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Palash Patra
Assistant Teacher in
Geography Ghoga Junior High
School West Bengal, India

Avijit Guray
M.A. In Geography
Guru Ghasidas University
Chhattisgarh, India

Sandipan Ganguly
Guest Lecturer In Geography
Suri Vidyasagar College
West Bengal, India

A Study on Brick Kiln Industry in Pursura Block of Hooghly District, West Bengal

Palash Patra, Avijit Guray, Sandipan Ganguly

Abstract

In pursura block of Hooghly district of West Bengal, many brick kilns are situated on the banks of the Damodar river. Socio-economic activities of this area also depend on these. The paper attempts to study the brick-making process and an overview of brick kilns of the area along with the socio-economic profile of workers engaged in the brick kilns. The paper also deals with the environmental impact of the brick kilns on their surrounding areas. The study also reveals that at present, the brick kilns of the area are facing a lot of problems. The problems should be jointly managed by the state govt. and the local bodies. If properly managed, the brick kilns of Pursura block, forming an industry, would become one of the important forces of economic development of the area.

Keywords: Brick kiln, Drying, Firing, Livelihood of workers, Moulding, Pollution and Tempering.

1. Introduction

Brick is a precious building material. In India fired-clay bricks are produced in traditional, organised small scale industries. Indian brick industry is the second largest brick producer in the world after China. The industry has an annual turnover of more than 10,000 crores and it is one of the largest employment generating industries. The main requirement to develop a brick field soil is the main raw material and it can be easily collected from the banks of river or from fallow land. The brick production of Pursura block also depends on various factors such as availability of water, market and other raw materials required in brick making process. In Pursura block, due to constant supply of alluvium from Damodar river, a number of brick kilns have developed over the entire block in a scattered fashion and some have been located beside the Damodar river bank and on either side of the road.

2. The Study Area: Pursura is a block in Hooghly district of West Bengal state, India. Pursura is located at 22° 51' 01" N and 87° 57' 46" E. Pursura has an area of 96.92 km². It has the elevation of 13 m (altitude). Pursura block is bounded by Tarakeswar block in the east, Arambagh block in the west, Khanakul I in south-west and Dhaniakhali in the north-east. Pursura block shares its borders with the adjoining Barddhaman and Howrah districts. Damodar is the main river of this block. It has a population of 1, 56, 322 (Census of India, 2011). Several brick fields have grown in this block. The economy of this area is mainly based on cultivation (potato and paddy are the main crops), the brick kiln industry also plays a dominant role on the economy of this region (Fig. 1).

Correspondence:

Palash Patra
Assistant Teacher in
Geography Ghoga Junior High
School West Bengal, India

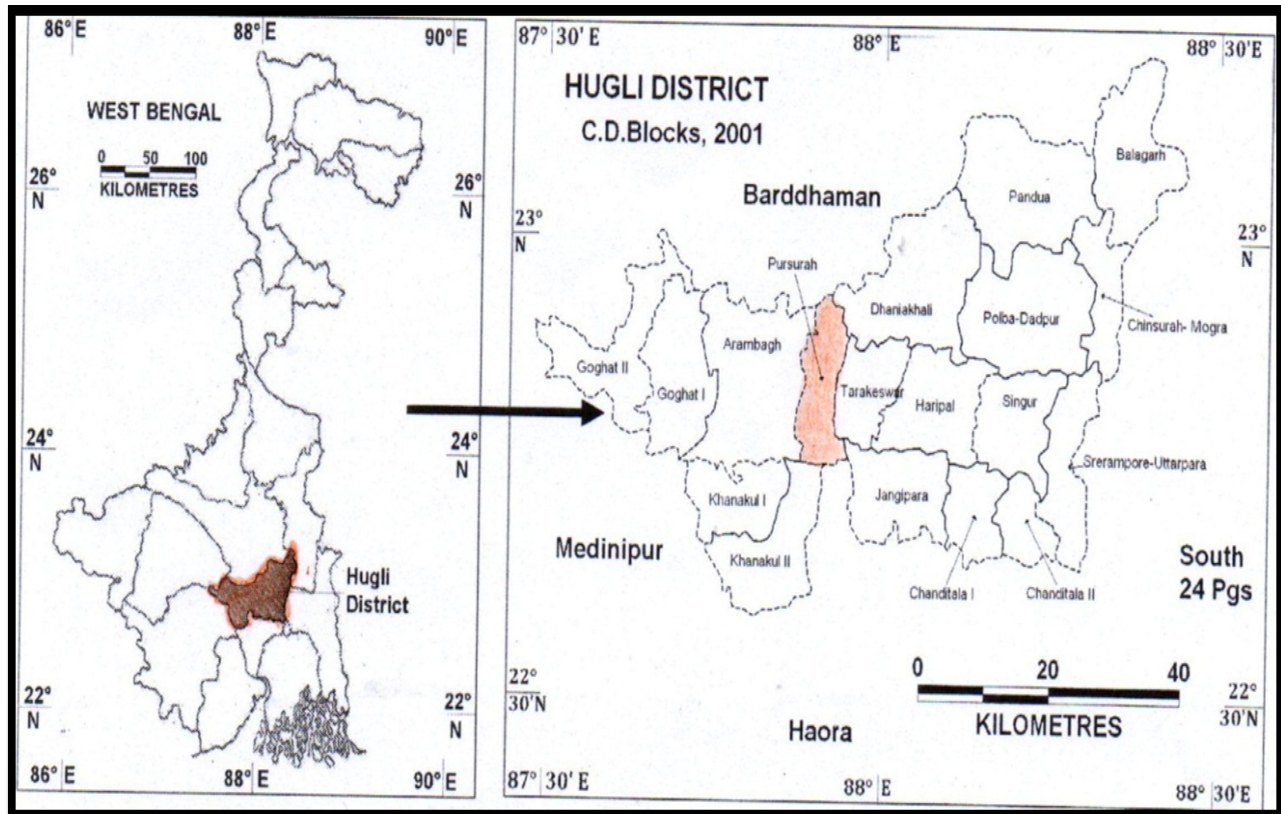


Fig 1: Location Map of the Study Area

3. Objectives

- I. To understand the brick-making process in the brick kilns of the study area.
- II. To find out the socio-economic profile of workers engaged in the brick kilns.
- III. To analyse the environmental impact of the brick kilns on their surrounding areas.
- IV. To investigate into the problems associated with the functioning of the brick kilns.

4. Materials and Methods: The entire study is primarily based on extensive field survey. The relevant secondary data have been collected from appropriate sources. The data have been analysed with the help of suitable simple quantitative and cartographic techniques.

5. Results and Discussions:

i. Brick Making Process: Traditionally the main steps followed to make a brick are explained below:

Material Procurement: The clay is mined and stored in the open.

Tempering: The clay is then mixed with water to get the right consistency for moulding. Mining is done manually with hands and feet sometimes and in certain areas animal driven pug mills are used.

Moulding: A lump of mix is taken rolled on sand and shaped into the mould. Sand is used so the brick does not stick to the mould.

Drying/Loading: The mould is emptied into the drying area, where the bricks are arranged in a herringbone pattern to dry in the sun. After two weeks, they are ready to be burnt.

Firing: The bricks are arranged in a kiln and insolation is provided with mud pack. Fire holes left to ignite the kiln area are later sealed to keep the heat inside. This is maintained for a week.

Sorting: After the kiln is disassembled, the bricks are sorted according to colour.



Machine used in Brick Making Process



A Glimpse of a Brick Field

ii. An Overview of Brick-Kilns of the Study Area: The first brick-kiln of the area was developed in 1970 at the Dhibar para. Consequently, other brick kilns were developed from 1986 onwards at Berapara, Fatepur area etc. The main causes for the development of brick kiln industry in Pursura block are availability of raw materials, minimum rate of land beside the Damodar river, availability of cheap labourers, low transport cost, high demand and proximity to market. Here raw materials are cheap and plenty and easily available from the river side of Damodar and other fallow land and 26 no. roadway is connected with Durgapur Highway and Kolkata and 16 no. roadway is also connected with

Arambagh and Tarakeswar towns. So these roadways play an important role in delivering produced bricks to the market. The major raw materials used in the production of the bricks in these brick kilns are surface soil (75%) and fly-ash (25%). Coal which is used in the burning of bricks is brought mainly from Raniganj coal belt of West Bengal and Jharia coal belt of Jharkhand. There is high demand of bricks within 25 km of the local brick kilns. The brick kiln industry is mainly a labour-intensive industry. There are mainly four categories of Labourers: i) Moulder Labourers or Dressers, ii) Reja-banki, iii) Loading or Beldar Labourers and iv) Firing Labourers (Fig. 2 and 3).

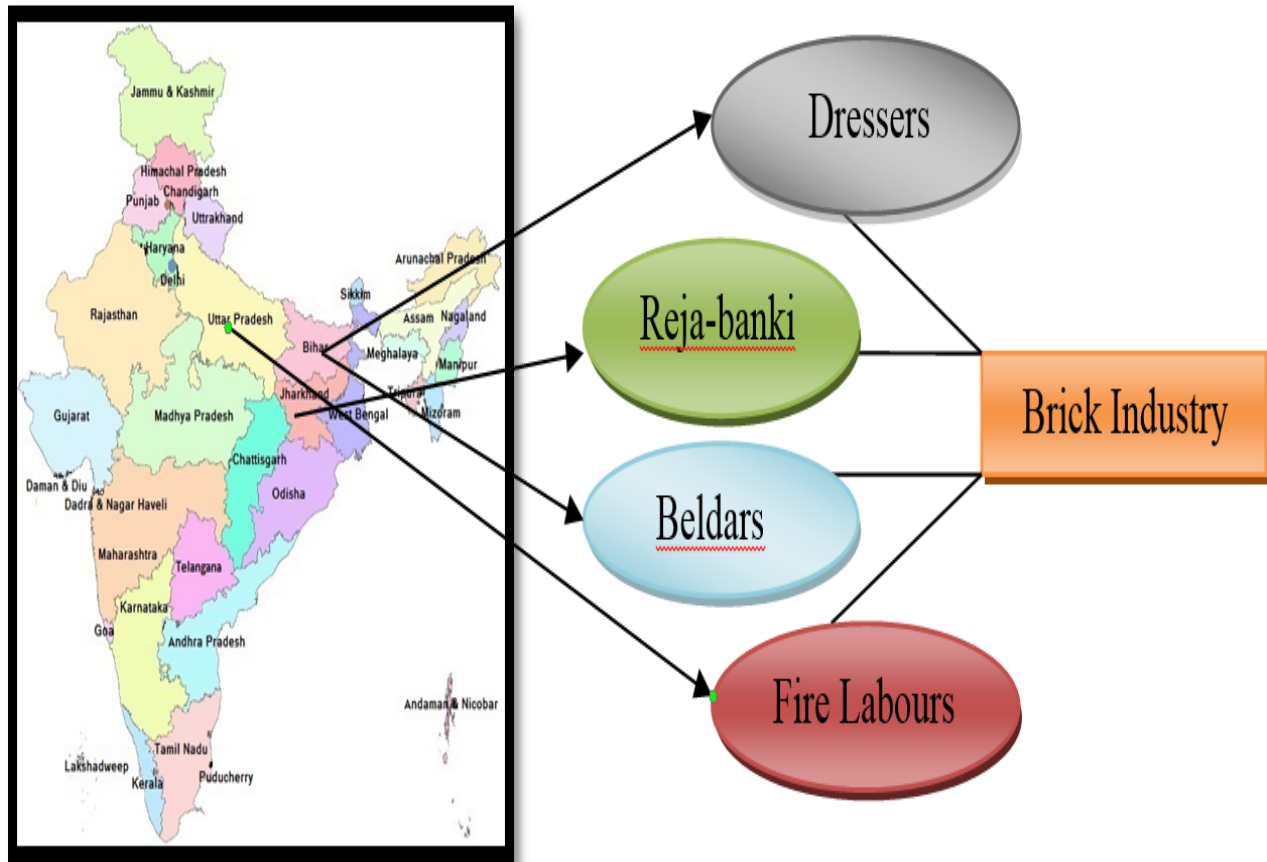


Fig 2: Place of Origin of Labourers in Brick Kilns of Pursura Block

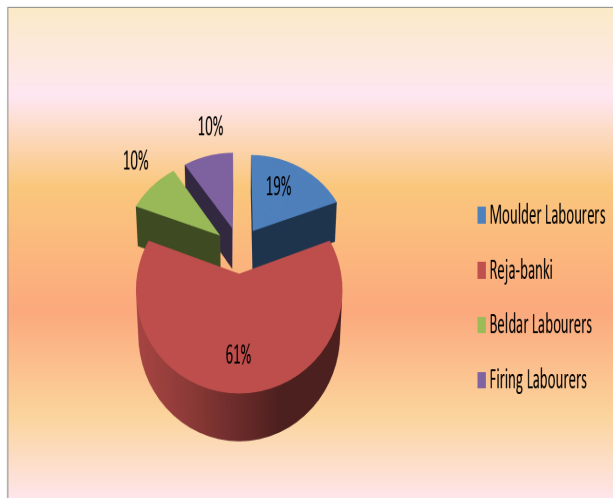


Fig 3: Composition of Labourers in Brick Kilns of Pursura Block

Table 1: Work Profile of Labourers in Brick Kilns of Pursura Block

Type of Labourers	Work Duration (Hours/Day)	No. of Days in a week
Moulder Labourer	8	6
Reja-banki	7-8	6
Beldar Labourer	7-8	6
Firing Labourer	24	7

Source: Primary Survey

The large percentage of labourers is temporary. The main season of brick production is from December to March. During this period, the labourers come to work in these brick kilns.

In this industry, male dominates over female labourers. Nearly 60% of labourers are between the age group of 15-42 years. It is because in different stages of brick production, healthy and strong labourers are needed. But child labour force is also employed as workers and female child labour

percentage is higher than the males and female child labours are paid lower than males.

From the field study it is found that 17% of labourers are from general caste, 50% from Scheduled tribes and 33% from scheduled caste category (Fig.4). The child labour mainly belongs to the SC and ST category.

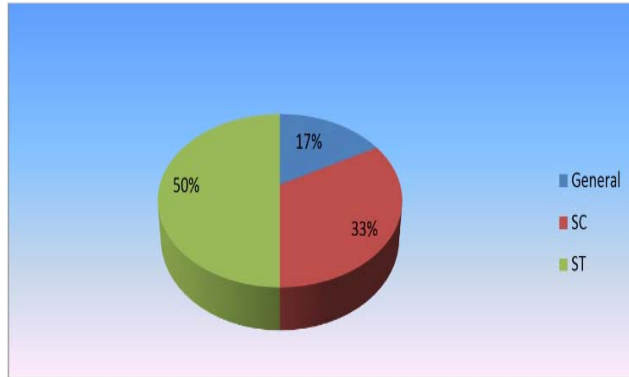


Fig 4: Caste-Composition of Labourers in Brick Kilns of Pursura Block

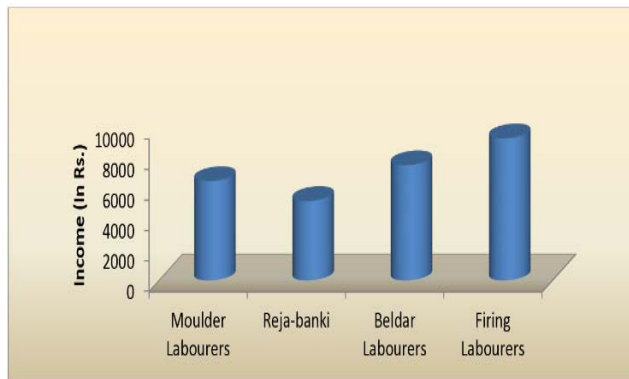


Fig 5: Monthly Income of Labourers in Brick Kilns of Pursura Block

iii. Environmental Impact: While the cluster of brick kilns are source of local air pollution affecting local population, agriculture and vegetation, at global level they also contribute to climate change.

The traditional brick manufacturing needs considerable land area and top soil. The land used for top soil loses its fertility and the land erosion is accelerated. The land area near the kiln is subjected to high temperature making it unfit for uses in agricultural activities after being abandoned. The brick manufacturing uses thousands of tonnes of coal and biomass fuel (The energy use is 30-35 % of production cost).

The possible pollutants from brick kilns are:

1. Carbon dioxide (CO₂).
2. Carbon monoxide (CO).
3. Sulphur dioxide (SO₂).
4. Nitrogen Oxides (NO_x).
5. Suspended Particulate Matter (SPM).

Along with these there is a problem of high volume of bottom ash as residue. It affects the agricultural productivity of the surrounding fertile tracts. The other possible environmental threat may be disturbance of flow path of natural stream, nullah, river due to establishment of the brick kiln in the vicinity in the path leading to obstruction in downstream as well as for distribution on flow of water during rainy season. The waste produced from the brick kilns of the area fall into the Damodar river, thus polluting its water.



Brick Kilns near river Damodar



Labourers busy in their Work



Bricks Kilns near Agricultural Fields



Bricks being loaded for Transportation

iv. Problems

- i. As it is a labour-intensive industry, labour crisis is one of the major problems of this industry. After the introduction of the NREGA, the brick kilns experience the shortage of labourers which hamper production.
- ii. Coal is one of the major sources of energy of this industry. In recent times the increasing price of coal, coupled with increased transport cost have resulted into the increased production cost of bricks.
- iii. These brick kilns mainly depend on outside demand. In

the last few years, the demand has increased substantially but at the same time a lot of brick kilns have already developed in different parts of the state. Due to this the sale of bricks produced in these brick kilns located in the Pursura block has decreased gradually.

- iv. The brick-kilns were established according to the Pollution Control Act, 1986. These were established on fallow land, far from the locality. But a new circular has been introduced by the govt. of West Bengal. According to this circular, a brick kiln should follow the following norms:
- a) A brick kiln should not be established within the range of 200 m of a habitable area.
 - b) A brick kiln should not be established within the range of 200 m of a major river.
 - c) A brick kiln should not be established at the vicinity of a major road especially Highway.
 - d) The brick kilns should have a boundary wall of 3 m height.
 - e) Adequate trees should be planted upto 3 m from the boundary wall.

Due to the encroachment of human settlement towards the brick kilns and the location of them on either side of the river bank or road, these brick kilns are supposed to be illegal according to the new circular.

6. Conclusion

From the overall analysis, it can be concluded that the livelihood of a lot of people very much depends on this brick industry. So proper management should be taken to safeguard this industry so for it remains intact. The social life of labourers should also be upgraded so that they do not force their children to work as child labours in brick kilns. For abatement of pollution, the brick kiln owners must abide by the rule and regulation laid by the govt. in this regard.

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