



## IMPACT OF BOKO HARAM'S TERRITORIAL TERRORISM ON LEGUME FARMERS' SAVINGS

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### ABSTRACT

The study investigates the impact of armed conflict on household savings in a weak institutions using household cross-section survey data collected in 2019 in one Boko Haram affected area (Borno State) and three non-affected areas (Kwara, Kebbi, Kaduna States and federal capital territory, Abuja) as counterfactual. Multistage sampling procedure consist of purposive and random sampling was adopted to select 956 legume farmers. The result of independent sample t-test of socioeconomic characteristics shows that legume farmers in conflict and non-conflict areas differed in terms of household size ( $P \leq 0.01$ ), farming experience ( $P \leq 0.01$ ), legume farming experience ( $P \leq 0.01$ ), expenditure and saving ( $P \leq 0.01$ ). The findings also reveal that age, years of formal education and legume farming experience are positively affecting being from conflict area ( $P \leq 0.01$ ,  $P \leq 0.01$  and  $P \leq 0.01$  respectively). While farming experience, household size and expenditure are negative but significantly affecting being from conflict area ( $P \leq 0.01$ ,  $P \leq 0.01$ ,  $P \leq 0.01$  and  $P \leq 0.05$  respectively). The result further shows that the conflict has no impact on savings of the legumes farmers in North-eastern Nigeria. It's then concluded that armed conflicts have no impact on a household saving due to viable interventions to improve farmers' livelihood through legume farming in order to mitigate the impact of Boko-haram territorial terrorism in North-eastern Nigeria. It is hence recommended that an effective intervention could mitigate the impact of armed conflict on savings.

**Keywords:** Boko-Haram, Conflict, Legume, Propensity and Saving

### INTRODUCTION

The term "territorial terrorism" is suggested by Adelaja and George (2019<sup>a</sup>) to more accurately describe the activities of groups like Boko Haram, as it involves violence aimed at achieving political or social objectives through intimidation beyond immediate victims. Boko Haram, for instance, inflicts highly destructive attacks, encompassing both human casualties and infrastructure damage, including agriculture. Despite Boko Haram's stated goals, their actions affect rural livelihoods and households, leading to an array of negative consequences (Adelaja and George, 2019<sup>a</sup>). Boko Haram's actions have spatial implications, leading to increased fallow land, reduced land values, and shifts in cropping diversity (Adelaja and George, 2019<sup>b</sup>). This can impact farmers' savings and agricultural investments. Savings play a crucial role in economic growth, particularly for countries in the process of capital accumulation. Countries affected by conflicts tend to exhibit lower savings rates and negative correlations with conflict intensity (Torres-Garcia *et al.*, 2019). Agricultural intensity can attract armed actors due to resource availability (Tranchant *et al.*, 2019).

The Lake Chad basin relies heavily on agriculture, but the presence of insurgents like Boko Haram has disrupted farmers' activities, leading to food insecurity and displacement (FAO, 2017). Conflict hinders institutional functions and exacerbates vulnerabilities, affecting savings and agricultural livelihoods (Usman *et al.*, 2015). Intensified conflict also correlates



with changes in household behaviour, including asset liquidation and shifts to subsistence activities (Arias *et al.*, 2019).

Efforts to mitigate the impact of insurgency on farmers have included interventions like N2AFRICA and North-east Development Commission, emphasizing legume production to enhance soil fertility and household nutrition (N2Africa, 2020). However, conflict's implications on farmers' decisions and savings have received limited attention. While some studies have explored saving determinants, few have considered the impact of conflict on savings, especially among farmers. This study fills that gap, analyzing how armed conflict influences legume farmers' savings behaviour in Nigeria. The findings provide insights for policy development in conflict-affected regions with weak institutions.

## **THEORETICAL FRAMEWORK**

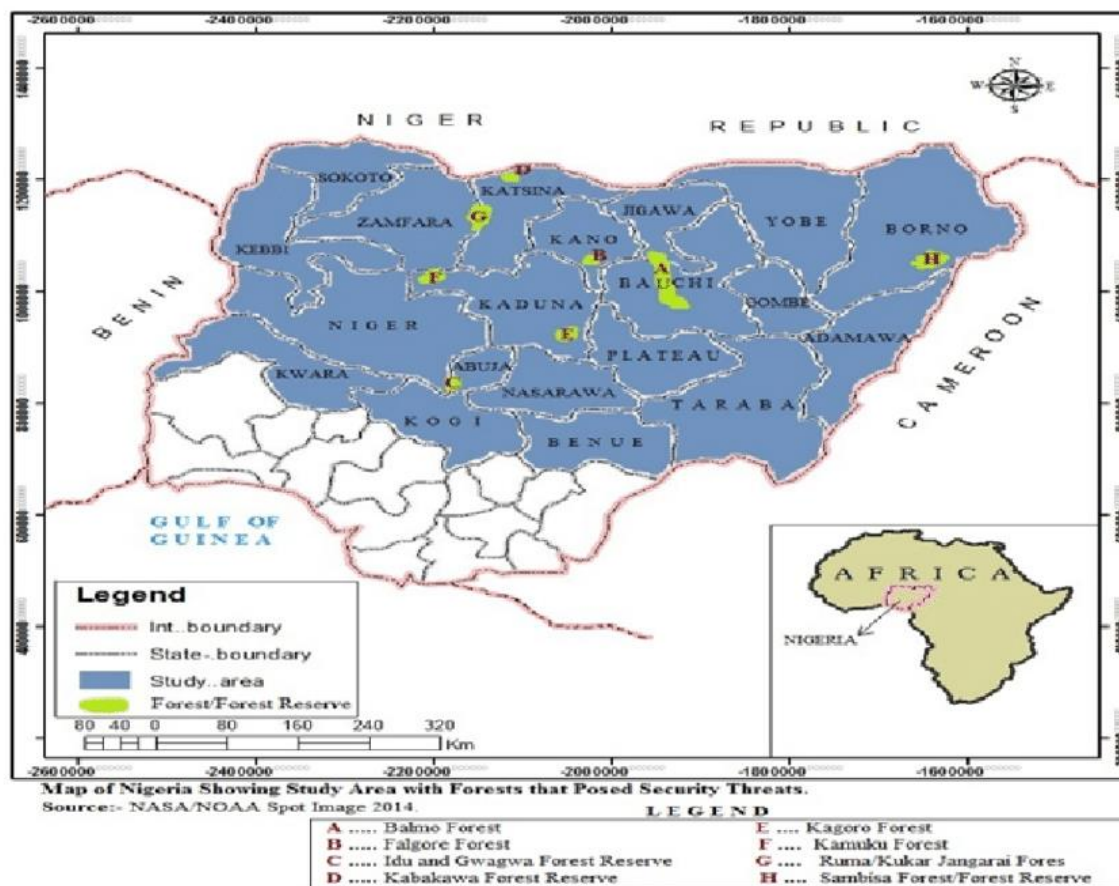
The connection between conflict and saving can be understood through the lens of the Permanent Income Hypothesis (PIH). Proposed by Friedman (1957), this theory offers a novel perspective on income and consumption behaviour. Its core assumptions suggest that individuals aim for consistent consumption patterns throughout their lives. To achieve this, they make decisions about when to save and when to spend based on their current and anticipated income levels. While income shocks can influence consumption decisions over a person's lifetime, only permanent shocks tend to have a lasting impact. Temporary shocks mainly affect decisions about saving or spending, rather than altering consumption choices.

However, the assumption of homogeneous consumers in the PIH contradicts the reality of consumer diversity in terms of age, income, and access to credit. This has led to the emergence of an alternative theory, the Life Cycle Hypothesis (LCH), which accounts for consumer heterogeneity based on age-related factors (Grigoli *et al.*, 2018). In practice, consumption behaviour is influenced by both observable and unobservable variables, and this perspective is explored in various studies.

## **METHODOLOGY**

### **The Study Area**

The study is conducted in Northern Nigeria, a region located between longitudes 30° and 150° east and latitudes 90° and 140° north. This area experiences alternating wet and dry seasons, with temperatures peaking in March/April and reaching their lowest in December/January. Dominated by savanna vegetation types such as Guinea, Sudan, and Sahel Savanna, the region's agricultural activities are heavily influenced by its climate (Ugbem, 2019). Despite its economic potential, agriculture faces challenges due to factors like out-dated land tenure systems, low irrigation development, limited technology adoption, high input costs, inadequate credit access, and poor market access (Ugbem, 2019). This area covers approximately 60.00% of Nigeria's landmass, representing about 52.57% of the total national population of 200 million. Agriculture remains a cornerstone of the Nigerian economy, supporting the livelihoods of many residents (Ugbem, 2019). However, productivity is hindered by various factors, leading to low agricultural output and significant postharvest losses. The study aims to shed light on the impact of armed conflict on legume farmers in the region (average of 246.25 kg of legumes per hectare) (FAO, 2020; Soharwardi *et al.*, 2014).



## Sampling Procedure

Multistage sampling procedure was adopted. In the first stage, Northern Nigeria was purposely selected as it's the major legume producing area in Nigeria. In the second stage, one (Borno) states were purposively selected from the 19 Northern states as a major area affected by Boko Haram territorial terrorism, Kwara, Kebbi states and Abuja were selected as counterfactual. In the third stage, major legume producing local government area were purposively selected as given by Agricultural Development Programme of the states, three from Borno as one of the major legume production area in Nigeria (Biu, Hawul and Kwaya Kusar). One from Abuja (Bwari), one from Kebbi (Danko Wasagu) and two from Kwara (Ilorin-east and Ilorin south). In the last stage proportionate random sampling was employed to select 5% of registered farmers in the study area, making 956 respondents for the study. The data were collected using interview schedule of a household head. The data quality assuring measures adopted were proper supervision and review of filled questionnaire.

## Method of Data Analysis

To accurately understand the causal effects of residing in conflict-affected areas on potential savings, it's important to address selection bias. This arises due to the lack of random assignment of individuals into treatment groups, making it necessary to control for observable characteristics. The study employs propensity score matching (PSM), using various matching estimators to mitigate selection bias. The core idea of PSM is to pair treated households with similar untreated households and then quantify the differences in outcome variables between the two groups. The study aims to answer the question, "What would have happened to the savings of treated households if they hadn't received treatment?" The average treatment effect on the treated (ATT) is a key concept, defined as the difference between the outcomes for



treated and untreated households. However, in the dataset, only one side of the ATT equation is observable ( $ATT = E\{Y(1)\}/T=1$ ), while the other ( $ATT = E\{Y(0)\}/T=1$ ) remains unobserved. Simply comparing savings between treated and untreated groups introduces bias due to self-selection. This bias is quantified as the difference between the outcomes of treated and untreated households under different conditions.

Propensity score matching aims to reduce bias by making treated and untreated households comparable based on observable characteristics. However, it assumes that unobservable characteristics are similar between the two groups, and relies on the condition of conditional independence and overlap. To address selection bias, the study employs sensitivity analysis using various matching techniques, including Nearest-Neighbour (NB), Stratification, and radius approach. This approach helps account for potential biases and strengthens the robustness of the findings.

## RESULT AND DISCUSSION

### Descriptive Statistics

Table 1 presents descriptive statistics for key variables of interest comparing legume farmers in conflict and non-conflict areas. The results indicate no significant differences between the two groups in terms of age, marital status, farming experience, years of formal education, and income. The average age of legume farmers in conflict and non-conflict areas was approximately 45.47 and 44.85 years, respectively, suggesting they were within an active age range for engaging in demanding farm activities. This aligns with previous research by Shehu *et al.* (2019) and Ahmed *et al.* (2020) on farmers' ages in similar regions.

Education-wise, legume farmers had an average of 8.01 years of formal education in conflict areas and 7.28 years in non-conflict areas, indicating a generally low level of education. This aligns with findings from other studies conducted in similar regions. Farming experience averaged around 21.77 years in conflict areas and 22.53 years in non-conflict areas, reflecting the experience of farmers in both settings. These figures are in agreement with research by Shehu *et al.* (2019) and Ahmed *et al.* (2020). Household sizes were substantial, averaging 8 people in the conflict area and 10 people in the non-conflict area. This pattern is consistent with previous findings and suggests the availability of family labour for farming activities. Average legume farming experience was notably higher in conflict areas (15.43 years) compared to non-conflict areas (10.78 years). This difference of 4.65 years suggests that farmers in conflict areas were more experienced. However, this contradicts previous studies by Shehu *et al.* (2019) and Ahmed *et al.* (2020).

Regarding economic factors, legume farmers exhibited low average annual incomes in both conflict (₦353,490.87) and non-conflict (₦457,286.91) areas. This aligns with findings from Manda *et al.* (2019) regarding the income levels of Nigerian farmers. Average expenditure was ₦202,698.79 in conflict areas and ₦401,378.24 in non-conflict areas, indicating significantly lower expenditure in conflict areas. This suggests that Boko Haram's territorial terrorism had a substantial negative impact on farmers' economic welfare, corroborating with research by Adelaja and George (2019<sup>a</sup>) and Adelaja and George (2019<sup>b</sup>). The average saving of legume farmers was ₦150,792.09 in conflict areas and ₦55,908.6 in non-conflict areas. This significant difference (₦94,883.41) suggests that, at an aggregate level, armed conflict influenced donor agencies to socially protect farmers through legume production. This interpretation aligns with Torres-Garcia *et al.* (2019) and highlights the complex effects of armed conflict on saving behaviour. However, caution should be exercised in interpreting this effect as it doesn't fully capture the impact of conflict on savings.





**Table 1: Description Statistics by Treatment**

Variable	Conflict area (n=597) Mean	Non conflict area (n=359) Mean	Mean Difference Mean	t-value
Age	45.47	44.85	0.62(0.94)	0.66
Household Size	8.34	9.84	-1.50(0.35)	-4.27***
Farming Experience	21.77	22.53	-0.86(-0.76)	0.89
Legume farming experience	15.43	10.78	4.65(0.70)	6.62***
Years of Formal Education	8.01	7.28	0.73(0.44)	1.66
Expenditure	202698.79	401378.24	-198679.45(65160.87)	-3.05***
Income	353490.87	457286.91	-103796.04(70195.84)	-1.48
Saving	150792.09	55908.67	94883.41(54318.01)	1.75*

### Impact of Boko Haram Territorial Terrorism on Saving

The result of the effect of armed conflict on saving is presented in Table 2, the result revealed that, 590 and 283 for stratification and 590 and 283 for radius matching respectively. The saving of the legume farmers in a conflict area was found to be ₦5,039.82 less, compared to the legume farmers from non-conflict area using nearest neighbor matching which is not statistically significant in all the matching algorithms. The standard error of 123000 showed a wider variation between savings of legume farmers from conflict and non-conflict area. The saving of the legume farmers in a conflict area was found to be ₦18,600 less, compared to the legume farmers from non-conflict area using stratification matching method. The standard error of 72742 showed a wider variation between savings of legume farmers from conflict and non-conflict area. The saving of the legume farmers in a conflict area was found to be ₦9,955.29 less, compared to the legume farmers from non-conflict area using radius matching. The standard error of 72549 showed a wider variation between savings of legume farmers from conflict and non-conflict area. This depicts that conflict in an area reduces savings. This is in line contrary to study of Torres-Garcia *et al.* (2019) who found that countries that experienced conflict are 2.7% less in saving compare to their counterpart. This was probably due to the peculiarity of North-eastern Nigeria, there were significant intervention that cushion for saving of the legume farmers like N2AFRICA project that improved farmers livelihood through legume production. The sensitivity analysis showed that the model was robust as the three matching techniques were consistent in sign, significant level and closer in amount.

**Table 2: Matching Treatment and Control using Nearest Neighbour, Stratification and Radius method**

Matching Method	Treatment	Control	ATT	Std. Err.	T
Nearest neighbor	590	179	-5039.82	123000	-0.041
Stratification	590	283	-1.86E+04	72742.06	-0.255
Radius	590	283	-9955.29	72548.86	-0.137

### CONCLUSION AND RECOMMENDATIONS

Based on the findings, it could be concluded that armed conflicts have no effect on a household saving in a weak institution due to viable interventions to improve farmers' livelihood through legume farming in order to mitigate the effect of Bokoharam territorial terrorism. It is



hence recommended that an effective intervention could mitigate the impact of armed conflict on savings.

The limitation of this study was its restriction to observable variables only. It could be checked in further studies by using Endogeneous switching regression and IPWRA should be used in addition to PSM, panel data or experimental approach to account for problem of endogeneity.

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