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Environmental and Health Implications of Brick kiln Emissions: A Case Study of Budgam

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Abstract
Brick kilns were considered an asset until their contribution to air pollutant emissions was recognised . Co2 is the major contributor of global warming in which brick klin is one of the major sources of carbon dioxide. Globally brick klins earn 375 million tons of coal per year. The season when brick klins are being operated that continue 30% to 50% of the 2.5 micron particulate matter (PM_{25}) in the air in near cities where they are operated. The other major pollutants such as Sox, Nox, Co etc are being emitted. These pollutants have adverse impact on human health, physical environment and vegetation. To understand the impact of brick klins on human health environment, vegetation etc. This paper takes set-up-to-date review on the recent publications regarding the issue. The lung cancer, chronic bronchitis, asthama, emphysema, cough, sputum, weezing etc. are the names of some respiratory diseases which caused by the air pollutants released from the brick klins. Several studies have indicated that particulate matter when combined with carbon and sulphur oxides can lead to irritation in the eyes, nose and throat and other respiratory pathways. the same pollutants are mainly responsible for ozone layer depletion and the acid rain. When these gases met rain water flow into the river or sea it costs huge to the components of environment. Moreover, absorption of such chemicals by soil may impact the PH of soil. The hoffman klins and other modern technologies may reduce the harmful impacts of brick klin emission. District budgam of Kashmir valley (India) have shown some major negative impacts on environment, air quality human health, vegetation etc

Keywords:- *Brick- kiln, Air pollutants,Sox, Nox, Acid Rain, Ozone Layer, PH of Soil.*

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I. Introduction

In last few years an increasing trend of number of brick klin industry in district budgam has been found particularly at fringe of a rural large settlement with a good transport link with urban or sub urban area. Progress and development of urban region have close relation with the location of brick klin industry because bricks are one of the main elements of the urban construction. Normally a good quality soil is required to flourish the production of high grade bricks. For this reason, in particular, the brick klin industry are found to be located in the neighbourhood of the fertile- level land. Level land is, that is an evenly surfaced area is very much needed for processing of bricks. The industry needs soil for bricks which is collected from agricultural tracts of farmers. Farmer gives the soil from there agricultural land because he gets much higher returns without any labour. Brick making consumes large amount of clay which leads to top soil removal and land degradation.Large areas of lands are destroyed every year due to excavation of top soil from a depth of about 1feet to 2 feets from agricultural land. The expansion of affected area is accelerating with the rise in brick production as the process not only depletes essential soil nutrients and organic matter but also modifies the physiochemical characteristics of soil . An important step of brick making is firing of green bricks in brick klin and exerts serious influence on the concentrations of greenhouse gases in the atmosphere and causes environment pollution and health problems. Orchard farming (apple) is very much hampered by the air pollution (carbon dust). The agricultural productivity of surrounding area is severly demaged at a circumference of 200 meters more by the dust, emitting from the brick klin. River bank erosion is also a problem due to quarrying of silt from river.Turning to socio economic environment it has been observed that majority of labourers involved in manufacturing of bricks come from Bihar and Jharkhand and also some 3 to 4 percent local labourers are involved. These labourers stay with their family and they have no basic infrastructural facilities. The children do not receive the basic education. Some children are appalled to extend their working hand to their parents. The sanitation condition is so power that they constantly suffer from diseases like malaria, dysentery. They are exploited to a large extent in their wages. Moving to human health, the lung cancer, bronchitis, asthmas, emphysema, cough, sputum, weezing etc are some respiratory disease caused by air pollutants released from

brick klin industry. Research findings suggest that particulate matter combined with carbon and sulphur oxides can trigger irritation of eyes, nose and throat. The same pollutants are responsible for ozone layer depletion and the acid rain.This calls for a comprehensive study on the impact of brick klin industry on environment, health, vegetation, socio economic condition of migrant workers etc. considering district budgam-as it is the agriculture centric.

II. LITERATURE REVIEW

The brick klin industry in modern society has all alone been important it has attracted the attention of the scholars in different countries. A good number of govt publications mostly in forms of booklets and reports and particularly the project reports of the central building research institute , articles books, online papers, newspapers. several authors have pointed about air pollution problems of brick kilns. some of them have tried to establish the problems of air pollution in terms of quantitatively and qualitatively whereas others try to assess the impact on environment. In relation to this perspective panday (1997) has mentioned inefficient coal ombustion that creates huge amount of sulphur dioxide (so2) in the atmosphere by the brick klin during summer and winter when the brick klins are functional. Tuladhar (2006) showed that brick klins of kathmandey valley were responsible for air pollution in respect to total suspended particulate (TSP) air quality standard, Ahmad and Hussain (2007) (cited in chanhanand Joshi 2010) studied the pollutant load within the cluster region of Bangladesh for so_2 and particulate matter. It was found that particulate matter was a major pollutant in that region Maity (2010) has been mentioned that brick klin are the major and single source of so_2 and PM in environment of kathmandu valley, contributing over 60% of the emissions. Baum (2010 has established that USKB is more efficient klin technology in respect to other klin technology to minimize the klin industry. Bhat Mohd Skinder,Ashok , pandit, Afeefa Qayoom sheikh and BashIr Ahmad Ganai (2012) a detailed survery of panzan bricklin (district Budgam) area was done and their effects in the air quality were analysed And according to them bricklins are known to be a leading cause of ambient air pollution in rural areas. The levels of So, No, and SPM(RSPM+ NRSPM) area major problems in panzan village of district budgam because the level of these are significantly higher than NAAQs guidelines. High air pollution levees in the atmosphere have shown significant negative impact, as they do not only pose serious occupational health hazards but also adversively affect the surrounding environment (2026). On other hand guptan and narayan (2010) have mentioned the leg term impacts associated with brickklin industry, on biomass and diversity structure of plant commeroties in Buland shahr, utter Pradesh, Joshi and Dudani (2008) studied the environment health effects of bricklin industry in kathmadu valley and found that the concentration of various air pollutants of brick klins and the health status of school children attending the school close to the vicinitu of bricklin was worse compared to the student attending the school away from the brick klin. The work of asgher (2004) clearly emphasizes on environmental pollution of bricklin in Aligarh city and finds out different impacts of bricklin in the city. Das (2015) deserves special attention as he unfolds the problem of air pollution in a micro level work at khajuri cd blocks over coastal medinipur in west Bengal.Numerous authors have made an attempt to assess the impact of local degradation due to top soil loss for the brick making drechsel etal (2004) attempts in soil nutrient condition by approaching two different methodologies to estimate the loss of soil nutrients and its economic well as environmental cost. Several authors have made an attempt on the topic of utilization of fly ash in brick manufacturing industry. The rapid expansion of power generating industry has caused the secondary phenomena of increase in the amount of fly ash. As brick klin industry uses top soil for brick making process, it is also too urgent to find the alternative of soil. Keeping this mind, the main focus of these literatures is the use of fly ash in brick making process to minimize the problem of top soil loss. Several studies have been found in connected to this like tyagi(1989) Roy(1992) suresh (1999) Kumar etal(1999). Several investigations made an attempt on the subject of up gradation of brick making technology to minimize the air pollution in and around the concerned area. there is several klin technology used in brick making but old klin technology create plenty of problems regarding pollution these literatures has been tried to establish the proformas of modern technologies over the age old technologies. Maithel et-al (2003) have mentioned the need for energy conservation and pollution control in Indian brick industry through up gradation process. Whereas Biswas (1999) mentioned up gradation is very much need for porper utilization of industrial wastes. Aslam(1999) has pointed the several suggestion on the technological up gradation if Indian brick klins. A research fellow of TERI, maithel (1997) mentioned the preferences of upgradation of brick klin to maintain the emission standard CBRI and different agencies have publisjed several papers on the promotion of technological upgradation of brick klins.

III. Database and Methodology

The proposed research follows various types of research methods -Exploratory qualitative research approach has been adopted for present study as a tool to investigate different facts of impact on environment by the brick klin industry. Narrative method includes oral history biography to unfold past experiences related to

brick klin industry of the study area. Observation method was also used to understand the generalised aspects of brick industry in the study area. Different charts and bar graphs has been used to depict various types of data.

IV. RESULT AND DISCUSSION:

Impact of Bricklin industry on land:-Land is an essential natural resource both for the survival and prosperity of humanity and for the maintenance. Land serves as the fundamental source of all material wealth. The economic prosperity of a country is closely linked with the richness if her natural resources. The quality and quantity of agriculture wealth of a country depends on soil over million, people have become progressively more expert in exploiting land resource for their own ends. Increased demand or pressure on land resource shows up as declining crop production degradation of land quality and quantity and competition for land. village economies mainly rely on agriculture. The availability of fertile agriculture land is vital for the farmers to continue the agriculture land activity. The removal of top soil for bricks making is growing rapidly due to tremendous growth in urbanization and industrialization in the study area. brick klins are mostly situated in and around the fertile agriculture tract, as brick klin owners need good quality soil with good drainage condition . local and regional political power structures also play an essential role in the market for soil quarrying process especially around the brick klins. The new generation is unable to continue the primitive agriculture based activities and they either leased their land to the brick klin owners for a long period for the monitory, benefits without any loss of human labour. As a result after over of lease period land is converted into barren unproductive land.

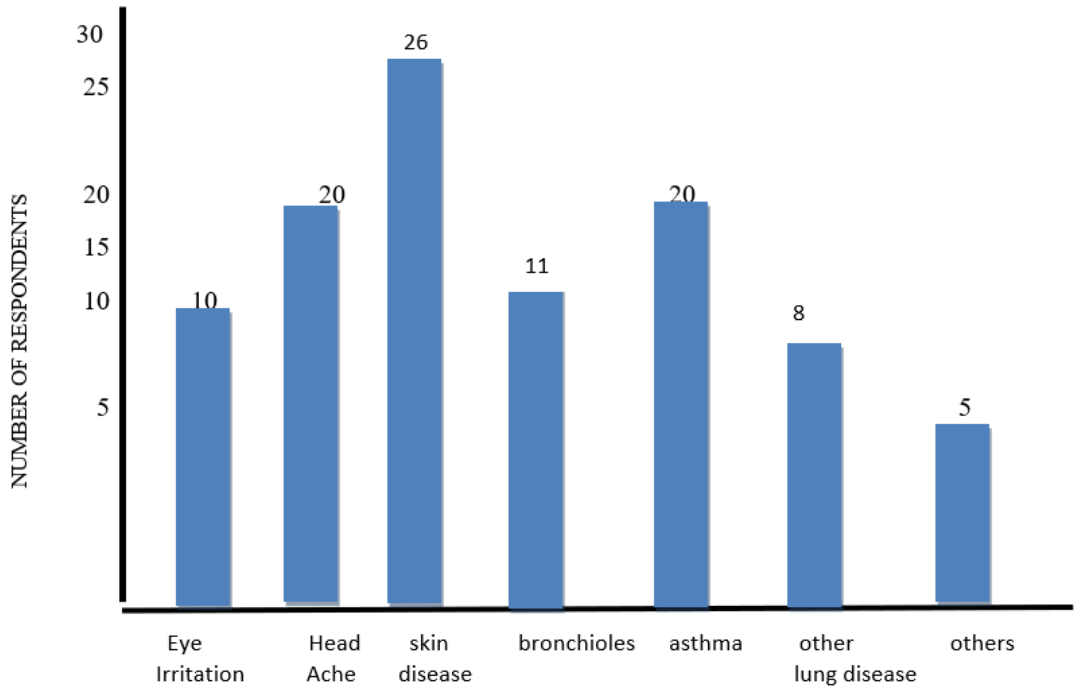
Impact of top soil removal on crop productivity:- The quarrying of soil for brick making has not only negative impacts on land degradation on soil nutrients, on soil erosion but it also play negative role in agricultural productivity due to the removal of top soil, the deeper layers of the soil are brought under cultivation inspite the remedial measures under taken by farmers by way of application of additional fertilizers and manure the crops yields suffer at least during the five years at least after the removal of top soil. This is mainly due to inadequate organic matter content in the deeper layers of the soil and reduced microbial activity in the deeper layers due to lack of humus content and reach of sunlight. The physical properties of the deeper layers are also poor as compared to top layers which are subjected to frequent turnover due to ploughing, weeding and other crop related operations. However the farmers have reported that within two to three years after the removal of top soil the bottom layers also become equally good in physical properties as it is alluvium tract. However over a period of time, the deeper soil layers which are brought under cultivation begin to gain higher fertility status and desirable physical properties due to the addition of organic residues, inorganic fertilizers, water and sunlight.

Impact of Brick klin industry on air pollution:- Central pollution board has (CPB) has recognised the brick klin industry as a highly resource and intensive energy consuming and polluting industry due to occurance of old fashioned production technologies while the clustine of brick klin industry are the prime source of local. Air pollution harms people, crops and vegetation locally and also poses challenges at the global scale. They also contribute to the climate change.It is seen that Brick klin mostly use low quality coal as primary source of fuel. The design of klins, fuel characteristics and lack of complete combustion and emission control contribute to the release of highly concentrated pollutants from brick klin in the form of flue gases. The flue gases which are emitted from the stacks brick klin mainly comprise of fly ash, so2, co2, Nox, Co, particulate matter respirable particulate matter so many times having elevated concentrations of toxic metals and volatile organic compounds. Being one of the second largest consumers of coal in the country, it is one of important source of carbon dioxide emission in the country. Other air pollutants from brick klins include SPM(suspended particulate matter) in the flue gases which is generated mainly due to incomplete combustion of fuel (black smoke) are comes from fine coal dist ash present in coal and burnt clay particles. Hydro carbon and carbon monoxide due to incomplete combustion of fuel, sulphur oxides, concentration of which mainly depends on the amount of sulphur present in the coal is significant where high sulphur contents coal is used; and dust pollution generated during removal and laying down of ash. On the top of the klin and also die to blowing of ash stacked on the top and side of the klin.The air pollutants are released in large quantities by combustion of units including the oxide of sulphur, nitrogen and carbon as well as particles of ash, that enter in the hot flue, gases, small quantities of inorganic elements and hydro carbon are also emitted. These are often absorbed on the surface of the ash particle. Once emitted to the atmosphere, most of these substances may be transformed by a variety of chemical reaction and all will be transported and deposited under different meteorological conditions. The pollutants may reach with other pollutants from the same source or other source or with natural atmosphere component. This causes human health hazards and environmental damage depending on the types and rates of reaction in composition with the atmosphere transport and deposition.

Impact Of Brick Klin Industry On Human Health:

Details	Acute and chronic
Sulphur dioxide	Increases respiratory diseases
Carbon monoxide	Headaches, coma, death
Nitrogen dioxide	Increase respiratory infection
Sulphates	Increases respiratory diseases, breathing difficulty in asthmatic
Nitrates	Increases infant susceptibility to lower respiratory infection due to conversion of nitrates, nitrites

Health probles are one of the important determinants which depicted the relationship between respondent groups and their interaction with surrounding environment conditions. Brick klin emission significantly degrades the surrounding air quality and poses serious degrades the surrounding air quality and poses serious health problems to inhabitants in the locality. Brick klin industries typically use woods recycled motor oils, coals fuel oil diesels, tiris, tra shs and plastics for fuel. Combustion of these fuel in brick klin produce air pollutants like Cox, Sox, Nox and suspended particulate matter (SPM). All of these pollutants play important role in developed of respiratory diseases, such as pneumoconiosis and silicosis and irritation of skin and eyes in nearby population when inhaled to these pollutants. Incomplete combustion of coal could also cause undesirable health effects on central nervous system and eventually resulted in symptoms of headache. Noises execution and shortness of breath the suspension of particulate matter in air can last for a few minutes to many hours can travel from 72 km to 10km . thus the people living far away from the brick klin clusters area also suffered from such health problem however the author observed that people residing near brick klin emissions face a higher risk of illness, than those living in emission free zones, with common health impacts including headaches, noise related stress, and respiratory ailments s. These pollutants can also inhibit the mental and physical growth of children school children near to the brick klin industries has the worst health states and suffered from upped respiratory infections like phyrangitis and tonsillitis



V. CONCLUSION

Present civilization cannot be perceived without acclaiming the importance of a brick. It is one of the precious gifts of human civilization. However, mankind cannot live in such an environment that has been physically threatened and socio-economically challenged due to mushrooming growth of brick kilns. Since the present research concerns about both issues; it provides ample evidences of environmental degradation. Therefore, we need to balance both; that is, addressing the infrastructure needs by making bricks available while restoring the environment from its eventual collapse. From the discussion, technological up gradation and alternative use of soil seem as an important solution to the existing problem. The foregoing research claims that

technological solution provide a pathway for improving environmental quality. Therefore, it is the need of the hour to attach the concept of sustainability with the emerging problems of physio-social environment. "*People 'over-produce' pollution because they are not paying for the costs of dealing with it*",

observed Ha-Joon Chang (2011) in his interesting book „23 Things They Don't Tell You About Capitalism". Over the last two decades, environment had turned out to be a major concern as illegal development of brick kilns became a commonplace phenomenon. The scale of the problem makes both the government and the common people worried an indication of which is that the common people having to find no solution or alternative knock on the door of the courts to get the justice. Earlier to this, the government had very limited

resolve to regulate the illegal operations of brick kilns in West Bengal. Indifferent regulation has failed to check various irregularities existing in brick kilns that have been allowed to thrive by dint of political nexus among brick kiln owners, sardars and political leaders. Recently on 15th May, 2015 another government order (Appendix) has been published, mindful of checking illegalities in brick kilns. Though, no law or order is useful unless and until we, the common people, become serious about our own survival. People should be encouraged to think independently for their overall betterment. If they are not conscious or socially-aware citizens, we all have to pay more damage at the cost of our environment. We can borrow the immortal words of Derrick Jensen, (Endgame, Vol. 1: The Problem of Civilisation, 2006): "*We cannot hope to create a sustainable culture with any but*

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