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Contemplating unregulated growth of Brick Kiln: A case study of Dudhnoi Zone

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ABSTRACTS

In today's time every nooks and corners of the world are racing to achieve the goal of development. Virtually, more often than not the bar of development is measured by structures complimented by concrete buildings. In one such corner of the world exists a quaint locale called Dudhnoi in Assam state of North East India. With a population of 14,931 (2011 Census of India), Dudhnoi revenue circle as headquarter cater to all their needs. This budding settlement area has prompted development which led to the growth of brick manufacturing industry in Dudhnoi and its outskirts. This paper seeks to highlight the socio-economic importance and problems of these industries to the dependent population within the Dudhnoi zone. It also tries to pinnacle the environmental problems due to increasing number of brick kiln (brick manufacturing plants, 'eent bhatta' in Hindi language) with necessary suggestions for sustainability.

Key words : *Brick kiln, Dudhnoi, Environmental problems, Socio-Economic, and Sustainability.*

Study area

Dudhnoi is a revenue circle under the Rabha Hasong Autonomous Council[5] (RHAC) within Goalpara district of Assam state. Dudhnoi as its headquarter harbours government offices, educational institutions, library, shops/stores of different merchandise, daily and weekly market places, nursery, medical clinics, laboratory, pharmaceuticals, residential places, and others that serve its increasing communicational, educational, commercial and administrative functions. The NH[6] 37 and NH 62 connect Dudhnoi with the important places of Assam, its neighbouring state Meghalaya and to rest of the nation. The combined effects of all these have converted Dudhnoi as a fast growing and fast changing service centre near to the recognition of rural town. At present, three adjacent revenue villages of Dudhnoi circle are recognised as urban villages viz. Thekasu Part i, Thekasu Part ii and Damra Patpara.

Introduction

The dominant issue is that as the developmental processes are speeded up the settlement morphology and other concrete structures of Dudhnoi are changing very fast and exerting tremendous pressure on the natural environment in and around Dudhnoi. Generally the raw materials for any kind of constructional work are collected from nearby areas and for which the fringe areas are also affected in the ongoing process of development. The concretisation process consumes huge volume of bricks as they are essential for all types of construction right from building houses, walls, footpaths, supermarkets etc. This very process of development definitely increased the demand of bricks ulti-

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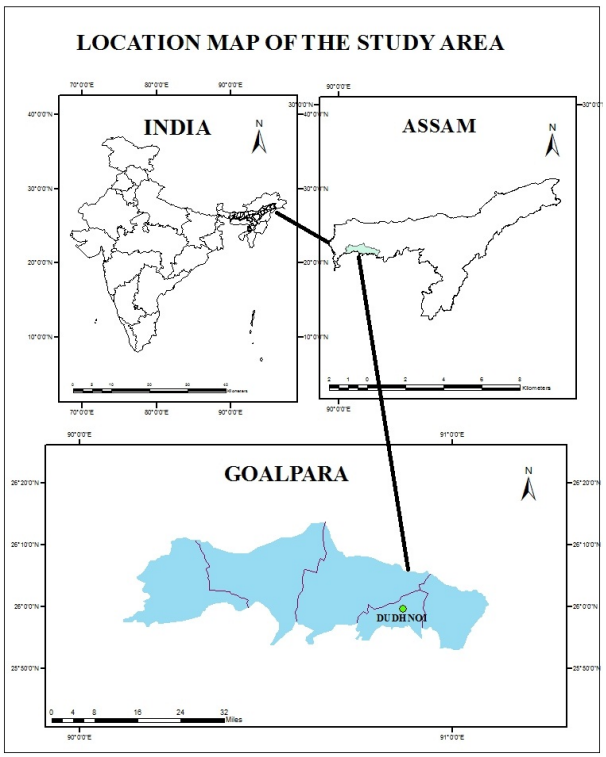

mately leading to the haphazard growth of brick manufacturing plants (kilns) in and around Dudhnoi locality. Further it is noticed that these brick manufacturing plants are playing very crucial role in the degradation of natural environment as well as bio-diversity of the respective areas.

Objectives

The study area witnesses' unregulated growth of brick kiln and therefore the first objective of this research paper is to calibre the affect of brick industry on the environment. This paper is also an attempt to interpret the underlying socio-economic importance and other related problems and to arrive at necessary suggestions on sustainability without curbing brick manufacturing for the betterment of the concerned population of the study area.

Materials and Methods

The study is based mainly on primary data and which are collected through direct personal investigation with the help of questionnaire prepared for the problem after much judgement. And the necessary secondary data and references are collected from different books, journals, govt. offices and from internet sources. The data are processed statistically and diagrams are provided wherever assumed necessary. Out of the total reported 40 numbers of brick kilns scattered around Dudhnoi and its adjacent areas the data are collected randomly from 12 kilns and thereby the sample size comes to be 40 percent out of the total population.

Industry and Pollution

The term industry is usually used by the geographers to describe the activities related to secondary sector. However, it is primarily concerned with manufacturing. The latest definition of manufacturing industry according to UNO is "the mechanical or chemical transformation of inorganic or organic substances into new products, whether the work is performed by power driven machinery or by hand, whether it is done in a factory or in the workers home, and whether the products are sold wholesale or retail.[7]" The crucial fact is that a manufacturing industry whether big or small and belong to any category contribute to pollution into different spheres of environment. The processing and manufacturing of bricks also make pollution in different directions and has taken very serious turn at present.

Manufacturing of bricks

The chief raw materials for the production of bricks are the sticky soil, water, firewood and coal. Some amount of sand of very fine quality grain is necessary when put into dice. Firewood and coal are used to burn the bricks. In the initial step the soil is grinded and mixed with water and converted into the form of sticky clay and then a definite shape is given by putting it into dice and dried in the open sun. The dry bricks are then piled up together in a 'bhatta' as locally called and burned using fire wood and coal which is ready to use once cooled off. The bhatta are of two types, the bangla bhatta and the chimney bhatta. The Chimney bhatta are large in size and need huge capital investment and therefore bangla bhatta are more common which is feasible at smaller level without much capital. But the problem is that they exert more pressure in the environment in comparison to chimney bhatta. The study area comprises entirely of bangla bhatta. The industry is seasonal, weight gaining, breakable, labour oriented and cottage type.

Drawbacks of brick industry

The main drawbacks of brick industry are:-

1. A brick industry consume huge amount of soil and therefore try to encroach anywhere if the land areas available at cheap rate. The government khas[8] or the village grazing lands are generally targeted by the manufacturing plants for their immediate benefit.
2. Topsoil is destroyed and fertility is lost.
3. Consumes huge amount of firewood and coal and emission CO_2 in the air.
4. The overall pollution is high in bangla bhatta as compared to chimney bhatta which is more technical in terms of regulated emission of smoke from burning dried bricks.
5. The land areas become useless after once used for bricks as the smooth surface is drastically deformed.
6. The village grazing lands are shrinking at a faster rate and habitats of many animals are lost which are intimately related with the village environment. So in a way the bio-diversity affected.

Land use

Brick industry consumes huge amount of soil and therefore regular supply of soil at cheap rate is the primary requirement for the selection of its manufacturing site. It should also be connected with good transport network and nearness to consumers. The sight of these advantages paved way to about forty brick making plants scattered in the villages of Karipara, Salapara, Tangabari, Thekasu part-ii, Siluk and Damra within the radius of 4 kms from Dudhnoi, the consumer centre. Primary information reveals that annual production of each plant ranges from 1.5 lakh to 4 lakh numbers of bricks and consume land areas from 0.19 to .67 hectare per plant. The land area from where the soil is collected can be used for 3 to 4 years only; thereby land encroachments of these kilns are increasing at an alarming rate. It is noteworthy that the abandoned lands are of little to no use for productive purposes because of fertility loss and original ecological balance. Following are the data of land areas encroached by the plants into different categories of land.

In the above distribution it is seen that barren and uncultivable land occupies 42% of the total encroachment. But the area seems to be unaffected by this encroachment because some amount of land of this category is essential for developmental works. But encroachments of village grazing land by 26% and cultivable land by 16% is environmentally hazardous because these lands are resource of the physical environment as well as for socio-economic purpose. Shrinking of cultivable land directly affects the agricultural production and the grazing lands have their own role to keep the ecology of the natural environment intact. They are necessary for domesticated cattle and number of wild animals like fox, wild cat, rabbit, birds etc. Their existence is as important as that of man. The lands which fall in other categories are village fallow land, grazing land or low-lying areas. The owners of the plants reported that these are the lands under the category of TB[9] register, Eksonia[10] patta etc. But correct designation of this category of land is necessary.

Biodiversity

There are wild animals co-inhabiting within short reach from human settlement. These animals are intimately related to our traditional existence as they maintain a distinctive type of ecological balance. Some of them are like Fox Vulpini, Jungle Cat FelisChaus, Mongoose Herpestidae, Pole Cat MustelaPutorius, Rabbit Leporidae, Rate Rattus, Snake Serpentees, and Squirrel Sciuridae etc. Some of these animals are also believed to be sacred and therefore its killing is traditionally restrictive. It is reported that existing grazing lands were once home to these animals but now they are rarely seen around the vicinity. This happened because their

Table 1. Land area covered by brick plants and its estimated production, 2018-2019.

Sl. No.	Category of Land	No. of plants (Brick Kiln)	Area Covered (in Hectares)	Percentage of area	Estimated Brick Production (2018-2019)
1	Barren & Uncultivated Land	5	1.1	42%	10 Lakhs
2	Village grazing land	3	0.67	26%	6 Lakhs
3	Cultivable patta land	2	0.41	16%	4 Lakhs
4	Other category land	2	0.41	16%	4 Lakhs
	Total	12	2.59	100%	20 Lakhs

Source: Primary survey, 2019.

habitats or the permanent pasture and grazing lands are shrinking at an alarming rate as these are encroached by man for different purposes like for the expansion of human settlement, cultivation of rubber, tea etc. used for government or public buildings, expansion of transport network, transferring the soil for different constructional purposes and lastly the expansion of brick manufacturing plants. If necessary measures are not taken in time to control these encroachments and save the grazing lands then this very rich bio-diversity will remain only in the folk tales for some years among the villagers. A proper survey and enactment of strict laws by the authority and all positive help from different N.G.O groups have become very urgent at present to save them.

Consumption of fire wood and coal

Burning of firewood and coal is a distinct problem of the brick industry which directly affects environment. At the time of burning of a single bhatta the following quantities of firewood and coal are necessary, fully loaded three trailer[11] firewood and 5 tonnes coal is used to produce 60,000 bricks, without firewood it requires 7 tonnes of coal. If we estimate total production of bricks in a single season is 80, 00,000 then the total volume of firewood and coal will be 400 trailers or 2800 tonnes and 666 tonnes respectively. This figure is just a minimum estimation but the actual figure may be more than the estimated value. It is to be noted that the entire firewood used by these plants are collected locally while coal is collected from nearby coalfields of Meghalaya state. This figure of consumption of firewood and coal by brick industry of Dudhnoi zone gives us a glimpse of increasing consumption of firewood and fossil fuel all over the state of Assam. Now the question is how long our forest cover will be able to cater the needs of firewood for the preparation of bricks? The forest cover of Assam is already in a deteriorated condition and below the required norms for ecological balance (only 23.60% of the total geographical area is under forest cover as against the normal requirement of 33%) and if more pressure is given it will definitely go beyond capacity which will eventually lead to environmental crisis.

Another important problem is the emission of huge amount of carbon in the air and very little chance to check the smoke. This condition definitely leads to the increase of green house gases and global warming.

Socio-economic importance

In respect of socio-economic benefits there are some positive effects of brick industry. All these may be listed as follows:-

a) Brick has got a big market at present and therefore a large share of population are engaged for livelihood in this industry right from its manufacturing, transportation, marketing and finally in constructional works.
b) It is reported that a brick kiln in order to prepare of 1, 50,000 (one lakh and fifty thousand) blocks of bricks per season it requires a minimum of 14 labourers (4 skilled and 10 unskilled). There are about 1000 (one thousand) labourers currently working in such plants around Dudhnoi zone.
c) 60 percent of the entire productions are marketed annually and are transported by vehicles like tractors, small trucks, pickup vans etc. and therefore a handful of ready staffs and labourers for transportation and loading-unloading works are also directly engaged in this sector.
d) Market price of bangla bhatta bricks is also cheap in comparison to chimney bhatta bricks. The manufacturing cost is Rs. 2.5/piece and selling price is Rs. 3.00/piece. On the other hand the price of a chimney bhatta product is Rs 7.00/ piece. So the people of low income group have taken this advantage for their constructions.
e) The National Rural Development Agency (NRDA) responsible for various developmental schemes implements these schemes for the benefit of the poor rural people through D R D A (District Rural Development Agency) by building roads, houses, sanitation etc. These agency have are also a major consumer of these bricks.

Pertinent Problems

The bricks produced in Bangla bhatta are comparatively of lesser quality than Chimney bhatta and therefore some problems are related with the Bangla bhatta bricks.

(a) The bricks are not scientifically tested. These bricks are directly use in all types of construction which pose a threat to lives for a seismically sensitive zone like Assam.
(b) Unplanned construction of concrete structures served by cheap availability of bricks lead to percolation of running water or rain, causing

flash floods.

(c) There is little control on the manufacturing and production of bricks. In the study area, no brick kiln is reported as having due permission from government for setting up of the plant.

(d) The labourers lack in terms of wage.

(e) There is also the problem of child labour but such cases are rarely detected because they are not regular workers due to seasonal nature of the plant or may be because of the authority's negligence.

(f) People are not aware about pollution and environmental degradation caused by brick kiln and therefore there remain high chance of taking undue advantages by the plant proprietor in creating environmental crisis in the days to come.

Conclusion

The development achieved at any level the pressure always goes to the natural environment. There are so many leakages in the way of development that sustainable development seems to be only a vacuum shout (slogan) at the present context. The brick is very essential for all types of R.C.C. construction but we cannot stop its production as we cannot stop development. On the other hand there are so many environmental problems are related with its production. Therefore appropriate scientific procedures and policies for using the land resource, minimization of the burning of fossil fuel and fire wood and emission of carbon dioxide, protection and conservation of bio-diversity have become so urgent at the time of production of bricks. There are also question of the use of bricks at appropriate place in a proper way and therefore statutory controls should be imposed at the time of the use of bricks. Dudhnoi being an important commercial, transport and communicational node the number of concrete structures are increasing in a haphazard way. This should be controlled and allowed to grow in a planned way. The increasing number of brick manufacturing plants in the fringe zones is also a matter of grave concern which urges for a more thorough study of the entire problem and to work out some appropriate policies immediately.

Suggestion for sustainability

We cannot avoid the production of bricks as it is essential for the modern day society and its use is increasing very fast. But we can move towards more sustainable means of production and consumption. As there are a number of socio-economic and environmental problems relating with the production and the use of bricks, it is necessary to adopt proper policies and sustainable methods to control environmental degradation, pollution and other problems and arrive at a balanced condition. This may include some of the following suggestions:-

(a) All the areas used for the manufacturing of bricks should be surveyed and properly recorded.

(b) Necessary guidelines are to be framed and implemented very strictly through which haphazard growth plants and other related problems can be solved.

(c) Allotment of land area to be made only in the comparatively unproductive and less fertile lands while the Govt. khas and village grazing lands should strictly be avoided.

(d) Research works are to be encouraged to introduce and promote alternative device for minimization of firewood and fossil fuel as well as control of carbon emission, quick remaking the degraded land are

(e) Strict policies on prohibiting overuse of land for brick manufacturing and adequate time for rejuvenation of land.

(f) Quality must be controlled because the under quality products will produce weak structures and which are summarily danger in seismically unstable zone like Assam.

(g) Preservation of the village grazing land biodiversity at any cost.

(h) Proper policies for the welfare of labourers in terms of alternative source of livelihood, health and wage.

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