

## Socio-Economic Impact of Insurgency on Livestock Farmers in North Central Nigeria

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### Abstract

This study examined the socio-economic impact of insurgency on livestock farming households in the North Central States of Nigeria, with a focus on its contribution to rising poverty levels among farmers. A total of 3,285 respondents were randomly selected from Benue, Kwara, Niger States, and the Federal Capital Territory (FCT). Data were gathered through structured questionnaires and interview schedules and analyzed using both descriptive and inferential statistics to address the research objectives and test hypotheses. Findings revealed that the average respondent was 35 years old, had a household size of 5, farming experience of 8 years, and had lived in their community for an average of 12 years. Livestock farming was predominantly practiced by married, educated men. The insurgency had severely impacted livestock production levels, with 83.84% of respondents reporting significant declines. This was closely linked to a high perceived poverty level among farmers, recorded at 85.08%. Major challenges included insurgency-related conflicts (mean = 4.00), insufficient capital (mean = 3.64), lack of government support (mean = 3.52) and scarcity of water (mean = 3.38) and, all of which compounded farmers' poverty. Statistical analysis identified key determinants of livestock farmers' income: educational level ( $\beta = 6.178$ ), farming experience ( $\beta = 1.935$ ), length of residency ( $\beta = 3.381$ ), marital status ( $\beta = 2.938$ ), age ( $\beta = -4.985$ ), and household size ( $\beta = 3.249$ ). The calculated Chi-square value ( $X^2 = 1617.3$ ) was significantly higher than the tabulated value ( $X^2 = 2.706$ ), indicating that insecurity and insurgency had a significant effect on farmers' perceived poverty levels. The study recommended that the government take decisive and sincere action to combat insurgency, enabling farmers to resume and improve their livestock production. Increased security would help boost farmers' incomes and reduce, if not eliminate, their poverty levels.

**Keywords:** Insecurity, Insurgency, Livestock Farmers, Production, Perceived Poverty, Income Level.

### Introduction

Livestock refers to animals raised in agricultural settings for their various products, including cattle, sheep, goats, pigs, horses, and chickens (Mahr, 2023). The importance of livestock to individuals, industries, and national economies cannot be overstated. As Mahr (2023) highlights, livestock provides vital resources such as income, meat, milk, eggs, and

wool. Despite these substantial benefits, the advantages of livestock farming are increasingly diminishing, largely due to rising crime, conflict, and insecurity in the communities where farmers live and work. Conducting regular livestock censuses could offer valuable insights into whether livestock production is growing, whether current levels are adequate to meet population demands, and whether livestock farming is contributing to reducing poverty among the farmers involved.

Musab and Otovwe (2021) define insurgency as a violent, armed rebellion against established authority. According to Jelilov *et al.* (2018), the Boko Haram sect has been the primary driver of such insurgency in Nigeria. Boko Haram, a radical Islamist group whose name in Hausa means "Western education is forbidden," launched an armed uprising in 2009 that has since evolved into a prolonged conflict. This insurgency has had devastating consequences for food security in the region. Since violence intensified in 2012, households in northeastern Nigeria, particularly poorer communities, have experienced severe food insecurity directly attributed to the ongoing conflict (Musab and Otovwe, 2021).

The ongoing insurgency has severely disrupted agricultural practices and destabilized the socioeconomic activities of farmers, particularly those living in northern Nigeria (Ojo *et al.*, 2018). The instability resulting from the conflict has caused a sharp rise in the prices of key agricultural crops and livestock produced in insurgent-controlled areas, as well as those transported to other regions of the country. This surge in prices is largely driven by reduced agricultural output, labor shortages, scarcity of farm inputs, market uncertainties, and increased transportation costs. For example, the production of staple crops such as cowpeas, maize, millet, rice, and sorghum in the affected areas has declined by 40%, significantly impacting the overall food supply and availability of livestock products both locally and nationwide (Matopote *et al.*, 2025). The decline in crop and livestock production, directly linked to Boko Haram's activities has broadly disrupted farming and agricultural livelihoods (Musab and Otovwe, 2021). It is therefore essential to specifically assess how these impacts have affected livestock farmers and the poverty levels within their households.

Okwuokenye *et al.* (2024) categorized poverty into two distinct forms: relative poverty and absolute poverty. According to their definitions, relative poverty describes a situation in which individuals are considered poor when compared to others within the same society. In contrast, absolute poverty refers to a condition where individuals live below a defined minimum standard of living or quality of life. This study has become necessary because most existing research has focused on the effects of insecurity on agricultural output, particularly crop production, while paying less attention to livestock production and its connection to farmers' poverty status. This study, therefore, aims to fill this important gap. By emphasizing the impact of insecurity on livestock production and examining its consequent effect on the poverty levels of livestock farmers, the study addresses the need for reliable data. Such information is essential to assess the extent to which insecurity has hampered livestock production and to determine whether the observed decline is primarily due to insecurity or the subsistence nature of livestock farming. Insights from this research

will help inform the government at both state and federal levels and other stakeholders in developing effective management strategies and policies to support and enhance livestock production. Against this background, the study focuses to:

- i. examine the socio-economic characteristics of livestock farmers in the North Central Zone of Nigeria.
- ii. assess the degree to which insecurity has affected livestock production in the region.
- iii. evaluate the perceived poverty status of livestock farmers in the aftermath of insecurity and insurgency in the area.
- iv. identify the major challenges hindering livestock production among farmers in the study region.

## Hypotheses of the study

The null hypotheses were:

**Hoi:** Livestock farmers socio-economic characteristics do not significantly influence the income level of the farmers during period of insurgency.

**Hoi:** Incidence of insecurity/insurgency has not significantly affected the farmers perceived poverty level.

## Methodology

### Area of Study

This research was carried out in 3 States and the Federal Capital Territory. The States are: Benue, Kwara and Niger States and they all in North Central geo-political zone of Nigeria. They are described below as:

### Federal Capital Territory

Federal Capital Territory (FCT), Abuja, was indeed carved out from its neighboring states during the process of selecting and creating a new capital for Nigeria. The FCT was established in 1976, though became functional in 1991 as the capital seat of Nigeria. Its land was taken from the old Kwara, Niger, Kaduna, and Plateau States to form this new administrative region. It has 6 Local Government Councils. Its estimated population according to National Population Commission (NPC) as at 2023 was 3,840,000 with a land mass of 7,620Km<sup>2</sup>. The coordinates of FCT lies between Latitude 9.07°N and Longitude 7.339°E (FCT Wikipedia, 2016). Okwuokenye, *et al.* (2023) the vegetation in the FCT, Abuja, is primarily Guinea savanna in nature. This type of vegetation is characterized by tall grasses and scattered trees. Additionally, the region supports the growth of shrubs, which are smaller woody plants that complement the grassy savanna landscape and suitable for rearing of animals. The Federal Capital Territory, Abuja, is known to have various mineral deposits, including clay, feldspar, tin, gold, iron ore, and others. These mineral resources contribute to the area's potential for economic development and the presence of these minerals highlights the region's rich natural endowment

### Benue State

Benue State was founded in 1976 its geographical coordinate is 7°20'N and 8°45'E. The land area of the State is 30,783 Km<sup>2</sup> and it has 23 Local Government Areas (LGAs) with Makurdi as the State capital. The State estimated population size as at 2023 was 6,141,300 and. The State is rich agriculturally as it is known to grow several cash and arable crops, hence it is known as the "food basket of the nation".

### Kwara State

Kwara State is an old State founded in 1967 with 16 LGAs and has its capital at Ilorin. The estimated population size as at 2023 is 3,551,000, while the land area size is 33,433 Km<sup>2</sup> (NPC, 2023) The geographical coordinates of the State is 8.9669°N and 4.3874°E (Kwara State Wikipedia). The Wikipedia also stated that the State is hot all year round and its temperature typically varies between 64°F to 95°F and is rarely below 57°F and above 100°F. On economic trend, the inhabitants are mostly engaged in growing crops (coffee, kola nut, ground nut, cotton, cocoa, etc) and rearing animals (cattle, sheep and goats) (Al-Mustapha and Ashiru, 2021).

### Niger State

Niger State is known to be the largest State in Nigeria. It was created in 1967 and presently has 25 LGAs with Minna as its capital. The population size as at 2023 was 27,202,843 and a land area of 1,266,700 Km<sup>2</sup> (NPS, 2023). The State's coordinate is Latitude 8°.20'N and 11°30'N and Longitude 3°30' and 7°20'E (Niger State Encyclopedia). The monthly average temperature of the State is between 23°C and 37°C, while the annual rainfall is between 1100 – 1600mm with a -vegetation that is mainly composed of short grasses, shrubs and scattered trees. Major livelihood activities of the inhabitants is farming (both crops and animals) (Adewumi *et al.*, 2022).



Figure 1: Shaded States show area of study.

### Sampling technique and sample size

A multi-stage sampling technique was used to select respondents for the study. In the first stage, Benue, Kwara, Niger States, and the FCT were purposively selected from the North Central Zone of Nigeria, as these areas have been significantly impacted by insecurity and insurgency. In the second stage, all three agricultural zones in each of these states were chosen to ensure comprehensive coverage of the affected regions, and this made it 9 agricultural zones and the FCT Local Government Councils (LGCs). Out of the 23, 16, 25 and 6 Local Government Areas or Local Government Councils in Benue, Kwara, Niger States and the FCT, respectively, 3 LGAs were randomly selected from each of the Agricultural zones, therefore resulting to 27 LGAs and 3 LGCs. It all it became 30 LGAs that were randomly selected for the study (stage 3). In the fourth stage, four villages or communities were randomly selected from each Local Government Area (LGA), resulting in a total of 120 villages or communities for the study. The fifth stage involved the employment of random sampling technique to select 30 respondents from each of these villages or communities. This method was used to reduce bias, resulting in a total of 3,600 respondents who were contacted and administered the questionnaire. From the returned question instruments, 3285 (91.25%) of them that were good for analysis were used for the study. The information on State, Agricultural zone, LGAs, village/communities and respondents selected are shown in Table 1.

**Table 1: States, Agricultural Zones, LGAs and Communities/Towns used for the study**

| State | Agric. Zone        | LGAs Used for the study | Towns/Communities                                                  | No. of farmers |
|-------|--------------------|-------------------------|--------------------------------------------------------------------|----------------|
| Benue | Benue              | Katsina-Ala             | Katsina-Ala (30), Yoooyo (30), Utange (30) & Mbajir (30)           | 120            |
|       |                    | Logo                    | Ugba (30), Zanzan (30), Anylin (30) & Abeda (30)                   | 120            |
|       |                    | Kwande                  | Dio (30), Gube (30), Adikpo (30) & Ahundu (30)                     | 120            |
|       | Benue North - West | Buruku                  | Mbaya (30), Etulo (30), Shorov (30) & Mbaazager (30)               | 120            |
|       |                    | Gboko                   | Mbatan (30), Mbadam (30), Mbaanku (30) & Mbakwen (30)              | 120            |
|       |                    | Makurdi                 | Aki (30), Agam (30), Adaka (30) & Akaan (30)                       | 120            |
|       | Benue South        | Ado                     | Igah (30), Oturukpo (30), Osabo (30) & Olek (30)                   | 120            |
|       |                    | Apa                     | Ugbokpo (30), Adija (30), Amoke (30) & Igoro (30)                  | 120            |
|       |                    | Otukpo                  | Adoka (30), Otobi (30), Pgobia (30) & Upu (30)                     | 120            |
| Kwara | Kwara Central      | Ilorin South            | Owode-Ofaro (30), Omupo (30), Ganmo (30) & Oke-Ode (30)            | 120            |
|       |                    | Ilorin West             | Ajikobi (30), Oko-erin (30), Baboko (30) & Alanamu (30)            | 120            |
|       |                    | Asa                     | Aboto (30), Laduba (30), Ogele (30) & Afon (30)                    | 120            |
|       | Kwara South        | Ekiti                   | Koro (30), Osi (30), Etan (30) & Eruku (30)                        | 120            |
|       |                    | Offa                    | Balogun (30), Essa (30), Shawo central (30) & Ojomu Central (30)   | 120            |
|       |                    | Oke-Oro                 | Ilofffa (30), Ekan (30), Odu-Owa (30) & Idofin (30)                | 120            |
|       | Kwara North        | Baruten                 | Igbogi (30), Gwanara (30), Haruna Buran (30) & Ibrahim Zamari (30) | 120            |
|       |                    | Edu                     | Igbaja (30), Edidi (30), Gure (30) & Buari (30)                    | 120            |

**Table 1: Contd.**

| State        | Agric. Zone                           | LGAs Used for the study | Towns/Communities                                           | No. of farmers |
|--------------|---------------------------------------|-------------------------|-------------------------------------------------------------|----------------|
| Niger        | Niger East                            | Pategi                  | Pategi (30), Bide (30), Ebu (30) & Eka-Cheja (30)           | 120            |
|              |                                       | Tafa                    | Ija (30), Iku (30), Zuma (30) & Wuse (30)                   | 120            |
|              |                                       | Rafi                    | Dada (30), Bangu (30), Ankawa (30) & Agwai (30)             | 120            |
|              |                                       | Suleja                  | Chimbi (30), Apia (30), Dwakoro (30) & Buru (30)            | 120            |
|              | Niger South                           | Bida                    | Wagini (30), Bamisu-Wuya (30), Agibogga (30) & Baba Ko (30) | 120            |
|              |                                       | Edatti                  | Sakpe (30), Etsu-Tasha (30), Edati (30) & Enagi (30)        | 120            |
|              |                                       | Lapai                   | Muye (30), Yamma (30), Tashibo (30) & Kpada (30)            | 120            |
|              | Niger North                           | Borgu                   | Agumu (30), Aranguru (30), Adamu (30) & Bakuta              | 120            |
|              |                                       | Rijan                   | Doka (30), Dawaworo (30), Bini-Edrira (30) & Gbako (30)     | 120            |
|              |                                       | Magama                  | Kawo (30), Ibelu (30), Nnali (30) & Auna (30)               | 120            |
| FCT          | 3 LGCs                                | Abaji                   | Gbagyi (30), Ganagana (30), Basa (30) & Egbira (30)         | 120            |
|              |                                       | Kuje                    | Agwai (30), Achmbi (30), Bamishi (30) & Atsauna (30)        | 120            |
|              |                                       | Gwagwalada              | Atopi (30), Agota (30), Alu Wamo (30) & Akwayi (30)         | 120            |
| <b>Total</b> | <b>9 Agric. Zones + 3 LGCs of FCT</b> | <b>30 LGAs</b>          | <b>120 town / communities</b>                               | <b>3,600</b>   |

### Sources of data and data collection instrument

This research used data that were sourced from primary and secondary sources. The were respectively sourced from the respondents and materials in the shelves like Journals, text books, the Internet, including other documented sources.

Data collection process follows the following sequence:

*Instruments Used:* Both questionnaire and interview schedule were respectively administered to literate and illiterate livestock farmers that were used for the study.

*Administration and Retrieval:* Both instruments were administered and collected by the researchers. Trained enumerators assisted in this process.

*Selection of Enumerators:* Enumerators were residents of the study area and Local Enumerators were used for the purpose of overcoming language barriers and to build trust and research confidence among respondents.

### Validation of data collection/question instrument

Validity and reliability approaches were used to validate the research instrument. The former was applied through presenting the question instrument to Agricultural Economics and Extension experts for the purpose of going through and be sure that it the instrument addresses the research objectives and hypotheses. The latter involved the technique known as test-re-test which has to do with administering the instruments to same set of farmers but at two different times, say about an interval of 6 weeks. The data were then collated

and analysed and it yielded Correlation Coefficient ('r') of 0.716, which according to Okwuokenye, *et al.* (2023) implies a high level of reliability of the instrument.

### Analytical techniques of the study

Descriptive and inferential statistics were employed to analyze the study data. For descriptive statistics, methods such as frequency counts, frequency tables, percentages, means, and standard deviations were utilized. These techniques helped to determine the socio-economic characteristics of the farmers, ascertain the extent to which insurgency has affected livestock farmers production level and income, and the challenges faced by the farmers in their production process. Inferential statistics used for analysing the hypotheses were the Binary logistics regression analysis and Chi-square. Binary logistic regression is a regression analysis that is applied in relationships between a set of independent variables (say, age, income, gender, etc) and a binary dependent variable that is dichotomous in nature e.g. income, which is described as either high or low (Penman, 2022). It is used to analyse the first hypothesis: Socio-economic characteristics of livestock farmers do not significantly influence the income level of the farmers during period of insurgency. Binary logistic regression explains relationship between one dependent variable and one or more independent variables. The model variables are operationalized as;

Y = Income (N) (High = 1; low = 0)

X<sub>1</sub> = Gender (dummy: male = 1; female = 0)

X<sub>2</sub> = Age (years)

X<sub>3</sub> = Education (pri. educ. = 1, sec. educ. = 2 and tertiary educ. = 3)

X<sub>4</sub> = Marital status (single = 1, married = 2, divorced = 3 widow(er) = 4)

X<sub>5</sub> = Livestock farming experience (years)

X<sub>6</sub> = Household size (number of persons living and feeding together)

X<sub>7</sub> = Length of residence (years)

X<sub>8</sub> = Farming status (full-time = 1; part-time = 0)

X<sub>9</sub> = Religious affiliation (Christian = 1; Muslim = 2; Traditionalist = 3)

Chi-square was used to analyse hypothesis 2 and it was meant to analyse the incidence of insecurity/insurgency on farmers perceived poverty level. Uzoagulu (2018) noted that Chi-square produces frequency counts which usually are placed in two or more categories and that it helps to find out if the frequency with which each of the 2 or more categories endorsed by each group differ from the frequency that could be expected. However, it was stressed by Uzoagulu (2018) that Chi-square values are larger when there is a great difference between the expected and the observed frequencies.

The Chi-square is as shown below

$$\chi^2 = \sum \frac{O_i - E_i}{E_i}$$

Where:

$\chi^2$  = Chi-square

$O_i$  = Observed value (actual value)

$E_i$  = Expected value

### Assumptions and limitations of the study

Insecurity in some areas may limit access to certain communities, leading to potential bias in data collection or an incomplete sample. This was however overcome by selecting 3285 out of 3600 of the instruments that were correctly and completely filled by the respondents of the study. Response bias was guided against through assuring the respondents of anonymity and appealing to them that the study was just for academic purpose. The issue of language and communication barriers was taken care of through the use of locally trained enumerators in the collection of data. There is a need to state here that issue of generalization should be guided against since results from the North Central Zone may not be easily generalized to other regions of Nigeria experiencing different types or levels of insurgency.

## Results and Discussion

### Socio-economic characteristics of respondents

The socio-economic characteristics of the respondents are summarized in Table 2. The findings reveal that the majority of respondents (62.80%) were male, while females accounted for 37.20%. This indicates that livestock farming in the area is predominantly male-dominated. This trend may be attributed to the labour-intensive nature of livestock farming, which may be considered less suitable for women. Regarding marital status, the majority of respondents (62.60%) were married, while 21.50% were single, 7.70% widowed, 6.10% divorced, and 2.10% widowers. The high proportion of married respondents suggests that many farmers are household heads and likely serve as the primary economic providers for their families. Age distribution showed that 42.28% of respondents were between 26 and 34 years old, with an average age of 35 years. Additionally, 12.52% were younger than 26, and 45.10% were older than 34. This indicates that most livestock farmers are in their prime, physically capable of engaging in demanding farming activities. These findings align with Opeyemi *et al.* (2022), who reported similar trends in sex, marital status, and age among farmers in the same region.

In terms of education, 41.30% of respondents had post-secondary education, 37.10% had completed secondary school, and 16% had primary education. Only 5.70% had no formal education. The relatively high level of education among farmers suggests they possess the literacy skills necessary to access, interpret, and apply agricultural information, which can enhance the adoption of improved farming practices and increase productivity. Religious affiliation showed that the majority (78.62%) of respondents were Christians, followed by Muslims (11.97%), Traditionalists (5.85%), and adherents of other religions (3.56%). The dominance of Christianity may indicate a higher population of settlers from Southern Nigeria in the study area. Household size analysis revealed that 58.26% of respondents had between 4 and 6 household members, with an average of 5 persons per household. Additionally, 20.15% had fewer than 4 members, while 21.58% had more than 6. A large household size could be advantageous, providing readily available labor for farming activities, but it may also increase the financial burden on the household. Similar

observations regarding education level, religious affiliation, and household size were reported by Okwuokenye *et al.* (2023a).

**Table 2: Socio-economic characteristics of the respondents. N = 3285**

| Socio-economic variables         | Categories           | Freq | %     | Mean |
|----------------------------------|----------------------|------|-------|------|
| Sex                              | Female               | 1223 | 37.20 |      |
|                                  | Male                 | 2062 | 62.80 |      |
| Marital status                   | Single               | 707  | 21.50 |      |
|                                  | Married              | 2055 | 62.60 |      |
|                                  | Divorced             | 201  | 6.10  |      |
|                                  | Widow                | 252  | 7.70  |      |
|                                  | Widower              | 70   | 2.10  |      |
| Age range (years)                | ≤25                  | 411  | 12.52 |      |
|                                  | 26-34                | 1388 | 42.28 |      |
|                                  | 35-44                | 864  | 26.32 |      |
|                                  | 45-54                | 573  | 17.45 |      |
|                                  | ≥55                  | 47   | 1.43  | 35   |
| Education                        | No formal education  | 186  | 5.70  |      |
|                                  | Primary educ.        | 524  | 16.00 |      |
|                                  | Secondary educ.      | 1218 | 37.10 |      |
|                                  | Post-secondary educ. | 1357 | 41.30 |      |
| Religion                         | Christianity         | 2582 | 78.62 |      |
|                                  | Muslim               | 393  | 11.97 |      |
|                                  | Traditional          | 192  | 5.85  |      |
|                                  | Others               | 117  | 3.56  |      |
| Household size range             | 1-3                  | 662  | 20.15 |      |
|                                  | 4-6                  | 1914 | 58.26 |      |
|                                  | 7-9                  | 662  | 20.15 |      |
|                                  | 10-12                | 37   | 1.13  |      |
|                                  | 13 & above           | 10   | 0.30  | 5    |
| Farming status                   | Part-time            | 1697 | 51.70 |      |
|                                  | Full-time            | 1588 | 48.30 |      |
| Farming experience range (years) | <5                   | 304  | 9.30  |      |
|                                  | 5-9                  | 2229 | 67.90 |      |
|                                  | 10-14                | 614  | 18.70 |      |
|                                  | 15-19                | 76   | 2.30  |      |
|                                  | ≥20                  | 62   | 1.90  | 8    |
| Length of residence (range)      | <5                   | 219  | 6.67  |      |
|                                  | 5-9                  | 742  | 22.59 |      |
|                                  | 10-14                | 1729 | 52.65 |      |
|                                  | 15-19                | 375  | 11.42 |      |
|                                  | ≥20                  | 219  | 6.67  | 12   |

Source: Field survey, 2023

With respect to farming status, 51.70% of respondents were engaged in part-time livestock farming, while 48.30% were full-time farmers. The prevalence of part-time farmers suggests that many also participate in non-farm economic activities, such as civil service and small businesses, a finding supported by Hamidu *et al.* (2022). Regarding farming

experience, 67.90% of respondents had between 5 and 9 years of experience, with an average of 8 years. This indicates that livestock farmers in the area are relatively experienced. These findings are consistent with Adewumi *et al.* (2022), who reported an average farming experience of 9.77 years, with most farmers having between 1 and 10 years of experience. The average length of residence in the community was 12 years. Most respondents (52.65%) had lived in the area between 10 and 14 years, while 29.26% had resided there for less than 10 years, and 18.09% for more than 14 years. A longer duration of residence may provide farmers with better knowledge of local farming practices and profitable opportunities, as noted by Gocer *et al.* (2024).

### Extent to which insecurity has affected livestock production

The extent of the impact of insecurity and insurgency on livestock production is presented in Table 3. The results show that all respondents (100%) reported being affected by the prevailing insecurity and insurgency in the region. Notably, a significant majority (83.84%) indicated that the impact on their livestock farming activities was to a very high extent. These findings align with the study by Matopote *et al.* (2025), who reported that insecurity and insurgency have adversely affected farmers by limiting their access to farm inputs, reducing overall productivity, and resulting in the destruction of crops and livestock, among other negative outcomes.

**Table 3: Extent to which insecurity has affected the production of livestock**

| Variables                                 | Category    | Frequency | Percentage | Mean      |
|-------------------------------------------|-------------|-----------|------------|-----------|
| Insecurity affected production level      | No          | 0         | 0.00       |           |
|                                           | Yes         | 3285      | 100.00     |           |
|                                           | Total       | 3285      | 100.00     | Yes       |
| Extent of insecurity impact on production | Zero extent | 0         | 0.00       |           |
|                                           | Low         | 9         | 0.27       |           |
|                                           | Average     | 114       | 3.47       |           |
|                                           | High        | 408       | 12.42      |           |
|                                           | Very high   | 2754      | 83.84      |           |
|                                           | Total       | 3285      | 100.00     | Very high |

Source: Field survey, 2023

### Perceived effects of insecurity/insurgency on poverty level

The poverty levels of livestock farmers, both before and after the insurgency, are categorized based on their responses into four levels: low, average, high, and very high (see Table 4). Prior to the onset of insecurity and insurgency, the majority of livestock farmers (70.99%) described their poverty level as average. However, following the insurgency, a significant proportion (85.08%) reported that their poverty level had escalated to a very high level. This result suggests that the insurgency has had a severe impact on livestock farmers, leading to a decline in production and farm income, which in turn has exacerbated

their poverty situation. These findings are consistent with Mukhtar *et al.* (2018), who noted that insurgent activities have displaced many individuals from their primary sources of livelihood, including farming. As a result, their agricultural output and income have been adversely affected, ultimately increasing their poverty levels.

**Table 4: Perceived effects of insecurity/insurgency on poverty level. N = 3285**

| Variables                                 | Category  | Frequency | Percentage | Mean      |
|-------------------------------------------|-----------|-----------|------------|-----------|
| Perceived poverty level before insecurity | Low       | 528       | 16.07      |           |
|                                           | Average   | 2332      | 70.99      |           |
|                                           | High      | 425       | 12.94      |           |
|                                           | Very high | 0         | 0.00       |           |
|                                           | Total     | 3285      | 100.00     | Average   |
| Perceived poverty level after insecurity  | Low       | 0         | 0.00       |           |
|                                           | Average   | 0         | 0.00       |           |
|                                           | High      | 490       | 14.92      |           |
|                                           | Very high | 2795      | 85.08      |           |
|                                           | Total     | 3285      | 100.00     | Very high |

Source: Field survey, 2023

### Challenges of faced by farmers in livestock production

Livestock farmers in the region are confronted with numerous challenges, particularly during this period of heightened insecurity and insurgency. These challenges, which vary in nature and intensity, have significantly impacted their production capacity, income levels, and overall well-being. As presented in Table 5, the challenges were ranked according to their mean scores, reflecting the severity of each issue as perceived by the respondents. Among the most pressing concerns identified were insurgency, banditry, and conflict, which collectively recorded the highest mean score of 4.00, ranking as the foremost constraint on livestock production in the region. Additionally, a lack of government support, specifically the absence of essential infrastructure such as livestock shelters, accessible roads, and other necessary facilities, were highlighted as a major challenge, with a mean score of 3.52, ranking third. These findings are consistent with the report of Ishaya *et al.* (2018), who also identified these factors as major obstacles undermining agricultural productivity in areas affected by insurgency and conflict.

**Table 5: Challenges of faced by farmers in livestock production**

| Variables                                                                | SD   |       | D    |       | A    |       | SA   |        | Total |     |                  |
|--------------------------------------------------------------------------|------|-------|------|-------|------|-------|------|--------|-------|-----|------------------|
|                                                                          | Freq | %     | Freq | %     | Freq | %     | Freq | %      | Mean  | SD  | Ranking          |
| - Insurgency, banditry, Conflict                                         | 0    | 0.00  | 0    | 0.00  | 0    | 0.00  | 3285 | 100.00 | 4.00* | 0.0 | 1 <sup>st</sup>  |
| - Poor capital base for farmers to be meeting up with group's activities | 0    | 0.00  | 1    | 0.03  | 1185 | 36.07 | 2099 | 63.90  | 3.64* | 0.5 | 2 <sup>nd</sup>  |
| - Lack of government assistance                                          | 0    | 0.00  | 366  | 11.14 | 832  | 25.33 | 2087 | 63.53  | 3.52* | 0.7 | 3 <sup>rd</sup>  |
| - Water unavailability/scarcity                                          | 0    | 0.00  | 366  | 11.14 | 1300 | 39.57 | 1619 | 49.28  | 3.38* | 0.7 | 4 <sup>th</sup>  |
| - Lack of knowledge in livestock rearing                                 | 0    | 0.00  | 227  | 6.91  | 2561 | 78.01 | 495  | 15.08  | 3.08* | 0.5 | 5 <sup>th</sup>  |
| - Pilfering/theft                                                        | 62   | 1.89  | 145  | 4.41  | 2621 | 79.79 | 457  | 13.91  | 3.06* | 0.5 | 6 <sup>th</sup>  |
| - Lack of grazing fields or animal feeds                                 | 0    | 0.00  | 525  | 15.98 | 2306 | 70.20 | 454  | 13.82  | 2.98* | 0.5 | 7 <sup>th</sup>  |
| - Pest and diseases                                                      | 0    | 0.00  | 432  | 13.15 | 2427 | 73.88 | 426  | 12.97  | 2.73* | 0.6 | 8 <sup>th</sup>  |
| - Lack of Veterinary attention                                           | 1542 | 46.94 | 1196 | 36.41 | 355  | 10.81 | 192  | 5.84   | 1.76  | 0.9 | 9 <sup>th</sup>  |
| - Lack of technical knowledge of how to manage the animals properly      | 2097 | 63.84 | 1125 | 34.25 | 63   | 1.92  | 0    | 0.00   | 1.38  | 0.5 | 10 <sup>th</sup> |
| - Unavailability of labour                                               | 2633 | 80.15 | 652  | 19.85 | 0    | 0.00  | 0    | 0.00   | 1.20  | 0.4 | 11 <sup>th</sup> |
| - Poor weather conditions                                                | 2844 | 86.58 | 244  | 7.43  | 165  | 5.02  | 32   | 0.97   | 1.20  | 0.6 | 12 <sup>th</sup> |
| - Farmer willingness to rear animals                                     | 2994 | 91.14 | 70   | 2.13  | 221  | 6.73  | 0    | 0.00   | 1.16  | 0.5 | 13 <sup>th</sup> |

Source: Field survey, 2023

\*Agreed factor (mean  $\geq 2.50$ )

Beyond insurgency and inadequate government support, livestock farmers identified several other critical challenges hindering their production efforts. Among these, a poor capital base, limiting farmers' ability to meet financial obligations and participate effectively in group activities, ranked second, with a mean score of 3.64. Theft and pilfering were also noted as significant issues, ranking sixth with a mean score of 3.06, while pest and disease outbreaks ranked eighth, scoring 2.73. These challenges are consistent with the findings of Offor *et al.* (2018), who similarly identified these factors as major constraints to livestock production in areas experiencing insecurity and insurgency. In addition, the lack of grazing fields or adequate animal feed was highlighted as the seventh most critical challenge, with a mean score of 2.98. This factor was emphasized by Nkonki-Mandleni *et al.* (2018) as a key limitation to livestock production in insurgency-prone regions of northern Nigeria.

### **Influence of respondents' socio-economic characteristics on level of livestock farmers income**

Table 6 presents the analysis of the influence of socio-economic characteristics on the income levels of livestock farmers during the period of insurgency. The model yielded an F-

ratio of 92.76 (compared to an F-tabulated value of 6.63), indicating statistical significance at the 1% level. The coefficient of determination ( $R^2$ ) was 0.6797, suggesting that approximately 67.97% of the variation in livestock farmers' income was explained by the socio-economic variables included in the model. Out of the nine socio-economic variables analyzed, six were found to significantly influence farmers' income. Specifically, educational attainment and farming experience demonstrated significance at the 1% level, while length of residence, marital status, age, and household size were significant at the 5% level.

The length of residence in a community had a positive relationship with farmers' income. It showed a beta coefficient of 3.38, a standard error (SE) of 1.002, and a t-ratio of 1.682, with significance at the 5% level. This suggests that farmers who have lived longer in a particular area tend to earn more from livestock farming. The odds ratio was calculated at 1.85, indicating that farmers with longer residency are nearly twice as likely to have higher incomes compared to those who have not resided as long. This finding is consistent with Gocer *et al.* (2024), who observed that longer-term residents typically possess greater knowledge of their local environment, enabling them to make better economic use of available resources.

In terms of marital status, there was also a positive and statistically significant relationship with farmers' income at the 5% level. The beta coefficient was 2.938, with a standard error of 0.269 and a t-value of 1.562. The implication is that married individuals, who made up 62.60% of livestock farmers, tend to earn higher incomes. The odds ratio of 2.118 suggests that married farmers are likely to earn twice as much as farmers from other marital categories. This outcome aligns with the findings of Mohammed *et al.* (2015), who asserted that marriage often motivates household heads to increase their earnings in order to provide for their families.

The age of the respondents exhibited a negative relationship with farm income and was statistically significant at the 5% level. The beta coefficient was -4.985, with a standard error (SE) of 2.004 and a t-value of -2.045. This negative association suggests that as livestock farmers grow older, their productivity and income tend to decline. The implication is that older farmers may be less inclined to adopt innovative practices or technologies, which can limit their efficiency and output. This finding is consistent with Offor *et al.* (2018), who noted that older farmers often struggle with the physical demands of livestock farming, resulting in reduced productivity and consequently lower income.

On the other hand, the education level of farmers demonstrated a positive and significant influence on farm income at the 1% level. The beta coefficient was 6.178, with a standard error of 1.866 and a t-value of 3.848. This indicates that higher levels of education among livestock farmers are associated with increased income. Educated farmers are generally more willing to take calculated risks and are better equipped to adopt improved management practices, which enhances their productivity and profitability. The odds ratio was 2.806, implying that farmers' income is likely to increase by nearly three times with improvements in their level of education. This result aligns with the findings of

Akouegnonhou and Demirbas (2021), who also concluded that education has a statistically significant and positive impact on the income levels of rural household farmers.

The beta coefficient for household size was 3.249, with a standard error (SE) of 0.192 and a t-value of 2.008, indicating a positive and statistically significant relationship with farmers' income at the 5% level. This suggests that farmers with larger household sizes are more likely to earn higher incomes from their farming activities. The odds ratio for this relationship was 2.120, meaning that an increase in household size could potentially double the farmer's income compared to previous levels. This finding aligns with Nkonki-Mandleni *et al.* (2018), who emphasized that larger household sizes often ensure the availability of family labor for farm operations, leading to timely task completion and increased productivity, which ultimately boosts income.

Similarly, farming experience was found to have a positive and significant effect on livestock farmers' income. The beta coefficient was 1.935, with a SE of 0.001 and a t-value of 2.103, demonstrating significance at the 1% level. This implies that farmers with greater experience in livestock production tend to earn higher incomes, likely due to their enhanced skills and better decision-making in managing livestock. The odds ratio was 3.124, suggesting that farmers with extensive experience are likely to earn up to three times more income compared to those with less experience. This result is consistent with the findings of Akouegnonhou and Demirbas (2021), who reported that greater farming experience significantly contributes to higher household incomes.

**Table 6: Relationship of livestock farmers socio-economic characteristics and level of farm income**

| Socio-economic variables   | B-Coefficients |       |         |             |           |
|----------------------------|----------------|-------|---------|-------------|-----------|
|                            | B              | SE    | t       | Prob. level | Odd-ratio |
| (Constant)                 | 14.473         | 9.295 | 4.625   | 0.001       | 2.331     |
| Length of residence (year) | 3.381          | 1.002 | 1.682*  | 0.219       | 1.85      |
| Sex                        | 2.491          | 1.826 | 2.417   | 0.007       | 1.374     |
| Marital status             | 2.938          | 0.269 | 1.562*  | 0.261       | 2.118     |
| Age (years)                | -4.985         | 2.004 | -2.045* | 0.410       | 1.999     |
| Education                  | 6.178          | 1.866 | 3.848** | 0.094       | 2.806     |
| Household size (no.)       | 3.249          | 0.192 | 2.008*  | 0.225       | 2.120     |
| Farming status             | 2.008          | 2.000 | 0.332   | 0.008       | 0.315     |
| Farming experience (years) | 1.935          | 0.001 | 2.103** | 0.181       | 3.124     |
| Religious affiliation      | 2.149          | 2.013 | 0.916   | 0.101       | 0.851     |

$R^2 = 72.52$ ; Adjusted  $R^2 = 67.97$ ;  $F$ -Statistics = 92.76 ( $p < 0.050$ ); Dependent Variable: Farm income

\*Significant at 5% level; \*\*significant at 1% level

### Effect of insecurity/insurgency on farmers perceived poverty level.

Effect of insecurity/insurgency on perceived poverty level of livestock farmers' is shown in Table 7. Results revealed that Chi-square calculated ( $X_{cal}$ ) was 1617.3 at the 1% level, while the Chi-square tabulated was 2.706. Since Chi-square calculated ( $X_{cal}$ ) is greater than Chi-square Tabulated ( $X_{tab}$ ), the alternative was accepted against the null. It states that: incidence of insecurity/insurgency has significantly affected the farmers perceived poverty level.

This claim is justified by the findings of Yau *et al.* (2021) who stressed that insurgents have attacked livestock farming activities which consequently has resulted to increased poverty level amongst the farmers. Sidney, *et al.* (2017) was also of similar opinion that insurgency has negatively impacted on the peasant farmers through destruction of their farmers which has thus resulted to raising poverty situation amongst the affected people.

**Table 7: Perceived poverty level after insecurity**

| Category of poverty | Observed N | Obs. % | Expected N | Expected % | Chi-square            |
|---------------------|------------|--------|------------|------------|-----------------------|
| High                | 490        |        | 1642.5     |            |                       |
| Very high           | 2795       |        | 1642.5     |            |                       |
| Total               | 3285       |        |            |            | 1617.3 ( $p < 0.01$ ) |

Source: Calculated from field survey data, 2023

### Conclusion and Recommendations

This study examined the socio-economic impact of insurgency on livestock farming households in the North Central States of Nigeria, highlighting its role in increasing poverty among farmers. The findings revealed that livestock farming in the area is predominantly carried out by married males who are educated and fall within the active working-age group. Most of the respondents identified as Christians, had an average household size of five members, and practiced part-time farming. Additionally, they had considerable experience in livestock farming and had resided in their communities for an extended period.

The study concluded that livestock production in the region has been significantly affected by the insurgency, contributing to the farmers' heightened poverty levels. Various challenges hindering livestock production were identified, further exacerbating their economic vulnerability. Statistical analysis showed that factors such as educational attainment, farming experience, length of residency, marital status, age, and household size were key determinants of the farmers' income.

Based on findings, the study thus recommended that:

- The issue of insurgency, banditry and conflict were major challenges facing the livestock farmers. To this end, government should do her best and in all sense of genuity combat the insurgents so that the farmers can be able to rear and improve in their animal production and earn higher income and therefore be able to lower, if possible, overcome their perceived poverty level.

- ii. The farmers also have to be encouraged to form groups from which they can have a sense of cohesion, pull their resources together and borrow larger sums which they can use to enhance their production level and earn better income.
- iii. There is also a need for the government to assist the livestock farmers by putting in place major infrastructural facilities that can help to encourage and support livestock production. Such facilities include having good roads as well as shades, and;
- iv. Farmers also need to be trained on livestock feeding, disease control, housing and other management practices that can help to improve on animal production.

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### Conflict of Interests

The author declares that there is no conflict of interest.

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