



Challenges Of Wood-Based Burnt Bricks Production As A Livelihood Activity In Benue State, Nigeria.

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ABSTRACT

Burnt brick is one of the most vital materials for the construction industry. The traditional mining and wood-based production and firing of bricks, result in resource depletion, environmental degradation, unprecedented and unsustainable fuelwood consumption even though it generates employment. This paper seeks to identify the challenges of wood-based burnt brick production in eight (purposely selected) out of twenty-three Local Government Areas (LGAs) of Benue State. One hundred respondents were randomly selected from each LGA making a total of 800 respondents. Results indicate that dearth of operating capital was the most critical challenge facing the brick producers. Other main challenges include increasing scarcity of preferred fuel wood species, increasing cost of procuring fuel wood, poor prices of bricks during the active brick production season, seasonality and scarcity of skilled/migrant labour, absence of collaterals for loans from banks, dearth of mechanization/drudgery in operations, lack of government assistance/recognition, poor infrastructure (bad roads, lack of health facilities etc), seasonality in operations which reduces income, and degradation of agricultural land. Stringent requirements for collaterals by banks need to be relaxed to enable brick producers to have access to operational capital. There is need for afforestation programmes at degraded bricks sites using mainly the fuel wood tree species preferred for brick firing.

Keywords: Burnt bricks, livelihood, fuel wood, Brick production, Pollution

INTRODUCTION

Brick is a smaller, rectangular block of fired clay used in the construction of foundations, walls, piers, buttresses and arches of buildings and other structures and in the construction of ducts, flues, lining and chimneys of furnaces (Encyclopedia Britannica, 1998). Brick making was one of man's first steps towards self-preservation, once man moved out of the caves (Morton 1990). The use of burnt bricks dates back to the Stone age (ie 2500 BC) as narrated in the Bible story of "The Tower of Babel" in Genesis chapter 11 verse 3, where the people were said to "make bricks and burn them thoroughly". Bricks are made from earth, fire, water and air.

Burnt bricks are the most popular building material, with a current demand estimated at 55 billion per year (Kumar et al, 1998). Morton (1990) identified four main stages in brick making, namely, winning the clay and preparing it, shaping the bricks, drying the green bricks, and firing the bricks. The industry employs low technology, manual and inefficient methods such as hand molding, sun-drying and open clamp burning. The most promising method of decentralized burnt brick production, vertical shaft brick kiln technology was developed in China (Kumar et al, 1998). The world leading brick producing countries like China and India, clay brick manufacturing is transforming into more energy-efficient production methods now than it was a few decades ago (National Institute of Standards and Technology, 2007). The reason for this significant transformation is that the modern brick manufacturing process adapts many practices intended to conserve resources and promote sustainability.

The traditional mining and wood-based production and firing of bricks result in resource depletion, environmental degradation, unprecedented and unsustainable fuel wood consumption, even though it generates employment. These problems can be overcome through sustainable production systems developed to improve the basic factor conditions in the local economy (Levi, 1990).

Energy consumption and pollution are the two important environmental and cost concerns related to the brick industry. Emissions of several harmful gases like carbon monoxide, sulphur dioxide, nitrogen oxide and particulate matter from burning of fuel wood or coal in brick kilns cause serious respiratory diseases like bronchitis and asthma. Moreover, these pollutants weaken the immune system of the human beings and hurt their resistant power to fight various types of infections.

The informal clay brick makers lack formality in terms of the licensing laws, tax laws, labour laws, and environmental health regulations. These informal operations are small scale, mostly family or household-based enterprises that are unregulated by government institutions (Swiss Agency for Development cooperation, 2014). As a livelihood activity, this enterprise employs quite a number of personnel in various phases such as excavation, loading, driving, retailing, etc. In spite of all of these, there are challenges the entire enterprise faces as a livelihood activity. This study is therefore carried out to identify and rank the key challenges to fuel wood-based burnt brick production as perceived by the producers in Benue State.

The Study Area

The study was carried out in Benue State, Nigeria, between April and October for wet season, and November to March for dry season. Benue State is made up of twenty three Local Government Areas (LGAs) that make up the geo-political zones (A, B, and C). Zones A and B are homes for the commercial wood-based clay bricks production because of the abundance of clay deposits there. Out of the 14 LGAs that make up Zones A and B, 8 were selected for this study, based on their ranking in terms of abundance of clay deposits as well as massive production of burnt bricks. The selected LGAs include Buruku, Gboko, Gwer West, Konshisha, Kwande, Makurdi, Ushongo and Vandeikya (Figure 1).

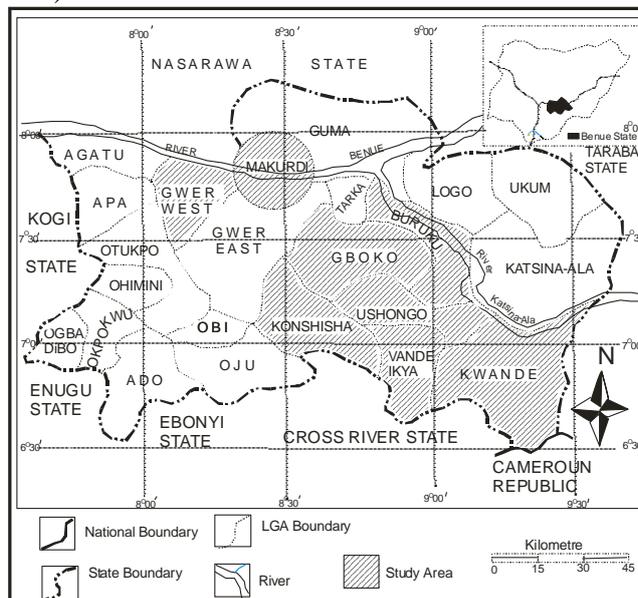


Fig. 1: Map of Benue State showing the studied Local Government Areas

METHODOLOGY

Eight LGAs were purposively selected for this research out of the 23 LGAs of in Benue State, since wood-based burnt-brick industries are not uniformly distributed in the state. One hundred brick producers were selected from each of the eight selected LGAs, making a total sample size of 800 respondents, randomly drawn from the brick producers.

A semi-structured questionnaire was administered on the respondents through personal interviews. Information on brick production and challenges were also obtained from key informants in the study area, using focused group discussions. The responses of the respondents were recorded and analyzed using descriptive statistics.

Table 1: Challenges Burnt Bricks Production in Benue State

S/No	Nature of problem identified	Relative frequency of respondents	Percentage
1	Low or poor operating capital	75	9.38
2	Increasing scarcity of preferred fuel wood species	71	8.80
3	Increasing cost of procuring fuel wood	69	8.63
4	Poor prices of bricks during production season	65	8.13
5	Seasonality and scarcity of skilled/migrant labour	63	7.88
6	Absence of collaterals for loans from banks	61	7.63
7	Dearth of mechanisation/ drudgery in operations	58	7.25
8	Lack of government assistance/recognition	55	6.88
9	Poor infrastructure (bad roads, lack of health facilities etc)	53	6.63
10	Seasonality in operations which reduces income	47	5.88
11	Degradation of agricultural land	36	4.50
12	Changes in landscape	29	3.63
13	Land use conversion/changes.	27	3.37
14	Scarcity/disappearance of valuable plant species	20	2.50
15	Land tenure restrictions for new entrants	15	1.88
16	Requirements for tree-cutting permits	13	1.63
17	Water and air pollution	11	1.38
18	Absence of workers' safety provisions	9	1.13
19	Water shortages during brick production season	7	0.88
20	Exposure of workers to health hazards	6	0.75
21	Dearth of quality control standards	5	0.63
22	Destruction of buffer strips	2	0.25
23	No strategic planning involving stakeholders in the brick industry.	2	0.25
24	Dearth of public awareness on the environmental problems of brick production and mitigation measures	1	0.13
	TOTAL	800	100

RESULTS

The main challenges faced by burnt brick producers in Benue State, Nigeria were identified and ranked in decreasing order of importance based on the number of respondents recognising the problems as presented in Table 1. Altogether, 24 main problems were identified. The problem of low/poor operating capital recorded the highest percentage of response from the brick producers (9.38%), closely followed by increasing scarcity of preferred fuel wood species and increasing cost of the preferred fuel wood species which recorded responses of 8.80% and 8.63% respectively. The problems of dearth of public awareness on the environmental problems of brick production and mitigation measures and absence of strategic planning involving all stakeholders in the brick industry recorded very low responses from the respondents.

DISCUSSION

Due to the seasonal nature of the brick industry in the state, the workforce gets employment for a limited period of five months per annum (November to March each year). During the wet season period (April to October), the workforce has to look for alternate options of earnings. Generally they move out to their agricultural fields as farmers or get engaged as agricultural labourers. But at the onset of the next brick-making season, there is no guarantee to get employment in the same kiln. In the brick sector, labour may be brought in through a contractor (from distant places). Since they are not on the payrolls of the kiln owners, they are not covered under the current labour laws, e.g. Minimum Wages Act. For jobs such as transportation of green bricks which are done by both males and females, there are no separate wages for women. There is no practice of systematic spending or savings by the brick labourers.

The social issues of brick making are mainly linked to workforce. They may be envisaged as two different categories based on the scale of operation: kiln owned by the brick making community and community engaged as laborers. Open clamp kilns may be owned and operated by small producer brick-making communities. These communities live in permanent settlements and partly earn their living through selling bricks. Alternatively, large brick producers employ labour on contract which is paid against completion of specific tasks such as provision of cords of firewood, molding of 1000 bricks, loading and off-loading of 1000 bricks etc. Brick workers are mainly migratory populations moving in families. Shelter may or may not be provided by the entrepreneur (Development Alternatives, 2005)

Tight profit margins in the brick market coupled with rising costs of fuelwood result in poor remuneration for majority of brick workers and deterioration in the quality of life. The firemen work under severe conditions of heat, dust and pollution (Development Alternatives, 2005) There are no avenues for brick workers to acquire new and upgraded skills. Sometimes, children accompany their parents to the work place instead of attending school. During holidays students (who may be less than 18 years of age) also participate in brick production to raise money for their needs. Nearly all brick producers in the study area defecate openly and this is a major environmental and health concern. The reason for this is the lack of change in behavioral patterns in favour of using enclosed spaces for defecation. Thus, there is no provision of toilet facilities at the brick sites.

Burnt bricklaying has significant positive impact on poverty alleviation, job creation, and income generation in Benue State, Nigeria. Average annual incomes, number of children sponsored in school and health facility patronage significantly and positively influence the poverty status of Brick producers in Benue State. (Ogburabor, 2013).

Surely, competition for wood within a region is an important factor when considering a wood-using facility. This is particularly an issue for existing small-diameter wood-using industries such as burnt brick industries. From an economic perspective, however, an increase in competition should drive the price of wood higher, which could encourage more forest landowners to plant trees for future feedstock needs. And while woody biomass is a new and potentially revolutionary forestry product, there are many additional uses and benefits of forests, including recreation, timber, paper production, and wildlife habitat. Communities must prioritize local economic, ecological, and social needs and values regarding forest use and decide how to allocate forest resources. Wood bioenergy is typically grown in proximity to where it is used, therefore, community members may be more aware of their energy source and thus, more cognisant of how they use it. With more communities

working toward self-sufficiency through diverse economies, locally grown food, and thriving infrastructure, locally produced energy can provide yet another way for communities to be self-reliant.

Crude techniques used in brick-making cause considerable worker drudgery. For example, manual brick moulders are exposed to high concentrations of dust and the sun for long hours. There is also the risk of exposure to open fire during manual feeding of the kiln with fuel wood. They are also exposed to high concentrations of respirable suspended particulate matters (RSPM), during monitoring and regulating the fire. Transportation of green and fired bricks by head load on a regular basis causes health problems, especially in women. Sadly, the exposure of the brick workers to these occupational hazards is never covered by any sort of insurance or medical facilities.

The use of woody biomass for burnt brick production and other products also creates concerns about aesthetics and health. Smoke and dust from brick sites can be hard to contain, both of which aggravate nearby residents. Also, since wood typically is transported by trucks, many small-scale wood-powered facilities may require increased truck traffic. This can create concerns about noise, safety, road and traffic issues. There is also public concern about the visual impacts that wood harvesting can leave. While these issues may seem less important to some people than those that directly affect health and economics, they can dramatically influence public opinion about fuelwood use in industrial production..

Koenig (1990 and 1993) noted increases in incidences of asthma and other respiratory diseases and declines in lung function among children exposed to woodsmoke. Lung-function declines were especially great during wintertime wood burning periods and in children who lived in smoke trapping valleys. As much as 90 percent of the winter particulate levels were produced by wood burning. Zelikoff (1994) found that rats suffered significantly lower rates of lung bacterial clearance and lung phagocytic (ie. microbe killing) activity when exposed to wood smoke at concentrations typically found indoors during residential wood burning period.

Brick production results in conversion of large areas of fertile, agriculturally productive land into brick production. Mining areas of East Konga in Iceland witnessed loss or reduction of farmlands as a major impact of gravel mining (Musah and Kjorn, 2007). Other significant impacts of gravel mining in the area were: pits serving as breeding grounds for mosquitoes and spread of other diseases, erosion and loss of vegetation, loss of economically important trees, as well as roots of conflicts. In Ratnapura district, Sabaragamuwa province of Sri Lanka (Sri Lankan Net Water Report, 2010) like many other minerals sand has become a scarce resource due to high demand for construction and developmental activities

Using woody biomass for energy production in the burnt brick industry affects air quality, land use, forest health, and other natural resources in different ways and at different intensity levels. Implementation of a woody biomass production and utilization plan has both environmental costs and benefits. The costs and benefits should be compared to those of other energy options, such as fossil fuels for industrial products. It is envisaged that the growing demand for wood, especially for energy production, will lead to rampant harvesting and removal of forests around brick sites. Certainly, competition for wood and long-term supply within a region is an important factor to consider when thinking about using woody biomass. Using wood for energy and in new, emerging markets may allow landowners to maintain their forests rather than sell their land for development. Working forests provide environmental benefits such as soil protection, clean air and ground water, carbon sequestration, and wildlife habitat.

CONCLUSION

Low or poor operating capital appeared to be the most important challenge to burnt brick producers in Benue State. Other important challenges identified were : Increasing scarcity of preferred fuel wood species, Increasing cost of procuring fuel wood, Poor prices of bricks during production season, Seasonality and scarcity of skilled/migrant labour, Absence of collaterals for loans from banks, Dearth of mechanisation/ drudgery in operations, Lack of government assistance/recognition, Poor infrastructure (bad roads, lack of health facilities etc), Seasonality in operations which reduces income, and Degradation of agricultural land.

RECOMMENDATIONS

1. To drastically reduce the volume of fuel wood used in burnt bricks production, there is need to use modern kilns which utilise fossil fuels (like the Otukpo Burnt Bricks Industry in Benue State Zone C Senatorial District which used fossil fuel (but is presently out of production) needs urgent revitalisation.
2. There is need for afforestation programmes at degraded bricks sites using mainly the fuel wood tree species preferred for brick burning
3. There is need to protect buffer strips (vegetation) around water bodies adjoining brick sites to stem soil erosion, future water shortages and erosion of genetic integrity of flora species around brick sites
4. The Federal and State Governments should enact and enforce laws regulating burnt bricks production
5. Stringent requirements for collaterals by banks need to be relaxed to enable brick producers to have access to operational capital.
6. The challenge of poor infrastructure, especially access roads and transportation services should be addressed by the Federal, State and Local governments, communal efforts, the organised private sector

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