



## PERCEIVED EFFECT OF BUSH BURNING ON HOUSEHOLDS LIVELIHOOD SECURITY IN AGAIE LOCAL GOVERNMENT AREA OF NIGER STATE, NIGERIA

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### ABSTRACT

*This study was to determine the effect of bush burning on household's livelihood security in Agaie Local Government Area of Niger State. Multi-stage sample technique was used to select 130 respondents in the study area. Data was collected through the use of interview scheduled with the aid of well-structured questionnaire and analyzed using descriptive and inferential analysis. The study revealed that the agricultural activity was the major occupation of the respondents in the study area. Also, the level of livelihood security was low with more than half (53.8%) felt the negative effect of bush burning ranging from destruction of wildlife, pollution of environment, destruction of soil texture, respiratory infection and lastly destruction of agricultural products. However, significant relationship existed between livelihood activities and livelihood security. ( $r = -0.318$ ,  $p \leq 0.000$ ). This study therefore recommends that the dwellers should be educated by extension agents on safer cultivation strategies and appropriate farming methods to be used instead of bush burning.*

**Keywords:** Bushing burn, Livelihood and Livelihood Security

### INTRODUCTION

Bush burning is one of farming practices commonly used by vast majority of farmers in developing countries where traditional farming system is been operated. This practice could be described as the process of clearing, gathering and burning of forestland for the purpose of preparing the land for crop or livestock production. According to Isah and Adeyeye (2002) in similar study on bush burning, reported that vast majority of area in savanna ecological zones are been burnt and cleared annually for cropping, hunters, and grazing condition for livestock. However, research had shown that the practice had series of environmentally problems contrary to the people believed on the benefit of the practice. Wilkinson *et al.* (2005) reported that fire as a result of bush burning could lead to change soil-microbial composition while Andersson *et al.* (2004) substantiate that fire results in abrupt physical destruction of vegetation and its related ecosystem

function. This practice of bush burning invariably results in heating and drying of the soil and destroying the ecosystem of the savannah. Furthermore, bush burning resulted into major air pollutants that are emitted during bushfire and these include Carbon monoxide, Carbon dioxide, oxides of Nitrogen, and oxides of Sulphur, particulates and Hydrocarbon as a result of incomplete combustion of cellulose materials (Hamid *et.al*, 2010).

Furthermore, it has also been observed that the activities of this people sometimes determine the manner in which they engage in bush burning. This action may likely damage assets or means of livelihood of the people in the rural area. All these problems tend to directly affect the household security and have negative effect on the livelihood of the people in such area. Livelihood security has been a fundamental component underpinning the scientific discourse on sustainable development (Frankenberger and McCaston 1999, Lindenberg

2002). Food and Agricultural Organization (FAO, 1996) defined households livelihood security as adequate and sustainable access to income and other resources to meet basic needs (including adequate access to food, potable water, health facilities, educational opportunities, housing, time for community participation and social integration). Livelihoods can which range from on-farm and off-farm activities. These activities provide a variety of procurement strategies for food and cash. However, these strategies could be jeopardized in cases of disaster such as fire disaster thus, resulting in destruction of lives and properties, releasing toxic waste to the soil as well as air, if strong measures are not taken to safeguard the livelihood of the people.

The North central zone of Nigeria which is considered as the food basket of the nation is not left out of this menace as rural dwellers and hunters engage in bush fire indiscriminately. In many Local Government Area of Niger state, uncontrolled and indiscriminate bush burning has become a common and yearly practice, particularly during the dry seasons (Adetunji and Onumadu, 2005). These authors also noted that the effect of bushfire on rural livelihoods and on the ecosystem is increasingly becoming extensive and damaging. Thus, suggesting the need for a clearer understanding effect of bushfires to inform policies that will address the undesirable effects with respect to arable agriculture, rangeland and soil conservation.

Although several studies on bush burning activities have been carried out in north central zone of Nigeria, however, most of these studies were centered on the negative effect of bush burning on farmlands and soil condition of the affected area without considering the effect on livelihood as well as the livelihood security of the people. It is therefore germane to critically investigate the

perceived effect of damaged caused by bush fires on livelihood security of rural dwellers so as to resolve the problems emanating from these phenomena. It was against this background that the study intended to assess the perceived effect of bush burning activities on change in livelihood security of respondents in the study area as well as identifying the livelihood activities of the respondents in the study area and also ascertain changes in livelihood of respondents as a result of bush burning activities in the study area. The study also ascertained if there is significant relationship between perceived effect of bush burning and livelihood activities of the respondents in the area.

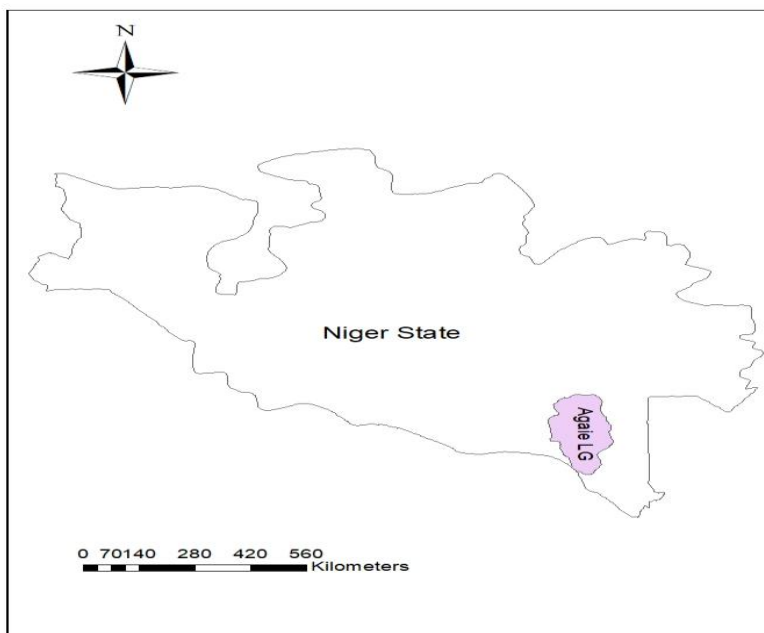
## **MATERIALS AND METHODS**

### **Study Area**

This study was conducted in Agaie Local Government Area of Niger State. Agaie is the headquarter of Agaie LGA and lies between latitude  $9^{\circ}00'30.60''$  N and longitude  $6^{\circ}19'5.56''$  E. Agaie is found in a low basin found by the valleys of one river Gbakogi, the mean annual rainfall of the town is  $1227\text{ mm}^3$  and mean monthly temperature of  $31^{\circ}\text{C}$ . The predominant tribe is Nupe with an average low representation of other tribes. The indigenous habitants are mostly Muslims. The residents are predominantly farmers and fishermen. The socio-economic status of the town is on the average as most people use pit latrines and the literacy level is averagely low. Infrastructural facilities present in the town include a government owned general hospital, electricity and pipe-borne water that is erratic in its supply like other major parts of the country.

### **Target Population of the study**

The target population was household heads or representatives in farm-households in Agaie Local Government, Niger State.



**1: Map of the Niger state showing Agaie LGA**

### Sampling procedure and Size

Multistage sampling technique was used to carry out the study. Two districts in Agaie Local Government Area of Niger State namely Kintado and Kintifi were considered for the study. There are 64 towns/villages in Kintado and 220 town/ village in Kintifi (NPC, 2006).

**First stage:** Purposive sampling technique was used to select three (3) farm household settlements in each of the districts. In Kintado, Dekdoza, Ejitigi and Jito-magaji were selected while Kapagi, Tagagi, Wanigi were selected in Kintifi district.

**Table 1: Selected Household Settlements in each District**

S/No.	Selected Settlement in each District	
	Kintado District	Kintifi District
1	Dekdoza	Kapayi
2	Ejitigi	Tagagi
3	Jito-magaji	Wanigi

**Second stage:** There are 72 household in Dekdoza, 41 household in Ejitigi, 60 household in Jito-magaji, 88 household in kapagi, 25 household in Tagagi, and 105 households in wanigi. Systematic sampling technique was used to select 24 from

Dekdoza, 14 household from Ejitigi, 20 household from Jito-magaji, 29 household from Kapagi, 8 household from Tgagi, while 35 household from Wanigi to give a total of 130 respondent to be interview from the study.

**Table 2: Sample size of Selected Districts in Selected Local Government Area**

District	Number of household	Settlement	Number of household	Selected households
<b>Kintado</b>	1	Dekdoza	72	24
	2	Ejiti	41	14
	3	Jito-magaji	60	20
<b>Kintifi</b>	1	Kapagi	88	29
	2	Tagagi	25	8
	3	Wanigi	105	35
<b>Total = 2</b>	<b>6</b>	<b>6</b>	<b>391</b>	<b>130</b>

**Total number of households selected is 130**

**Measurement of variables**

**Livelihood activities**

Livelihood activities were measured using some identified income generating (Agriculture – non Agriculture) activities. Respondents were asked to indicate their activities which was measured on 2 point scale of Yes and No. Scores of each item was summed up to obtain a composite score of livelihood activities. The lowest score was 11 and 22 were the highest score. The mean score was used as benchmark in categorizing into high and low livelihood activities such that respondents with below mean score was assumed to have low activities while those within the mean an above the mean score was categorized as having livelihood activities. The composite score was used in the hypothesis

**Change in household livelihood security scales**

Change in household livelihood security scale was adapted from CARE, (2001) who considered five main domains which include; economic security, food, health, empowerment and education. This was measured on a four point scale of improving, unchanged, decline and worse off while score of 4, 3, 2, and 1 was assigned respectively. Scores of each item were summed up to obtain a composite score of household livelihood security. The lowest score was 22 and 88 was the highest score. The mean score was used as benchmark in categorizing into high and low household livelihood security such that respondent with below mean score was assumed to have low household livelihood security while those within the mean an above the mean score was categorized as having level of household's livelihood security. The composite score was used in the hypothesis.

**Perceived effect bush burning:** Respondents were asked to respond to extent of damage caused by bush burning activities which was measured on 3 point scale of often major, minor and none. A score of 3 was assigned to often 3 to Major, 2 minor and 1 to none. 4 questions were asked ensure the high score was 12 while lowest was 4. The composite score was used in the hypothesis. The composite score was used in the hypothesis.

**Data collection**

Data was obtained using a well-structured questionnaire.

**Data analysis**

The statistical tools used for this research work are descriptive statistical tools, which include frequency table, simple percentile while the inferential statistical tool was Pearson Product Moment Correlation (PPMC).

**RESULT**

Tables 3 revealed that majority (99.2%) of the respondents were into crop farming in the study area. It was further revealed that 56.2% of the respondents are into hunting activities while 43.8% of the respondents are not into hunting as an occupation. Furthermore, 68.5% of the respondents never engage in lumbering, while 31.5% of the respondents practice lumbering operation as their livelihood activity. In addition it was further stated that the majority (54.6%) of the respondents never engage in gathering of non-timber forest product. 25.45% of the respondents are fully involved in grazing in the study area while with majority (84.6%) of the respondents never involved in petty cassava processing. It was also revealed that

majority (82.3%) of the respondents were not into livestock farming. Trading was viewed as a regular activity in the study area with majority (87.7%) of the respondents engage in petty trading while 12.3% never involved in the activity. Also, it was further

reported that 50.8% of the respondents were artisans while 41.5% of the respondents survive on income generate from hired labor job. Lastly, transportation business was reported as livelihood activity engaged by 22.3% of the respondents in the study area.

**Table 3: Livelihood Activities of Respondents in Agaie LGA**

<b>Variable</b>	<b>Yes (%)</b>	<b>No (%)</b>
<b>Agriculture</b>		
Crop Farming	129(99.2)	1(0.8)
Hunting	73(56.2)	57(43.8)
Lumbering works	41(31.5)	89(68.5)
Gathering of non-timber forest product	59(45.4)	71(54.6)
Grazing	33(25.4)	97(74.6)
Cassava processing	20(15.4)	110(84.6)
Production of livestock	23(17.7)	107(82.3)
<b>Non Agriculture</b>		
Trading	114(87.7)	16(12.3)
Artisan	66(50.8)	64(49.2)
Hired labour	54(41.5)	76(58.5)
Transporter	29(22.3)	101(77.7)

**Source: Field survey, 2018.**

From Table 4, 78.5% of the respondents reported that the income derived from their livelihood activities decreased and worse off as a result of burning of farmland. Furthermore, 71.5% of the respondents affirmed that their housing facilities remain unchanged even in the mist of bush burning activities. In terms of dwellers assets, majority (46.2%) reported that their assets are gradually declining. Also the majority (73.9%) of the respondents recorded that banking savings worse off. 89.2%, 91.5%, and 90.0% respectively of the respondents attested to the fact that household food grain stocked, affordability of food items and access to food items improved. it was revealed that majority (42.3%) of the respondents reported that access to health facility remains unchanged while

45.4% of the respondents affirmed that there is frequent respiratory infection. In addition, it was reported that 43.1%, 47.7%, 57.7%, respectively of the respondents attested that level of other disease/infection, dependency in medication; numbers of days unable to work due to sickness were worsen off in the study area. Furthermore, it was revealed that majority (42.3%) of the respondents reported that access to health facility remains unchanged while 45.4% of the respondents affirmed that there is frequent respiratory infection. In addition, it was reported that 43.1%, 47.7%, 57.7%, respectively of the respondents attested that level of other disease/infection, dependency in medication; numbers of days unable to work due to sickness were worsen off in the study area.

**Table 4: Household Livelihood Security of the Respondents in Agaie LGA**

Variable	Improved	Unchanged	Declined	Worse-off
<b>Household Livelihood Security</b>				
<b>i Economic Security</b>				
Income derived from livelihood activity	25(19.2)	1(0.8)	2(1.5)	102(78.5)
Current housing facility	34(26.2)	93(71.5)	2(1.5)	1(0.8)
Current value of asset	28(21.5)	40(30.8)	60(46.2)	2(1.5)
Bank saving rate	0(0.0)	26(20.0)	8(6.2)	93(73.9)
<b>ii Food Security</b>				
Household food grain stocked	116(89.2)	11(8.5)	2(1.5)	1(0.8)
Affordability of food items	119(91.5)	9(6.9)	2(1.5)	0(0.0)
Access to food items	117(90.0)	10(7.7)	3(2.3)	0(0.0)
<b>iii Health security</b>				
Access to health facility	8(6.2)	23(17.7)	55(42.3)	44(33.8)
Frequency of respiratory infection	36(27.7)	3(2.3)	32(24.6)	59(45.4)
Level of other diseases/infection	56(43.1)	1(0.8)	25(19.2)	48(36.9)
Dependency in medication	62(47.7)	2(1.5)	23(17.7)	43(33.1)
Number of days unable to work due to sickness	75(57.7)	2(1.5)	20(15.4)	33(25.4)

*Percentage in parenthesis*

In summary, table 5 shows that the level of household livelihood security was low with more than half proportion of the respondents (53.8%)

recorded low level while 46.2% of the respondents recorded high level of household livelihood security.

**Table 5: Level of Household Livelihood Security of Respondents in Agaie LGA**

Level	Frequency	Percentage
High	60	46.2
Low	70	53.8
Total	130	100.0

Table 6 revealed that majority (62.3%) of the respondents accepted the fact that bush burning resulted into destruction of agricultural product and produce. Also. The Table further shows that majority (100%) of the respondents agreed to the statement that bush burning resulted into destruction of soil structure. it was revealed that 61% of the

respondents believed that bush burning result to environmental pollution in the study area while 100% accepted the fact that bush burning contributed to respiratory diseases in the study area. it was revealed by majority (100%) that bush burning resulted into destruction of wildlife/Non-wild animal in the study area .

**Table 6: Perceived Effect of Bush Burning by the Respondents in Agaie LGA**

Variable	Major (%)	Minor (%)	None (%)
Destruction of agricultural product	81(62.3)	43(33.1)	6(4.6)
Destruction of soil structure	130(100)	0(0)	0(0)
Pollution of environment	79(61)	51(39)	0(0.0)
Causes respiratory diseases	130(0)	0(0)	0(0)
Destruction of wildlife/ Non-wild animal	130(0)	0(0)	0(0)

*Percentage in parenthesis Source*

Table 7 revealed a significant relationship between effects of bush burning

and livelihood activities. The p-value is  $\leq 0.05$ .

**Table 7: Spearman correlation coefficient for relationship between effect of bush burning and livelihood security**

Variable	r-value	p-value	Decision
Livelihood activities and Livelihood security	-0.318	0.000	S

## DISCUSSION

Majority (99.2%) of the respondents were into crop farming. This implies that majorities are into crop farming operation. This is in line with Kamanga *et al* (2009) who reported that agriculture as a sector is dominated by small holding crop farming families, with most of them residing in rural area. Hunting was another occupation engaged by 56.2% of the respondents in the area. This could be attributed to the fact that more than half engaged in bush burning to drive out animal such as rodents, wild rabbits, cane rat etc. from the wild. This is in agreement with Gnado (2004) who observed that farmers use fire to hunt for games or bush meats despite its widely acclaimed long-term devastating effects on the environments. 25.45% of the respondents are fully involved in grazing in the study area. This implies that few respondents engaging in this activity are doing it on temporary bases.

Household livelihood securities of the respondents were operationalized on three key indices (Economic security, Food Security, Health security). Majority (78.5%) of respondents reported that the income derived from their livelihood activities decreased and worse off. This could be attributed to the fact that bush burning destroyed the nutrients in the soil which could result into low productivity. This is in agreement with the findings of Wilkinson and Boulding, (2003) that estimated net annual bush fire losses for N, P and K in a similar study in northern region of Ghana. Furthermore, 71.5% of the respondents affirmed that their housing facilities remain unchanged even in the mist of bush burning activities. This unchanged could be directly link to the fact that their farmlands are far from their homes, therefore did not have any effect on the facilities. This implies that bush burning do not cause destruction to their buildings. Also the majority (73.9%) of the respondents recorded that banking savings worse

off. This could be as a result of longer proximity to the bank from/to the study area. This could be concluded that the respondents in the study area do not use banks. 89.2%, 91.5%, and 90.0% respectively of the respondents attested to the fact that household food grain stocked, affordability of food items and access to food items improved. This implies that their main occupation of the dwellers is farming and there is enough food for consumption in the study area. This is in agreement with Ekong (2010) who reported that rural dweller in Nigeria having farming as their major livelihood activity and also in agreement with Falusi and Adeleye (2002), who reported agriculture has the main occupation of 75% of people in most developing nation. Furthermore, it was revealed that majority (42.3%) of the respondents reported that access to health facility remains unchanged while 45.4% of the respondents affirmed that there is frequent respiratory infection. In addition, it was reported that 43.1%, 47.7%, 57.7%, respectively of the respondents attested that level of other disease/infection, dependency in medication; numbers of days unable to work due to sickness were worsen off in the study area. This could be linked to the fact that bush burning spread air borne diseases easily.

The level of household livelihood security was low with more than half proportion of the respondents (53.8%) recorded low level. This implies that bush burning contributed negative to the household livelihood security most especially in the area of economic activities and their health conditions. Majority (87.7%) of the respondents were traders. This implies that trading was a major non-agricultural activity of the respondents in the study area. This could also be attributed to the fact that the respondents in the study area engaged in trading to sell or dispose their farm produce. Transportation business was reported as livelihood activity engaged

by 22.3% of the respondents in the study area. This is an indication that the few people engaging in this business were assumed to be responsible for movement of farm produce with their vehicles from farm gate to market spots.

The effect of bushing revealed that majority (62.3%) reported that bush burning resulted into destruction of agricultural product and produce. This is in line with Izah *et. al.* (2017) who reported destruction as an adverse impact of bush burning on the un-harvested crops on farmlands. This implies that bush burning could retard agricultural production of the nation if not properly managed. All the respondents (100%) believed that bush burning resulted into destruction of soil texture while they also reported that bush burning led to respiratory diseases in the area as reported by all the respondents interviewed in the study area.

It was revealed that 61% of the respondents believed that bush burning results to environmental pollution while majority (100%) reported that bush burning resulted into destruction of wildlife/Non-wild animal in the study area. This is an indication that bush burning is hazardous and could destroy

### Recommendation

The following are the recommendations made based on the findings of this study.

- i. Agricultural extension agent should be empowered, in order to guide and enlighten the farmer on cultivation strategies that can be best adopted based on the activities of the respondents.

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the environment resources if drastic actions are not taken to halt the effect. There is significant relationship between livelihood activities and effect of bush burning. This is an indication that the nature of livelihood activities of the dwellers contributes to the bush burning activities and its effect in the study area.

### CONCLUSION

From the result of this study, it shows that larger percentage of the respondents were into agricultural activities than non-agricultural activities. Farming was the major agricultural activities of the respondents while trading is the non-agricultural activities engaged by majorities of the dwellers in the study. The result further revealed that bush burning contributed negatively to the sources of income of the dwellers as well as their health status. The rate of diseases such as respiratory and other air borne diseases/infections increased in the study area resulting into the dweller depending on constant medication for survival. The livelihood activities were reported to influence the livelihood security of the respondents in the study area.

- ii. Appropriate and correct farming methods should be made available by the government for land clearing which will reform their attention from bush burning.
- iii. Educating farmers on extension service to educate the farmer on effect of bush burning and their environmental health and livelihood activities.

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