



Assessment of the Effect of Boko Haram Insurgency on Crop Production in Hawul Local Government Area, Borno State, Nigeria.

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ABSTRACT

This study was conducted in Hawul Local Government Area Borno State, North-eastern Nigeria. The study aimed at assessing the effect of *Boko Haram* Insurgency on crop production in the Local Government Area. Multistage random sampling was to select 240 crop farmers. The data were analyzed by descriptive and inferential statistics-paired t-test. Socio-economic characteristics were analyzed using percentages and means while paired t-test method was used to test the effect of insurgency on farm operation, farm inputs and crop yield before and after the conflict. The analysis of the results revealed that majority (83.8%) of the farmers were male, literate(85.1%) and experienced 41years farmers with mean annual farm income of ₦165,000.00. There was significant increase in expenses of farm operation after the conflict. Inputs usage (seed, fertilizer, herbicides, pesticide and labour) also increased significantly by more than 60.0% after the conflict. Average crop yield in kilogram per hectare after the conflict in years 2015-2017 decreased significantly compared to years 2004-2008 before the conflict. The percentage decrease from -45.0%,-45.0%,-45.0%,-55.0%,-64.8%, and-83.5% respectively for rice, cowpea, groundnut, maize, sorghum and soybean. Others were -45.0% for pepper, -52.7% for Garden egg and -55.9% for tomato. The study therefore, established that with the significantly increased in cost of farm operation and inputs usage after the insurgency the farmers recorded low yield in the study area. Furthermore, output of kilogram per hectare has also reduced significantly during the period of after the attack. It is therefore, recommended, that this reduction in crop production could be detrimental to the welfare and livelihood of farmers in the study area. Hence, livelihood support programme is urgently needed to supplement this under production.

Key words: *Boko Haram*, Insurgency, farm operation, yield, Hawul

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INTRODUCTION

The Nigerian economy, in terms of revenue and foreign exchange, is undoubtedly dominated by the oil sector but agriculture holds the key to sustained development of the country with respect to provision of employment opportunities, as a source of income for rural families, food for the population and for the provision of raw materials for industry. The agricultural sector also employs over 60 percent of total labour force in Nigeria (Adeoti, 2002). According to (Sunday, Azeez and Oyediji, 2017) despite the poor performance of the agricultural sector which is below economic expectation, the sector is still capable of aiding socioeconomic development of people living in rural areas, most especially in the northern states of Nigeria as they engage more in agriculture in order to sustain themselves, and traded within their capacity or capabilities for profit

The *conflict and* insurgency in northeastern Nigeria, which began in 2009, has caused a lot of devastating effects to agricultural activities. It has undermined crop production and caused food insecurity conditions. Since the escalation of violence in 2012, poor households in northeastern Nigeria have experienced low crop productivity and acute food insecurity related to this insurgency (Mustapha, 2015). Since the emergence of the *Boko Haram* activities in Maiduguri and every sector that has direct impact on the wellbeing of the people have been negatively affected. As *Boko Haram*'s insurgency in the north is concentrating where agricultural activity is highest, Nigeria's national government is becoming increasingly concerned with threats to food crops (Merrick and Li, 2014). Merrick and Li (2014) explained that over the past five years, the Nigerian government has kept mostly closed borders with Cameroon, Chad and Niger due to the insurgency. This has crippled the agricultural export market in northern states, resulting in the loss of one of Nigeria's largest potential revenue sources. Almost 80% of Nigeria's northern population are active farmers.

The security impact is multidimensional, *Boko Haram* related insurgency has led to population displacements in Borno State and kept many farmers away from their usual livelihood activities (mainly agricultural activities). The manifestation of *Boko Haram* recently has been a great threat to the Nigeria business environment as farming and other business activities are being harmed (Council on Foreign Relations, 2015). Dabugat (2013) identified that the present problem of low agricultural production is due to violence in the Northern States. While most literature seems to focus solely on physical security, food insecurity and poverty, that is, the security of life and

property, little attention is paid to the implication of the Boko Haram activities on crop production in Borno state, in general and Hawul Local Government Area, in particular. It is necessary to focus attention to this aspect because low crop production does not only constitute reduction in income, but it has the tendency to worsen food insecurity and poverty. It is therefore, important to study the effects of insurgency on crop production in Hawul LGA of Borno State, in lieu to providing solutions to the problems brought about by the insurgency so as to increase crop production and livelihood of crop farmers.

METHODOLOGY

The study was conducted in Hawul Local Government Area of Borno State, Nigeria. It is located between latitudes 10° 15'N and 11° 40'N and longitudes 12° 00'E and 12° 37'E. It is bounded to the north by Biu Local Government Area, AskiraUba Local Government area to the East, Gombi (Adamawa State) to the South, in the West by Shani and KwayaKusar Local Government Areas. Administratively, Hawul Local Government Area has seven administrative districts viz: Kwajaffa, Sakwa, Kwaya-Bura, Shaffa, Pama, Kidang and Mbulatawiwi (BOSADP,2010.).

The area falls in tropical continental climate also known as Sudan Savanah. It has two distinct seasons wet and dry: the wet season is short and usually lasts for 5-6 months (May-October). The dry season lasts for 6-7 months (October-April).The mean annual rainfall of the area is between 650-1000mm with the highest recorded in July and August. The average mean temperature is about 27°C with temperature as low as 7°C and as high as 44°C (Yakubu, 2009). The soil of Hawul Local Government Area consist of wide spread series of sand, clay, silt and sandy clay soil.

The area has transitional vegetation type of Northern Guinea Savanna located in the Northern Sudan Savanna area of Nigeria. It is typical parkland savanna with the landscape covered by weaving grass in the raining season and studded with solitary trees such as *Butyrospermum paraduxum*,(shea butter),*Adonsonia digitata* (Baobab), and *Tamrindus indica* (Yakubu, 2009).). The economy is largely agrarian. Major crops grown include maize, rice, sorghum, beans and groundnuts, pepper, cocoa yam and cassava. Many vegetable crops are also grown . Livestock kept include cattle, sheep and goats and chicken.

The data for the study were collected from both primary and secondary sources. Primary data were collected through administered of structured questionnaires to respondents while the secondary data were obtained from the records of BOSADP, textbook, journals and the internet.

Random sampling procedure was used to select respondents for this study. Six communities were randomly selected from the affected area. A Proportionate sample of crop farmers were selected from each of the six selected community, making a total of 240 respondents .

Frequency, percentage and mean were used to summarize farmers based on their socioeconomic characteristics. Paired sample t-test was used to test effects of Boko *Haram* on crop output. The Paired sample t-test:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \dots \dots \dots 1$$

Where:

\bar{X}_1 = mean of sample before attack

\bar{X}_2 = mean of sample after attack

S_1 = standard error of the sample before attack

S_2 = standard error of the sample after attack

n_1, n_2 number of the samples before and after attack

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The socio-economic characteristics of crop farmers directly affect their farming operations as presented in Table 1. The analysis of the results revealed that majority (83.8%) of the farmers were males, the mean age was 41years and average household size of 8. This implies that the farmers are active and are in their productive age. In terms of educational attainment it was found that majority of them had attended formal education (85.1%).

Results further revealed that majority of the farmers were small scale farmers with mean farm size of 1.6 hectares with an average farming experience of 16 years. The mean annual farm income was ₦165,000.00 after the conflicts.

Table 1 Socio-economic Characteristics of Respondents

Socioeconomic Characteristics	Frequency	Percent	Mean
Sex			
Female	39	16.3	
Male	201	83.8	
Age			
<20	10	4.2	
20-30	6	2.5	
31-40	84	35.0	41
41-50	92	38.3	
>50	48	20.0	
Household size			
0-5	14	5.8	
6-10	109	45.4	
11-15	73	30.4	8
16-20	41	17.1	
Above 20	3	1.3	
Educational qualification			
No education	36	15.0	
Primary	54	22.5	
Secondary	90	37.6	
Tertiary	60	25.0	
Farm Size			
<1	74	30.8	
1-2	104	43.3	
2.1-3	20	8.3	1.6
3.1-4	30	12.5	
>4	12	5.0	
years of farming experience			
0-5	12	5.0	
6-10	84	35.0	
11-15	32	13.3	16
16-20	106	44.2	
Above 20	6	2.5	
Annual income			
<50,000	11	4.6	
50001-100,000	48	20.0	
100,001-150,000	63	26.3	165,000.00
150,001-200,000	97	40.4	
200,001-250,000	14	5.8	
Above 250,000	7	2.9	

Source: Field survey, 2017

Farm Operations used in Crop Production

Table 2 presents the summary of farm operations carried out in crop production by farmers in the study area. Variables studied include land clearing, ploughing, planting, weeding, fertilizer application, harvesting, packaging and transportation.

Table 2 Summary Statistics of Farm Operation used in Crop Production by Farmers

Farm operation	Cost(n/ha)				
	Before	After	Mean difference	% increased	t-value
Land clearing	639.29	1,214.29	575.00	89.9	3.82***
Ploughing	12,452.60	12,666.49	213.89	1.7	0.92
Planting	1,639.29	2,214.29	575.00	35.1	3.82***
Weeding	12,287.05	13,687.27	1400.23	11.4	3.70***
Fertilizer application	3,634.89	4,464.41	829.52	22.8	1.98**
Harvesting	3,492.56	6,677.23	3184.67	91.2	3.93***
Packaging	2,334.62	4,688.46	2353.85	100.8	11.5***
Transportation(n/truck)	10,492.01	21,296.19	10804.19	103.0	3.79***

Source: Computed from Field Data, 2017. ***Significant at 1% **Significant at 5%

Farmers used different forms of labour in farm operations, one of such is land clearing with about 89.9% increase in cost of labour, amounting to ₦575.0 increase after the conflict. This may be attributed to the fact that most young and active men who work as farmhands fled from their villages as a result of the crisis and leaving behind the old and less active farmers this, created scarcity of labour, and thus, increase in cost of labour in the study area.

Ploughing recorded only 1.7% increase in cost after the conflict. This may be as a result of geographical location of the area, most of their upland farms located in high and slopping area which make ploughing activities difficult either by oxen or tractor and so making the activities less cost attractive.

Planting cost has significantly increased after the attack with an average cost per hectare of ₦1,638.29 and ₦2,214.29 respectively before and after the conflict. This indicate about 35.1% increase in cost of planting recorded after the conflict which created scarcity of labour.

Cost of weeding increased significantly from ₦12,287.05 to ₦13,687.27, respectively, before and after the conflict. Cost of fertilizer application also significantly increased from ₦3,634.89 in the years before the conflict (2004-2010) to ₦ 4,464.41 after. Harvesting and packaging cost also increased by ₦3184.67 and ₦2353.85 respectively. The implication of this is that as the cost of

fertilizer and harvesting and packaging increased there will be decreased in the yield of crops hence the significantly reduced of crop yield after the conflict.

Transportation cost increased by 103.0% after the attack as a result of scarcity of trucks and restriction of movement of petroleum products by the State Government to the affected areas in order to curtail the activities of insurgency this has affected not only the transportation of inputs and required labour but also has effect of the crop yield. Another factor that has slowed down transport business in the North is the presence of multiple check points, which were set up to ensure safety of passengers and goods in some parts of the north.

In addition, the reason for the significant increase in farm operation is as a result of reduction in the availability of labour due to the threat of attacks on farmers on their way to their fields because many farmers and labourers have been attacked and/or abducted. Therefore, both farmers and farm labourers feared the attacks on their farms or bombs planted on the roads to their farms. As a result those who are brave enough to be hired as labourers raised their wages by more than 50%.

Change in Cost of Inputs (₦/kg)

Table 3 presents the summary of productive inputs used by the crop farmers. Relevant variables inputs used include seed, chemical fertilizer, herbicide, pesticide and labour. Mean expenses on seed, fertilizer, herbicide, pesticides and labour were significant at 1% level. The mean expenses for seed, fertilizer, herbicide, pesticides and labour were ₦ 221.07, ₦ 100.0, ₦ 1,114.18, ₦ 1,112.76 and ₦ 700.00, respectively before the attack and this rose to ₦360.00, ₦160.0, ₦2,115.98, ₦2,113.94 and ₦1,500.00 respectively after attack.

Table 3 Change in Cost of Inputs (₦/kg)

Inputs	Cost(₦/kg)				
	Before	After	Mean difference	% increase	t-value
Seed	221.07	360.00	138.93	62.8	15.248***
Fertilizer	100.0	160.0	60.00	60.0	15.421***
Herbicide	1,114.18	2,115.98	1,001.80	89.9	5.615***
Pesticide	1,112.76	2,113.94	1,001.18	90.0	13.297***
Labour (manday)	700.00	1,500.00	800.00	114.3	5.432***
Farm size(ha)	2.1	1.2	-0.9	42.9	2.431***

Source: Computed from Field Data, 2017. ***Significant at 1% **Significant at 5%

The percent increase in cost of inputs was recorded after the conflict of about 62.8%, 60.0%, 89.9%, 89.9%, 90.0% and 114.3% respectively for seed, fertilizer, herbicide, pesticides and labour. This implies that improved seed, chemical fertilizers, herbicides and pesticides were the inputs most affected by the conflict. Before the conflict, fertilizers were delivered by agro-dealers directly to the area. However, during the conflict, fertilizers were delivered from Kano (about 700 kilometers to the conflict zone), and farmers compelled to purchase at the traders' prices.

Many farmers were not able to obtain the quantity of improved seed, fertilizer, herbicide and pesticides that they needed, which resulted in reduced area of land under cultivation and lower yields. Moreover, in some communities, farm implements were stolen by the insurgent, making crop cultivation impossible. In some areas, the insurgents also destroyed bridges and controlled road movement, forcing trader's to switch to expensive, but lower-quality sources that often results in low yield. The government restricted the supply of Urea to the affected areas because it was used by the insurgents to make explosives. Seed growers and supply works were interrupted as institutions (Research Institutes) dealing with seed multiplication abandoned their works relocated from the conflict zone.

Effect of Insurgency on Crop Yield

Effect of conflict on crop yield was tested using paired t-test. Table 4 presents results of the crop yield in kg per hectare before and after conflict. The results show significant drops in the average production yield of maize, rice, Soybean, cowpeas, groundnut, sorghum, pepper and garden egg after the conflict in years 2015-2017(Table 4).

Table 4 Change in Crop Yield (kg/ha)

Crops grown	Output(kg/ha)				
	Before	After	Mean difference	%decreased	t-value
Maize	2,910.42	1,309.69	-1600.73	-55.0	13.44***
Rice	1,196.25	657.94	-538.31	-45.0	6.03***
Soybean	1,838.62	302.69	-1535.93	-83.5	10.57***
Cowpea	839.58	461.77	-377.81	-45.0	5.58***
Groundnut	1,146.67	630.67	-516.00	-45.0	11.99***
Sorghum	2,271.43	799.29	-1472.14	-64.8	3.26***
Pepper	574.58	316.02	-258.56	-45.0	4.98***
Garden egg(bag/ha)	4,512.00	2,132.00	-2380.00	-52.7	7.65***
Tomato(basket/ha)	70,324.00	31,032.00	-39292.00	-55.9	3.76***

Source: Computed from Field Data, 2017. ***Significant at 1% **Significant at 5%

There were significant decreases in average production of cowpeas, maize, millet, rice and sorghum, before the conflict (2004-2008) and during the conflict, (2009-2013) (Table 4).

This Significant ($p \leq 0.01$) reduction in the output of crops is due to a combination of multiple factors. First, there has been reduction in the availability of labour due to the threat of attacks on farmers on their way to their fields. Both farmers and farm labourers feared the attacks on the their farms or bombs planted on the roads to their farms. Therefore, lack of labour had caused inadequate and improper timed weeding and harvesting. Second, the crop farmers had experienced increased prices of seed, fertilizer, herbicide and pesticide and, inadequate supply of such inputs. Thirdly, high level of insecurity associated with working in the field, distant farms were hit hardest, as farmers were cut off from their fields and thus unable to produce their crops. Large farms are often merely a reflection of large families, which cultivate multiple plots or have big herds of cattle. They were the most affected because they could not cultivate all of their land and could not access adequate inputs.

Conclusion:

The study concludes that majority of the farmers were males and in their middle with average household size of 8. Farm operations such land clearing, planting, weeding, fertilizer application, harvesting, packaging and transportation has significantly reduced due to the conflict. Cost of inputs has increased significantly while crop yield reduced significantly. The study, thus encourages government and farmers to take advantage of programmes such as the national fadama development project, research institute and NGOs supporting material which targeted toward

boosting agricultural productivity and expanding income generating activities and improving the livelihood of the farmers.

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