

Assesment of Adobe Brick Making as a Source of Livelihood in Gombe State, Nigeria

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Abstract:- This research was inspired by the work of Ahmad and Zarma (2017) where the authors listed brick making as a source of livelihood resource that is found in Morom river basin of Gombe state. The work therefore picked interest on Adobe brick making as a source of livelihood for people residing not only within the basin, but far and near the river basin who uses brick making as a source of livelihood. The bricks were made from materials sourced locally like by sand, clay, water, and organic material such as sticks, straw and manure. Adobe bricks are being made for construction of houses, barns, silos and animals stable in the rural, urban and recreational buildings. The objectives of the study among others were to identify environmental resources used in adobe bricks making within the study area; to identify different value chains and types of brick making and to assess the livelihood impact of brick making on producers. Data was collected from two hundred respondents through interview describes the environmental resources used as materials for bricks making, economic activities related to brick production, and the economic impacts of brick production to the producers. Result from chi-square test conducted revealed that adobe brick production in Gombe state significantly contributes positively to the livelihood of the people engaged in economic activities within the brickyards.

Keywords:- Adobe, Brick, Brickyard, Livelihood, Gombe.

I. INTRODUCTION

For many years, adobe bricks have been the major source of building and construction material in the world. The history of adobe brick and brick making goes back to early years in the civilization of human race. The bricks were made from materials sourced locally like by sand, clay, water, and organic material such as sticks, straw and manure. After molding the wet mud are simply placed in the sunlight to dry and for hardening. As building for shelter, industrial, roads and other uses grow, bricks making became a lucrative business. Due to economic meltdown, sourcing bricks materials locally intensifies in order to minimize cost of production thereby, rising the economic status of brick producers. Bricks are made in different shapes and sizes depending on the structure it is intended to be used. Adobe bricks are being made for construction of houses, barns, silos and animals stable in the rural, urban and recreational buildings. Adobe bricks are used in the construction of

ovens in bakeries, and renovation of artifacts, city walls and museums.

This research was inspired by the work of [1] where the authors listed brick making as a source of livelihood resource that is found in Morom river basin of Gombe state. The work therefore picked interest on Adobe brick making as a source of livelihood for people residing near or far from river basin as a source of livelihood that is practiced not only by rural people but urban settlers as well. Brick making business is so popular that apart from what is mentioned above, it is practiced as small scale business carried out by only two workers using simple tools (frames) as well as large scale business venture by construction companies using sophisticate molding and ramming machines to produce millions brick in less than a week. Brick making is a venture practiced in developing as well as developed societies of the world. Adobe bricks are major components of many constructions that provide the needed architectural design, shape and stability. Adobe is a natural building material made from sand, clay, water and some kind of fibrous or organic material (sticks, straw and or manure), which the builders shapes into bricks using frames and dry in sun. Adobe buildings are similar to cob and mud brick buildings. Adobe structures are extremely durable, and account for some of the oldest existing building in the world. In hot climates, compared with wooden buildings offer significant advantage due to their greater thermal mass, but they are known to be particularly susceptible to earthquake damage. Buildings made up of sun-dried earth are common in the West Asia, Northern Africa, West Africa, South America, Spain, Eastern Europe and East Anglia [2].

There are numerous literatures on brick production processes. However, there is minimal research concerned with adobe brick production as a source of livelihood in Gombe state.

A research done by [1] on Gombe mountain as a source of livelihood, looks at other environmental resources other than mountains – in this case clay soil- that is being used to mold bricks of various types equally present a means of survival to the people in Gombe where the resource is available in abundance. This study is therefore aimed at assessing the economic activities been carried out on brickyards and adobe brick production as a source of livelihood in the study area. The study also wants to find out whether these activities undertaken by the people have

significant relationship to their livelihood. These can be achieved through the following objectives.

- To identify environmental resources used in adobe bricks making within the study area.
- To identify different value chains and types of brick making.
- To assess the livelihood impact of brick making on producers.
- To identify problems faced by bricks making industries.

II. LITERATURE REVIEW

Mud construction is as old as man's attempt to build home and cities, which dated back to about 10,000 years. Consequently, construction in earth was developed independently in all the main cradles of civilization the banks of the Nile, the Indies and the Hwango [3]. Building materials such as clay and mud require only man's effort to make a structure from them and as a result, people in this planet live in buildings made from earth [3]. About 30 per cent of the world population (or nearly 1,500,000,000) live in home of unbaked earth, roughly 50 per cent of the population of developing countries, the majority of rural populations and at least 20 per cent of urban and semi-urban populations live in mud homes [3]. Moreover, mud house is a term that is used interchangeably referring to buildings constructed by using adobe bricks which can either be fired or sun-dried and it could also refer to a house built using cob architecture. Buildings made up of sun-dried are common in Africa and other parts of the world [2].

According to [4], adobe bricks are blocks of earth produced manually by throwing wet earth into a framework. It is natural building material made from sand, clay, water, and some kind of fibrous or organic material (sticks, straw, and/or manure), which the builders shape into bricks using frames [5] and will harden when dried or fired [6]. Adobe structures are extremely durable, and account for some of the oldest existing buildings in the world [5]. In countries with high demand, adobe bricks are produced mechanically in commercial brick yards or there is the option of hiring a brick making machine to make adobes on site [7].

In Nigeria, adobe brick construction has been a popular option since pre-colonial era. There is virtually no ethnic group that does not have a traditional type of earth building [3]. Most of these houses are constructed using adobe bricks or cob. They are low-cost building, suitable to both tropical and sub-tropical climatic conditions, aesthetically attractive and eco-friendly [3]. High cost of building materials, poverty, increase in population, poor access to mortgage and high rate of urban migration has been compelling people to go for cheaper alternatives, hence uncovering opportunities for teaming youths to venture into adobe brick making as their livelihood source. In Gombe state, adobe materials are found around Gombe mountains, Liji-Kashingi laterite soil, clay soil along Kashere-Pindiga road, Maina-Boye, Bye-pass, Yamaltu-Deba Lithosol and Eutrophic brown soils along the Gongola River that extends from Dukku to Balanga local government areas. Straws,

animal dungs and water used as binding materials in making adobe bricks are available everywhere within the state.

Originally, the word livelihood meant nothing but "occupation" or "employment", that is, a way of making a living. More recently, the meaning of the term has expanded to include broader system that encompasses the economic and other attributes. Within these livelihood systems various factors have an effect on the strength, resilience and vulnerability of people's way of life. These may be their assets, their work and other cultural activities and factors that help people get access to these assets and activities [1].

Globally, clay has a wide occurrence in Nigeria, clay is widely distributed though not always found in sufficient quantity or suitable for modern industrial purposes. More than 80% clay deposits have been reported from all parts of the country. For instance, clay deposits occur in abak, akwa ibom state, uruove near Ugehelli in Delta state. Ifon in ondo state, Gombe in Gombe state, Umuahia in Abia state, Dangara in Niger State, Onitsha in Anambra state and Aloji, Udane Bioni, Agbenema and ofe jiji all in Kogi State [9].

III. THE STUDY AREA

Gombe town is located between latitudes 10° 15' N to 10° 20' N and longitudes 11° 10' E and 11° 19' E. It is the capital of Gombe State and occupied an area of about 45km². The climate of Gombe is characterized by a dry season of six months, alternating with a six months rainy season. The mean annual precipitation is 835 mm and the mean annual temperature is about 26°C whereas relative humidity has same pattern being 94% in August and dropping to less than 10% during the harmattan period [8]. The area of study includes Liji, Maina Boyi and Bye-pass brickyards which are located within the Geologic unit of Gombe state which consists of limestone, sandstone, shale and clay [10].

IV. MATERIALS AND METHODS

The data acquired for this study include data describing the environmental resources used as materials for bricks making. These were collected from literature and interviews conducted with block industry owners and laborers; data describing other economic activities (transporters and hawkers) related to brick production. Information on this was obtained from questionnaires interviews conducted at bricks industries and brick making sites; data describing brick production as a means of livelihood of the people in the study area. These data were sourced to understand the economic impacts of brick production to the producers. Information from this was sourced from individuals at different value chain of brick making.

The information studied involved the inventory of bricks provided by each respondent, income derived from brick productions as a livelihood sources and other economic activities as a result of brick production within the study areas.

Sample selection

A total of 200 respondents were selected and interviewed by the authors at production sites. Purposive sampling techniques were used in this study. Respondents comprise of brick makers, water vendors, hawkers and transporters that were found at the production sites and who have been in adobe brick making for three years. This was adopted to ensure only those respondents who have taken bricks making as source of livelihood were included in the

interview. Results of the interview were analyzed as follows:

V. RESULTS AND DISCUSSIONS

Demographic Data

Demographic data was obtained from 200 respondents within the 3 brickyards. Data collected include age, gender, education, level of income and marital status.

Table 1: Demographic characteristics of respondents.

| Data | Frequency | Percentage | Marital status | Frequency | Percentage |
|------------|-----------|------------|----------------|-----------|------------|
| Gender | | | | | |
| Male | 185 | 92.5 | Single | 130 | 65.0 |
| Female | 15 | 7.5 | Married | 70 | 35.0 |
| Total | 200 | 100 | Total | 200 | 100 |
| | | | Age | | |
| Education | | | 18-25 | 60 | 30.0 |
| Primary | 65 | 32.5 | 26-33 | 95 | 47.5 |
| Secondary | 60 | 30.0 | 34-41 | 35 | 17.5 |
| Non-formal | 75 | 37.5 | 42-49 | 10 | 5.0 |
| Total | 200 | 100 | Total | 200 | 100 |

The demographic data collected on gender revealed that 92.5% are males which constituted the highest percentage of the population, while 7.5% were females of which mostly are hawkers.

In the age category, the data distribution revealed that those from 26-33 age categories constituted the highest number at 47%, 18-25 at 30%, 34-41 at 17% and 42-49 at 5% respectively.

Of the 200 respondent interviewed on marital status, the result showed that exactly 65% are single, while 35% are married. This corroborate with earlier findings on age distribution where age group of 18-33 constitute the highest number of participants in the brick industry.

The educational characteristics of the respondent revealed that 32.5% attendant primary school, 30% attended secondary school, while 37.5% attended non-formal education at various traditional Islamic schools.

Economic activities of the study area

Figure 1 shows the economic activities that were carried out in the brickyards. The results from the study revealed that brick producers constituted 67.5% of the activities which formed the bedrock of the overall economic activities. Moreover, 15% of the respondents engaged in transportation of bricks as their livelihood source of income to clients from various locations within Gombe for construction purpose. Hawkerc and water vendors constituted 10%, 7.5% respectively.

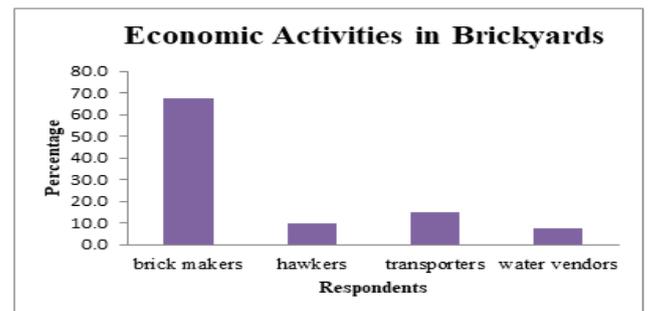


Figure 1: economic activities of brickyards

Income levels of respondents

Using the minimum wage of Gombe state civil service of N30, 000 per month on GL 1-15 as a yardstick, the research discovered that more than 80% of the respondents earn above the stipulated minimum wage from the livelihood activities engaged in the brickyards, while less than 15% earn between N10, 000-N40, 000 per month as show in table 2 below.

Table 2: Minimum wage and Income levels of respondents

| SN | Income (N 000) | Frequency | Percentage |
|----|----------------|-----------|------------|
| 1 | 10-40 | 30 | 15.0 |
| 2 | 41-71 | 55 | 27.5 |
| 3 | 72-102 | 20 | 10.0 |
| 4 | 103-133 | 15 | 7.5 |
| 5 | 134-164 | 10 | 5.0 |
| 6 | 165-195 | 15 | 7.5 |
| 7 | 196-126 | 5 | 2.5 |
| 8 | 127-157 | 5 | 2.5 |
| 9 | 158-188 | 20 | 10.0 |
| 10 | 189-219 | 10 | 5.0 |
| 11 | 220-249 | 15 | 7.5 |
| | Total | 200 | 100 |

Table 3: Chi-Square table for the respondents' income

| SN | Income | O | E | O-E | (O-E) ² | (O-E) ² /E |
|----|---------|-----|-------|--------|--------------------|-----------------------|
| 1 | 10-40 | 30 | 18.18 | 11.82 | 139.67 | 7.68 |
| 2 | 41-71 | 55 | 18.18 | 36.82 | 1355.58 | 74.56 |
| 3 | 72-102 | 20 | 18.18 | 1.82 | 3.31 | 0.18 |
| 4 | 103-133 | 15 | 18.18 | -3.18 | 10.12 | 0.56 |
| 5 | 134-164 | 10 | 18.18 | -8.18 | 66.94 | 3.68 |
| 6 | 165-195 | 15 | 18.18 | -3.18 | 10.12 | 0.56 |
| 7 | 196-126 | 5 | 18.18 | -13.18 | 173.76 | 9.56 |
| 8 | 127-157 | 5 | 18.18 | -13.18 | 173.76 | 9.56 |
| 9 | 158-188 | 20 | 18.18 | 1.82 | 3.31 | 0.18 |
| 10 | 189-219 | 10 | 18.18 | -8.18 | 66.94 | 3.68 |
| 11 | 220-249 | 15 | 18.18 | -3.18 | 10.12 | 0.56 |
| | Total | 200 | | | | 110.75 |

A chi-square test was conducted as shown in table 3 above to test the significance of the respondents' activities and their level of income. The research revealed that the calculated value (110.75) is greater than the chi-square distribution value at (0.001) = 29.588 and at (0.01) = 23.209 confidence levels. Thus, the research rejects the null hypothesis (H_0) and accepts the alternative hypothesis (H_1) which states that there is significant relationship between the respondents' livelihood and their levels of income.

VI. SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

This study has revealed how adobe brick production serves as a means of earning livelihood for the producers and other participants within the brickyards. A significant number of respondents earn more than the state public service minimum wage as their income. The study found out brick makers, transporters and water vendors formed the bedrock of all the economic activities within the brickyards. The minimum wage and income level data shows that the majority of the participants earn more than the minimum wage as their income. Hypotheses tested revealed that adobe brick production in Gombe state significantly contributes positively to the livelihood of the people engaged in economic activities within the brickyards.

Conclusion

Adobe brick production provides great economic opportunity to people within the study area irrespective of age, gender and educational background. thus, from the findings of the study the following conclusions are drawn:

- Many youth within the study area depend on the brickyards as a means of earning a living.
- Hypothesis testing revealed a significant relationship between what is been produce from the brickyards and peoples' source of livelihood.
- Majority of the people who engaged in economic activities on the brickyards earn more than the nation's minimum wage.

Recommendations

The following recommendations are proposed:

- Governments should propose permanent sites, shades and water reservoirs for production of bricks.
- Governments should play their role as agents for local economic development by supporting these entrepreneurs to formalize their businesses and by giving business-friendly services and helping to empower them.
- Training should be given to brick makers to improve their outputs.
- Conduct a comprehensive environmental inventory of the area with view to develop those resources.
- A policy should be formulated to ensure strict adherence to safety precautions and the use of safety equipments.
- First aids facilities should be readily made available at brickyards.
- Government should provide security out-post to avert criminal activities.

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