro-chemicals, discharge and runoff of polluted effluent and air pollution. All these lead to the degradation of soil, air waste and wildlife too.

Objectives of the Study

1. To understand the concept of environmental pollution

2. To highlight the major polluting industries in India
3. To highlight the concept of air pollution
4. To mention the sources and effects of air pollution
5. To highlight the concept of noise pollution
6. To pinpoint the noise pollution and maximum permissible limits
7. To mention the ways to control noise pollution
8. To understand the relationship between air, noise pollution and sugar industries

The Concept of Environmental Pollution

Environmental pollution is one of the major and serious threats now-a-days and often defined as "the contamination of physical and biological components of the earth to such an extent that normal environmental processes are adversely affected." The contamination of the earth creates the serious environmental problem. All is due to human beings' avarices as well as the lifestyles and gradually has created and destroyed life on earth. This has affected our health a lot and the future too through mixing the harmful pollutants with our environment and now degrading the environmental quality. No one will be able to survive comfortably on this planet if environmental problems exist as usual. Now, time has come to ponder that healthy environment is the assets for life existence.

Table 1. 17 Categories of the Major Polluting Industries

Aluminium Smelter	Dyes and Dye Intermediates	Petrochemicals	Thermal Power Plant
Caustic Soda	Fertilizer	Drugs and Pharmaceuticals	Zinc Smelter
Cement	Integrated Iron and Steel	Pulp and Paper	
Copper Smelter	Tanneries	Oil Refineries	
Distilleries	Pesticides	**Sugar**	

Source- *Central Pollution Control Board, 2019*

The Concept of Air Pollution

Air is a mixture of gases comprising 78% nitrogen, 21% oxygen, 0.03 % carbon dioxide etc. All human beings need continuous supply of fresh air almost at the rate of 10-20 cubic meters per day. Polluted air is not suitable for people to breathe and may make them sick. Air pollution refers to the presence of any substance in the atmosphere in such a concentration that may or tend to be injurious to all living creatures especially human beings or plants or the atmosphere itself.

Table 2. Sources and Effects of Air Pollutants

S. No.	Pollutants	Sources	Effects
1.	CO	Smoking, Burning	Reduced O_2 supply, poisoning, giddiness, exhaustion, reduced vision
2.	CO_2	Smoking, Burning, Respiration, Decay	Nausea, Headache, atmospheric warming
3.	Sulphur oxides	Burning, Smelting,H_2S	Respiratory disease, Irritation, Plant damage, Acid precipitation, damage to clothes and buildings
4..	Hydrocarbons	Incomplete combustion, Decay	Cancer in Man, Senescence and Abscission in plants
5.	PAN	Interaction of N_2 oxides and	Irritation and respiratory diseases in

		HCs	man, Discoloration of leafy vegetables
6.	Nitrogen oxides	Automobiles, Burning, Lighting	Reduced O_2 supply, Irritation of epithelium in humans, defoliation and necrosis in plants, spoil metals and clothes
7.	Ozone	Interaction of N_2 oxides and HCs	Irritation, Chest pain and coughing in man, Premature leaf fall in plants, Damage to clothes and rubber
8.	Aldehydes	Interaction of N_2 oxides and HCs	Irritation of respiratory and G.I. tracts
9.	Fluorides	Aluminium, Steel and Phosphate Industries, Coal burning	Fluorosis, Uneven teeth in animals, Delayed maturing and Low yield in fruit trees, Attacks glass, paints metals
10.	Dusts	Coal burning and Industries	Lung fibrosis, Lead poisoning
11.	CFC	Jet Aeroplane emission Plastic burning	Depletion of Ozone layer, Damage liver and CNS , vision impair, Change in Skin pigmentation
12.	PCBs	Plastic burning	Depletion of ozone layer
13.	Benzphyrene	Tobacco smoke, burning, tar	Lung cancer
14.	Smog	Dust+smoke	Toxic to all organisms, accidents, rubber cracking
15.	Pollen, spores, Cysts, Bacteria	Organisms	Allergies, respiratory and other diseases
16.	Radioactive pollution	Nuclear and war explosions	Death of living tissues

Source- *Foundation of Environmental Studies (2005)*

Noise Pollution

Noise is a major outcome of industrialization and modern civilization. It is undesirable sound usually caused by industries, vehicles, aeroplane etc at a wrong time and place. The unit of noise measurement is decibel (dB). Human ear can tolerate noise up to 120 dB.

Table 3. Maximum Permissible Limits (Standards) For Noise as Recommended by CPCB Committee

Area Code	Category of Area	Noise Level in dB (A) Leq	
		DAY	NIGHT
(A)	Industrial	75	70
(B)	Commercial	65	55
(C)	Residential	55	45
(D)	Silence Zone	50	40

Source- *Perspectives in Environmental Studies*

The repeated sound of high intensity often causes hearing loss and may also cause permanent loss of hearing ie damaging of the ear drum. It also affects the functioning of various systems of the body. It may result in hypertension, insomnia (sleeplessness), gastro-intestinal and digestive disorders, peptic ulcers, blood pressure changes, behavioural changes and emotional changes etc.

Table 4. Impact of Various Noise Level (WHO, 1986)

Noise Level	Adverse Effect
20-50 db	Speech impairment and Annoyance
50-90 db	Hearing impairment
90-115 db	Partial deafness and nervous irritability
More than 115 db	Permanent deafness

Source- *Foundation of Environmental Studies (2005)*

Ways to Control Noise Pollution

1. Industries should be away from the residential areas.
2. Use of well-designed engines in factories to reduce noise
3. Locations of railway station aerodromes should be away from residential areas.
4. For less noise, proper maintenance and lubrication of machines
5. Reduction in noise pollution by the trees around the factory or industry; as they absorb noise.
6. Silence zone should be near schools, colleges, and hospitals.
7. Restriction on the noise pollution by strict legislation
8. Noise control methods in industrial plants

The Relationship between Air, Noise Pollution and Sugar Industries

Almost every industry releases a large amount of carbon monoxide, hydrocarbons, organic compounds and chemicals etc into the air and its result is before us as the depletion in the quality of air. The various constituents from sugar mills can be assessed easily and their impact on environment too via recording the data during the crushing and non-crushing periods. Sugar industries are now known for the prime cause of ambient air pollution in urban as well as areas. The emission from the world's second largest sugar industry in India is often known to reduce the air quality and promoter of noise pollution. Due to producing the toxic constituents, sugar industry has adverse impact on the whole ecosystem. To reduce the amount of air and noise pollution, now-a-days, every sugar industry tries to implement the environment management system (EMS) for improving the performance of sugar processing unit. The Indian sugar Exim Corporation (ISEC) , an apex body with Indian sugar mills association (ISMA) and national federation of cooperative sugar factories (NFCSF) as its constituents should help to make a road map to encounter the environmental problems especially air and noise pollution.

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