



ASSESSING THE IMPACT OF BOKO HARAM INSURGENCY ON THE LIVELIHOODS OF RICE FARMERS IN MAFA LOCAL GOVERNMENT AREA, BORNO STATE, NIGERIA

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Journal Info:

ISSN (e): 3026-8028

(p): 3027-0928

Vol: 01

Issue: 02

December 2024

Pages: 59 – 74

ABSTRACT

The study assessed the impact of Boko haram insurgency on livelihood of rice farmers in Mafa local government areas, Borno State-Nigeria. The objectives of paper were to examine impact of Boko haram insurgency on rice farm income and non-farm income in the study area. Primary data were obtained through questionnaire. Multi-stage sampling technique was used to select 100 rice farmers. The data were analyzed using descriptive and inferential statistics (Paired t-test statistics). The empirical finding shows due to the activity of Boko haram insurgency in recent years, most household members particularly women and children were deserted from their homes for fear of been killed, kidnaped and attacked by the insurgents. This had resulted to decreases in supply of family labour for farming activities in the study area. The finding revealed that null hypothesis was rejected and there was a significance difference in mean farm income before and during the insurgency in the study area because mean farm income of rice farmers decreased (55%) significantly during the peak period of the Boko haram insurgency, compared to before insurgency. The study further revealed that the mean of non-farm income of rice farmers increased (43%) significantly during the peak period of insurgency, compared to before insurgency. This was because substantial numbers of rice farmers fled their farmland due to persistent attacks on their farmland by the insurgents. The study concluded that a sizeable number of rice farmers have been forced to seek alternative means of income and have turned to non-farm income activities as a means of generating income to support daily livelihood activities. The study recommended that Borno state government should establish Agro ranger a combined security outfits to provide security to farm land and protect farmers from being attacking while cultivating their land by the sect with a view to increase farm income in the study area.

Keywords:

Boko haram insurgency,
Rice Farmers, Rice Farm
Income and Non-Farm
Income

1.0 Introduction

Insurgency is a global menace threatening the livelihood activity of communities, also one of the largest challenges of mankind in the 21st century across West African countries. United Nations (UN) has actively worked to improve the livelihood of households through Sustainable Development Goals (SDGs) by providing policy guidelines to tackle some of the

pressing challenges facing the world such as poverty, climate change, food insecurity, conflict and insurgency among others (UN, 2021). However, Nigeria has experienced a high incidence of insurgency in the last two decades such as Niger Delta militants in the South-south, clashes between herders and farmers in the North central, armed bandits and kidnapping in the Northwest, and Boko

haram in Northeast Nigeria among others. This has made Nigeria consistently rank low (2.6) in the global peace index (GPI), signifying a worsened state of insecurity and other forms of uprising such as insurgency in the country (United Nations, 2022).

Crop farming is a sub-sector of the agricultural sector which comprises rice, maize, cassava, millet, sorghum, and wheat among others. According to the Food and Agricultural Organization (FAO) (2015), crop farming remains the foundation of the Nigerian economy and accounts for 82% of the agricultural sector economy of the country, it is the main source of livelihood through the generation of farm income to rural household farmers and employing 40% of a workforce, many of whom are farmer themselves among others. Furthermore, non-farm income enterprise plays a vital role in enhancing the livelihood of farmer households by providing them with income diversification opportunities and supplementing the income generated from the farming enterprise which improves the means of livelihood of farmers. According to Umar (2019), non-farm income has been increasing over the years and contributed 40% to farmer household's income in the country.

According to the Borno State Ministry of Agricultural (BSMA) (2016), crop production accounts for two-thirds of agricultural activities in the state and provides 43% of the gross domestic product (GDP), which also accounted for 65% of the income-generating by household farmers in the State. The report further revealed that rice farming is one of the main stable crops in the State and accounts for 14% of crops cultivated by households in the state. Income generated in rice farming accounted for 19% which improved the means of livelihood and provided 10% of work force for both direct and indirect in crop farming subsector in the State. Furthermore, Mafa Local Government, rice farming is a driving force of the economy and not only prevents food insecurity in the state but also could

contribute to income creation, generating employment opportunities and making a remarkable contribution to the economic prosperity of livelihood of rice farmer households which protecting households from falling into poverty track.

However, to Borno State Bureau of Statistics (BSBS) (2021) observed that there was a secular declining in crop farming output generally in the state in recent years, while that of rice farming decreased from 165 metric tons in 2020 averaging 140.2 metric tons between 2021 and 2022 farming season. Further drops to 139.3 metric tons of rice in 2023. This is a significant decline from its earlier contribution average (198 metric tons) over the past decade. Several causes were identified by researchers for decline in rice farming performance over the years. Furthermore, this reduction in rice farming activities in the recent years in the State has been further worsened by the advent and recent reoccurrence of insurgency in the form of Boko Haram in the North-east region, particularly in Borno State, where the State is the epicentre of the sect. This is because, among all forms of insurgency in recent history of the state, the Boko haram insurgency has most severe impact on crop farming subsector where rice farming activities are being threatened due to persistent bombings of farmland, burning of farm products, kidnappings of farmers, occupy communities where rice farming activity is mostly dominated among others, by the Boko haram sect have seriously affected livelihoods of rice farmers, particularly their source of income both from farm income and non-farm income. Awortu (2015) argued incessant closures of business enterprises because of Boko haram insurgency in Borno state due to curfew imposed by the government and insurgents in the affected area had led to a significant negative impact on income generated from non-farm and farm activity. Therefore, this work will attempt to shed more light by examining the effect of the Boko-haram insurgency on the livelihood of rice farmers'

income in the Mafa local government area of Borno state.

In spite restoration of relative peace in many parts of the state, several farmers have returned to communities for farming activities but had limited opportunity to earn means of livelihood from farming enterprise again, because the activities of the Boko haram insurgency, have prevented several farmers from accessing farmland more than 5km farther from the main town for purpose of farming activities by the authority in the state. Even where farmers who managed to produce some farm output, could not move these outputs to marketplaces in time because of the ban on motorcycles and vehicle movement which is a major means of transportation for these farmers. This has significantly limited the accessibility to marketplaces and reduced the frequency of visiting farmland thereby leading to several farmers losing their farm income. Also, the restriction of purchase of farm inputs especially chemical fertilizers and fuel which the insurgents use for their insurgent activities as well and farmers are not allowed to plan toll crops such as rice which is easy for insurgents to hide in, when it nears maturity. This resulted in the continuous deterioration of the means of livelihood of affected rice farmers in the state. This makes farmers practically inactive in society and depend on humanitarian aid for survival and means of livelihood. The negative effect of the Boko haram insurgency could trickle down to all levels of society.

A lot of studies have been done on Boko haram insurgency and rural farming particularly, rice farming in Nigeria and globally. Salma (2019) carried out a microeconomic analysis and highlighted insurgency has compounded the challenges of rice farming enterprises in Borno State, by the enormous loss of lives of farm workers and the destruction of farm inputs. However, the study does not shows quantitative analysis on how rice farm income in particular was affected by the insurgency. Even though farm income was

adversely affected and likely to generate a multiple negative consequence on livelihood status of affected farmers. Karu (2022) considered impacts of the insurgency on farming after the return of residents to the study area, after almost four years of exiled in other places as a result of insurgency. The study failed to highlights effects of Boko haram insurgency on socioeconomic characteristic of rice farmers, even though it was of paramount importance in determining level of rice farming income in the study area. Therefore, this work will fill the gap by analyze the effects of insurgency on socioeconomic characteristic of rice farmers in Mafa local government, Borno state Nigeria. A previous study by Mai, Fatima and Ahmad (2020) examines the effects of insurgency on farm income in Borno State, the research work has a limitation because the study considered only farm income from all the respondents in determining the effects of insurgency on livelihood status of farmers. However, the study did not consider other sources of income (non-farm income) of the farmers to observe how they were affected too by the activities of insurgency. However, the effect of insurgency on nonfarm income is an essential component of the livelihood of rice farmers that needs to be studied. This created a huge knowledge gap in their work and this gap is part of what this work seeks to address by assessing the effect of the Boko-haram insurgency on the livelihood of rice farmers considering both farm income and nonfarm income among rice farmers in Mafa local government, Borno state Nigeria.

It is agaist this background, the purpose of this study was attempted to shed more light by examining effects of Boko-haram insurgency on socioeconomic characteristic of rice farmers and the effect of the Boko-haram insurgency on the livelihood of rice farmers by considering both farm income and nonfarm income among rice farmers in Mafa local government, Borno state Nigeria.

2.0 Literature Review

2.1 Conceptual Review

2.1.1 Concept of Boko Haram Insurgency

The official name for the group is “Jama'atu Ahl as-Sunnah li-Da'awati wal-Jihad” which in Arabic means people committed to the propagation of the prophet's teachings and Jihad. The term Boko-haram is a derivation of Hausa word and combination of two Hausa words: Boko means “fake” but now signifies “western education and culture” or otherwise non islamic education and culture, while Haram is a word with Arabic origin that figuratively which means forbidden or sin, and in an Islam the word was used to refer to anything that was prohibited by the Islamic faith. Therefore, joining them together would give Boko Haram. This implied “Western education was forbidden or was a sin” (Sunday and Oyedeki, 2017). According to Olawale (2010) Boko-haram was just an adopted name given to the group by residents of Maiduguri because of the strong tendency to reject western education and culture, viewed as corrupting Muslims. This according to Edmund, (2019) people in Maiduguri and environs name the organization Boko haram due to their strong opposition to western education and the fundamental ideology of Boko Haram is “Western Education was forbidden and therefore should not be allowed to prevail among nations; particularly, Muslim dominated states. This implies that, the ideology of Boko haram which considers western education, voting in elections, wearing shirts and trousers and receiving a secular education as a taboo or sin.

Therefore, within the context of this study, Boko haram insurgency could be seen as the activities of the insurgents such as killings of innocent people, particularly farmers, destruction of both farm land and output, educational, health, water supply facilities among others which has an effect on livelihood of farmer households especially in

the areas of farm income and non farm income.

2.1.2 Concept of Livelihood

The concept of livelihood has gained wide acceptance as a valuable means of understanding factors that influence people's lives and well-being, particularly those of the poor in the developing world. Piers, Oliver and Matthew (2002) observed livelihood has a number of meanings and required clarity to achieve its full potential as a basis for development initiatives that are in tune with the realities on the ground. According to Haan (2017) livelihood in its simplest sense is a means of gaining a living. A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. A living is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term.

According to Tang (2015) posited that concept of livelihood was conceptualized for the first time in the Human Development Report issued by the United Nations Development Program (UNDP) in 1990. Since then, the issue of livelihood had gradually attracted the scientific community's attention. Thus, the study of livelihoods was not only full of challenges and subjective but a scenario of single sub-sector is not available anywhere. Livelihood as a body of knowledge and a field of practice is complex and diverse. The diversity of natural resource endowments and local cultures make it difficult to have a common approach across the country.

According to Organization for Economic Cooperation and Development, OECD (2019) livelihood simply refers to the entire life of an individual including his state of wealth, comfort, material goods, and

necessities available to a certain socio-economic class in a certain geographic area, usually a country. Livelihood consists of physical assets such as equipment and machinery, household jewelry and sustainable goods, accommodation, livestock and infrastructure. Ayana, Megento and Kussa (2021) highlighted that aspect of human assets include skills, knowledge, availability of workforce and capacity to labour, good health and physical capability of individuals or members of households were also part of livelihood.

Ellis (2000) further observed livelihood any activities necessary for a means of living and comprises capabilities, assets and abilities do not only include sheer physical labour, but also knowledge, trainings, skills, and years of experience. Assets are the basic material or social, tangible or intangible services, resources, skills or attributes. They are the physical, natural, social, financial, and human resources that people use for constructing their livelihoods. Livelihood activities are understood in the sense of individual and group perspectives that transform materials, using the abilities and resources to produce goods and/or services that can be exchanged, especially for a price. Activities in livelihood analysis include income-generating (agricultural and non-agricultural), and non-income generating (for example, religious, environmental, fun/relaxation, etc.). International Federation of Red Cross and Red Crescent Societies (IFRC), (2013) livelihood is a means of making a living. It encompasses people's capabilities, assets, income and activities required to secure necessities of life. The study further states livelihood as the sustainable access to meet basic needs including adequate access to food, potable water, health facilities, educational opportunities, housing, time for community participation and social integration. Livelihood is a process of securing basic necessities of life, such as food, water, shelter and clothing. Dekker, (2002) concept of livelihood used mostly to address the issue of poverty that aims to be people-centered,

non-sectional and grounded in the multidimensional reality of daily life over the years, livelihood has emerged as a boundary term; something that brings disparate perspectives together, allows conversations over disciplinary and professional divides and provides an institutional bridging function (linking people, professions and practices in new ways).

2.2 Empirical Literature

2.2.1 Socio-Economic Characteristics of the Rice Farmers

Age

According to Abdullahi (2019) analysis of the age distribution of household heads in Biu local Government of Borno state among rice farmers showed that most of the rice farmers (97.1%) fell within the age 18-45 while 2.9% of the household heads fell above 45 years. A summary of the socioeconomic characteristics of the rice farming households' mean age was 35.17 and the modal age was 31-50 years in the study area. This implies that majority of the rice farmers in the study area were middle age, energetic and there was likelihood of increased of productivity in rice farming. According to Ibrahim, Yusuf, Mohammed and Audu (2021), majority of farmers (43.3%) were between the ages of 37 and 42 years. Hence, they were energetic to cultivate large size farms for increased food production also engage in off-farm jobs so as to increase household income.

Gender

Tijani et al. (2010) gender is a significant factor in agriculture because of it's vital role in determining the farmers agricultural activities. In the northern Nigeria, males engage more in agricultural activities than female due to the drudgery involved in agriculture. Ibrahim, Yusuf, Mohammed and Audu (2021) showed that majority of rice farmers were male (60.4%) while only 39.6% were females. This could be attributed to the fact that most women in the study area do

not own farm lands due to tradition and farming is male dominated profession and female were however, more involved in processing of rice products.

However, Abdullahi (2019), argued that there are increasing numbers of females who are serving as a household heads in the study area, due to the insurgent activities which resulted in to death or displacement of men and with substantial number of male rice farmers as the crisis affected a lot of women who constituted the major rice farmer group in the study area. The study was further collaborated by Shettima (2020), observed that as a result of the Boko haram insurgency, there have been increasing in numbers of female rice farmers who are serving as household heads due to the death or relocation of men to safer places in the study area.

Education

According to Jare and Bunu (2021) no formal education constituted 13.31%, 7.55% attained adult education, while majority (79.14%) of the rice farmers had one form of formal education or another. The results revealed that majority of the respondents were literate and this can enhance the level of adoption of improved farm practices by the respondents. This agrees with the observation by Gloria (2021) that education plays a vital role in adoption of improved farm practices and innovations. The study further argued, farmers being educated implied that they could comprehend improved technologies being disseminated to them and cope with different hazards both social and technological.

Farming Experience

According to Jare and Bunu (2021) indicates that 29.14% of the rice farmers had between 16 – 20 years farming experience, while 21.58%, 14.39% and 13.67% had between 11 – 15 years, 6 – 10 years and 21 – 25 years of farming experience respectively. This indicates that the rice farmers had farming experience that could help them improved

their productivity on the farm by knowing the correct practices. The study shows long number of years of farming equip farmers in making rational decision in among others efficient resource use for high farm productivity and increased income. Muhammad et al. (2018) coefficient of years of experience in rice farming (0.851) was positive and significant ($p < 0.01$), implying that as years pass with continuous rice farming, farmers tend to increase their capacity to do better in rice farming; hence, they become more energy-use efficient. Over time, the farmers are better placed to acquire more knowledge and skills necessary for choosing appropriate new farm technologies.

Household Size

According to Mary, Hussein and Sani (2022) average farmer rice households size nine (9) members were discovered per household. (47.8%) farmers have 6-10 members in their households. This implies that availability of labour in which household members were mostly used in many areas in the North. This shows family labour was needed to cultivate their farm land. The study concluded that a large household size was part of the cultural practice among farmers, which may provide the required labour for farming because household members were mostly used for farming activities. In an earlier study by Abdullahi (2019) household size of the rice farmer was 2.1% of the household heads had less than 3 people in their families, 28.5% had a range of 3-6 family members and 35.6% had 7-10 members. Furthermore, household heads with family members ranging from 11-14 represent 12.0% and household heads with members above 14 members represent 21.8% in the study area. This implies that, there would be enough work force to supply the needed labour in farming activities. The study was further collaborated by Ibrahim,

2.2.2 Effects of Insurgency on Rice Farm Income

Onwuaroh, Yusuf, Yusuf and Akpu (2017) studied effects of the insurgency on farm

income in North-eastern Nigeria. Data from field were analysed using both description and inferential statistics (F-chow test analysis). The study revealed there was a significant relationship between insurgency and farm income of household farmers in the study area. Insurgent activities had adversely impacted on income of the farmers. This is because the F-chow value estimate (92.59) for income was statistically significant at a one per cent level of probability. The research work suggests insurgency had to decreases in crop farming enterprises in the region and distorted the local economy.

Mai et al. (2019) studied effect of the insurgency on farm income in Borno state, by used a primary data in which 394 questionnaires were distributed some selected internally displaced people's camps in Maiduguri, Borno state. The study observed insurgency have an adverse and significant effects on rice farm income. This confirmed when farmers have no accessed to their farm land due to insurgent activities and farm income was completely affected. The study suggest that insurgency had harmfully affected farm income due to neglect of farmlands and loss of farm output in the study area.

2.2.3 Effects of Insurgency on Non-Farm Income

According to Umar (2019), income from non-farm activities among crop farmers in the study area has been reduced as a result of activities of the Boko haram insurgency. The mean average income from non-farm activities among farmers who engage in non-farm activities had dropped from 1.58 before the insurgency to 1.23 after the insurgency. This implied a 12.46% decline in the number of those who engage in non-farm activities as a result of the Boko haram insurgency in their communities. This was because the communities had been displaced and business activities were no longer viable. Several farmers have fled their homes and it was not safe to visit markets in the nearby

communities. The study concluded that there was an enormous reduction in the number of crop farmer households that were engaged in non-farm activities during the Boko-haram insurgency. According to Awortu (2015) incessant closures of business enterprises in the affected areas, due to the curfew imposed by the government had led to a significantly negative impact on income generated activities outside crop farming enterprise among farmer households. The study further shows the majority of crop farmers engaged in income-generating activities outside crop farming had been reduced during insurgent attacks. The study concluded that the statistical t-test for the difference between before and after Boko-haram attacks among crop farmers shows significant decreases in income from non-farm activities.

The review of empirical studies suggests that most of the studies were done at the macroeconomic level such as effects of insurgency on the livelihood of crop farmers as a whole by Umar (2019) and Abdullahi (2019) which are macroeconomic. Even those studies at a micro-economic level such as Gloria (2022), failed to highlight the effect of insurgency on the livelihood status of rice farmers particularly, on rice farm income and non-farm income in the study area. This research will intend to fill this gap, identified in the literature by analysing effects of the Boko haram insurgency on livelihood of rice farmers in the Mafa local government, to provide empirical evidence of how farm income and non-farm income adversely affect rice farmers as a result of insurgency which may have affects farmer households' means of livelihood in the study area.

3.0 Methodology

3.1 Study Area

Mafa Local Government (MLG) has its headquarters in the town of Mafa. It has an area of 2,869 km² with a population of 145,600 (2006 National Census). MLG falls under the Borno Central Senatorial District. It is bounded to the north by Monguno LG,

to the north-east by Marte LG to the east by Dikwa LG to the south by Maiduguri LG and to the west by Jere and Nganzai Lg. It has eleven (11) wards comprising Abbari, Anadua, Koshebe, Loskuri, Ma'Afa, Mafa, Masu, Mujigine, Tamsu and Gawa wards (Ministry of Land and Survey, 2011).

Rice farming is the main occupation of the people of Mafa local government (MLG), it is the major source of income for rice farmers and provides a means of livelihood for more than 60% of the population because a huge proportion of their population is involved in rice farming and agri-business activities (Shettima, 2021). At the peak of the rainy season, between August and December, farmers use rainwater, while between December and July, irrigation method is used. Water for irrigation is sourced from hand-drilled boreholes using water pumping machines and the release of water also from Lake Alo Dam (Borno State Ministry of Agriculture, 2016). Rice cultivation thrives, and villagers, especially women, earn a living along the rice production value chain, working as par boilers, millers, and marketers. Furthermore, many people in MGA, especially civil servants and businessmen engaged in rice farming enterprises to augment their source of livelihood and income.

However, activities of insurgency in the state have negatively affected rice farming in Mafa Local Government. The lingering insurgency in MLG has been the major cause of widespread farmer displacement in the study area because there is continuous fear of abduction and killing of community members the insurgents who have gone to farmland for farming activities. This has prevented farmers from accessing their farmlands and have lost their investment in rice farming in the area. The activities of insurgency have dislodged farmers from their communities and worsened the main source of livelihoods both farm income and non-farm income as well as employment generation of rice farmers. Due to insurgency rice farmers could not key into

the various agricultural interventions of the federal government to boost rice production in the state. According to Karu (2022), the insurgency attacked Mafa LG in 2021. This attack led to a substantial number of population displacements. As a result of the attack, a total of 1,237 farmers from 245 households were displaced within various wards in the Mafa LG to neighbouring local governments.

3.2 Source and Method of Data Collection

This study used primary data from farming household heads. Population of the study were the total number of rice farmers engaged in rice farming in Mafa Local Government (MLG). There are 350 rice farmers registered with various rice farmers associations in the study area. This study will use cross-sectional data, through a structured questionnaire to collect data. Data were collected through a questionnaire schedule. A total of 105 copies of the well-structured questionnaire were administered to rice farmer household heads in the five (5) wards in rice farming communities in the MLG area of Borno State. The number of questionnaires considered for analysis after data cleaning was only 100 rice farmers as others were discarded for inconsistency or incompleteness.

Table 3.1 Sample Frame Rice farmers' population and sample size

Wards	Population	Sample
Mafa	146	44
Ajiri	53	16
Abbari	45	14
Loskuri	55	16
Ngwom	51	15
TOTAL	350	105

Source: Rice farmers Association records

3.3 Sampling Technique and Sample Size

Multi-stage sampling technique was employed to select rice farmers. In the first stage, purposive sampling was used to select

(5) five wards out of the eleven (11) existing wards within Mafa local government which were Mafa, Ajiri, Abbari, Loskuri and Ngwom. According to Salma (2020), these were the wards where rice farmers are predominantly found. In the second stage, a proportionate (30% percentage) random sampling technique as developed by Mugenda (2003) and adopted by Abdikadir (2013) was applied to select rice farmers within these five wards based on the number of rice farmers in each ward as attached in appendix I. According to Mugenda (2003), a sample of 30% is adequate to represent the target populace in data gathering for a research study. Rice farmers selected across the five wards were 44, 16, 14, 16 and 15 respectively making a total of 105 rice farmers. In the third stage, a simple random sampling procedure was used to select one (1) villages randomly in each of these five wards, making a total of five (5) villages. This were carried out by using Microsoft Excel, a random number-generating procedure which allocates a random number to each of these villages. The list of these villages is attached in Appendix. Simple random sampling were used because rice farming households are fairly homogeneous in these villages, even though the population of the villages are not uniform. In the fourth stage, snowball sampling technique developed by Goodman (1961) and adopted by Babagana et al., (2018) were employed in selecting thirty twenty one (21) rice farming household heads from each of these ten (5) villages making a of one hundred and five (105) respondents, out of which five questionnaires were discarded making a total of one hundred (100) respondents to meet the sample requirement. These rice farmers were selected on the fact that they were affected by the Boko haram insurgency and are most accessible for data collection.

3.4 Analytical Techniques

The analytical techniques employed in this study including descriptive statistic to achieve specific objective i and inferential statistics such as paired t-test statistics to

examine effects of insurgency on rice farm income and non farm income of rice farmers before and during insurgent activities in the study area to achieve specific objective ii. Mean rice income for 2019 were compared with that of the 2023 farming season by asking rice farmers to indicate their income before and during the insurgency. The study used quantitative data for the 2019 farming season before the Boko haram insurgency started having noticeable effects on rice farmer households' livelihood in the study area and also for the 2020 farming season during the peak period of the Boko haram activities in the study area (RIFAN, 2024). The Econometric software were used for inputting and analysis of data including Excel Software with CSV (Comma Separated Value), Eview software, Stata software and SPSS software.

4.0 Presentation of Results

4.1 Socio-Economic Characteristics of the Rice Farmers

Table1: Descriptive Statistics and Frequency Distribution of Socio-Economic Characteristics of the Rice Farmers

(n=100)		
Variables	Frequency	Percentage
Age		
21-40	49	49
41-60	38	38
61 and above	13	13
Family Size		
1-4	30	30
5-9	42	42
10 and above	28	28
Farming Experience		
1-3 years	15	15
4-6 years	36	36
7 years and above	49	49
Education Level		
Formal education	21	21
Non formal	46	46

Islamic education	31	31
Illiterate	2	2
Gender		
Male	79	79
Female	21	21

Source: Field Survey, 2023.

Table 1 shows the analysis of the age distribution of rice farmer household heads in the study area, majority of the farmers (49%) fell within the age 21-40 while 38% of the household heads fell within (41-60) and 13% fell within 61 above 65 years, with a mean age of 32 years were involved in rice farming. This shows that rice farmers are in their prime productive age group with a great potential for rice production in the in the study area. This is because age of a farmer has an effect on the type of crop activities he may engage in and mostly productive or active age group embark on more strenuous farm operations than older farmers and children. However, the result further shows most of the elderly farmers were not engaged in rice farming due to high level of insurgency in the study area. This agrees with the findings of Umar, (2019) that most farmers between 18 to 45 years of age in Adamawa were in their active age which enabled them to perform actively in strenuous farm activities and majority of farmers were skeptical to involved in farming activity because of insurgents. This similarity arises because both studies were conducted in the North-eastern part of Nigeria, where Boko haram insurgency was dominated in the region.

Analysis on the household size of the rice farmers in the study area revealed that majority (42%) of the household heads with family members ranging from 5-9 while 30% of the household heads had less than 5 people in their families and household heads with members above 10 members represent 28% were involved in rice farming in the study area. According to Salma (2021) argued that that a large household size was part of the culture practice among farmers, which may provide the required labour for

farming because household members were mostly used for farming activities. This implies that family labour would be beneficial for the household heads with high household size, which could further lead to increase in farming activity and boosting farm income and improving the livelihoods of household farmers. This was in conformity with Abdullahi, (2019) where most of the farmers in rural communities in Biu area have large family size who were participates in farming enterprise. However, in Mafa LG due to the activity of Boko haram insurgency in recent years, most household members particularly women and children were deserted from their homes for fear of been killed, kidnaped and attacked by the insurgents. This had resulted to decreases in supply of family labour for farming activities in the study area. This result tallies with Gloria (2021) where study observed that as the household size decreases, the likelihood of expanding farm size was expected to be low because of low family labour for farming operations which could decreasing both farm output and income thereby led to low livelihoods condition among farmer households.

Analysis on the farming experience indicates that 15% of the rice farmers had between 1 – 3 years farming experience, while 36% had between 4 –6 years and majority (49%) of farmers had farming experience between 7years and above. This revealed that majority of the rice farmers had long farming experience which may help them improve significantly on rice farming activities by adopted correct method of practices. This agrees with the finding of Ume and Jare and Bunu (2021) observed that long number of years of farming equip farmers in making rational decision in order in to use efficient utilization of scarce resource to obtained high level of farm output and income from farming activity. This further implies that rice farmers had wealth of experiences over time to adjust with the accompanying changes and challenges that comes as a result of the Boko haram insurgency as experienced in study area.

Analysis on the educational qualification of the rice farmers revealed that majority (46%) of the household heads attended non formal schools, followed by respondents with Islamic education with 31%. Analysis further indicated that respondents with formal education were ranked third, with 21% and those without any educational background were ranked fourth with 8. %, were engaged in rice farming. The study shows that majority of rice farmers had one form of non-formal education or another. This could enhance the level of adoption of improved new method of practices by the rice farmers in the study area. This agrees with the observation by Jare and Bunu (2021) that non formal education plays a vital role in implementation of improved new method of practices and innovations. However, this study argued that the formal educational status of the rice farmers was low and most farmers were not able to attend both primary and secondary schools. This low formal educational status could be attributed to the negative impact of insurgency on formal education in the study area which the insurgents destroyed educational facilities with a view to denied people access to pursue and enhance their educational level. This was in line with the finding of Gloria (2021) argued formal education positively influences likelihood of farmers by encouraged them to adopted a new method or practice because farmers with higher education have more exposure to new thoughts about farming activities which increases both farm output and income.

The analysis on the gender distribution of the rice farmer household heads in Mafa local government showed that 87% were males while 13% females, were engaged in rice farming. This shows majority of rice farmers were male, indicating male dominance in rice farming. This is probably because male farmers have great responsibility in their families as the heads to engaged in farming to supply food and other household basic needs. The finding further observed that male is more likely to be victims of insurgents than their female counterpart since rice farming were dominated by male and insurgents mostly targeting those physically engaged in farming activity in the study area. This supports the findings of Tijani et al. (2010) that majority (80%) of the farmers in Borno State, Nigeria, were male, while 20.0% were female. This finding was further corresponded to that of Umar (2019) postulated that most of the farmers in Chibok local government area were male. The similarities could be attributed to the fact that the target respondents were all from the rural farmers. However, Abdullahi (2019) argued that substantial number of female farmers were now engaged into farming activity because of Boko haram insurgency, as the crisis affects a lot of male farmers who constituted the major vulnerable group to the insurgency. This was further collaborated by Shettima (2020), there were increasing numbers of female rice farmers who are serving as household heads due to the Boko haram insurgency as a result of the death or relocation of men to safer places in the study area.

4.2 Effects of Boko haram insurgency on rice farm income

Table 2: Paired T- Test Analysis of Rice Farm Income before and during the insurgency.

Variables	Mean farm income before insurgency	Mean farm income after insurgency	Paired t-test statistic	p-value
Rice farm income	1,055,804.00	470,818.73	4.0032	0.02

Source: Field Survey, 2023.

Table 2 shows the analysis of effects of insurgency on rice farm income in Mafa local

government. The rice farmers were asked to indicate their annual mean income on rice

farms before and during the peak period of insurgency. The result shows the mean annual income of the rice farmers before the insurgency was N 1,055,804.00 which was higher than the mean annual income of N 470,818.73 among the rice farmers during the insurgency. This implies that the farmers have experienced a remarkable decline in rice farm income of 55% due to insurgency. This significant decrease in rice farm income is largely due to the insurgents destroying several farmland and farmers cannot visit farms distance away from their residential area for fear of being killed by insurgents on the farm. The few farmers also who managed to return to their farming activities during the insurgency could not operate at a maximum level of production and could not sell their farm produce in the market due to restrictions of movement imposed by insurgents and fear of being looted farm produce by the insurgent. This has rendered most of the farmers vulnerable and could no longer provide enough income for their families which resulted in low means of livelihood and increasing poverty levels among affected rice farmers in the study area. The study was further collaborated by Mai et al. (2019) posited Boko haram insurgency in the Northeast had a devastated-on family's disposal income which had resulted to decline in rice farmers income. This is because once a farmer neglects farming activity due to insurgency, their farm income was drastically reduced.

The results from Table 2 further show that T-test analysis of rice farm income where the null hypothesis stated that there was no difference between mean income before and during the peak period of insurgency. A statistical test for the difference in mean annual income of the rice farmers between before and during the insurgency shows that the decrease in annual income was significant at a 5% level with t-test value of 4.0080 and P-value of 0.02 were obtained which was less than 0.05 P-value, implied that null hypothesis was rejected and concluded that there was a significance difference in mean income before and during the insurgency in the study area because mean income of rice farmers decreased significantly during the peak period of the Boko haram insurgency, compared to before insurgency. This was because there was a substantial decrease in rice farming due to the abandonment of farming activity due to the activity of the Boko haram insurgency in the study area, thereby leading to decreases in the income generated from sales of farm produce. This agrees with Onwuaroh, Yusuf, Yusuf and Akpu (2017) that insurgent activities had adversely impacted on income of the farmers. This is because the F-chow value estimate (92.59) for income was statistically significant at one percent level of probability.

4.3 Effects of Boko haram insurgency on Non- farm income

Table 3: Paired T- Test Analysis of Non- Farm Income before and during the insurgency.

Variables	Mean non-farm income before insurgency	Mean non-farm income after insurgency	Paired t-test statistic	p-value
Non- farm income	650,600	930,400	2.2200	0.035

Source: Field Survey, 2023.

According to Table 3 above, shows the analysis of non-farm income among rice farmers in the study area. The rice farmers were asked to indicate their annual mean income on non-farm income before and

during the peak period of insurgency. The mean non-farm income of those rice farmers engaging in non-farm activities, as a means of income diversification before the insurgency was N650, 600 while during the

peak period of insurgency was 930,400, which indicated that between 2019 and 2023, the rice farmers experienced an increase (43%) in non-farm income in the study area. The result further indicated that null hypothesis was rejected because increases in non-farm income were significant at a 5% level with a t-test value of 2.22 and a P-value of 0.035 were obtained which was less than 0.05 and concluded that there was a significant difference between the mean of non-farm income before and during the insurgency because the mean of non-farm income of rice farmers increased significantly during the peak period of insurgency, compared to before insurgency. This was because substantial numbers of rice farmers fled their farmland due to persistent attacks on their farmland by the insurgents. This has made it difficult for rice farmers to continue with farming activities, as a main source of income in the study area. Therefore, a sizeable number of rice farmers have been forced to seek alternative means of income and have turned to non-farm income activities as a means of generating income to support daily family activities thereby leading to increases in non-farm income activities such trading, transportation, construction, local manufacturing and other forms of self-employed human services have been increased. This was contrary to Umar (2019) argued that there was a significantly negative impact on income-generating activities outside farming among the community members in Chick local government. This was because the communities had been displaced and business activities were no longer viable. Several farmers have fled their homes and it was not safe to visit markets in the nearby communities.

5.0 Summary and Conclusion

This paper examining effects of Boko-haram insurgency on socioeconomic characteristic of rice farmers and the effect of the Boko-haram insurgency on the livelihood of rice farmers considering both farm income and

nonfarm income among rice farmers in Mafa local government, Borno state Nigeria. The empirical finding shows due to the activity of Boko haram insurgency in recent years, most household members particularly women and children were deserted from their homes for fear of been killed, kidnaped and attacked by the insurgents. This had resulted to decreases in supply of family labour for farming activities in the study area. The study shows only 13% of the elderly farmers were engaged in rice farming, this could be due to high level of insurgency in the study area. The study further shows that the Boko haram insurgency has greatly affects rice farmers particularly to their farm income and non-farm income in Mafa local government. This is because the mean annual rice farm income of the rice farmers before the insurgency was higher than the mean annual income during the insurgency among the rice farmers. This implies that the farmers have experienced a remarkable decline in rice farm income by 55% as a result of the insurgency in the study area. The study further revealed that the mean of non-farm income of rice farmers increased (43%) significantly during the peak period of insurgency, compared to before insurgency. This was because substantial numbers of rice farmers fled their farmland due to persistent attacks on their farmland by the insurgents. The study concluded that a sizeable number of rice farmers have been forced to seek alternative means of income and have turned to non-farm income activities as a means of generating income to support daily livelihood activities.

5.1 Recommendation

The study recommended that Borno state government should establish Agro ranger a combined security outfits to provide security to farm land and protect farmers from being attacking while cultivating their land by the sect in the study area. The study further recommended that both Mafa Local Government and Borno State Government should establish micro finance banks to

assist farmers who are victims of insurgent activities, through provision of soft loans and micro credit loans to rice farmers who do not have access to conventional financial system as a results of damage done to their farm land by the insurgents.

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