Income Inequality, Terrorism, and Poverty: The Economic Perspective of the Terrorised

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Abstract

Tackling challenges of terrorism in the northern region requires implementation of effective redistribution policies to reduce poverty and gender income inequality by promoting equity in educational opportunities. A poor society is more equal than a rich society. These conclusions are based Gini coefficient and Lorenz curve analysis and statistical tests from analysis of variance in terrorism-affected North-eastern areas of Nigeria. Low income inequality as indicated by Gini coefficient equal to 0.27 in Northeast and Northwest Nigeria relative to much higher 0.35 national average coexists with very high level of poverty as reflected in the poverty headcount ratio of 73% against the national average of 33% in 2021.

Keywords: Income inequality, terrorism, poverty, Gini coefficient

1.0 Introduction

Research on the economic consequences of terrorism has revealed its substantial costs. Nevertheless, there has been limited focus on examining these costs at the microeconomic level, particularly on the residents of regions where insurgency is prevalent. The sustained impact of terrorist activities on household income and expenditures can have significant implications for economic stability. This study sheds light on the economic conditions of households residing in regions affected by terrorism in northeast and northwest Nigeria.

Since 2009, Nigeria has been plagued by a persistent and violent Islamic insurgency spearheaded by the extremist group, Boko Haram. The terrorist organisation has wreaked havoc in Nigeria's northern region, perpetrating a slew of heinous acts such as assassinations, assaults, bombings, hostage-takings, attacks on public and private properties, invasions of border communities, and territorial seizures and control in Nigeria and neighbouring countries such as Cameroon, Chad, and Niger Republic in the Lake Chad region. As a result of these actions, Boko Haram has caused widespread destruction and disruption, resulting in the deaths, maiming, and kidnapping of tens of thousands of people, a displacement of over two million, and the destruction of properties worth $5.2 billion, including one million houses and 5,000 classrooms in Borno state, which serves as the group's primary theatre of operations (Onuoha & Oyewole, 2018).

The extant literature posits that terrorism and other forms of political violence are rooted in poverty and inadequate resource distribution, which has become a fundamental assumption for both national and international policymakers. This connection between material deprivation and terrorist activity has been endorsed by political figures across the political spectrum and integrated into mainstream discussions on economic development and international security. Poor countries with high levels of poverty, low education, unemployment, and a growing divide between the wealthy and poor, in conjunction with low literacy rates, create fertile grounds for the emergence of violent and dangerous extremist groups. Furthermore, the underdeveloped state of the economy and society exacerbates the allure of political extremism and fosters political violence and instability (Piazza, 2006; Krieger & Meierrieks, 2019).

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Terrorism poses a significant problem in Africa, resulting in a substantial loss of life and property, as well as damage to African economies (Iheonu & Ichoku, 2021). The examined literature failed to provide any insight into the economic circumstances of individuals or households residing in regions where terrorism is prevalent. Consequently, the primary objective of this study is to gain a deeper understanding of the economic circumstances experienced by households located in areas affected by terrorism. Thus, the research questions to be assessed are as follows: How does the level of income inequality in northeast and northwest Nigeria compare with overall income inequality in the country? How does terrorism affect income inequality in both victims and non-victims? What insights does the poverty headcount ratio provide regarding households in northeast and northwest Nigeria, relative to the overall poverty headcount ratio in the country?

The subsequent sections of this paper are organised as follows: Section 2.0 provides a summary of the literature, followed by Section 3.0, which delves into the description of the data sources. Section 4.0 details the empirical approach utilised for the empirical analyses presented in this study. Section 5.0 presents the empirical results and Section 6.0 critically examines these results. In Section 7.0, the study presents policy recommendations, it concludes in Section 8.

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2.0 Literature Review on inequality, poverty and terrorism

Several theories have been proposed for evaluating the relationship between inequality and terrorism. Among these are relative deprivation theory and rational choice theory. Relative deprivation theory suggests that individuals in society assess their economic standing relative to a reference group. According to this theory, individuals experience feelings of dissatisfaction and frustration when their economic status is inferior to that of the reference group, which leads to relative deprivation. This theory asserts that these sentiments significantly contribute to the emergence of political violence (Muller & Weede, 1994). As per the principles of rational choice theory, it has been expanded to incorporate the relationship between inequality and terrorism. Sandler and Enders (2007) advocate for this perspective, in which terrorists are viewed as rational agents who optimise expected utility or net returns, subject to constraints. Increased income inequality is expected to affect rational terrorists' decision-making process, making terrorism more probable.

Krieger and Meierrieks (2019) examine the connection between income inequality and terrorism in a sample of 113 countries between 1984 and 2012. They presented robust evidence even after accounting for various methodological changes, such as the use of instrumental-variable approaches. Their findings suggest that higher levels of income inequality are linked to an increase in domestic terrorism. This study further investigates the underlying causes and finds that the negative effects of income inequality on institutional outcomes, such as corruption, contribute to the motivation for domestic terrorism. Additionally, the researchers examined the efficacy of redistribution in decreasing terrorist activity and found that nations with higher levels of redistribution experience less domestic terrorism, partly because redistribution enhances institutional conditions.

Iheonu and Ichoku (2021) investigate the association between poverty and terrorism in Africa between 2000 and 2017. They utilised a panel two-stage least squares model and instrumental variable quantile regression with fixed effects to examine the effect of poverty on terrorism in 26 African countries. This study indicates that poverty has a direct impact on the number of terrorism incidents. Nevertheless, once other factors, such as unobserved heterogeneity, are considered, the connection between poverty and terrorism becomes insignificant. Additional findings reveal that the level of terrorism incidents plays a crucial role

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in determining the impact of poverty on terrorism. Moreover, research underscores that poverty alone is not a determining factor for terrorism in Africa when compared to economic growth, political stability, and unemployment (Iheonu & Ichoku, 2021).

Piazza (2006) explored the relationship between poverty, terrorism, and economic development, challenging the notion that poverty is the primary driver of terrorism. This study examined the connection between socioeconomic factors, particularly poverty, and the frequency and severity of interstate terrorism in the current context. To achieve this, the study conducted multiple regression analyses on terrorist incidents and fatalities in 96 countries between 1986 and 2002. This research revealed that the widely accepted notion regarding the relationship between economic growth and terrorism is not supported by evidence. Instead, factors such as population, ethno-religious diversity, state repression, and the structure of political parties emerge as significant indicators of terrorism (Piazza, 2006).

In a similar study conducted by Ajide and Alimi (2021) titled "Income Inequality, Human Capital, and Terrorism in Africa: Beyond Exploratory Analytics," the authors examined the relationship between income inequality and terrorism in a panel of 34 African countries over the period–1980-2012. This study used a zero-inflated negative binomial regression estimator to analyse the data. The results suggest that income inequality plays a significant role in predicting terrorism, except for transnational terrorism. In addition, the impact of the human capital variables on both domestic and total terrorism is positive and significant. Furthermore, their research revealed that the influence of interactions between human capital measures and income inequality indicators is negative, especially at higher levels of educational attainment.

Evans and Kelikume (2019) investigate how poverty, unemployment, inequality, corruption, and poor governance influence Niger Delta militancy, Boko Haram terrorism, and Fulani herdsmen attacks in Nigeria. This study examines the socio-economic factors that contribute to the emergence of violence in Nigeria and uses the Fully Modified OLS (FMOLS) method of estimation to analyse trends from 1980 to 2017. Their findings suggest that poverty, unemployment, inequality, corruption, and poor governance are significant factors in the prevalence of violence in the country and that there is a strong association between

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these socioeconomic factors and the occurrence of Niger Delta militancy, Boko Haram terrorism, and Fulani herdsmen attacks (Evans & Kelikume, 2019).

Coccia (2018) examined the root causes of terrorism with a focus on demographic factors, such as high population growth, income inequality, and relative deprivation. The author further opined that to better understand the occurrence of terrorism, it is crucial to have precise information about the environmental determinants in which it takes place, such as demographic, economic, geographic, and social factors. Without this knowledge, it is not possible to explain the reasons behind terrorism effectively. Coccia assessed the relationship between these demographic elements and the consequences of terrorist incidents on society while also identifying potential socioeconomic and psychosocial risk factors. To this end, Coccia (2018) employed bivariate, partial, and linear regression analyses. Their research indicated that regions with high population growth rates are more likely to experience terrorism. This is because high population growth rates can lead to income inequality, subsistence stress, and relative deprivation among the population. Additionally, studies show that countries in Africa and the Middle East have a strong correlation between fatalities from terrorist incidents and population growth (Coccia, 2018).

Coccia (2018) posed a few inquiries, one of which was: How can the differences between terrorist attacks in various contexts be accounted for? The existing body of literature generally focuses on the causal link between terrorism, income inequality, and poverty (Piazza 2006; Evans & Kelikume, 2019; Krieger & Meierrieks, 2019; Iheonu & Ichoku, 2021), with some exceptions, such as Coccia (2018), who, in part, explored the effects of terrorism on society. Existing literature lacks clarity on the precise impact of terrorism on victims' income inequality and poverty levels. This study aims to fill this gap by assessing the economic impact of terrorism and insurgency on the inhabitants of northeast and northwest Nigeria. The primary objective of this study is to gain a more comprehensive understanding of the economic circumstances faced by households located in areas impacted by terrorism. Furthermore, previous research has utilised macro data to scrutinise the relationship between terrorism, income inequality, and poverty. However, this study aims to investigate this relationship using microdata, with a particular focus on the income of households residing in the northeast and northwest region of Nigeria. The hypotheses to be examined are stated below.

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Hypotheses

H0: Income inequality in the northeast and northwest is higher than the national average.

H1: Income inequality in the northeast and northwest is lower than the national average.

H0: Income inequality does not exist across gender and education level of household head.

H1: Income inequality exist across gender and education level of household head.

H0: Violence made no significant difference to income inequality.

H1: Violence increased or reduced income inequality significantly.

H0: Majority of households residing in northeast and northwest Nigeria live above poverty line.

H1: Majority of households residing in northeast and northwest Nigeria live below poverty line.

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3.0 Data Sources and Description

To analyse income inequality in a consistent manner, we utilised the year 2021 household survey data from the Food and Agriculture Organization of the United Nations (FAO). The FAO conducted a household survey in Nigeria, covering five states: Yobe, Borno, and Adamawa in the northeast and Zamfara and Katsina in the northwest. The survey comprised 2739 household interviews administered across five states. The data were further divided and compared between Local Government Areas that were directly impacted by armed conflict and those that were not (FAO, 2022). Estimates were computed for the entire population in the dataset, as well as for households that had experienced violence and those that had not, to understand the extent of inequality that exists between the two groups.

The variables of interest are the gender of the respondents, educational level of household heads, experiences of violence and insecurity/conflict (victim and non-victim), total income, and the income quintile derived from total income (See Table 1 for the income quintile distribution). Furthermore, education, gender, and violence are categorical variables, with categorisation for education comprising university, secondary, primary, religious education, and no education. Education was ranked from 1 (highest qualification) to 5 (lowest qualification). Gender was categorised into female (1) or male (2), while the violence variable was categorised into non-victims (1) and victims of violence (2) – See Table 2. The individuals referred to as "victims" are those who have experienced violence or insecurity within their household or community, which has consequently hindered their ability to earn a livelihood. On the other hand, those referred to as "non-victims" are those who have not encountered such challenges. Furthermore, due to the fact that some of the extremist campaigns by terrorists were targeted towards formal education and the redefinition of female gender roles within society (Onuoha & Oyewole, 2018), we chose education and gender as variables of interest to evaluate the extent of income inequality. It is also intriguing to explore the relationship between these variables, as both quality of education and gender equality are part of the United Nations Sustainable Development Goals 4 and 5, respectively (UN, 2015).

The source of income for households in the dataset varies, ranging from agricultural to public employment (FAO, 2022). The diverse nature of income sources makes it an ideal dataset for

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understanding and estimating income inequality, poverty, and attendant effects. The summary statistics are presented in Table 2.

Table 1 Income Quintile

inc_q	N	Mean	Min	Max	SD	p50
1	370	14331.02	0	40021.99	14184.15	12013.33
2	369	65174.41	40023.15	90024.93	15343.20	60071.53
3	369	124860	90030.71	169980.20	22737.28	120039.20
4	369	247243.90	169985.80	349973.50	51746.48	240042.70
5	369	886356.30	350006	8700005	900324.50	599999
Total	1846	267455.90	0	8700005	513994.80	120035.20

Table 2 Variable definitions and descriptive statistics

Variable	Name	Obs.	Mean	Std. Dev.	Min.	Max.	Definition
Total Income	Tot_income	2689	278755.6	537057.7	0	8700005	Total Income
Education	educ	2689	1.737	1.233	1	5	Educational level attained by head of household
Gender	gender	2689	1.846	.361	1	2	Gender of respondents
Violence	violence	2689	1.313	.464	1	2	Violence indicator
Income Quintile	Inc_q	2689	2.999	1.414	1	5	Income quantile computed from total income

(data from: FAO, 2022)

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4.0 Empirical Approach

Many theories have been proposed to explain inequalities in various forms, one of which is the Multidimensional Inequality Framework (MIF). Goran Therborn, a prominent sociologist who has delved deeply into the concept of multidimensionality from a theoretical standpoint, contends that social inequalities are imbalances that are deemed unjust. Inequality, which refers to the absence of equality, is perceived as unjust and constitutes a breach of equality (Carmo, 2021). The MIF serves as a systematic and theoretically grounded tool for quantifying and examining inequalities, while also pinpointing causes and potential remedies. Although the understanding of income inequality trends varies, studies indicate that different measures can be used to paint a particular picture in certain countries, over specific periods, or globally. Despite these variations, individuals express discontent with and disapproval of inequality in all forms. There is an increasing awareness that inequality and poverty are more comprehensively understood as multidimensional phenomena (McKnight et al., 2017).

Drawing on the multidimensional theory of inequalities, this study comprehensively investigates income inequality and poverty estimation in northeast and northwest Nigeria using the Gini coefficient, Lorenz curve, poverty headcount ratio, and one-way analysis of variance. The intention of the aforementioned analyses is to show associations rather than to draw conclusions about causation.

4.1 Inequality Measures

A plethora of indicators have been proposed in the literature to determine income inequalities. These indicators encompass a range of statistical measures, such as the Lorenz curve, Gini coefficients, lognormal distribution, coefficient of variations, relative mean deviation, kakwani, inter-quartile range, and ratios of income received by the highest and lowest income groups. Furthermore, these measures also encompass normative aspects that take into account the values of society towards the well-being of various population segments. This includes Theil's entropy measure, Atkinson's Index, and Sen's Index (Whitehouse, 1995; Cowell, 2011). However, the Lorenz curve and Gini coefficient are among the most widely used methods for evaluating changes in income inequality. An effective measure of income inequality ought to fulfill the following conditions:

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(i)   Pigou-Dalton transfer sensitivity: Transfers of income from poorer individuals to wealthier ones contribute to the growth of income inequality.

(ii)   Symmetry: Income inequality remains consistent when two individuals merely swap their positions in the distribution.

(iii)   Independence: If all individuals' incomes rise by the same proportion, income inequality will remain unchanged.

(iv)   Population homogeneity: If the relative increase or decrease in the population of each income group is the same, then there would be no alteration in income inequality.

(Cowell, 2011).

It is essential to acknowledge that not all measures of inequality meet the criteria for a suitable inequality measure. Shorrocks and Foster (1987) proposed an alternative to the Pigou-Dalton condition, which prioritises income transfers among individuals with low incomes over those between high-income earners. The coefficient of variation, for instance, is heavily influenced by those with high incomes. They proposed using the standard deviation of logarithms (SDL) as an alternative, although this measure does not satisfy the Pigou-Dalton condition.

4.2 Gini Coefficient and Lorenz Curve

The Gini coefficient is a straightforward concept that is derived from the Lorenz curve, and it satisfies all four properties in previous section. It measures the ratio of the area between the Lorenz curve and the 45-degree line to the total area of the box. See Figure 1 for example of Lorenz curve. The 45-degree line is referred to as the egalitarian line, signifying a completely equal society in terms of income distribution (Whitehouse, 1995; Deaton, 2018). Furthermore, the Gini coefficient illustrates the distribution of income across a population in a cumulative manner, starting with the poorest 20% and progressing to the 40%, 60%, 80%, and 100% brackets. By plotting this distribution on a graph and comparing it to the 'line of equality,' the distance from this line represents the extent of inequality in a given country. The Gini coefficient is expressed as a value between 0 and 1 or as a percentage between 1 and 100. A lower Gini coefficient is desirable, and an increase in the coefficient indicates a rise in income inequality within a country (Oxfam,2017).

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The GINI coefficient equation was adapted from Whitehouse (1995). The equation is presented as follows:

Equation 1

$$I_{GINI} = \frac{2}{n^2 \bar{y}} \sum_{i=1}^{n} i(y_i - \bar{y})$$

Where I_{GINI} is the Gini income, $\bar{y}$ denotes the mean of the distribution, 'n' is the sample size (total number of observations), y_i is the naira value of the ith household income and are arranged in ascending order. Gini-coefficient used was for the estimation and comparison of the degree of income inequality in the sample, between both genders (male and female), level of education attained, and violence (victims and non-victims).
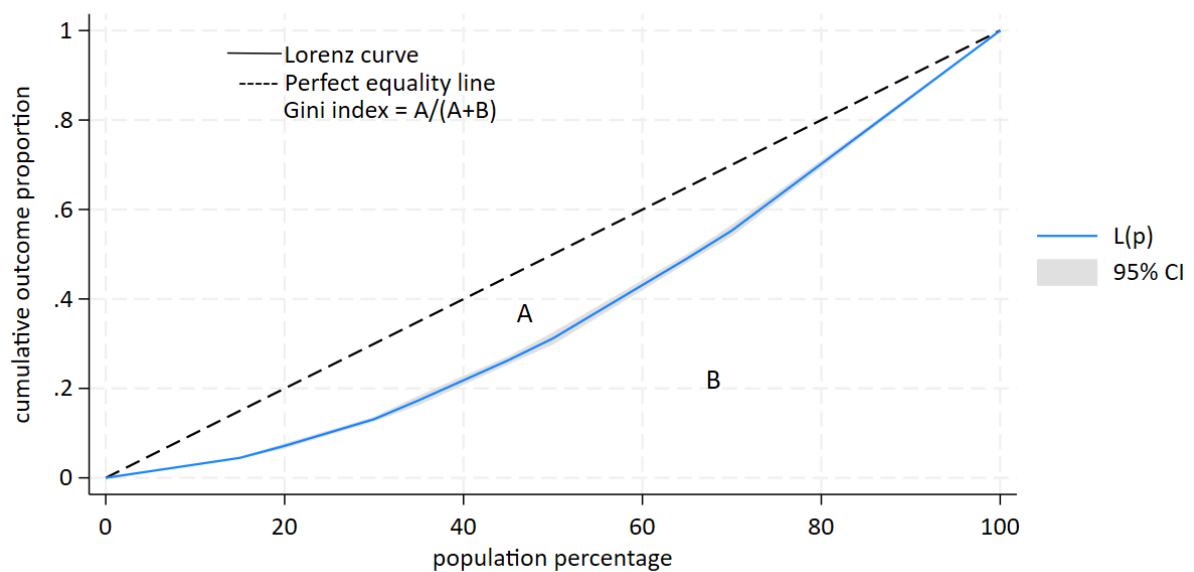

Figure 1 Lorenz Curve
Created with Stata, data from FAO (2022)

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4.3 Poverty Measures

The social sciences have encountered challenges in arriving at a unified definition of poverty due to its intricate and multi-dimensional nature. The conventional viewpoint posits that individuals who fail to generate sufficient income or expenditure to attain a minimum acceptable level are deemed poor. The poverty line is often used to denote this threshold. From this standpoint, poverty is predominantly conceived in financial terms. Another viable way to define poverty is as the absence of a particular commodity or service, such as housing, education, food, or healthcare. The focus of well-being and poverty lies in an individual's ability to thrive in society. Unfortunately, those struggling with poverty often lack essential skills, such as insufficient financial resources and education, poor health, a sense of helplessness, and the absence of political freedoms (World Bank, 2005).

To evaluate and establish poverty levels, we apply Foster, Greer, and Thorbecke's (1984) poverty classification. The poverty line plays a crucial role in gauging poverty levels. It divides the population into two categories: those who are considered poor and those who are above the poverty line. By utilising the poverty line, the number of individuals experiencing poverty and the severity of their circumstances can be determined (Leibbrandt & Woolard, 1999).

4.3.1 Poverty Headcount Ratio

A key measure of poverty is the poverty headcount ratio, which assesses a nation's poverty levels by considering the number or proportion of impoverished individuals in the country. The headcount ratio is a useful method for quantifying poverty (Foster et al., 1984; Castleman et al., 2016). We used World Bank poverty lines to compute the poverty indices for the population in the dataset. The World Bank's international poverty line is regularly revised to account for fluctuations in prices worldwide. As of 2021, the World Bank poverty line is $1.90 (World Bank, 2022). In addition, we used the average USD to naira rates since my dataset is in local currency. In 2021, the average exchange rate for the US Dollar (USD) to the Nigerian Naira (NGN) was 403.58 naira. This covers 365 days of USD in NGN historical data (Exchange Rates, 2021). The FGT poverty indices were adapted from Jaiyeola and Choga (2021).

Equation 2

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$$P\alpha = \frac{1}{n} \sum_{i=1}^{q} \left[(z - y_i)/z \right]^{\alpha} \; for \; \alpha \geq 0$$

z is the poverty line, y_i is the household income of the ith household, α is the parameter that shows poverty aversion, while q is the number of households who are adjudged to be poor using the poverty line z.

P_0 is the headcount ratio $(\alpha = 0)$

<div align="right">Equation 2</div>

$$P_0 = \frac{1}{n} \sum_{i=1}^{q} 1 = \frac{q}{n}$$

4.3.2 Poverty Gap Ratio

P_1 is the poverty gap ratio $(\alpha = 1)$

where $(\alpha = 1)$, the poverty gap ratio is obtained. This is a normalised gap function averaged across the population. It is calculated by summing all the shortfalls $(z - y_i)$ and dividing the result by the population (n), which is then expressed as a ratio relative to the population line itself $(/z)$. By setting poverty aversion parameter to 1, it indicates uniform concern about the depth of poverty. Furthermore, the poverty gap ratio is a measure that calculates the average disparity between the living standards of impoverished individuals and the poverty line, represented as a proportion of the poverty line. It encompasses all people, and it quantifies the cost of eradicating poverty through perfectly targeted transfers to the poor (World Bank, 2005).

<div align="right">Equation 3</div>

$$P_1 = \frac{1}{n} \sum_{i=1}^{q} \left[(z - y_1)/z \right]$$

4.3.3 Squared Poverty Gap Ratio

P_2 is the poverty gap squared $(\alpha = 2)$

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When ($\alpha = 2$), the squared poverty gap measure is obtained. This measure evaluates each individual's normalised gap function by raising it to a power of two and weighing it separately. When the poverty aversion parameter is set to 2, the poverty-gap index shows heightened sensitivity to the plight of the poorest of the poor. The measure's lack of intuitive appeal is due to its complexity and lack of ease in interpretation, which has resulted in limited widespread use. It can be considered as one of the family of measures introduced by Foster, Greer, and Thorbecke in 1984 (World Bank, 2005).

Equation 4

$$P_2 = \frac{1}{n} \sum_{i=1}^{q} \left[(z - y_i)/z \right]^2$$

P_2 is often referred to as a measure of the 'severity' of poverty because of its frequent usage. However, interpreting P_2 can be challenging. Nonetheless, P_2 provides limited information when considered on its own. Nevertheless, P_2 is highly beneficial in making poverty comparisons over time or space, as well as in evaluating the poverty impacts of different policy options (Leibbrandt & Woolard, 1999).

4.4 Analysis of Variance (ANOVA)

One-way analysis of variance (ANOVA), which is a statistical technique used to test for differences in the means of two or more groups, was used to examine the data. ANOVA is a straightforward method for implementing a statistical testing procedure. This strategy was used to determine if there were any significant variations in the variable of interest across gender, education, and violence (victims and non-victims). The hypotheses to be tested are outlined in Section 2. If at least one of the means is significantly different, the null hypothesis will be rejected.

The dependent variable is the log of total household income. The independent variables assessed were the educational attainment of the household head, gender of the respondent, and the violence indicator. To ensure that the household income data were normally distributed, the log of the variable was computed. Therefore, the sample data met the ANOVA assumption that the data must be normally distributed, have equal variances, and contain independent groups (Park, 2009). This assumption has been empirically confirmed by

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Bartlett's equal-variances test, which has a significance level greater than 10% for all one-way ANOVA tests.

The one-way ANOVA model is hereby presented below:

$$y = \bar{x} + \alpha + \varepsilon$$

where y is the dependent variable representing total household income. The overall sample mean $\bar{x}$ serves as the central aspect that has a uniform impact on all values, and it could be considered as the starting point from which the dependent variable diverges due to the influences of multiple factors and random error. In this study, the factors α correspond to circumstances (gender or experience of violence), efforts (level of education attained), and other unobservable factors. The random component ε represents the random influence associated with sampling each individual subject within a group.

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5. Empirical Results

5.1 .1 Income Inequality - Gini Coefficient and Lorenz Curve

The Gini coefficient for the entire population in the dataset is 0.27. The level of income inequality in this region is considerably lower than the national average, which is 0.35 as of 2018. The Lorenz curve for the distribution of total income among the population, which is a commonly used tool for analysing income inequality, is illustrated in Figure 2. The graph clearly indicates that income inequality is present, as the Lorenz curve is notably distant from the line of equality, as shown in the figure below (See Appendix A for Lorenz estimates).
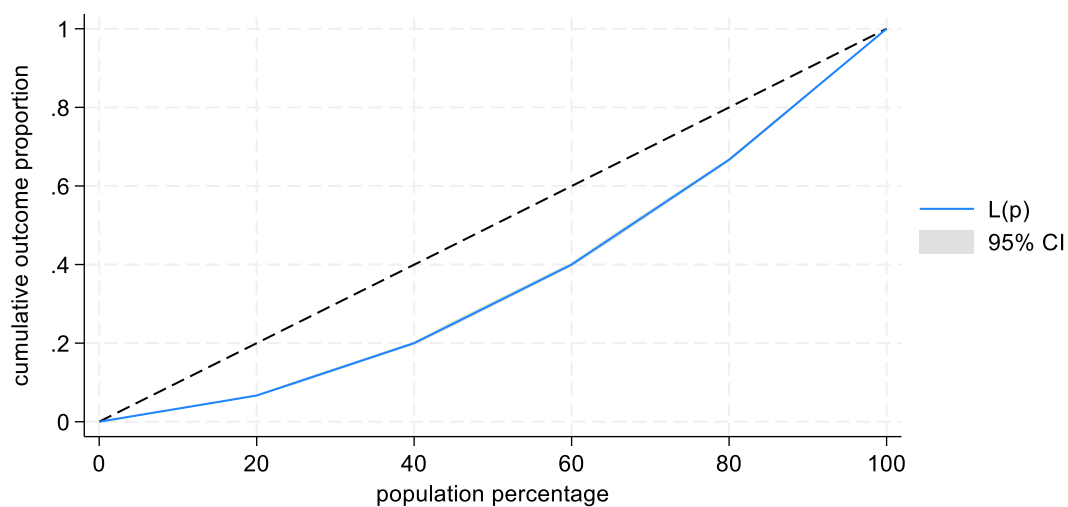
Figure 2 Total income Quintile Lorenz Curve

(data from: FAO, 2022)

5.1.2 Income Inequality by Education

The subgroup Gini coefficient results presented in Table 3 indicate that household heads with the least education experience greater inequality than those with higher education. Similarly, the graphs in Figures 3 and 4 show that the Lorenz curve for those with the lowest level of education appears further from the equality line than for those with higher education, highlighting the disproportionate impact of inequality on this group. By contrast, individuals with secondary education fare better than those with little to no education, as indicated by the Lorenz estimation. Additionally, the Lorenz curve for individuals with tertiary or university education is closer to the equality line than that for those with lower education. The graphs

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depicted in Figures 4 illustrate the estimates of the Lorenz curve for income quintiles based on educational attainment (See Appendix B for Lorenz estimates).

Table 3 Income Inequality by Education

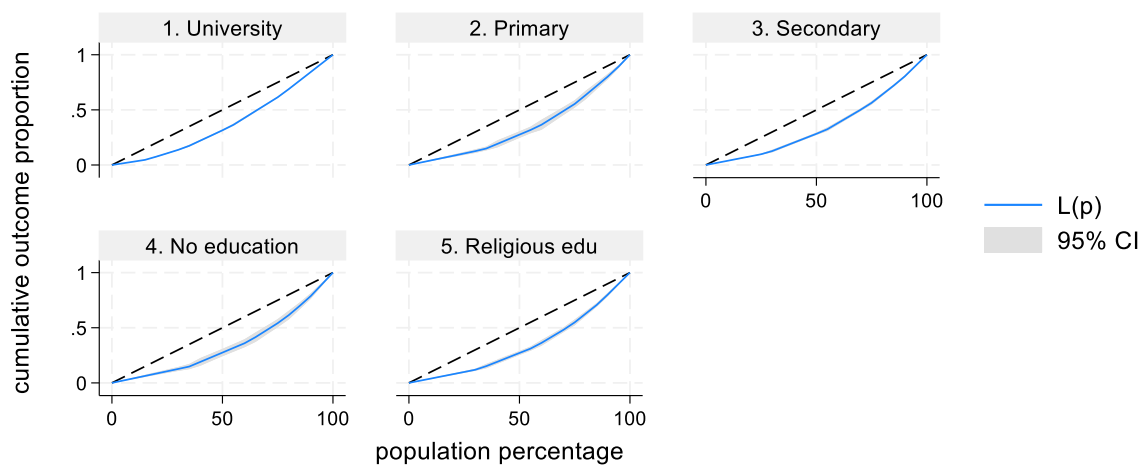| Education Level Attained	Resp.	Gini
University	1878	0.24
Secondary	70	0.29
Primary	495	0.30
Religious Education	63	0.31
No Education	183	0.31

(data from: FAO, 2022)

Figure 3 Lorenz curve - Education
(Created with Stata, data from FAO (2022))
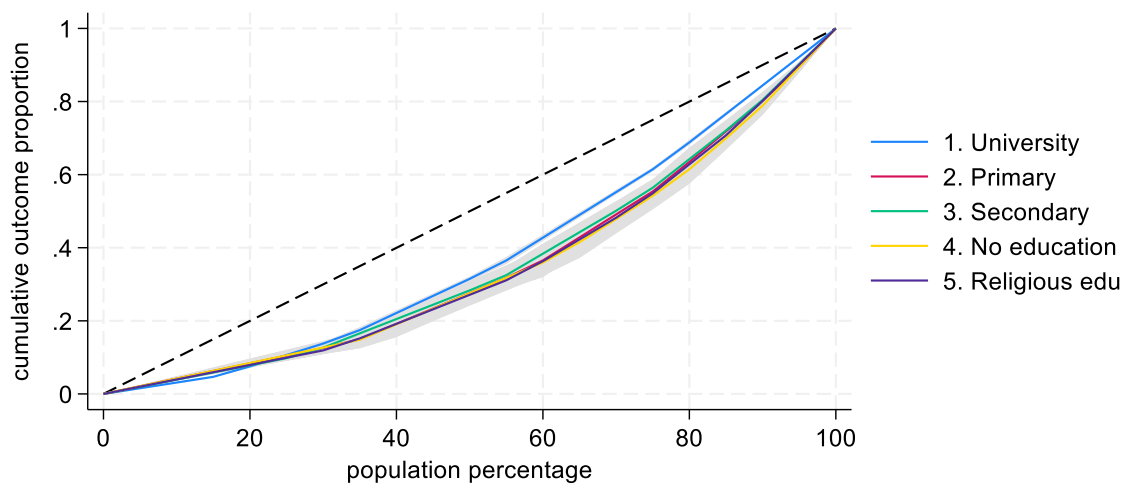
Figure 4 Combined Lorenz curve - Education
(Created with Stata, data from FAO (2022))

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5.1.3 Income Inequality by Gender

The Gini coefficient for female respondents has been determined to be 0.31, which is notably higher than the Gini coefficient for male respondents, which is 0.25. The findings indicate a significant difference in the distribution of income between male and female respondents. See Table 4 below. The distribution of income between male and female individuals is primarily similar up to the bottom 30% as depicted in Figure 6, and thereafter, it diverges further. The consequence of unequal income distribution is that women experience greater effects than men. The Lorenz curve graphs presented in Figures 5 and 6 indicate that female respondents are slightly farther from the line of equality than male respondents. This is more obvious in Figure 6 (See Appendix C for Lorenz estimates).

Table 4 Income Inequality by Gender

Gender	Resp.	Gini
Female	413	0.31
Male	2276	0.25

(data from: FAO, 2022)
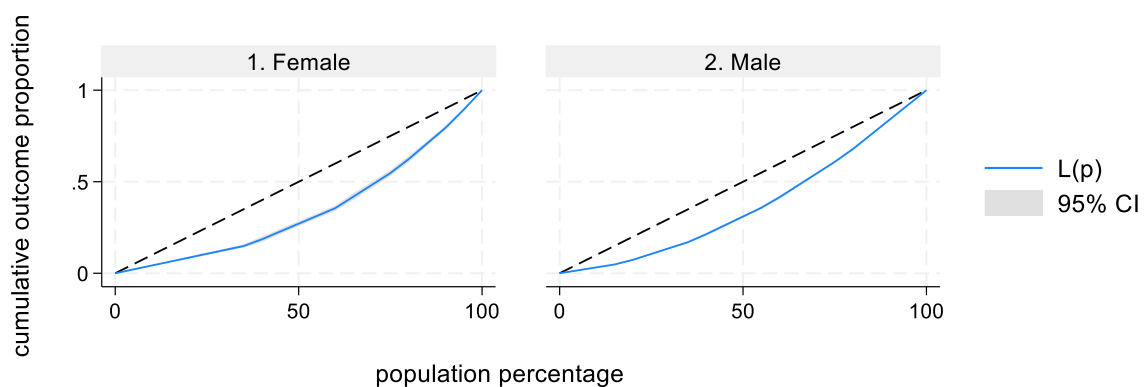
Figure 5 Lorenz curve - Gender

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(Created with Stata, data from FAO (2022))

Figure 6 Combined Lorenz curve - Gender
(Created with Stata, data from FAO (2022))

5.1.4 Income Inequality by Victims and Non-Victims of Violence

The dataset was further disaggregated, and an estimation was performed on both terrorism victims (those who experienced violence) and non-victims. The results in Table 5 indicate that the Gini coefficient for the group that did not encounter violence or terrorism is 0.27, while for the terrorism victims, it is 0.26.

Table 5 Gini Coefficient of Victims and Non-Victims

Population	Resp.	Gini
Non-victims	1846	0.27
Victims	843	0.26

(data from: FAO, 2022)

5.1.5 Income Inequality by Education

Based on the results from the subgroup estimates presented in Table 5, income inequality by education between individuals who have experienced violence and those who have not is relatively minimal. This conclusion was drawn from the subgroup estimation results.

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Table 6 Income Inequality by Education

Education Level Attained	Resp.	Non-Victims	Victims
University	1878	0.25	0.23
Secondary	70	0.29	0.29
Primary	495	0.30	0.29
Religious Education	63	0.30	0.31
No Education	183	0.31	0.32

(data from: FAO, 2022)

5.1.6 Income Inequality by Gender

Based on the results from the subgroup estimation presented in Table 7, the income inequality by gender between individuals who have experienced violence and those who have not is also relatively minimal. The Gini coefficient for females, who have experienced violence, is 0.32, while for those who have not experienced violence, it is 0.31. Similarly, the Gini coefficient for the male gender is the same for those who have experienced violence and those who have not.

Table 7 Income Inequality by Gender

Gender	Resp.	No Violence	Expr Violence
Female	413	0.31	0.32
Male	2276	0.25	0.25

(data from: FAO, 2022)

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5.2 Poverty Analysis

5.2.1 FGT Poverty Estimates (Total population)

The Foster-Greer-Thorbecke Poverty (FGT) indices show that the poverty headcount ratio of the population is 73%. This implies that approximately three-quarters of the population lives below the World Bank poverty line, while the remaining 27% live above it. According to data available for 2013, the poverty headcount in the northeast and northwest region stood at 40% (Jaiyeola and Choga, 2021). This further suggests that poverty increased significantly over the years. In a similar vein, the poverty gap at 48% signifies the cost of entirely eliminating poverty via perfectly targeted transfers to the impoverished. By definition, the poverty gap ratio measures the average disparity between the living standards of impoverished individuals and the poverty line, represented as a proportion of the poverty line. Furthermore, the squared poverty gap, is 36%.

The presentation of the Pen's Parade in Figure 7 serves to complement the poverty headcount result previously presented in Section 5.2.1. The Pen's parade comprises a lineup of individuals in the economy, arranged in ascending order of income, with the height of each person proportionate to their earnings. Thus, those with average income would occupy a position of average height, while those with greater income would tower above the rest, and the observers would be the shortest (Haughton & Khandker, 2009). These figures effectively illustrate the visual representation of the distribution of income within the sample.
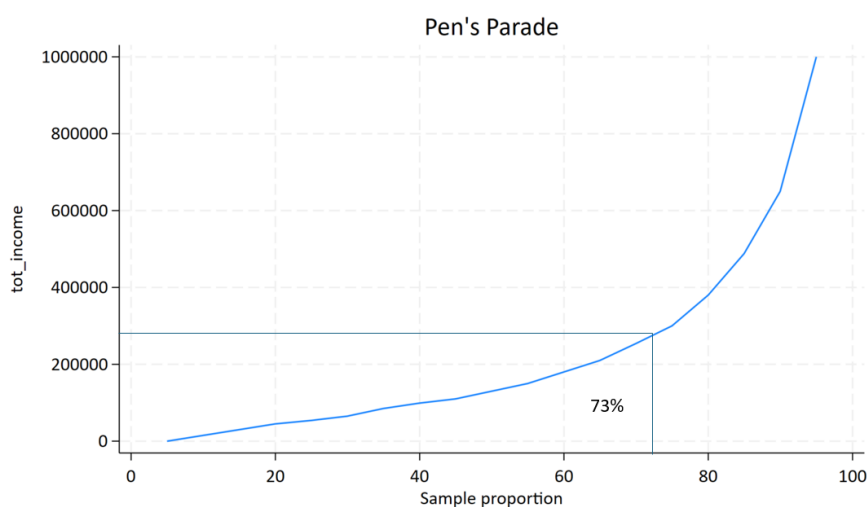

Figure **Error! No text of specified style in document.**.7 Pen's Parade
(Created with Stata, data from FAO (2022))

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5.2.2 FGT Poverty Estimates – Education

The results presented in Table 8 of the subgroup poverty headcount indicate that individuals with the least education experience higher levels of poverty than those with more education. It is noteworthy that, with the exception of household heads with university education, all other household heads accounted for more than 80% of those living below the poverty line within their subgroup. Although individuals with university education fare better than those with lower levels of education, it is crucial to acknowledge that a significant proportion of this group (approximately 63 %) live below the poverty line. This finding suggests that educational attainment does not guarantee financial stability. Still on Table 8, it is evident that those who lack formal education are disproportionately affected by poverty, as they exhibit the highest poverty gap (65%) and poverty severity (54%). Conversely, individuals with university education experience better outcomes, as they display the lowest poverty gap (43%) and poverty severity (32%) in the table.

Table 8 FGT Poverty Estimates – Education

Household Poverty Line (N279,882.73)

Education Level Attained	Resp.	Poverty Headcount	Poverty Gap	Squared Poverty Gap
University	1878	0.63	0.43	0.32
Secondary	70	0.84	0.59	0.47
Primary	495	0.83	0.62	0.51
Religious Education	63	0.81	0.59	0.47
No Education	183	0.86	0.65	0.54

(data from: FAO, 2022)

5.2.3 FGT Poverty Estimates – Gender

The proportion of female respondents living in poverty was found to be considerably higher than that of male respondents, at 87% and 71%, respectively. This difference is notably significant. This is presented in Table 9. The consequence of this finding is that a greater proportion of women are living below the poverty line when compared to the number of men living below the poverty line. Only 13% of females in the dataset surpassed the poverty line, whereas 29% of males have exceeded the poverty line. Given that a majority of the population (approximately 70 %) lives beneath the poverty line, it can be reasonably inferred that a considerable portion of the population is poor. Similarly, it is clear that women are disproportionately impacted by poverty, as they exhibit a higher poverty gap of 65% and

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poverty severity of 54%, while men experience better outcomes, with a lower poverty gap of 45% and poverty severity of 34% according to the table.

Table 9 FGT Poverty Estimates – Gender

Household Poverty Line (N279,882.73)				
Gender	Resp.	Poverty Headcount	Poverty Gap	Squared Poverty Gap
Female	413	0.87	0.65	0.54
Male	2276	0.71	0.45	0.34

(data from: FAO, 2022)

5.2.4 FGT Poverty Estimates – Victim and Non-victim

The dataset was subsequently divided, and an estimation was carried out for both terrorism victims (those who experienced violence) and non-victims. The findings in Table 10 indicate that the poverty headcount for the group that did not encounter violence or terrorism is 73%, while for the terrorism victims, it is 71%. This follows a pattern similar to that observed in the Gini coefficient results. Those who suffered violence had lower poverty headcounts than those who did not. The same pattern is evident in the poverty gap and poverty severity indicators. It is observed that individuals who have experienced violence tend to have lower poverty gap and poverty severity ratios. The reason for this could not be determined in the present study. Therefore, future research should assess why this could occur or the cause of this phenomenon.

Table 10 FGT Poverty Estimates - Victim and Non-victim

	Household Poverty Line (N279,882.73)			
	Resp.	Poverty Headcount	Poverty Gap	Squared Poverty Gap
Non-victim	1846	0.73	0.48	0.37
Victim	843	0.71	0.46	0.34

FGT Poverty Estimates – Victim and Non-victim (Education)

Based on the subgroup estimates presented in Table 11, there are differences in the poverty headcount based on education between individuals who have experienced violence and

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those who have not. When comparing the poverty headcount rates of the population sample, it appears that individuals who have experienced violence and have university education, as well as those with no education, have lower poverty headcount rates than those who did not experience violence in their respective groups. However, as might be anticipated, individuals who have experienced violence and possess secondary, primary, or religious education have higher poverty headcount rates than those who have not experienced violence in their corresponding groups. The same pattern is evident across poverty gap and poverty severity indicators. It is recommended that future studies examine these observed dynamics.

Table 11 FGT Poverty Estimates – Victim and Non-victim (Education)

		Household Poverty Line (N279,882.73)					
		Non-victim			Victim		
Educational Level Attained	Resp.	Poverty Headcount	Poverty Gap	Squared Poverty Gap	Poverty Headcount	Poverty Gap	Squared Poverty Gap
University	1878	0.69	0.43	0.32	0.65	0.40	0.29
Secondary	70	0.84	0.59	0.47	0.86	0.60	0.46
Primary	495	0.83	0.62	0.51	0.92	0.64	0.51
Religious Education	63	0.81	0.59	0.47	0.86	0.63	0.51
No Education	183	0.86	0.65	0.54	0.79	0.66	0.57

5.2.5 FGT Poverty Estimates – Victim and Non-victim (Gender)

In accordance with the findings from the subgroup estimation shown in Table 12, the poverty headcount based on gender for individuals who have experienced violence and those who have not is comparable to the result obtained in Section 5.2.4 Those who have experienced violence have a lower poverty headcount ratio than those who have not. The same pattern is evident across poverty gap and poverty severity indicators. As previously proposed, future studies should delve more deeply into the reasons for this outcome. Nevertheless, in both samples, women seem to have a higher poverty headcount ratio than men do, implying that women are disproportionately affected by poverty.

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Table 12 FGT Poverty Estimates – Victim and Non-victim (Gender)

| | | Household Poverty Line (N279,882.73) | | | | | |
| | | Non-victim | | | Victim | | |
Gender	Resp.	Poverty Headcount	Poverty Gap	Squared Poverty Gap	Poverty Headcount	Poverty Gap	Squared Poverty Gap
Female	413	0.87	0.65	0.54	0.84	0.64	0.53
Male	2276	0.71	0.45	0.34	0.69	0.43	0.32

5.3 One-way Analysis of Variance (ANOVA)

5.3.1 One-way ANOVA: Total Income by Household head Educational Level

The ANOVA model starts with the education level of the household head, which is a categorical variable that separates the sample into five groups. As shown in Table 13, this variable contributes significantly to income inequality among households, making it one of the factors shaping income inequality in northern Nigeria. The F-statistic of the model is statistically significant at the 1% level, with a degree of freedom of 4 for between-groups and 2472 for within-groups. The Bonferroni test was conducted to perform multiple comparisons for each of the one-way layouts of education levels. The results as shown in Table 14 demonstrate a significant relationship between the level of education among household heads and household income. In particular, there is a discernible negative difference between the mean income of households with low or no education and those with higher education.

Table 13 One-way ANOVA: Total Income by Household head Educational Level

Source	SS	df	Ms	F	Prob > F
Between groups	180.113	4	45.028	35.34	0.0000
Within groups	3149.472	2472	1.274		
Total	3329.585	2476	1.345		

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Table 14 Bonferroni Multiple comparison test: Levels of Education

Education Comparison	Difference in mean
Primary Education – University Education	-.652***
Secondary - University Education	-.559***
No Education - University Education	-.667***
Religious Education - University Education	-.624***

5.3.2 One-way ANOVA: Total Income by Gender

The second variable examined was gender, which was divided into male and female categories. The objective is to determine the level of income inequality based on gender. The results in Table 15 suggest that gender is a significant contributor to income inequality between households and is therefore one of the determinants of income inequality. The F-statistic of the model is statistically significant at the 1% level, with a degree of freedom of 1 between groups and 2475 within groups. This finding suggests that gender has a significant impact on income inequality. Similar to the household head's education level, the Bonferroni test, as shown in Table 16, is employed to evaluate the gender of respondents, and the results indicate a substantial positive distinction in income levels between male and female individuals. The average income of the male respondents was found to be greater than that of their female counterparts. There is a positive difference between the mean income of the male and female respondents.

Table 15 One-way ANOVA: Total Income by Gender

Source	SS	df	Ms	F	Prob > F
Between groups	90.534	1	90.534	69.18	0.0000
Within groups	3239.051	2475	1.309		
Total	3329.585	2476	1.345		

Table 16 Bonferroni Multiple comparison test: Gender

Gender Comparison	Difference in mean
Male – Female	0.558***

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5.3.3 One-way ANOVA: Total Income by Violence

The results in Table 17 indicate no distinction in income levels between terrorism victims and non-victims. This implies that terrorism did not significantly influence income inequality between victims and nonvictims. The results of the F test are not statistically significant, as validated by the Bonferroni test presented in Table 18.

Table 17 One-way ANOVA: Total Income by Violence

Source	SS	df	Ms	F	Prob > F
Between groups	1.836	1	1.836	1.37	0.2427
Within groups	3327.749	2475	1.345		
Total	3329.585	2476	1.345		

Table 18 Bonferroni Multiple comparison test: Violence

Violence Comparison	Difference in mean
Nonvictim – Victim	0.058

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6. Discussion

The Income inequality of the household in the dataset, as measured by the Gini coefficient, is low (0.27). Income inequality in the northeast and northwest region of Nigeria is notably lower in comparison to the national average which is 0.35 as at 2018 (WDI, 2020). Thus, the null hypothesis stating that Income inequality in the northeast and northwest is higher than the national average is hereby rejected. It is often assumed that areas with ongoing insurgency are characterised by high levels of inequality (Sandler & Enders, 2007). However, the available data indicate low levels of inequality in this region, necessitating the use of alternative measures such as the poverty headcount ratio to better comprehend the economic circumstances of the local population.

As this study indicates, northeast and northwest Nigeria exhibit a relatively low level of income inequality among their residents, which implies that resources are distributed in a relatively even manner in the region. The extant literature, as outlined by Krieger and Meierrieks (2019) and Ajide and Alimi (2021), posits that high levels of income inequality can act as catalysts for terrorism. However, this hypothesis does not appear to be applicable in northeastern and northwestern Nigeria.

Income Inequality by Education

According to the Gini sub-estimates, individuals with lower education levels have a higher Gini coefficient than those with tertiary or university education. Specifically, those with university education had a Gini coefficient of 0.24, those with secondary education had a coefficient of 0.29, those with primary education had a coefficient of 0.30, and those with no education had a coefficient of 0.31. These findings suggest that individuals with lower education levels are more likely to experience higher income inequality than those with higher education levels. This observation is also visibly evident from the Lorenz curve subgroup graphs presented in Figure 3 and 4. Furthermore, the result of the one-way ANOVA analysis validates the findings of the Gini coefficient and Lorenze curve analysis. The one-way ANOVA indicates that the level of education attained by the household head have a significant impact on income inequality. The findings suggest that as the level of education attained by household heads increases, so does the household income. Thus, the hypothesis suggesting that income inequality does not exist across the educational level of household heads is rejected. These results align with the

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existing literature (Checchi, 2001; Negara, 2018; Vu, 2020). The relationship between income inequality and educational levels has been well established, and it is widely believed that this correlation is due to the fact that educational choices influence earning potential.

Studies have consistently demonstrated a positive relationship between the educational level of household heads and household income. In particular, research conducted in Vietnam has revealed that higher qualifications or vocational education of household heads is associated with increased income levels (Vu, 2020). Similarly, Negara (2018) investigated the effect of higher education on income and economic growth across various countries and found that tertiary education has a substantial and positive impact on both income and economic growth. Furthermore, an exploratory study conducted in Ghana emphasised the importance of education in financial management practices and income levels, showing a significant relationship between household budgeting, level of saving, educational level, income level, and age of the household (Krah et al., 2014). Collectively, these findings support the notion that the higher education levels of household heads are linked to higher household income levels.

Income Inequality by Gender

The Gini coefficient results indicate that male respondents had a lower Gini coefficient (0.25) than female respondents (0.31). Thus, the hypothesis that income inequality does not exist across gender is hereby rejected. This suggests that female respondents bear a greater burden of income inequality than their male counterparts. This finding is also supported by the Lorenz curve of income by gender. Moreover, the findings of the one-way ANOVA analysis corroborate the results of the Gini coefficient and Lorenze curve analysis, indicating that gender type has a substantial influence on income inequality. Specifically, the one-way ANOVA demonstrates that there is a significant difference in the mean income between male and female individuals, with the latter mean income lower than their male counterparts. Therefore, the hypothesis that income inequality is not present between genders is not supported. It is worth noting that these results align with Nigeria's perception as a masculine society. Traditionally, society has conditioned men to assume leadership, decision-making, and primary domestic responsibilities, while women are often relegated to unpaid domestic labour and low-wage jobs. As a result, the development and education of women has received

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limited attention, which partially contributes to the lack of female empowerment. In Nigeria, the concepts of masculinity and femininity are shaped by a combination of cultural, social, and psychological factors (Jaiyeola, 2020; Okongwu, 2021).

Income Inequality between victims and non-victims

The Lorenz curve and Gini coefficient for the group that did not encounter violence or terrorism (0.27) and those who experienced violence or terrorism (0.26) appeared similar, with a one percentage point difference. The results of the one-way ANOVA also indicate no distinction in mean income levels between terrorism victims and non-victims. The F-statistics of the model are not statistically significant. This implies that violence and terrorism did not significantly influence income inequality between victims and non-victims. Therefore, this study failed to reject the null hypothesis that violence or terrorism has no significant effect on income inequality.

FGT Poverty Estimates (Total population)

The existing body of literature has primarily focused on the root causes of terrorism and the causal links between poverty, terrorism, and income inequality (Piazza, 2006; Coccia, 2018; Iheonu & Ichoku, 2021). However, this study adopts a distinct approach by assessing the poverty rate in a region severely impacted by terrorism. The poverty headcount ratio of the population under observation is 73%. The poverty gap and poverty severity are also quite high. According to the latest publicly available data from a survey conducted in 2021, 33% of Nigeria's population is living below the World Bank poverty line, while an additional 16.6% is considered vulnerable to it (UNDP, 2023).

These results suggest that the poverty rates in northeast and northwest Nigeria are high. Thus, the null hypothesis stating that the majority of households residing in northeast and northwest Nigeria live above the poverty line is hereby rejected. This finding is supported by Jaiyeola and Bayat (2020), who noted that poverty is most prevalent in the northern region of the country. Based on their findings, the poverty rates in the northeast and northwest zones of Nigeria were 77.7% and 76.3%, respectively (Jaiyeola & Bayat, 2020).

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It is important to note that while northeast and northwest Nigeria exhibit a low level of income inequality, their high poverty rate suggests a different reality. In other words, although the region appears relatively equal, its largely impoverished population suggests otherwise. Only 27% of the population live above the World Bank poverty line. The findings of this study underscore the importance of the economic devastation caused by terrorism in the northern region. Due to terrorism, the infrastructure sector in the northern region has suffered significant damage. Many foreign and local contractors working on projects such as road construction, bridge building, housing estate development, dam construction, National Integrated Power projects, and railway track rehabilitation have either abandoned their sites or moved them to other states. This has caused a major setback in the region's economy (Chibuike & Eme, 2019). In addition, Jaiyeola and Bayat (2020) opined that insurgency in the region has led to a significant increase in the poverty headcount, and it has also resulted in the region mainly depending on agriculture and a subsistence way of life.

FGT Poverty Estimate - Education

This research indicates that the FGT subgroup poverty estimates for education demonstrate a clear correlation between educational attainment and economic well-being. Specifically, the data shows that individuals with higher levels of education are less likely to live in poverty than those with lower levels of education. Notably, over 80% of household heads with an education lower than a university degree fall below the poverty line in their respective subgroups. In terms of poverty gap and poverty severity, individuals with higher levels of education tend to have lower values compared to those without education. These findings underscore the crucial role that education plays in alleviating poverty, with an emphasis on the significance of university education. Existing literature (Afzal et al., 2012; Ukwueze & Nwosu, 2014) corroborates this conclusion.

FGT Poverty Estimate - Gender

Finally, the data indicate that female respondents exhibit a higher poverty headcount rate than male respondents do. Specifically, 87% of the female respondents were below the poverty line, which is higher than the 71% of the male respondents in their respective subgroups. Similarly, men exhibit lower levels of poverty gap and poverty severity in contrast

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to their female counterparts. These findings have significant implication, as a larger proportion of women live in poverty than men. This disparity further accentuates gender inequality in northeast and northwest Nigeria. Extant literature suggests that women and girls are more frequently subjected to higher levels of poverty than are men and boys. This unfortunate reality is demonstrated by the United Nations' Sustainable Development Goals (SDGs) projection for 2022. According to these projections, an alarming 83.7% of the world's extremely impoverished women and girls will reside in only two regions: Sub-Saharan Africa (accounting for 62.8%) and Central and Southern Asia (20.9%) (UN, 2022).

Poverty Headcount – Victim and Non-victim

The poverty headcount among individuals who have not encountered violence or terrorism appears to be greater than among those who have experienced terrorism across all samples, genders, and educational backgrounds, both with university education and no education. The same pattern is evident across poverty gap and poverty severity indicators. The cause of this phenomenon remains unclear according to the findings of the present study. Future research should therefore investigate the factors that contribute to this phenomenon or the reasons for this occurrence.

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7.0 Policy Recommendation

This study successfully achieved its intended objectives by answering the stated questions. These findings indicate that income inequality in northeast and northwest Nigeria is lower than the national average. However, low-income inequality alone does not offer a complete picture, as poverty rates in the northeast and northwest are higher than the national average. This study revealed that a substantial portion of the population in northeast and northwest Nigeria live below the World Bank poverty line, suggesting that they struggle to meet their basic needs. Therefore, it is crucial that steps are taken to address this issue and work towards reducing poverty levels in northeast Nigeria.

To attain this goal of reducing poverty, it is imperative for Nigeria to adopt the strategies suggested by Bhattarai (2010), which emphasises the need for a mechanism that is both growth-promoting and redistributive, and that is compatible with incentives for all three parties–the wealthy, the poor, and the government. Bhattarai suggested that alleviating poverty requires collaboration from the rich who are willing to pay their fair share of taxes, the poor engaging in skill enhancement, and the government being able to implement policies geared towards reducing poverty. Thus, redistribution policies are crucial for reducing poverty and Nigeria should implement effective measures to achieve this goal. In addition, it is necessary to prioritise addressing terrorism challenges in the north and in the country at large. Krieger and Meierrieks' (2019) findings reinforce the notion of redistribution. Their study investigated the impact of redistribution on reducing terrorist activity, revealing that countries with higher levels of redistribution experience less domestic terrorism, partly because redistribution bolsters institutional conditions.

Furthermore, the study also found that household heads with higher education fare better than those with lower education, as it relates to income inequality. Policymakers in Nigeria must carefully consider incorporating educational inequality policies into their policy agenda in a more deliberate manner to address income inequality and poverty. Similarly, our analysis reveals that female residents in the northeast and northwest regions experience greater income inequality than their male counterparts do. It is recommended that priority be given to the promotion of gender equality in terms of earnings. This can be achieved by implementing policies that encourage women to participate in wage-paying jobs rather than

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confining them to traditional domestic roles that have been historically assigned to them. This will lead to further reduction in poverty among women.

8.0 Conclusion

The present study aimed to assess the economic state of households within a region that has been impacted by terrorism, and it effectively fulfilled its objectives by addressing previously stated research questions. These findings indicate that income inequality in northeast and northwest Nigeria is lower than the national average. However, low-income inequality alone does not offer a complete picture, as poverty rates in the northeast and northwest are higher than the national average. Furthermore, this study indicates that approximately a quarter of households in the northeast and northwest regions of Nigeria live above the poverty line, as defined by the World Bank. This suggests that a substantial portion of the population in northeast and northwest Nigeria lives below the poverty line, meaning that they struggle to meet their basic needs. The study also found that household heads with higher education fared better than those with lower education, as it relates to income inequality and poverty estimates. Similarly, our analysis reveals that female residents in the northeast and northwest regions experience greater income inequality than their male counterparts do. Therefore, policy recommendations have been proposed to address these issues.

Our approach is not without its limitations. Specifically, we do not have access to longitudinal data, which restricts our ability to determine whether current income inequality and poverty headcounts will expand or contract. It is important to note that our analysis was based on a snapshot of history and further research may be necessary to draw more conclusive findings using longitudinal data.

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Appendices

A Lorenz Estimates – Income Quintile

inc_q	Coefficient	Std. err.	[95% conf. interval]	
0	0	(omitted)		
5	.0166708	.0001516	.0163736	.016968
10	.0333416	.0003032	.0327471	.0339361
15	.0500124	.0004548	.0491207	.0509041
20	.0666832	.0006063	.0654942	.0678722
25	.1	.002034	.0960116	.1039884
30	.1333416	.0019176	.1295814	.1371018
35	.1666832	.0018443	.1630669	.1702995
40	.2000248	.0018191	.1964578	.2035918
45	.2499876	.0033112	.2434949	.2564803
50	.3	.0030169	.2940843	.3059157
55	.3500124	.0027665	.3445878	.355437
60	.4000248	.0025726	.3949802	.4050693
65	.4666336	.0035361	.4596998	.4735674
70	.5333168	.0030322	.5273711	.5392625
75	.6	.0025728	.5949551	.6050449
80	.6666832	.0021863	.6623961	.6709703
85	.749938	.0022738	.7454794	.7543966
90	.833292	.0015159	.8303196	.8362644
95	.916646	.0007579	.9151598	.9181322
100	1	.	.	.

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B Lorenz Estimates - Education

inc_q	Coefficient	Std. err.	[95% conf. interval]	
1				
0	0	(omitted)		
5	.0155876	.000156	.0152819	.0158934
10	.0311753	.0003119	.0305637	.0317869
15	.0467629	.0004679	.0458456	.0476803
20	.0753984	.0021762	.0711311	.0796657
25	.1065737	.0020437	.1025663	.1105812
30	.137749	.0019525	.1339204	.1415776
35	.1746182	.0039936	.1667873	.1824491
40	.2213811	.0036615	.2142015	.2285608
45	.2681441	.0033618	.261552	.2747362
50	.314907	.003104	.3088205	.3209936
55	.3651394	.0046728	.3559768	.374302
60	.42749	.0041274	.4193969	.4355832
65	.4898406	.0036075	.4827669	.4969143
70	.5521912	.0031258	.546062	.5583205
75	.6145418	.002703	.6092417	.6198419
80	.688247	.003119	.6821311	.694363
85	.7661853	.0023393	.7615983	.7707722
90	.8441235	.0015595	.8410655	.8471815
95	.9220618	.0007798	.9205328	.9235907
100	1	.	.	.
2				
0	0	(omitted)		
5	.0209581	.0013669	.0182778	.0236383
10	.0419162	.0027338	.0365557	.0472767
15	.0628743	.0041007	.0548335	.070915
20	.0838323	.0054675	.0731113	.0945533
25	.1047904	.0068344	.0913892	.1181917
30	.1257485	.0082013	.109667	.14183
35	.1497006	.0086755	.1326893	.1667119
40	.1916168	.0162705	.1597128	.2235207

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45	.2335329	.0155089	.2031224	.2639435
50	.2754491	.0152076	.2456294	.3052688
55	.3173653	.0153935	.2871809	.3475496
60	.3652695	.0232601	.3196599	.410879
65	.4281437	.0205823	.3877849	.4685025
70	.491018	.0184354	.454869	.527167
75	.5538922	.0170213	.520516	.5872684
80	.6347305	.0197874	.5959306	.6735305
85	.7185629	.0154771	.6882146	.7489112
90	.8023952	.012138	.7785944	.826196
95	.8952096	.0068344	.8818083	.9086108
100	1	.	.	.
3				
0	0	(omitted)		
5	.0195807	.0004592	.0186803	.0204811
10	.0391614	.0009184	.0373606	.0409622
15	.0587421	.0013776	.0560409	.0614433
20	.0783228	.0018368	.0747212	.0819244
25	.0979035	.0022959	.0934015	.1024055
30	.1265823	.0060921	.1146366	.1385279
35	.1657437	.0057421	.1544843	.1770031
40	.2049051	.0055242	.1940729	.2157372
45	.2440665	.0054543	.2333715	.2547614
50	.2832278	.0055379	.272369	.2940867
55	.3249604	.0085081	.3082774	.3416435
60	.3837025	.0076547	.3686929	.3987122
65	.4424446	.0069711	.4287754	.4561138
70	.5011867	.006511	.4884197	.5139537
75	.5640823	.0077983	.548791	.5793736
80	.6424051	.0063302	.6299925	.6548176
85	.7207278	.0051065	.7107148	.7307409
90	.804193	.0045919	.7951891	.813197
95	.9020965	.0022959	.8975945	.9065985
100	1	.	.	.

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4				
0	0	(omitted)		
5	.0211409	.0015192	.018162	.0241199
10	.0422819	.0030384	.036324	.0482397
15	.0634228	.0045576	.054486	.0723596
20	.0845638	.0060768	.072648	.0964795
25	.1057047	.007596	.09081	.1205994
30	.1268456	.0091152	.108972	.1447192
35	.1483221	.0119108	.1249669	.1716774
40	.190604	.0178014	.1556982	.2255098
45	.2328859	.0171733	.1992117	.2665601
50	.2751678	.017071	.2416942	.3086413
55	.3174497	.0175037	.2831276	.3517717
60	.3597315	.0184337	.3235858	.3958773
65	.4151007	.0219231	.3721129	.4580885
70	.4785235	.0198626	.439576	.517471
75	.5419463	.0187074	.5052639	.5786287
80	.6147651	.0201594	.5752357	.6542945
85	.6993289	.0157301	.6684845	.7301732
90	.7885906	.0127459	.7635978	.8135834
95	.8942953	.007596	.8794006	.90919
100	1	.	.	.
5				
0	0	(omitted)		
5	.0198482	.0008167	.0182467	.0214496
10	.0396963	.0016334	.0364935	.0428991
15	.0595445	.0024501	.0547402	.0643487
20	.0793926	.0032668	.072987	.0857983
25	.0992408	.0040835	.0912337	.1072479
30	.1190889	.0049002	.1094805	.1286974
35	.1520607	.009975	.1325012	.1716203
40	.191757	.00947	.1731877	.2103264
45	.2314534	.0092303	.2133542	.2495525
50	.2711497	.0092763	.2529603	.2893391

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55	.310846	.009604	.2920139	.329678
60	.3631236	.013143	.3373523	.388895
65	.4226681	.0118231	.3994847	.4458515
70	.4822126	.0109015	.4608365	.5035887
75	.5488069	.0135213	.5222938	.5753201
80	.6281996	.0108883	.6068492	.6495499
85	.7075922	.0086966	.6905395	.7246448
90	.8015184	.008167	.7855043	.8175326
95	.9007592	.0040835	.8927521	.9087663
100	1	.	.	.

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C Lorenz Estimates - Gender

inc_q	Coefficient	Std. err.	[95% conf. interval]	
1				
0	0	(omitted)		
5	.0212667	.0005895	.0201109	.0224226
10	.0425335	.0011789	.0402218	.0448452
15	.0638002	.0017684	.0603326	.0672678
20	.0850669	.0023579	.0804435	.0896904
25	.1063337	.0029473	.1005544	.1121129
30	.1276004	.0035368	.1206653	.1345355
35	.1488671	.0041263	.1407762	.1569581
40	.1857878	.0069259	.1722072	.1993685
45	.2283213	.0065733	.2154321	.2412105
50	.2708548	.0064209	.2582644	.2834452
55	.3133883	.0064829	.3006764	.3261002
60	.3559217	.0067533	.3426796	.3691639
65	.419516	.0087972	.402266	.4367659
70	.4833162	.007881	.4678627	.4987696
75	.5471164	.0072859	.5328299	.5614029
80	.6236869	.0082916	.6074284	.6399454
85	.7087539	.0064698	.6960677	.7214401
90	.7938208	.0051073	.7838062	.8038354
95	.8936663	.0029473	.8878871	.8994456
100	1	.	.	.
2				
0	0	(omitted)		
5	.0160417	.0001508	.015746	.0163375
10	.0320835	.0003016	.031492	.0326749
15	.0481252	.0004525	.0472379	.0490124
20	.0736397	.0021149	.0694928	.0777866
25	.1057231	.0019834	.1018341	.1096122
30	.1378066	.0018912	.1340982	.141515
35	.16989	.0018444	.1662735	.1735066
40	.2135889	.0035488	.2066303	.2205476

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45	.2617141	.0032454	.2553504	.2680779
50	.3098393	.0029801	.3039958	.3156828
55	.3579645	.0027638	.3525451	.3633839
60	.4159008	.003998	.4080612	.4237403
65	.4800677	.0034833	.4732374	.4868979
70	.5442346	.0030018	.5383485	.5501207
75	.6084015	.0025722	.6033578	.6134451
80	.6791655	.0030165	.6732506	.6850803
85	.7593741	.0022624	.754938	.7638103
90	.8395827	.0015082	.8366253	.8425402
95	.9197914	.0007541	.9183127	.9212701
100	1	.	.	.

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