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A STUDY ON BRICK INDUSTRY OF NADUAR DEVELOPMENT BLOCK OF SONITPUR DISTRICT, ASSAM: PROBLEMS AND PROSPECTS.

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Abstract

Brick is one of the primary building materials known to the mankind. The process of manufacturing of brick also has not undergone much change over centuries across the world. The bricks are significant basic material for all kinds of building activities and constitute about 15% of the total building material cost. In Assam burnt clay bricks are mainly used as material for construction since it produces a superior, durable, strong and comfortable physical living environment than other materials.

The left bank of river Jia Bharali under Naduar Development Block is dotted with a lot of brick industries since 1985. Most of the industries are continuously producing bricks while some of them have been closed due to some constraints. The basin is thinly populated and there is no any shortage of land which is the major raw material. The brick industries of the basin are still maintaining their fame and bricks are supplied even to the nearby states of N.E. India.

The industry is basically dependent on imported skilled labors while local labors are semi-skilled or unskilled. The business is profitable if the cycle completes perfectly and no fuel, climatic or labor problems occur. Most of the farms are developing over the year 2000 at the cost of paddy fields. It is a significant economic activity that leads to loss of top soil of the agricultural fields, the principal raw material. In this study an attempt has been made to find out the problems faced by the owners, workers and environmental problems as well as future prospect of the industry. The study must be helpful to the policy makers and the concerned authorities regarding future development and welfare of the society.

Keywords: Building materials, semi-skilled, river basin, cycle

1. Introduction

Brick is one of the primary building materials known to the mankind since long. The process of manufacturing of brick also has not undergone much change over centuries across the world. The bricks are significant basic material for all spheres of building activities and constitute about 15% of the total building material cost. In Assam burnt clay bricks are mainly used as material for construction since it produces a superior, durable, strong and comfortable physical living environment than other materials.

India is the second largest producer of bricks in the world following China. It is a seasonal work as it operates 6 to 8 months in a year. In the process of manufacturing the activities like drying and firing are done in open which are not possible during rainy season. The demand of burnt clay brick in Assam is around 3500 and the study area produces 1.33% (2020) and is gradually increasing.

2. Objectives

The major objectives of this study are:

- a. To study the Brick firms of the Naduar area
- b. To analyze the impact of labors in brick production
- c. To study the changing land use pattern
- d. To highlight the level of modernization and environmental issues

3. Significance of the study

Popularity of bricks as construction material is increasing due to its heat retaining capacity, withstand corrosion and resistance to fire. The basic raw materials are clay, coal as energy source, sunlight, sufficient water and lime. Most of the raw materials are renewable but if it is used unscrupulously then it may convert in to non-renewable. Despite the initiation of other type building and walling materials such as earth block, concrete block, stone concrete, stone block, fly ash brick etc. burnt clay bricks still occupy the dominant position in Assam and elsewhere mainly due to economic as well as its environmental friendly reasons.

In this study care has been taken to highlight the problems faced by the owners, labors as well as environmental issues. So, this study must be helpful to the policy makers and planners. To carry on the study, primary data has been collected with the help of schedule prepared separately for both the owners and the labors. This information would definitely be helpful for future study. So, the paper has both economic and academic significance.

4. Research methodology

The whole study is mostly based on primary information collected from the field. We prepared schedule to collect data in a systematic way. Personal experience of the authors and field observation also helped a lot in preparation of the paper. The collected information was tabulated to be more meaningful and simple bar diagram and line graphs has been prepared to indicate changes and trends of production. To analyze environmental problems, government notifications published from time to time were discussed. So, the study is based on both the primary and secondary sources of information.

5. Study Area

The study area is located along the left bank of River Jia-Bharali of Sonitpur district of Assam. It is an important north bank tributary of mighty Brahmaputra. The study area is a flood plain of the said river and consists of alluvial soil which is very suitable for clay bricks. The total area of the Naduar Development Block is 41498.95 hectares (414.98 km²). The river Kani Dekorai flows along the east, Jia-Bharali in the west, Arunachal Pradesh in the north and the river Brahmaputra in the south of the study area. At present there are all total 15 brick manufacturing firms are working in the study area and almost 900 to 1200 labors are engaged in these firms.

6. Analysis and interpretation

The traditional brick making passes a several stages right from tempering to sorting. (i) Tempering: The clay is mixed with water to get right consisting either manually or with pug mills. (ii) Mouldings : The tempered clay is then rolled in sand and shaped into mould. The sand prevents the clay from sticking to mould.(iii) Drying : Sun drying in open air is carried for 10 days or so.(iv) Firing: The sun dried bricks are arranged in the kiln and insulation is done by mud pack. The firing is done through the fire hole and the kiln is kept in sealed condition to keep the heat inside for about a week. (v) Sorting: The sorting is done on basis of coloration which is an indication of level of burning.

Brick firms of the Naduar area play an important role in employment generation for local labors. Most of the firms were established after the year of 2000. . At present there are 15 numbers of firms while there was only one brick during 1990's. Prior to 2000 the firms had movable chimney with height 50 to 70 feet because of which the smoke evolving from fire stayed at a very low level. The Government passed a regulation according to which the Brick firms can't run unless they have fixed chimney with a height of more than 120 feet. The construction of fixed chimney is costlier but it helps the owners to increase the production capacity of the farms.

The myan(kiln) capacity of the firms ranges from 6.5 to 14 lacks. At present most of the firms under study are using some modern machines to produce bricks. To control the carbon emission the firm MATA with myan(kiln) capacity of 10 lacks is using modern technology. This zigzag technology of myan system reduces carbon emission up to 75%. Another firm TATA with a myan(kiln) capacity of 14 lacks is using modern machine to prepare raw bricks for the first time in the state of Assam. It can prepare 30,000 such bricks per day which needs only 5 persons to operate the machine.

Table1: Brick farms, year establishment, Myan(kiln) capacity of and average production, Naduar Development Block, Sonitpur, Assam

Sl. No.	Farm name	Owner	Year of establishment.	Myan(kiln) capacity (Lacks)	Average Production/Year (Lacks)
01	HBF	S. Gupta	1992	7	28
02	PB	T. Hazarika	2004	7	28
03	IBBI	R. Gupta	2004	6.5	26
04	PBF	B. Borah	2005	7	28
05	PBI	S. Mili	2005	7	28
06	MBI	S. Mili	2005	6	24
07	NDF	P. Sahoo	2006	7	28
08	STK	R. Prasad	2006	7	28
09	ABI	C. Das	2006	7	28
10	SBI	S. Agarwala	2010	7	28
11	CBI	M. Domai	2011	7	28
12	MATA	A.Gupta	2013	10	40
13	NBI	S. Das	2013	7	28
14	TATA	M. Sahoo	2017	14	64
15	IBN	M. Sahoo	2017	10	40

To meet the growing market demand, more entrepreneurs are encouraged to invest in this sector. As a result the numbers of brick firms increased from 01 in 2000 to 15 in the year of 2020 (Fig.1).

year	No. of firms
1990-1995	01
1995-2000	01
2000-2005	03
2005-2010	09
2010-2015	13
2015-2020	15

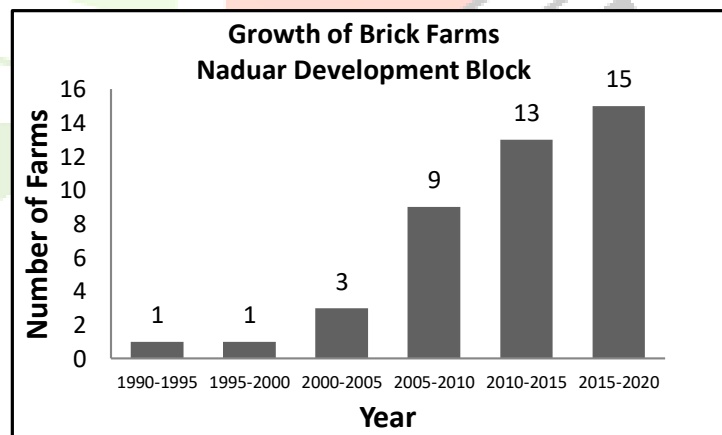


Fig.1: Growth of brick firms in the study area.

To fulfill the demand of market that extends to Upper Assam and Arunachal Pradesh, the number of Brick firms and total production is sufficiently increased. During 1990s total yearly production was 28 lacks that could not fulfill the market demand. The nearby Khanamukh area supplied the required bricks to those areas. But, after 2000 the

study area increased their production with the increasing number of bricks firms. In the year 2020 the total production increased to 464 lacks pieces.

Year	Production in lacks
1990-1995	28
1995-2000	30
2000-2005	84
2005-2010	248
2010-2015	372
2015-2020	464

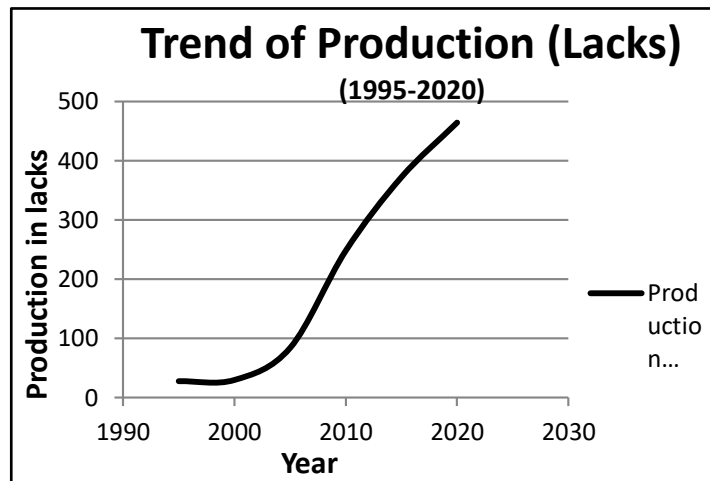


Fig 2: Trend of production of Bricks, Naduar Block, Sonitpur, Assam

The minimum requirement of labor force to conduct various activities of brick firms is about 100 nos. Out of which 10 nos. of skilled labors are needed in the burning process of bricks. These skilled labors are imported from other states like Bihar, West Bengal etc. The owners provide the shelter facility and sometimes provide them cloths, blankets and other necessary commodities needed for them. Other semi-skilled and unskilled labors are locally available. The owners provide transportation facility to the local labors to reach the firm. During study it is found that the entrepreneurs generally encourage the whole family as workers to get rid of interruption in the production process. They provide them all the minimum facilities to settle in the firm campus for 6 – 7 months.

The wages of the labors varies according to their type of works. The wage structure is furnished in the table-4.

Table-4: Wages of labors

Wages per week(Rs)	Number of labors	Percentage of labors
500-1000	24	24
1000-1500	64	64
1500-2000	12	12

The traditional brick manufacturing needs considerable land area and top soil. The land area near the myan(kiln) is subjected to high temperature making it unfit for use in agricultural activities after being abandoned. As a result the farmers are compelled to sell the fields to the firm owners. The brick manufacturing uses thousand of tones of coal and biomass fuel (The energy use is 30-35 % of production cost). The possible pollutants from brick firms are:

1. Carbon dioxide (CO_2)
2. Carbon monoxide (CO).
3. Sulphur dioxide (SO_2).
4. Nitrogen Oxides (NO_x).
5. Suspended Particulate Matter (SPM).

In the study area brick firms are growing up at the cost of paddy fields. The conversion of land in to brick firms is increasing year by year changing the land use pattern.

The contribution of owners to the society is remarkable. The owner of the firms are engaged in activities like road construction in rural areas, donating funds for development of schools, donating money for the festivals etc. The government should also contribute for the development of these firms so that it can generate employment opportunities and work for the betterment of the community.



Mixture Machine



Preparation of raw bricks



Conversion of paddy field to brick firm



A myan(kiln) with chimney

Drying of machine made raw bricks



Raw brick making machine



Workers inside the myan(kiln)



Workers resident

7. FINDINGS

- a. In the study area most of the firms invest from their own contribution and borrowed funds. The banks are not interested to provide loan as they are seasonal and dependent on weather condition.
- b. The raw brick makers (pothera) come from the distant places of the area with their family member, the owner provide them shelter facilities and encourage the whole family to work in the firm.
- c. The study reveals that maximum labours are of 25-35 years old and below primary level of education.
- d. Educational facility arranged by the owners for the child of labors is not satisfactory.
- e. The brick firms create employment opportunity for the people below poverty level.
- f. The owners of the firms give importance in pollution control and takes necessary steps for plantation in the firm site.
- g. In the study it is noticed that few firms are using new technology to reduce carbon emission and latest technology in making raw brick to increase production for the first time in Assam.
- h. The area under paddy fields is reducing with the increasing number of firms year after year.

- i. While the cluster of brick firms are source of local air pollution affecting local population, agriculture and vegetation. At global level they also contribute to climate change.
- j. The smoke and dust emitted by the brick industry creates adverse impact on the neighboring areas.

8. Suggestions

- a. The facilities provided to the labors are not satisfactory. The owners should try to improve facilities like residential, refreshment, medical and education etc.
- b. The labors need their union to inform the owners about their opinions, problems etc.
- c. The government should take adequate steps to reduce air pollution and force the owners to undertake plantation in the firm site.
- d. The owners should apply new technology to reduce carbon emission.
- e. For optimum utilization of raw materials the owners should introduce the latest brick making machines in their firms.
- f. The owners are unconscious about the by-product (fluorine) which is very harmful to health. The matter must be taken seriously by the owner.

9. Conclusion

From the study it can be concluded that maximum firms have the same production capacity per round. Only two firms (MATA and TATA) are exception with production capacity of 10 and 14 lacks per round respectively. New technology has recently been introduced in both the firms to maximize their production and reduce carbon emission. With the increase of their numbers employment opportunity of the lower income group people of the area also gradually increasing.

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