

SURVEY OF TREE SPECIES USED FOR FARM AND HOUSEHOLD IMPLEMENTS BY BLACKSMITH IN GIREI LOCAL GOVERNMENT AREA OF ADAMAWA STATE, NIGERIA

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Abstract

The study examined the tree species preference used by blacksmith for the production of farm and house hold implements in Girei Local Government Area of Adamawa State, Nigeria. Simple random sampling technique was adopted in collecting data. Five (5) wards were randomly selected out of the fifteen (15) wards in the LGA, and, ten (10) blacksmiths operating in each wards, questionnaire were administered to them. Data collected were analyzed, using descriptive and inferential (regression analysis) statistics. The results showed that, the male (96%) dominated the profession and their age fell within 36 - 45 years. Most (62%) of the respondent were married and 40% have primary education. The most preferred tree species used by the Blacksmiths in the study area for the production of farm and household implements are *Tamaridus indica*, *Balanites aegytiaca* and *Prosopis africana*. The regression analysis results revealed that household size and age are positively correlated and had significant effect on the income of the Blacksmiths income. The major constraints associated with blacksmithing in the study area are lack of access to loan, materials and labour. It was recommended that Government should provide loans at an affordable rate to the blacksmith in the area, in order to boost the production of farm and household implements in the study area.

Keywords: Blacksmith, Production, Tree Preference, and Implement

Introduction

Wood, a fibrous rigid material of plant origin is broadly classified as hardwood and softwood. Hardwood is derived from angiosperm or broad-leaved trees such as Iroko (*Meliaceae excelsa*), Lagos Mahogany (*Khaya ivorensis*), Obeche (*Triplochiton scleroxylon*), Opepe (*Nauclea diderichii*) and Danta (*Nesogordonia papaverifera*) among others hardwood timbers are mainly used for structural application because of their high strength and durability. Softwood is obtained from coniferous trees, which have needle-like leaves. Examples of softwood trees are: Scots pine (*Pinus sylvestris*), Norway spruce (*Picea abies*), and Douglas fir (*Pseudotsugamenziessii*). In some cases softwood is also used for constructional purpose, but it is preferred to hardwood in pulp and paper production (Ezeadichie, 2003)

The current global economic meltdown has had its devastating turn on Nigeria as a nation, biting hard on organizations, businesses, families and homes. The frantic search for alternative resource of national

revenue aside oil has become imperative for economic emancipation of the lots of Nigerians. Agriculture, forestry and technology including blacksmithing offer an unexploited succor capable of salvaging the people from abject poverty. Creating renewed awareness and practice of blacksmith in the rural setting would go a long way in eradicating global economic challenges and create a self-reliance enterprise that will help reduce the hardship, unemployment and other social vices associated with it (Atteh, 1992). However, the blacksmith sector in Nigeria is rudimentary and not well explored due to the high technical manpower requirement and neglect of artisans from successive government over the years. The industry is fading away like all other artisans and crafts as well as small and medium enterprises native to the country. However, blacksmith has direct, meandering and multiplier impacts on agricultural and technological development and it is one of most crucial sectors that advanced technological development in the world. For example, prior to the industrial revolution in developed countries,

a village smithy was a staple of every town (Ezeadichie, 2003). However, factories and mass-production reduced the demand for blacksmith made tools and hardware. As demand for their products declined, many more blacksmiths augmented their incomes by working as shoeing horses. With the introduction of automobiles, the number of blacksmiths continued to decrease, many former blacksmiths becoming the initial generation of automobile mechanics (Obikwelu, 1999).

The developed nations saw a decline and re-awakening of interest in blacksmithing, many developing nations' particularly, Nigerian blacksmiths have not advanced the frontier of technological development and continued doing what blacksmiths have been doing for decades. These include making and repairing iron, steel and agricultural tools and hardware for people in their local areas.

Blacksmith is vocational sector that requires competency, strength and physical conceptualization. In other words, a blacksmith is a metal smith who creates objects from wrought iron or steel by forging the metal, using tools to hammer, bend, and cut (David and Bernhard, 1993). The "black" in "blacksmith" refers to the black fire scale, a layer of oxides that forms on the surface of the metal during heating. The word "smith" was also derived from an old word, "smite" (to hit). Thus, a blacksmith is a person who hits black metal (Bealer, 1996). Therefore, blacksmith turns various reagents mostly metals, into agricultural implements, plate armor, local weapons, and some utility items. In addition, they produce objects such as gates, grilles, railings, light fixtures, furniture, sculpture, tools, decorative and religious items and cooking utensil. Suffice to note that blacksmith is recognized as one of the veritable weapons that can assist underdeveloped countries including Nigeria to achieve anti poverty Millennium Development Goals (MDGs). Essentially, blacksmith can have profound impact on the society particularly the youth, economy, agricultural and technological advancement. Socially, one of the most immediate benefits of blacksmith is its ability to create both skilled and unskilled employments. Blacksmith is a technologically inclined trade, which has the potential to create more jobs per unit of investment than any other artisan and can significantly cater for the

employment of technical incline youth and adult alike.

The technological breakthroughs recorded by blacksmiths industries was a function of sustainable forest management thus resulted into sustainable wood utilization in the country. Blacksmith is an ancient indigenous technology, which is the progenitor of various metal and wooden forging operations in use today and can be found virtually in all major cultures of the world (Oke and Aderoja, 2000). In Nigeria today, blacksmith processes still remain subsistence, primitive and rudimentary and is hardly employed as a viable means of commercial production of metal wares (Thomas, 1980). For long, particularly, during the pre-colonial era and even now, some of Nigeria local blacksmith are traditional producer of simple tools such as cutlasses, knives, head pans, diggers, machetes and many features and devices of primarily used for agricultural production. Other items produced through blacksmithing processes are domestic products, which include; kitchen wares, cooking utensils, basins, pails, which have found application in various homes. However, some blacksmith are involved in the production of industrial products, which include hammer heads, keys, chisel punch, bolts and nuts. The forge product of blacksmithing is also very important and highly demanded by those in the construction industry (RMRDC, 2000).

Therefore, this study is aimed at evaluating tree species preference used by blacksmiths for production of farm and household implements in Girei Local Government Area of Adamawa state.

Methodology

Study Area

This study was carried out in Girei local Government Area of Adamawa State, Nigeria. The state occupies about 36,917 square kilometers of land. It is bordered by Song and Maiha, Demsa and Yola south and Fufere local government areas to the north, south and east respectively. Its eastern border also forms an international border with Cameroon Republic. Topographically, it is a mountainous land crossed by the large river valleys (Benue, Gongola and Yedsarem). The state lies between Latitude 8.00° N and 11.00°N and Longitude 11.50° E and 13.50° E. The State is characterized by many rivers; the major one is the River Benue whose source is from the highlands of the Cameroon and flows

southwards to join the River Niger. The climate of the state is characterized by wet season from April to October, while the dry season lasts from November to March. The average rainfall for the State is 79mm in the Northern parts and 197mm in the Southern parts. The wettest months are August and September. The mean annual temperature is around 28°C. There is also, the harmattan period (December to February), when the dusty-laden North-Easterly trade winds from the Sahara desert imposes annual marked effect on the states climate. The period is cold and dry with an average range temperature ranges from 15.2°C - 39.7°C (Adebayo, 2004)

Also, there are two notable vegetation zones in the State (the Sub-Sudan zone and the Northern Guinea Savannah zone). The Sudan Zone is marked by short grasses and short trees, commonly found in the Northern parts of the State, while, the Southern zone vegetation is characterized with thick tall grasses and trees.

Study Design

Prior to the commencement of the study, a reconnaissance survey was made to the study site to identify the tree species used by blacksmiths, their workshop and materials being produced. Also, information on how the blacksmith converts the tree/wood species to different uses and or shapes was obtained from the preliminary observation.

Simple Random Sampling technique was adopted for this study, in which five (5) wards were randomly selected out of the fifteen (15) wards and copy of the structured questionnaire was administered to ten (10) blacksmiths operating in the selected five (5) ward, which comprises of the fifty (50) respondents used for these study.

Data collection

Information on the blacksmith bio-data and the types of wood/tree species used for production of farm implements was obtained through a well structured questionnaire. In addition, Participatory rural appraisal techniques were also adopted in extracting information from the respondents.

Data Analysis

The data obtained in this research was analyzed using both Descriptive and inferential statistics using, Statistical Package for Social Sciences (SPSS) version 20.

Results and Discussion

Socio-economic Characteristics

The socio-economic characteristics of blacksmith considered for this study were Gender, Age, marital status, Educational attainment, household size, occupation, and average monthly income generated from other jobs.

The results of this study indicates that majority (96%) of the respondent were male, while only 4% were females. This means that, Blacksmith as a profession is more a man's job. This could be as a result or attribute to the laborious nature of the job.

Age brackets of the respondents show that, majority (42.0%) are within the age of 36-45 years While 20.0% are within the age of 15-25 years. This is in accord with Oke (2007) that older people are likely to engage in Blacksmith as a source of income compare to younger counterpart, (Table 1).

It was revealed that, 62.0% of the respondents were married while, 1% is widow. This show that most of the Blacksmith in the study area are responsible people who mostly take advantage of family labour to minimize the cost of producing farm and household implements. Findings are in line with (Oladimeji, 2013) on the household size that, the average number of persons per Blacksmith was approximately 7 with 6-10 children as show household size model class.

The educational status of the respondents (Table 1.) showed that 40.0% attended primary school while 8.0% attended tertiary institution. Result also indicated that 44.0% of the respondents had household size ranges between 9-12, while, 4.0% of the respondents had house-hold size above 12 persons. This means that many of the respondents had a large number of household size in the study area. This agrees with Olademeji (2013) that most blacksmith in rural area have large household size of which majority of the household member contribute to the economic growth of the business. The average monthly income generated by the respondents varies between N15, 000 – N30, 000. This implies that Blacksmith is a lucrative profession, while, 8.0% attended tertiary institution.

Table 1: Socio-economic characteristics of the respondents

Variables	Frequency	Percentage (%)
Gender		
Male	48	96.0
Female	2	4.0
Age		
15-25	10	20.0
26-35	10	20.0
36-45	21	42.0
Above 45	9	18.0
Marital status		
Married	31	62.0
Single	14	28.0
Divorced	4	8.0
Widow	1	2.0
Educational attainment		
Primary Education	20	40.0
Secondary education	14	28.0
Tertiary education	4	8.0
Informal education	12	24.0
Religion status		
Christian	20	40.0
Muslim	24	48.0
Traditionalist	6	12.0
Household size		
1-4	16	32.0
5-8	22	44.0
9-12	10	20.0
Above 12	2	4.0
Primary occupation		
Blacksmith	28	56.0
Farming	10	20.0
student	12	24.0
Secondary occupation		
Blacksmith	28	56.0
Farming	17	34.0
Trading	2	4.0
Artesian	1	2.0
Average monthly income		
#15,000 – #30,000	17	34.0
#31,000 – #45,000	24	48.0
#46,000 – #60,000	8	16.0
Above #60,000	1	2.0

Source: Field Survey, 2015

Source of Materials and Socio-economic Benefits

The results (Table 2) showed that 80.0% of the respondents obtained wood for Blacksmith purpose from the forest while 10.0% get wood used for Blacksmith purpose

From the questionnaire administered, the most commonly tree species used by the Blacksmith are, *Tamarindus indica*, *Prosopis africana* and *Balanites aegyptiaca*. The results of Table 2 showed that 38.0% of the respondents preferred using *Tamarindus indica* for blacksmith purpose while, 2.0% preferred using *Annogeisus leocarpus*. From the result of Table 2, it was revealed that 76.0% of the respondents stated that, they preferred the species listed above due to their strength and durability, while 6.0% of the respondents stated that it was due

from sawmill and timber constructor. The result of the study also revealed that majority (84.0%) of the respondents (84.0%) used hardwood for blacksmithing purpose while, only 2.0% used plywood for blacksmithing

to availability of the species. From the result in Table 2, 76% of the respondents stated that the reason they preferred the earlier listed tree species is due to strength and durability, while, 6% said it was due to availability of the species. Also, in Table 2, 76.0% of the respondents prefer producing farming implement/tools while 2.0% of the respondents produce mainly bows and arrows. In addition, the result of Table 2, it was revealed that 76.0% of the respondents sold farm tools better than any other tools while 6.0% sold decorative tools

better. In term of income generation, the results revealed that, 44.0% of the respondents generate average monthly income between ₦1,

000 – ₦ 20, 000, while, 18.0% of the respondents generated average monthly income between ₦ 41, 000 – ₦ 60, 000.

Table 2: Distribution of Respondents According to Source of Materials and Socio-economic Benefits

Variable	Frequency	Percentage (%)
Source of wood		
Forest	40	80.0
Sawmill	5	10.0
Timber construction	5	10.0
Species preferred		
<i>Tamarindus indica</i>	19	38.0
<i>Balanites aegytiaca</i>	6	12.0
<i>Pilostigma reticulatum</i>	5	10.0
<i>Prosopis Africana</i>	6	12.0
<i>Terminalia laxiflora</i>	2	4.0
<i>Neuclea latifolia</i>	3	6.0
<i>Annogeisus leocarpus</i>	1	2.0
<i>Mansonia altissrma</i>	4	8.0
<i>Melicia excelsa</i>	4	8.0
Preferences		
Because it is cheap	5	10.0
Because it is available	3	6.0
Straight & durability	38	76.0
Flexibility	40	8.0
Tools produced		
Farm tools	38	76.0
Kitchen tools	7	14.0
Decorative tools	4	8.0
Bows and arrow	1	2.0
Tools sold better		
Farm tools	38	76.0
Kitchen tools	9	18.0
Decorative tools	3	6.0
Monthly income		
₦1,000 – ₦20,000	22	44.0
₦21,000 – ₦40,000	19	38.0
₦41,000 – ₦60,000	9	18.0
Satisfaction (Blacksmith as a work)		
Yes		
No	43	86.0
	7	14.0

Source: Field Survey, 2015

Accessibility to Capital

The results on accessibility to capital (Table 3.) revealed that 38.0% of the respondents had access to bank loan, while, 62.0% of the respondents do not. Also, majority (58.0%) of the respondents do not belong to any association or co-operative while, 42.0% of the respondents belong to one or two association or co-operative. Belonging to an association is an advantage to have access to loan by the member.

About 38.0% of the respondents derive no assistance from the government, while 4.0% of the respondents indicated that they derive assistance from the government through access to the government loan (Table 3). The high percentage of 58% exhibited by the respondents on benefit derived from an association and assistance from the government was as a result of lack of collateral for securing the loan.

Table 3: Distribution of respondents according to accessibility to capital

Variable	Frequency	Percentage (%)
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Accessibility to bank loan		
Yes	19	38.0
No	31	62.0
Belong to association/co-operative		
Yes	21	42.0
No	29	58.0
Benefit derived from belonging to an association		
Access to loan		
Access to cheap material	10	20.0
Access to labour	8	16.0
None	1	2.0
No responses	2	4.0
Assistance derive from government		
Subsidy on raw material	29	58.0
Access to govt. loan	4	8.0
Provision of equipment	2	4.0
None of all	4	8.0
No response	19	38.0
	21	42.0

Source: Field Survey, 2015

Regression analysis result

Linear regression equation was used to test variable such as; sex, age, marital status, religion, household size, secondary occupation and type of wood species used and the average monthly income. The results of the regression analysis (Table 4) revealed that Age and household number contributed to the blacksmith average income. The coefficients of household

size and age are positively correlated, while, the household and age is significant at 5% level of significance. This indicates that the number of household size and age increases blacksmith income. This result is line with that of Oni *et al.*, 2003, which reported that increase in household size contribute to the economy growth of blacksmith business in the rural area.

Table 4: Regressed variables, Coefficients and their Fit Statistic

Variable	Coefficient	t-value	R ²	F-ratio
Sex (x1)	-0.823	-1.341	0.182	1.133
Age (x2)	0.029	0.229**		
Marital status (x3)	-0.253	-1.644		
Religion (x4)	-0.066	-0.365		
Household (x5)	0.176	1.168**		
Secondary occupation (x6)	-0.119	-0.930		
Wood species used (x7)	-0.010	-0.035		
Constant	3.008	2.887		

** Highly significant (p < 0.01)

Summary, Conclusion and Recommendation

The Research was carried out to investigate the tree species preferences used by the blacksmith for the production of farm and household implement in Girei local government area of Adamawa state. The specific objectives focused on describing the socio-economic characteristics of the respondents identifying the types of tree species used by blacksmith, assess the types of tools/material used by blacksmith. Findings of the socio-economic characteristics indicated that 96.0% of the respondents were males, 42.0% falls within 36-45. Most of the respondents (62.0%) in the study area were married and 40.0% attended primary school. 48.0% of the respondent were Muslim and about 44.0% of the respondent has an average monthly

income of N15, 000 – N30, 000, the study also shows that 84.0% of the respondents sees blacksmith as a lucrative job and 80.0% of them sourced wood from the forest.

The finding shows that age and household size are the major characteristics affecting the blacksmith income in the study area as indicated by the regression analysis results. Also, the study identified the major problems faced by the respondents, which are lack of access to loan from banks and assistance from the government.

Based on the results of this research, it was found that, men dominated the activities of blacksmith with minimum attainment of at least one educational level or the other. It is also revealed that blacksmith had been the major

occupation of the inhabitants in the study area, but also having reasonable farming experience. The major constraints associated with blacksmith work in Girei local Government area were found to be lack of access to labour and loan facilities. These problems can be alleviated and the lives of the blacksmith improved if given access to government loans at an affordable rate.

Based on the findings of this study, the following recommendations were made; That blacksmiths in the study area should be given adequate training using community base on informal education, to enable them imbibe mechanized blacksmithing techniques and acquired materials inputs that will translate into

reasonable quantity and quality products, this will ensure proper understanding of modern equipment's and adopt technology capable of increasing not only the profitability of the blacksmith enterprise but also make efficient use of resources.

Establishment of blacksmiths co-operative association for annexing financial aids, marketing, information and inputs from government and non-government organizations through poverty alleviation Agencies.

Creating a market channel that will take care of commensurate price for products of blacksmith enterprise.

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