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SHORT COMMUNICATION PAPER

EFFECTS OF DIFFERENT TYPE OF BLACK SMOKE ORIGINATE FROM KILNS ON THE NATURAL ENVIRONMENT

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ABSTRACT

In recent years, rural industries have developed unexpectedly leading to augmented pollution and consequently affected human health, agriculture, horticulture as well as forestry. Transportation, urbanization and brick kilns playing an important role in the devastation of the environment and also cause global warming. Used different kinds of materials as fuel like wood, oil, saw dust and coal to burn the brick kilns. Many harmful and dangerous gases produced such as Oxides of Nitrogen, Carbon, Sulphur, Carbon monoxide and particulate matters. These emissions from brick kilns damage the environment and also hazardous for human health. This study provides the basic information to understand the issues and highlight their impacts on the natural environment, food production and human health arising from the brick kilns emissions.

KEYWORDS

Black smoke, Brick kiln emissions, atmospheric pollution

1. INTRODUCTION

The earth atmosphere has been unclear since the beginning of the last thousands of the year due to the enhancement of industries that cause air pollution [1]. Air pollutants are biological, physical or chemical substances which present in the air with sufficient concentration to harm the vegetation, humans, and animals [2]. There are lots of substances in the air that can affect the circumstance of animals as well as plants. The concentration of air pollutants such as ozone and nitric oxides swiftly increases in the atmosphere due to fast-growing urbanization in the developed countries [3]. Air pollutants which are injurious to vegetation, in terms of yield loss, nutrition quality, and physical injury, include ozone, sulphur dioxide, fluorides, acid deposition, nitrogen oxides, and heavy metals [4].

Air is contaminated indoor and outdoor environment with the aid of any physical, organic and chemical agent that modified the herbal traits of the environment. Industries, family combustion gadgets, cars, and burning woodland are commonplace sources of air pollution. These pollutants are harmful to our health, environment as well as property [5].

Internationally, it is very difficult to evaluate how many people are impulsively died due to pollutants found in our environment at different concentrations and people exposed to it. However, due to air pollution, there are approximately 3 million people died every year. Due to outdoor pollution, 800,000 people are died prematurely each year by several diseases such as respiratory diseases, lung cancer and cardiovascular [6]. Air pollution has a great impact on the national and global level. Acid rain, ozone depletion, fog, bio-variety loss, in surroundings is the poor influences for air pollution. Industrialization comprehensively brick kiln enterprise is the principal cause for acid rain due to industries release sulphur dioxide and nitrogen oxides gases which meet with water vapors in the atmosphere. Then come to the earth in the form of acid called acid rain. It extensively spoiled the plant's life, rivers and lake. Brick kilns produce black smoke and this smoke includes CO, CO_2, NOx, SOx, HF, and PM.

There are number of additives mixed in the soil to enhance the strength of bricks and soil is the main part of making bricks. When huge amount of soil is used in making bricks process then automatically soil is degraded. Furthermore, these kiln industries use large amount of inefficient fuel for brick making process then excessive amount of smoke is produced which leads to air pollution and harm to human health and vegetation [7].

The purpose of paper is to guesstimate the effects of brick manufacturing process through brick kilns on human health and environment. The study of brick kiln industry showed that there are sever effects of these brick kiln industries on air, soil, water, human health and vegetation.

2. BLACK CARBON

Black carbon is the finest and efficient form of particulate matter. It is a strongly light-soaking up factor and is shaped with the aid of incomplete combustion of fossil fuels, biomass, and biofuels.

Black carbon emission has an important effect on the environment, public health and Earth climate. Through many decades of scientific research, Black Carbon is an important element, which directly linked with unpleasant possessions on environment and health. Black carbon performs an essential role in weather alternate, even as there is

uncertainty about its effects on weather due to greenhouse gases (GHG) which includes methane and carbon dioxide. Black carbon has related to an extensive series of atmosphere impacts such as snowmelt, increased ice cap, increased temperature and splitting the rainfall patterns. Presently if we decreased the emission of BC then it helps us less change of climate change. Furthermore, reduction of BC can't decrease the long-lived greenhouse gases that are very necessary to mitigate climate change.

3. CARBON DIOXIDE

Carbon dioxide is the primary greenhouse gasoline emitted within the environment through human activities. CO_2 is the main anthropic genetic greenhouse gas that affects the Earth radioactive stability. Evidently, carbon dioxide is present in our surroundings and it is part of the earth carbon cycle. The important human hobby that produces CO2 is the burning of fossil fuels consisting of oil, coal and herbal gas for transportation and electricity, commercial procedure and land use conversion additionally launch CO2.

Human added more CO_2 into the atmosphere, change the carbon cycle as well and affect the capacity of natural sinks such as forests. CO_2 gas emitted from different natural sources; human activities are also responsible for increasing CO_2 which has happened in the ambiance since the industrial revolution.

4. SULPHUR DIOXIDE

After burning the Sulphur compounds, SO_2 is emitted as a chief product and it is very important for environmental concern. Automobiles may be important sources inside the main cities, but power and industry generation are the major regional sources [8].

The most important and alarming problem related to air pollution is Sulphur dioxide, which helps to increase urban pollution and regional acid depositions [9]. Acid deposition can damage the lakes, stream, crops, and forests by acidification of soil [10].

5. NITROGEN OXIDES

There are two types of NO_x such as Nitric oxide (NO) and nitrogen dioxide (NO_2) and direct effect on vegetation. NO_2 is a secondary pollutant. When NO and ozone (O_3) are reacted with each other than NO_2 is produced in the atmosphere. NO_x is formed at high-temperature combustion, the most important emission sources are automobiles and power generation.

6. SUSPENDED PARTICULATE MATTER

Suspended Particulate Matter (SPM) is the term used for solid or liquid particles emitting in the air. It is formed from the combustion processes which are done due to industrial and domestic activities, and from natural sources as well such as forest fires, dust, and volcanoes. There are different types of atmospheric particulate matters including respirable suspended particle, fine particles, suspended particulate matter, soot, and ultrafine particles. SPM is a local problem close to huge sources.

7. BRICK KILN

Brick kiln emission is a kind of pollution which directly affects the environment, human health, and food production. There are exclusive pollution emitting from brick kilns including Oxides of Sulphure (SOx), Oxides of Nitrogen (NOx), Carbon dioxide (CO2) and Hydrogen fluoride (HF).

Amongst this HF is one of the maximum phototoxic air pollutants [11]. HF is surprisingly reactive gas with its critically damaging to human health. Further outcomes to people, emissions were observed to harm crops and fruit trees and surrounding areas. HF and its other compounds are deposited on the vegetated surfaces in the form of particulates or in gaseous form.

At the side of the urbanization, those industries are swiftly emerging and relocation of human beings within the cities has expanded the demand for bricks and forcing to create more brick kilns.

Recent researches virtually confirmed that folks who are residing near to kilns are much more likely to be afflicted by ailments caused by kilns pollutants, evaluating people who are residing in areas without the kilns [12]. Emissions from brick kilns produce $PM_{2.5}$ that is extra dangerous for human beings, as it has the capability to tour into breathing system purpose impulsive transience and breathing sicknesses [13].

8. DISCUSSION

In recent years, the urbanization increases and the demand for construction material enhance day by day. The brick kiln is a small-scale industry and it has grown both in capacity and numbers. Emission of brick kilns is said to be the leading cause of air pollution [14]. Brick making process directly or indirectly creates health and environment problems. At the local level (in the surrounding area of the brick kiln) the atmospheric pollution from brick making process is harmful to animals, plants and human life. At the global level, atmospheric pollution from the brick making process is the main cause of climate change and global warming. According to the World Bank, the traceable and non-traceable greenhouse gases (N_2O, NO, NO_x, CO, and CO_2) are emitted due to the burning of biomass. Brick kiln industry emitted the Carbon monoxide (CO), Nitrogen oxide (NO) and Carbon dioxide (CO_2) in the environment by burning of hydrocarbon fuels and when the clay is heated sulfur dioxide (SO_2) is also produced [15]. The brick kiln industry uses the large quantity of wood and coal to burn the bricks and in result, a huge amount of greenhouse gases generated [16]. During the last few decades, the air pollution has severe environmental stress on foliage due to increasing of urbanization and industrialization.

9. CONCLUSION

Brick kilns produce black smoke and this black smoke includes CO, CO_2, NOx, SOx, HF, and PM. This smoke destroys agricultural and farming production. Ozone depletion, smog, global warming and decreases of soil fertility are the long-term effects of brick kilns. In short term impacts crops production decreases, vegetation process hampers, and plants fruits fall down.

The brick kiln industry is one of the most important sources for air pollution. In step with environmental regulations, brick kilns must not construct near agriculture land and minimal three kilometers distance far from any instructional organization, housing place, and wooded area.

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