University of the Witwatersrand: Department of International Relations

THE GEOPOLITICS OF CLIMATE CHANGE AND VIOLENT CONFLICTS IN AFRICA: THE NIGERIAN AND KENYAN PERSPECTIVES.

A Thesis submitted to the Faculty of Humanities, University of the Witwatersrand, Johannesburg, South Africa, in fulfillment of the requirements for the degree of Doctor of Philosophy in International Relations

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Declaration

I declare that this thesis is my own original work. It is being submitted for the degree of Doctor of Philosophy in International Relations at the Faculty of Humanities, University of the Witwatersrand, Johannesburg, South Africa. It has not been submitted before for any degree or examination in any other university.

Olanrewaju Ojo Emupenne

March 2024

Dedication

In loving memory of my dear mother, Mrs. Roseline Oluyemi Morayo Emupenne (1943 - 2022), my first informal and formal teacher.

Your prayers, guidance, wisdom, and unwavering support helped shape my life and academic journeys. Though you are no longer with us, your lessons live in my heart and mind.

This thesis is hereby dedicated to you, as a tribute to your profound influence and undying love.

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ABSTRACT

This study empirically examined the correlation between climate change (independent variable) and violent conflict (dependent variable), focusing on East Africa and West Africa. Climate change poses a serious threat to humanity and the ecosystem, particularly in Africa. Also, despite other serious challenges the continent faces, violent conflict remains among the most devastating. Various reasons, including poor leadership, social exclusion, and conflicting goals, are cited as causes of violent conflict in Africa. Recently, a new narrative has emerged suggesting climate change is a potential driver of violent conflicts. This study examines the correlation. So, to investigate this relationship, a survey research design was employed. The study adopted a descriptive research design, and four main research methods were used in the study namely, mixed methods research, comparative case study research, triangulation approach to social research, and convergent synthesis design. Also, the research utilized questionnaires that were directly formulated from the study's hypotheses and were tested using a parametric regression model. Furthermore, the research employed Key Informant Interviews (KII), and the data gathered were processed using *Atlas.ti*, a Computer Assisted Qualitative Data Software (CAQDAS). Sampling techniques included purposive, stratified, and random sampling. The study population comprised government officials, environmentalists, academia, farmers, herders, youth leaders, and community leaders. 17 government officials, 7 academia, 6 environmentalists, 15 farmers, and 13 herders randomly selected in Nigeria, and 22 government officials, academia, and environmentalists, 15 farmers and members of farmers cooperatives, and 12 herders and members of livestock associations randomly selected in Kenya participated in the Key Informant Interviews (KIIs) to make a sample size of 110. In addition, 174 government officials, environmentalists, and academics completed the Set A questionnaire in Nigeria, 116 government officials, environmentalists, and academics completed the Set A questionnaire in Kenya, and 423 farmers, herders, youths, and community leaders completed the Set B questionnaire in Nigeria, and 205 respondents do the same in Kenya to make a sample of 918 respondents. In all, a total of 1,028 respondents participated in the study. The study was systematically guided by four research questions and two hypotheses. These research questions are as follows: (1) To what extent does climate change effect features in the geopolitics of peace and security in West Africa and East Africa? (2) Specifically, what is the correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River County in Kenya? (3) What is the level of awareness about the effects of climate change among crop farmers, herders, and policymakers in the Northern region of Nigeria and Tana River County of Kenya, and how does the knowledge about the effects of climate change play a role in the different stakeholders' approach to conflict? (4) What are the policy frameworks in Nigeria and Kenya that create awareness about climate change and mitigate the effects

of climate change on violent conflict at both national and local levels? The quantitative data obtained were analyzed using SPSS Version 25 and R, while the qualitative data were analyzed using Atlas.ti. Results revealed a positive correlation between climate change and geopolitical dynamics of peace and security in West Africa and East Africa but did not establish causation. While climate change intensified, it contributed to shifts in geopolitical dynamics impacting peace and security. However, establishing causation requires more than observing correlation; it demands demonstrating that changes in the independent variable cause changes in the dependent variable. The findings of the study also revealed varying levels of knowledge and awareness regarding climate change among farmers, herders, and policymakers in Northern Nigeria and Tana River County of Kenya; divergent opinions about available policy frameworks for creating awareness about climate change and mitigating the effects of climate change on violent conflict. Some of the respondents agreed that policies were available, some were of the view that policies were available but not implemented while some expressed the fact that policies were not available. Considering these findings, several policy recommendations were made which include the integration of climate adaptation strategies with conflict prevention efforts, decision-making and policy implementation, creating more awareness programmes, indigenous approach and inclusivity, curbing migration, farmer/herder dialogue, and the establishment of special judicial commission solely for farmers and herders. In a nutshell, the study emphasized the need for nuanced understanding and consideration of multiple factors influencing the geopolitical landscape of Africa.

Keywords: Climate Change, Farmers, Herders, Geopolitics, Violent Conflict

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List of Abbreviations

ACLED	Armed Conflict Location and Event Data Project
ACPMDR	African Community of Practice on Managing for Development and Results
ACTS	African Centre for Technology Studies
AEZ	Agro Ecological Zone
AFAN	All Farmers Association of Nigeria
AfDB	African Development Bank
AGFI	Adjusted Goodness of Fit Indices
AGW	Anthropogenic Global Warming
AI	Aerosol Index
AQIM	Al-Qaeda in the Islamic Maghreb
C of O	Certificate of Occupancy
CAQDAS	Computer-Assisted Qualitative Data Software
CCRC	Climate Change and Incessant Conflict
CFI	Comparative Fit Index
CGTR	County Government of Tana River
CIPS	Climate Impact on Peace and Security
CMIN	Chi-Square Minimum
COP	Conference of the Parties
DCC	Department of Climate Change
DF	Degree of Freedom
DRC	Democratic Republic of the Congo
DV	Dependent Variable
EAC	East African Community
ECOWAS	Economic Community of West African States
EDA	Exploratory Data Analysis
EFA	Exploratory Factor Analysis
ENSO	El Niño-Southern Oscillation
FAO	Food and Agriculture Organization
FCT	Federal Capital Territory
GCCPS	Geopolitics of Climate Change on Peace and Security
GDP	Gross Domestic Product

GFI	Goodness of Fit Index
GHGs	Greenhouse Gases
HREC-NM	Human Research Ethics Committee Non-Medical
ICG	International Crisis Group
ICS	International Commission on Stratigraphy
IDMC	Internal Displacement Monitoring Centre
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IPCR	Institute for Peace and Conflict Resolution
IPOB	Indigenous People of Biafra
IR	International Relations
IV	Independent Variable
KCA	Kikuyu Central Association
KIIs	Key Informant Interviews
KMD	Kenya Meteorological Department
KMO	Kaiser-Meyer-Olkin
KNFF	Kenya National Farmers Federation
MACBAN	Miyetti Allah Cattle Breeder Association of Nigeria
MENA	Middle East and North Africa
MoALF	Ministry of Agriculture, Livestock and Fisheries
NACOSTI	National Commission on Science, Technology and Innovation
NBS	National Bureau of Statistics
NEMA	National Emergency Agency
NFI	Normal Fit Index
NGOs	Non-Governmental Organizations
NLBAK	National Livestock Breeders Association of Kenya
OAU	Organization of African Unity
OM	Climate Change and Migration
PCA	Principal Component Analysis
R	R Project for Statistical Computing
RMR	Root Mean Square Residual
RMSEA	Root Mean Squared Error of Approximation
RoC	Republic of the Congo
SALW	Small Arms and Light Weapons

SDE	State Department of Environment
SDGs	Sustainable Development Goals
SIPRI	Stockholm International Peace Research Institute
SPLA	Sudan People's Liberation Army
SPSS	Statistical Package for the Social Sciences
TLI	Tucker-Lewis Index
TRC	Tana River County
UCD	Uneven and Combined Development
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
WCED	World Commission on Environment and Development
WFP	World Food Programme
WHO	World Health Organization
WMO	World Meteorological Organization
WWI	World War I
WWII	World War II

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CHAPTER 1
INTRODUCTION

1.1. Background to the Study

The purpose of this study is to demonstrate the correlation between climate change and violent conflict in Africa. The study utilizes the cases of farmer-herder conflicts in the Republic of Kenya (in the Tana River County) and the Federal Republic of Nigeria (in the Middle Belt Region) to validate the link between climate change (independent variable) and violent conflict (dependent variable). Climate change refers to alterations in the climatic condition of a particular geographical region over a long period. of time. On the other hand, violent conflict encompasses the use of physical force, involving arms, ammunition, machetes, and other lethal weapons, by both state and non-state actors, to maim, kill, or destroy as a means of resolving disputes or as retaliatory measures. Additionally, it includes tactics such as raiding, looting, scorched-earth strategies, cattle rustling, hostage-taking, and the use of threats, intimidation, and violence. The fear created by these actions prompts individuals to flee their homes, resulting in their displacement. It is noteworthy that climate change has multiplier effects on security risk, as it does not exist in isolation but forms a web of interconnected factors that amplify overall security threats. The two variables will be discussed in-depth in the subsequent paragraphs.

Climate change is a major issue that confronts humanity in the 21st century (Ahmed, 2010; United Nations, 2015; Boshoff, 2017; Ogbuabor *et al,* 2017). There are two contending schools of thought regarding the causes of global climate change: the natural global warming theory versus the theory of anthropogenic global warming. The fundamental idea behind the natural global warming theory is that climate change, sometimes known as global warming, occurs as a direct consequence of natural processes on Earth. The impact of elemental forces such as the sun's intensity, volcanic eruptions, changes in the concentrations of naturally occurring greenhouse gases (GHGs), and orbital changes have all been described as probable causes of climate change (Stocker, 2013). The theory of Anthropogenic Global Warming (AGW), however, characterizes climate change as an unnatural and man-made phenomenon. To put it another way, human activities such as GHG emissions, electricity generation, transportation, industrial activities, deforestation, increased livestock farming, use of nitrogen-containing fertilizers for crop farming, and waste dumping at refuse dumps, to name a few, are said to be blamed for the disastrous alterations in global temperatures[1]. This submission is in tandem with the postulations of one of the theoretical frameworks underpinning this study, the Marxist/neo-

[1] https://royalsociety.org/topics-policy/projects/climate-change-evidence-causes/

Marxist theoretical framework on ecology and violent conflict. The framework, while identifying the causes of environmental degradation, pointed out that capitalist globalization exacerbates environmental challenges such as ozone layer depletion, global warming, deforestation, etc. since capitalism's pursuit of profit leads to the exploitation and commodification of nature.

Africa constitutes only 14% of the world's population and accounts for 2.3% of global fossil fuel consumption and 10% of global anthropogenic emissions of GHG (Hansungule & Jegede, 2014). However, most countries in Africa, including Kenya and Nigeria, are the most vulnerable to climate impacts and their multiplier effects on security risk and conflict threat (Collier, Conway, and Venables, 2008; Keating, 2009; Cabot, 2017). Over the past two decades, Africa has been significantly impacted by climate change, as indicated by data from the Intergovernmental Panel on Climate Change (IPCC), World Meteorological Organization (WMO), Statista, International Monetary Fund (IMF), World Bank, World Health Organization (WHO), United Framework Convention on Climate Change (UNFCCC), Afrobarometer, and Conference of the Parties (COP). Changes in precipitation patterns have led to both increased and decreased rainfall in different regions in Africa. East Africa, particularly the Horn of Africa, has experienced prolonged droughts[2] (a natural phenomenon characterized by an extended period of abnormally low precipitation and prolonged dryness that exceeds the typical dry spells in a particular region, leading to water scarcity), and intense rainfall events, resulting in food insecurity. It is noteworthy that in agriculture-dependent regions of Africa, intense rainfall, flooding, and fewer sunny days significantly affect food security in several ways. These include crop damage, delayed planting, the inability to harvest, infrastructure destruction, soil erosion, and nutrient loss. These adverse effects subsequently hinder the capacity to cultivate farms, resulting in food insecurity. Ethiopia, Somalia, and some regions of Kenya are particularly hard hit.

A severe drought has also affected southern Madagascar. Southern Madagascar has often experienced severe droughts over the years. These droughts have been recurring, wreaking havoc on the livelihoods of people in the region. One of the region's most recent severe droughts happened around 2021-2022 (Food and Agriculture Organization (FAO), 2021; United Nations (UN), 2021). During this period, the southern section of the country experienced severe drought, resulting in widespread crop failure, food shortages, water scarcity, livelihood impacts, environmental consequences, and a humanitarian disaster (de Berry, 2023; Fayad, 2023). The severity of the drought in Madagascar highlights Africa's vulnerability to climate-related disasters and the need for proactive measures to mitigate their impact

[2] https://www.statista.com/topics/9715/climate-change-in-africa/ *[Accessed 09/06/2023]*

on populations and ecosystems. In addition, more frequent, and intense droughts have resulted in water scarcity, crop failure, and livestock losses, particularly in the Sahel region.

Climate change also leads to heightened precipitation, thus amplifying the likelihood of flooding. Floods[3] have become more frequent and severe, affecting coastal regions and river basins causing loss of life, displacement, and infrastructure damage. For example, in South Sudan, Nigeria, the Democratic Republic of the Congo (DRC), the Republic of the Congo (RoC), and Burundi flooding has been severe, with South Sudan seeing its third consecutive year of significant flooding. This has resulted in elevated water levels in lakes and rivers because of heavy rains in 2020 and 2021. More so, the 2019-2020 Congo River floods were caused by unusually heavy rains between October 2019 and January 2020. These heavy rains led the Congo and Ubangi rivers to overflow their banks, causing widespread flooding and landslides in both the DRC and the RoC. These floods had a massive impact on communities along riverbanks and in low-lying areas. Rising waters prompted hundreds of thousands of people to flee their homes, resulting in a major displacement crisis. Similarly, the 2022 floods in Nigeria were quite unprecedented and had a widespread and profound impact across the country. These led to devastating consequences, including the loss of more than 600 lives and the displacement of approximately 3.2 million people. These individuals were forced to leave their homes due to the flooding, which affected 34 out of Nigeria's 36 states, as well as the Federal Capital Territory (FCT), Abuja. The damage caused by these floods was substantial. About 82,035 houses were destroyed, leaving many without shelter or a place to call home. Additionally, the floods ravaged approximately 569,000 hectares of farmland, causing severe agricultural losses. This destruction not only impacted individual livelihoods but also posed significant challenges to the agricultural sector, potentially affecting food security and the economy of the affected areas (Onukwue, 2022; National Bureau of Statistics (NBS), National Emergency Management Agency (NEMA) & United Nations Development Programme (UNDP), 2023).

Coastal regions of Africa[4] have faced an increased risk of cyclones, leading to widespread destruction and displacement. Landslides and tropical cyclones have caused significant devastation across the Horn of Africa, encompassing countries such as Somalia, Ethiopia, Eritrea, Djibouti, and parts of Kenya and South Sudan (The Africa Center for Strategic Studies, 2022). The geographical positioning and climatic conditions make this region susceptible to various natural hazards. Heavy rainfall and unstable terrain often trigger landslides, while warm ocean waters serve as breeding grounds for tropical cyclones. Landslides have displaced populations, destroyed homes, and disrupted livelihoods. Also, tropical

[3] https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_LongerReport.pdf
[4] https://www.imf.org/en/Blogs/Articles/2021/12/17/africa-cannot-confront-climate-change-alone

cyclones have serious formidable threats, unleashing strong winds, torrential rainfall, and coastal flooding in the region. These cyclones have inflicted widespread damage on infrastructure — damaging buildings, roads, and agricultural lands — adding to the challenges faced by local communities. The occurrences and frequency of landslides and tropical cyclones in this region are sporadic, influenced by seasonal weather patterns, and vary from year to year based on climatic conditions. For example, in 2020 thousands of people, mostly from South Sudan, Sudan, and Somalia, were forced to move because of natural and climate-induced disasters (IDMC cited by African Union, 2022). Agricultural yields[5] have also been both positively and negatively impacted, with some areas experiencing improved productivity and others facing food insecurity and reduced incomes: this is one example of the unpredictability and variability of anthropogenic climate change.

The continent has also experienced above-average temperature[6] increases, leading to more frequent and intense heat waves that impact human health, agriculture, and ecosystems. Between 1991 and 2021, Africa saw an average warming of +0.3°C per decade, which is significantly higher than the +0.2°C per decade observed between 1961 and 1990. Extreme heat was reported in several parts of Northern Africa, particularly in Tunisia, Algeria, Morocco, and Libya. For instance, both Tunisia and the northern regions of Algeria have experienced a temperature rise of roughly 2 to 3 degrees Celsius (The National Intelligence Council, 2009). Wildfires, sand, and dust storms were also common occurrences. The Middle East and North Africa (MENA) region has been described as the world's 'dustiest' due to its proximity to the Sahara Desert. The desert is considered the main source of dust, generating an annual range of 61 to 366 million tonnes (The World Bank, 2019; Awadh, 2023). However, besides the Sahara's contribution, factors such as changes in land use and anthropogenic climate change also play a role in causing dust storms in the region. North Africa is particularly recognized as one of the regions experiencing the most frequent dust occurrences and exhibiting the highest Aerosol Index (AI) values globally; the frequency and intensity of both sand and dust storms in the region have exacerbated over the past century (Meisner, 2020; Awadh, 2023).

More so, coastal regions of Africa, notably the deltas of the Niger and Nile Rivers, are particularly vulnerable to accelerated sea level rise, resulting in erosion, flooding, and saltwater intrusion (Nhantumbo, Dada & Ghomsi, 2023). The coastlines in Africa are experiencing a faster rate of sea level rise than the global average, particularly along the Red Sea and southwest Indian Ocean, where the rate

[5] https://www.afrobarometer.org/articles/climate-change-africa-survey-finds-worsening-agriculture-conditions-and-quality-life-limited/ *[Accessed 09/06/2023]*

[6] https://unfccc.int/sites/default/files/resource/Africa%20COP27_final.pdf

is close to 4 mm per year. By 2030, 108-116 million Africans are projected to be at risk from sea level rise[7]. Rising sea levels also pose a threat to low-lying coastal communities in West Africa such as Accra, Keta, and Takoradi in Ghana; Saint-Louis, Dakar, and Ziguinchor in Senegal, are also particularly at risk (Dahir & Willima, 2023; Nhantumbo, Dada & Ghomsi, 2023). In 2019, Côte d'Ivoire reportedly suffered damages amounting to nearly 5% of its gross domestic product (equivalent to up to US$2 billion) due to the impact of rising sea levels, according to estimates by the World Bank (Dahir & Willima, 2023). The rising sea level threatens coastal ecosystems, livelihoods, and infrastructure. Communities that are prone to sea level rise also face displacement and migration due to the loss of habitable land. According to Teye and Nikoi (2022), sea-level rise and the resulting coastal erosion have caused the displacement of residents in numerous West African coastal towns and villages in places like Dakar (Senegal), Lagos (Nigeria), Lomé (Togo), Accra (Ghana), and Tema (Ghana), just to mention a few. It is also noteworthy that ecosystems such as coral reefs and mangroves are at risk, with increased coral bleaching and potential loss of coastal protection. Having discussed the first variable - climate change - we shall, in the next section, explicate the second variable, conflict.

Conflict and the threat of violence are a universal occurrence. Conflict entails a contest between two or more people, actors, or groups competing for incompatible goals resulting in maiming, killings, and wanton destruction of property in a region or locality. Conflict is inherently a 'dynamic phenomenon' entailing a cyclical process of initiation, escalation, abatement, termination/resolution, or re-escalation (Sandole, 1999:16). It has been pursued by the privileged in defense of order, by the subjugated in the name of justice, and by the threatened out of fear of displacement (Anifowose, 1982:1). The twentieth and twenty-first centuries world have witnessed countless armed conflicts. Specifically, the twentieth century commenced with the Russo-Japanese War of 1904 to 1905, traversed through the two World Wars, and ended with the 1994 Rwandan genocide, during which an estimated 800,000 Rwandans lost their lives (Martel, 2015). The century marked an era of unprecedented violence and tragedy, defined by widespread turmoil which reached its peak with the devastation caused by the two World Wars, other major conflicts, the terrorism orchestrated by totalitarian regimes leading to death camps, the Jewish Holocaust, and the deployment of atomic bombs in Japan (Salvadori cited in Lo Cascio *et al*, 2014). A record shows 471 armed conflicts between 1700 and 1988, resulting in 101,550,000 deaths; in 1988 alone, there were 35,645,000 fatalities, encompassing 29,700,000 casualties from international wars and almost 6,000,000 from civil wars (Clodfelter, 2017).

[7] https://public.wmo.int/en/media/press-release/state-of-climate-africa-highlights-water-stress-and-hazards#:~:text=Temperatures%3A%20Africa%20warmed%20at%20an,years%20on%20record%20for%20Africa.

Although the number of violent conflicts in the world, especially in developed countries, has declined (Staub, 2011:3), the developing world has not had a breakthrough in achieving perpetual peace. Historically, Africa has been plagued by various forms of violence and conflict, including civil wars, terrorism, genocide, bloody coups and countercoups, intra-state bellicose, fratricidal wars, inter-communal clashes, and armed insurgencies[8]. These armed conflicts, inter-group tensions, and ongoing disputes have persisted since the end of colonial rule (Bowd & Chikwanha, 2008). It is important to note that conflicts in Africa are diverse and multifaceted in nature, with each having its unique context and dynamics. The causes, actors involved, and impact of violence can vary widely from one conflict to another. Also, the intensity and geographic spread of violence vary across different regions and countries within Africa.

The typology and patterns of conflicts in Africa are diverse and intricate, reflecting a blend of historical, political, economic, and social factors. Common typologies and patterns encompass ethnic and tribal conflicts, civil wars, post-colonial conflicts, coups and countercoups, resource-based conflicts, religious conflicts, political instability, terrorism, and, more recently, farmer-herder conflicts. Coups and countercoups were the prevailing forms of political violence in the 1970s and 1980s, experiencing a decline in the 1990s and 2000s. However, they have resurfaced since 2017. Jihadism, as a form of conflict, has witnessed an increase since 2011, while rebellions have seen a decline. Understanding the specific dynamics of each conflict is crucial for comprehending how climate change may have contributed to the escalation of farmer-herder conflicts in Africa.

Massive human casualties, deliberate destruction of property, population displacement, injuries, and psychological distress are some of the consequences of armed conflicts in Africa. These conflicts have played a role in the weakening or, in certain instances, the outright collapse of states. Intergroup tensions and some violent conflicts have persisted for a long time in different parts of Africa. The incessant terrorist attacks in countries like Nigeria, Chad, Niger, Cameroun, and Somalia; the farmer-herder clashes in Burkina Faso, Nigeria, and Kenya; the civil strife that is still ongoing in Libya, Mali, Somalia, South Sudan, the DRC[9], and most recently in Sudan, perhaps is an indication that working towards the achievement of peaceful societies still constitutes a challenge for many African countries (Abraham, 2003:717; Cilliers, 2018:3). Conflicts in Africa can be categorized as concluded civil wars, wars

[8] https://reliefweb.int/report/world/conflict-still-africa-s-biggest-challenge-2020 [Accessed 10/06/2023].

[9] The Stockholm International Peace Research Institute (SIPRI) has conducted extensive research on various regions, including Africa, and cover topics such as security, governance, conflict prevention, peacekeeping, and peacebuilding. The SIPRI yearbook is a valuable resource that provides comprehensive data, analysis, and insights into security and conflict trends in Africa and it's available online at https://www.sipri.org/yearbook/2020/07

between nations, major genocide/mass atrocities, and ongoing armed conflicts which have claimed an estimated[10] 16,044,465, 243,801, 2,312,000, and 866,845 respectively. So, the cumulative armed conflict fatalities[11] in Africa amount to approximately 19.5 million[12] people (Fang *et al*, 2020: 3-7), which is comparable to the populations of thirteen African countries: Seychelles (98,347), Sao Tome and Principe (219,159), Cabo Verde (555,987), Comoros (869,601), Djibouti (988,000), Mauritius (1,271,768), Equatorial Guinea (1,402,985), Guinea Bissau (1,968,001), Gabon (2,225,734), Botswana (2,351,627), The Gambia (2,416,668), Namibia (2,540,905), and Mauritania (4,649,658)[13]combined.

According to Statista[14], from 2013 to 2019, the number of conflicts in Africa decreased. However, after 2019, there was an increase in the number of conflicts, reaching a total of ninety in 2022. Out of these ninety conflicts, sixteen were defined as wars, which typically involve sustained armed confrontations between organized groups or state actors, while five were defined as limited wars, which typically refer to more localized conflicts, involving fewer participants and lower levels of intensity compared to full-scale wars. A diverse range of groups and individuals engage in armed conflicts across Africa (Malet & Anderson, 2017), illustrating the intricate nature of these confrontations. Participants in armed conflicts in Africa include criminal gangs, prominent in the Sahel region (Alcaro & Pirozzi, 2014); militias like the Lord's Resistance Army (LRA) in Uganda, notorious for abductions and brutal tactics (Allen & Vlassenroot, 2010); dissatisfied members of armed forces, leading to the recent military takeovers in countries such as Mali (2020 and 2021), Guinea (2021), Sudan (2021), Burkina Faso (2022), Niger (2023), and Gabon (2023) (Mahmoud and Taifouri, 2023). Others are rebels exemplified by the Sudan People's Liberation Army (SPLA) (Madut-Arop, 2006); politicians, often supporting rebel movements or exploiting ethnic tensions for personal gain; religious extremists, such as Boko Haram in Nigeria seeking to establish Islamic law; educated elites, as seen in the Rwandan genocide; unemployed and underemployed youths, as being recruited by Al-Shabaab in Somalia; farmers and herders, particularly in the Middle Belt region of Nigeria; terrorist groups such as the Al-Qaeda in the Islamic Maghreb (AQIM) operating across North Africa, and Islamic State - West Africa Province (ISWAP) operating across West Africa; and foreign mercenaries and militias in Libya's ongoing conflict, often supported by external actors, adding complexity to the dynamics (Sayapin *et al*., 2022).

[10] The Department of Peace and Conflict Research at Uppsala University and the Centre for the Study of Civil War at the Peace Research Institute Oslo (PRIO) have jointly published a dataset on armed conflicts and conflict-related fatalities/deaths from 1946 to 2008 [See Gleditsch, N.P., et al. (2002). 'Armed Conflict 1946–2001: A New Dataset', Journal of Peace Research **39**(5), pp. 615–637, available online at https://www.prio.org/data/4

[11] For more on conflict fatalities in Africa check Raleigh, C., C. Dowd & A. Linke. (2013). "African Conflict Baselines and Trends: Armed Conflict Location and Event Dataset (ACLED): Overview, Uses & Applications [Available online at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/304727/Conflict-pattern-Trend-Analysis-practioners.pdf

[12] For comprehensive statistical data on fatalities in Africa see the following ACLED files: Number of reported civilian fatalities from direct targeting by country-year: All reported fatalities stemming from events of direct civilian targeting; Number of reported fatalities by country-year: All reported fatalities; and Number of events targeting civilians by country-year: All civilian targeting events, including those stemming from remote violence [Available online at https://acleddata.com/curated-data-files/#aggregated

[13] https://www.worldometers.info/population/countries-in-africa-by-population/

[14] https://www.statista.com/statistics/262938/conflicts-in-sub-saharan-africa-by-intensity/

The situation in Africa is characterized by a concerning rise in violence, with conflicts taking on increasingly intractable forms (Gilpin, 2016). The continent faces challenges in addressing the root causes of violence and achieving peaceful societies.

However, it is worth mentioning that in post-colonial Africa, some countries have enjoyed relative peace and have been described as the most politically stable countries on the continent. The following countries were ranked as the least fragile in Africa according to the Fund for Peace[15] dataset for Fragile States Index 2023[16]: Mauritius came in first place in Africa and ranked 154th globally, followed by Seychelles in second place in Africa and 128th globally, Botswana in third place in Africa and 122nd globally, Cabo Verde in fourth place in Africa and 114th globally, Namibia in fifth place in Africa and 112th globally, Ghana in sixth place in Africa and 107th globally, Gabon in seventh place in Africa and 99th globally, Tunisia in eighth place in Africa and 96th globally, Morocco in ninth place in Africa and 90th globally, and Sao Tome and Principe in tenth place in Africa and 86th globally. In contrast, Somalia, South Sudan, the Democratic Republic of Congo, Sudan, the Central African Republic, Chad, Ethiopia, Mali, Guinea, and Nigeria, which were ranked first, third, fourth, seventh, eighth, ninth, eleventh, thirteenth, fourteen, and fifteenth globally respectively, are the most fragile and conflict-prone countries in Africa. These rankings, which evaluated the relative fragility of each country, involved 179 different countries. The index considers various indicators, including social, economic, and political factors, to determine the rankings.

State fragility denotes a situation characterized by a heightened vulnerability to institutional failure, the breakdown of social order, or the outbreak of violent conflict, potentially resulting in severe consequences (African Development Bank [AfDB], n.d). The connection between state fragility and armed conflict or war constitutes a dynamic, complex, and multifaceted relationship (Brock *et al*. (2012). Numerous interrelated factors contribute to the correlation between state fragility and conflict in Africa, they include governance challenges; ethnic and political tensions; economic factors; resource competition; political instability; human rights abuses; terrorism and extremism; weak security institutions; external factors; and historical legacies of colonialism and the arbitrary delineation of borders (AfDB, n.d, Osaghae, 2007; Uzechina, 2008; European University Institute, 2009; Ncube & Jones, 2013).

[15] https://fundforpeace.org/what-we-do/data-for-peace/
[16] https://fragilestatesindex.org/global-data/

In explaining the probable causes of conflict, Anifowose (1982:5-12), identified three hypotheses, namely, 'the relative deprivation, rising expectations, and frustration-aggression hypothesis; the systemic hypothesis; and the group conflict hypothesis'. These hypotheses offer different perspectives on the causes of violent conflict. The first hypothesis suggests that aggression is always a result of frustration and that violence becomes inevitable when there is a discrepancy between what individuals seek and what they perceive as attainable. The second hypothesis suggests that the social environment, including social interactions, relationships, and societal structures, can shape and influence aggressive behaviour. The last hypothesis emphasizes the role of power dynamics and political struggle as catalysts for violent conflict. These hypotheses provide different lenses for understanding the causes of conflict. It is noteworthy that violent conflict is a complex phenomenon influenced by multiple factors, and different situations may involve a combination of these hypotheses or other contributing factors (Stewart, 2002:342).

Conventionally, conflicts in Africa have often been driven by factors such as bad leadership, social exclusion, political instability, competition over resources, ethnic tensions, religious intolerance and extremism, governance challenges, corruption, human rights violations, proliferation of small arms and light weapons (SALW), poverty, selfish pursuit of incompatible goals, quest for secession and unhealthy inter-group rivalry (European Union, 2000:1-4; Humphreys, 2003:20; Buhaug & Rød, 2006; Brown, 2009:1-3). Among these causes of conflicts in Africa, four particularly prominent factors have significantly contributed to severe bloodshed across the continent. Firstly, military coups have played a pivotal role in destabilizing nations, leading to internal strife and violence. Secondly, social exclusion, marked by the marginalization of certain groups, has fuelled tensions, creating a breeding ground for conflict. Additionally, the widespread proliferation of SALW has intensified conflicts, providing means for various factions to engage in armed hostilities, thereby exacerbating the severity of confrontations. Lastly, the pursuit of secession, often driven by regional or ethnic aspirations, has been a potent force in triggering conflicts, contributing to complex and protracted struggles within African nations. These four factors collectively underscore the complex nature of conflict dynamics in the African context, where political, social, and military issues intersect, leading to profound and often devastating consequences.

As regards military coups and counter coups, Africa has had a handful of them. The major reasons often adduced to military putsch are bad leadership and corruption. For instance, the major reasons given for the first coup in Nigeria which eventually culminated in the Biafran civil war were the topsy-turvy of the political scene, bribery and corruption, political instability, and the tomfoolery of political actors

among others (Graf, 1985; Nyang'oro, 1993; Enor & Ebaye, 2011; Toyin, 2015). The coups in Africa, totaling 220 attempted, with 109 successful and 11 failed, since 1950, were characterized by a disturbing level of violence. The tumultuous nature of these events resulted in the deaths of 12 African leaders, marking a tragic toll on political stability and leadership. Furthermore, the aftermath of these coups witnessed widespread human rights abuses and extra-judicial killings, with West Africa being notably affected by these egregious violations. The turbulent history of coups in Africa reflects not only the volatility of political landscapes but also the human cost and severe consequences endured by the affected populations in the region (Duzor & Williamson, 2023; Institute for Security Studies (ISS), 2023).

Social exclusion has been described as a condition wherein individuals are incapable of engaging fully in economic, social, political, and cultural spheres, along with the processes that contribute to and uphold such a condition (United Nations Department of Economic and Social Affairs, 2016). Stewart *et al* (2005) have identified some places across the globe where social exclusion has given rise to violent conflicts, these include the Moslem rebellions in the Philippines and Thailand; the separatist movements of Aceh, East Timor, and Papua in Indonesia, and the separatism of East Pakistan and Eritrea; the Catholic irredentism in Northern Ireland; the rebellion of Indigenous peoples in Guatemala; the Shining Path movement in Peru; the Northern rebels in Cote d'Ivoire; the race riots that recur sporadically in developed countries; the rebellion of tribes in North East India; the Tamil rebellion in Sri Lanka; the Intifada among the Palestinians; the Berbers in Algeria; Christians in the South of Sudan; Northerners in Uganda; and the communist rebellion among underprivileged castes and regions in Nepal, to mention but a few.

Also, the proliferation of small arms and light weapons (SALW) has resulted in severe consequences especially in conflict zones in Africa with belligerents employing SALW as primary tools of violence, causing numerous deaths and injuries, especially among innocent civilians. The widespread availability of SALW exacerbates insecurity and prolongs the duration of violence, with the impact extending to neighbouring peaceful nations within the region (Nganga, 2008). Research findings have unequivocally affirmed the widespread proliferation of small arms and light weapons in numerous African countries; the situation that now serves as a catalyst for initiating and perpetuating violent conflicts within regions that were previously characterized by peace and stability (Oche, 2005; Ayuba & Okafor, 2014).

It is noteworthy to state that secessionist struggles in Africa have roots dating back to the 1960s and 1970s during the decolonization period (Forniès, 2022). The postcolonial secessionist conflicts in Africa are unique phenomena, intertwining politics and violence in distinctive ways compared to other struggles on the continent, and they have been influenced by past separatist armed conflicts, global

responses, and international political shifts (Thomas & Falola, 2020). These conflicts are a consequence of poorly demarcated borders in Africa by the European colonialists, sparking debates on whether to revise or maintain these colonial boundaries and resulting in a division between revisionists and anti-revisionists. Despite the decision by the Organization of African Unity (OAU) and its successor, the African Union (AU), to maintain the status quo to prevent chaos, border conflicts have persisted (Ikomei, 2012). In Angola, the Lunda-Tchokwé people are pushing for the Democratic Republic of Lunda-Tchokwé, particularly in the Cabinda region where an ongoing low-intensity war persists. Cameroon faces an ongoing civil war in the Ambazonian territory, where Anglophones of the former Southern Cameroon are fighting for the Federal Republic of Ambazonia. Ethiopia, on its part, grapples with various regions seeking autonomy or independence, such as Ogadenia, Oromia, Tigray, Sidama, and Amhara. Western Togoland in Ghana advocates for its independence, supported by the Western Togoland Restoration Front. Similarly, Nigeria has historical secessionist movements in Biafra, with groups like the Indigenous People of Biafra (IPOB) and the Biafra Zionist Movement. Also, the Yoruba people of Nigeria are calling for self-determination under Constitutional Force Majeure. In Sudan's Darfur region, various ethnic groups seek autonomy or unification with Chad, with the Darfur Liberation Front engaged in conflict[17]. So, military coups, social exclusion, the widespread proliferation of small arms and light weapons (SALW), and secessionist struggles are the four major conventional causes of conflicts in Africa.

However, recently a new narrative on another possible cause of violent conflicts has emerged: that of climate-induced conflict, known as climate change. Climate-induced conflict refers to social conflicts or heightened tensions among individuals or groups, such as farmers and herders, resulting from the adverse effects of climate change. These conflicts are intricately linked to changing climatic conditions, including desertification, droughts, the loss of arable land for grazing, rising temperatures, extreme weather events, sea-level rise, and shifts in precipitation patterns. They manifest in various forms, such as competition for scarce resources like water, pasture, and arable land, climate-induced population displacement, and heightened vulnerability to other climate stressors. Climate-induced conflict highlights the correlation between ecological factors and social dynamics, emphasizing the potential role of climate change as a contributing factor to conflict and instability.

[17] To access a comprehensive list of all active separatist movements in Africa, refer to https://academic-accelerator.com/encyclopedia/list-of-active-separatist-movements-in-africa

Climate-induced conflicts differ from conventional conflicts in their underlying causes, triggers, nature, means of resolution, duration, and intensity. Conventional armed conflicts typically arise from political, ideological, ethnic, or territorial disputes, as well as historical grievances, power struggles, or competing interests. On the other hand, climate-induced conflicts stem from the impacts of climate change, extreme weather events, and environmental degradation. Also, triggers for conventional conflicts may include political events, border disputes, historical tensions, or power struggles, with military and political decisions playing a central role. In contrast, climate-induced conflicts are triggered by climate-related events such as droughts, desertification, loss of pasture/grazing land, or general scarcity of natural resources. The nature of conventional armed conflict differs from that of climate-induced conflict. The former involves direct military engagement, organized armed groups, and strategic military actions following traditional patterns of warfare. The latter is often characterized by resource-driven disputes, migration due to environmental changes, and localized tensions. Resolution of conventional armed conflict often involves diplomatic negotiations, peace treaties, or international intervention, along with military victories or defeats. Resolving climate-induced conflict may only require addressing underlying environmental issues, resource management, and adaptation strategies.

Lastly, in terms of duration and intensity, conventional armed conflict can be prolonged and intense, with high levels of violence. In contrast, climate-induced conflict tends to be more localized and may involve lower levels of violence. However, the duration and intensity can vary based on the severity of environmental changes and the effectiveness of adaptation measures. Climate change is also tied to conflict as a 'conflict multiplier' because the impacts of climate change, such as rising temperatures, extreme weather events, sea-level rise, and resource scarcity, can exacerbate existing social, economic, and political tensions, thereby increasing the risk of conflicts (Mayoral, 2012; COMMISSION DE CONSOLIDATION DE LA PAIX, 2017). Nonetheless, it is imperative to note that these distinctions are not always sacrosanct, as conflicts have multiple causes and can be influenced by a combination of factors, including both conventional and climate-related elements.

Farmer-herder conflict is a good example of climate-induced conflict. Farmer-herder conflicts in Africa represent intricate socio-economic and political challenges that have persisted across the continent for decades. These conflicts are widespread across various African regions, with notable instances documented in countries such as Nigeria, Sudan, South Sudan, Mali, Niger, Kenya, Ghana, Ethiopia, Burkina Faso, and Tanzania (African Community of Practice on Managing for Development Results (ACPMDR), n.d; Beeler, 2006; Gaye, 2018; Brottem, 2021; Adams *et al*., 2023). The causes of the violent conflict between crop farmers and herders in Africa have been graphically illustrated below.

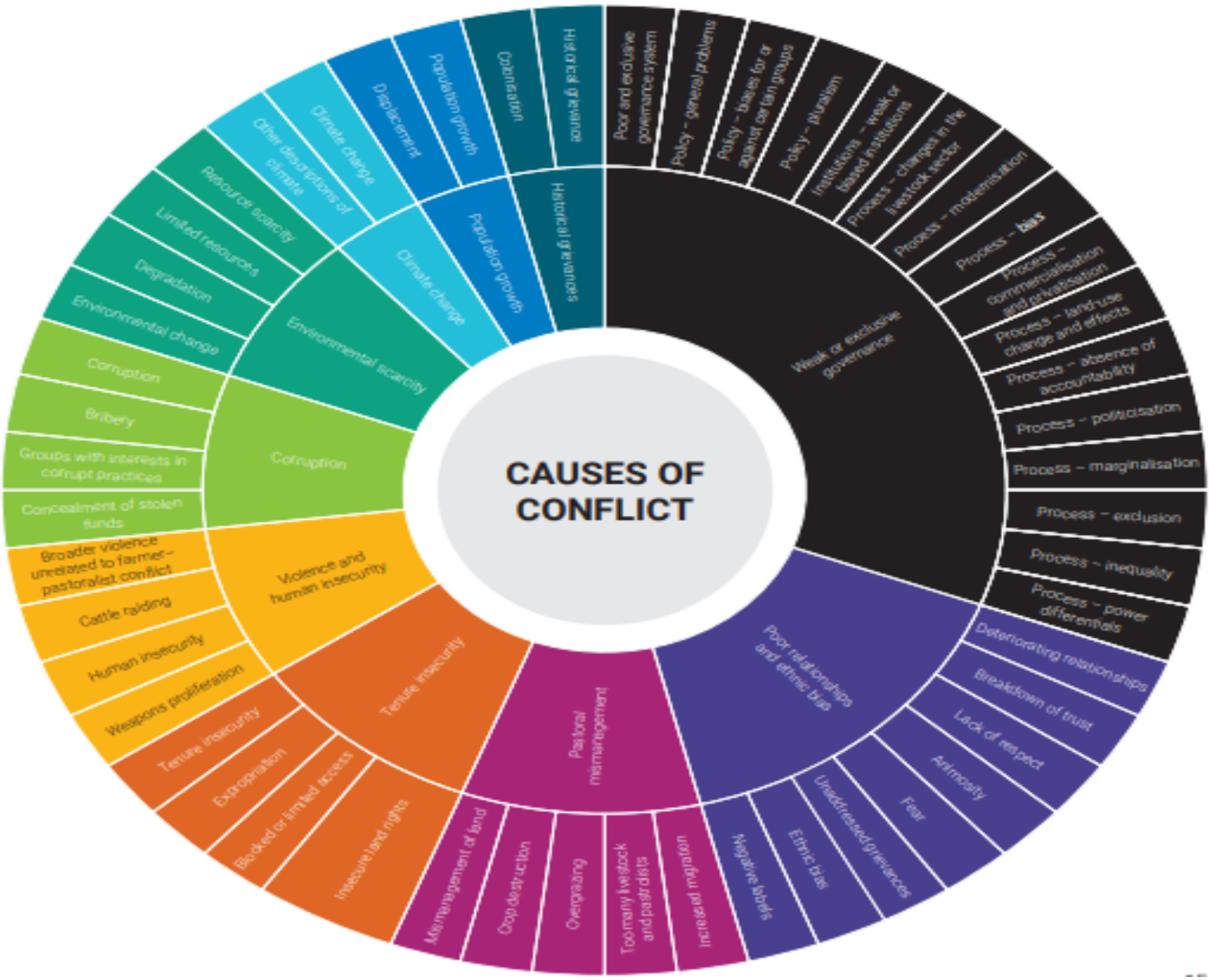

Figure 1.1: The Causes of Violent Conflict between Crop Farmers and Herders

Source: Nassef *et al.* (2023).

The above chart shows that these clashes typically occur when there is competition over natural resources such as land and water, exacerbated by factors like climate change, population growth, weak governance, and ethnic tensions (Hussein, Sumberg & Seddon, 1999). Conflict hotspots often coincide with areas where pastoralist communities intersect with agricultural lands. These regions are typically characterized by semi-arid or arid climates, where competition for limited resources is intense (Krätli & Toulmin, 2020). Farmer-herder conflicts often spill across national borders, impacting neighbouring

countries and regional stability (Kwaja & Smith, 2020). In short, cross-border pastoralist movements exacerbate tensions. Nigeria and Kenya have had their unenviable share of this phenomenon.

The disappearance of grazing lands in the core Northern region of Nigeria and the increase in the demand for beef saw a major migration of herders southwards since the return to democratic governance in 1999. Some of the herders settled down in the Middle Belt region with their herds (Li, 2018; Asueni & Godknows, 2019). The predominance of crop farming in the Middle Belt region has not made the farmers and herders live peacefully for a long time. So, this migration has led to conflicts between the migrant herders and the local crop farmers. Access to lethal weapons such as AK-47 assault rifles has made the conflicts more violent in the region than they had been in the past. Thus, the region has been characterized by incessant killings and wanton destruction of property (Sayne, 2012; Conroy, 2017; IPCR, 2017; Blench, 2018; Ilo, Jonathan-Ichaver & Adamelokun, 2019). According to the Armed Conflict Location & Event Data Project (ACLED) report, Benue State topped the list for the most violent attacks, because of farmer-herder conflicts in Nigeria, closely followed by Plateau, Kaduna, Taraba, and Nasarawa. The report, spanning 2005 to mid-2021, revealed that Benue witnessed 2,539 killings from 303 attacks while Plateau, Kaduna, Taraba, and Nasarawa reported 2,138, 1,188, 755, and 521 fatalities, respectively, from 279, 160, 111, and 93 attacks[18]. The current crisis in the Middle Belt region between the farmers and herders is also typified by a significant transnational character (Adamu & Ben, 2017 and Ghanem-Yazbeck, 2018). The influx of herdsmen from neighbouring countries such as Niger, Chad, Mali, and the Maghreb, fleeing worsening environmental degradation in the Sahel, has exacerbated the volatile situation in Nigeria. These migrant herders add pressure on grazing areas, intensifying tensions with crop farmers (Asogwa & Okafor, 2016).

Tana River County in Kenya has faced similar farmer-herder conflicts due to efforts to gain control over the delta of Tana River by the Pokomo and Orma people. The delta of the Tana River is described as a very important wetland in Eastern Africa. The prominent role the Tana River plays in Kenya cannot be overemphasized. The river starts from the Aberdare Mountains, west of Nyeri, Kenya, and flows into the Indian Ocean after covering about 1000 km. Major conflicts arose between the Orma, predominantly herders, and the Pokomo, primarily crop farmers, during the years 1991, 1992, 1995, 1999, 2001/2002, 2004, 2009, and 2012/2013 (Volisi, 2019). Particularly notable were the conflicts of

[18] For a more comprehensive report on fatalities resulting from farmer-herder clashes in Nigeria, you can refer to the article titled "Special Report: Farmers-Herders Conflict: After Many Deaths, Ondo Residents, Officials Seek Relief Under Anti-Open Grazing Law" available at the following link: https://www.premiumtimesng.com/regional/ssouth-west/502828-special-report-farmers-herders-conflict-after-many-deaths-ondo-residents-officials-seek-relief-under-anti-open-grazing-law.html?tztc=1

2001/2002 and 2012/2013, resulting in total fatalities of 110 and 265, respectively. The brutality of these killings was evident, as some victims were gruesomely murdered (Kipkemoi, 2018; Volisi, 2019). The violence intensified in recent years leaving stings of blood, sorrow, anguish, and colossal material loss in its wake (Odhengo *et al*, 2014:2; Baker *et al*, 2015).

Four core issues underpin conflict in Tana River County, Kenya: an increase in population, access to water, climatic changes, and competition for land and land-based resources (Duvail *et al*, 2012:322; Muthuwatta *et al*, 2018:37). These interconnected issues create a complex and volatile environment in Tana River County, where conflicts over resources are exacerbated by demographic pressures, environmental challenges, and historical grievances. Also, they serve as fundamental drivers that not only underpin but also amplify violent conflicts in the region. Firstly, the rapid increase in population has strained resources and heightened competition for land and water resources. This demographic pressure exacerbates existing tensions and escalates conflicts over scarce resources (Mohamed, 2015). Secondly, access to water is a critical issue in Tana River County, particularly in the context of changing climatic conditions. Erratic rainfall patterns and prolonged droughts have led to water scarcity, intensifying competition among communities for limited water sources. This scarcity not only triggers conflicts but also exacerbates the severity of disputes over water access and distribution (Chikandah, 2021). Thirdly, climatic changes have significantly impacted the region, exacerbating environmental degradation and resource scarcity. Rising temperatures, changing rainfall patterns, and increased frequency of extreme weather events have disrupted traditional livelihoods and intensified competition for land and other natural resources, further fuelling conflict dynamics (Ministry of Agriculture, Livestock and Fisheries [MoALF], 2016). Lastly, competition for land and land-based resources, such as grazing areas and agricultural land, is a longstanding source of conflict in Tana River County. Disputes over land ownership, land tenure arrangements, and resource allocation often escalate into violent conflicts, particularly in areas where herder and crop-farmer communities intersect (Mutua, Munyua & Odero-Wanga, 2022).

Land tenure systems[19] and their legal frameworks in Kenya are complex and can vary in different regions and communities (Doshi, *et al.,* 2014). The government has made efforts to address land tenure issues through various land reforms and policies to ensure equitable access, tenure security, and sustainable land management. While Pokomo people are mainly crop farmers and subscribe to individual land ownership, the Orma people are typically herders who believe in communal ownership and use of land, pasture, and water resources (Mwangi, n.d.). Conceivably, the land tenure systems in

[19] A more comprehensive explanation on the land tenure systems of Nigeria and Kenya was offered in Chapter 2.

the republic vis-a-vis the views held by the two communities on land ownership, land use, pasture ownership, and use of water resources may have triggered the conflict between Pokomo farmers and Orma herders. Efforts made by state and non-state actors such as government agencies, non-governmental organizations, and other stakeholders towards finding an enduring panacea to the crises have not yielded the desired result.

While not disregarding the internal fallout of the crises within Nigeria and Kenya and other causes of violent conflicts as discussed above, this study seeks to determine the extent to which climate change influences the movement of herders in Nigeria and Kenya and the resulting conflicts between them and crop farmers. There are competing schools of thought regarding the notion that climate change can trigger violent conflict. Therefore, the purpose of this study is to analyze and understand the correlation between climate change and violent conflict, using the farmer-herder conflicts in the Middle Belt region of Nigeria and Tana River County of Kenya as empirical case studies.

This study is motivated by the real-life situations in both countries, where climate change has led to increased competition over scarce resources, particularly between herders and farmers. In Nigeria's Middle Belt and Kenya's Tana River County, these conflicts have resulted in significant loss of lives, displacement of communities, and destabilization of local economies. Understanding the effect of climate change on these violent conflicts is crucial due to the following reasons: humanitarian impact, economic stability, political stability, and policy development.

While climate change poses a great challenge to Africa, its role as a driver of violent conflict is not always properly understood or adequately addressed. This study emphasizes the following points: climate change interacts with social, economic, and political factors to exacerbate conflicts; the phenomenon affects the availability of water and grazing land, which are critical resources for both farmers and herders. This scarcity often leads to competition and conflict; and climate change influences migration patterns, as herders move in search of water and pasture. This movement can lead to disputes over land use, making it imperative to understand and manage these dynamics.

Although the concepts of climate change and armed/violent conflict are not new to International Relations, empirical research on their connection is relatively novel. This study aims to fill this gap by providing empirical evidence on the correlation between climate change and violent conflict, using the farmer-herder conflicts in Nigeria and Kenya as case studies. It seeks to inform policy and practice, through its findings and recommendations, for both state and non-state actors involved in conflict resolution and climate adaptation. Effective intervention strategies require a nuanced understanding of the underlying causes of conflict. Additionally, this study contributes to the broader field of

International Relations by exploring the geopolitics of climate change and conflict, particularly in the African context, to enhance the theoretical and practical understanding of how climate-induced conflicts can be managed.

In summary, this study seeks to provide a comprehensive analysis of the impact of climate change on violent conflicts in Nigeria and Kenya, to inform more effective policies and interventions. By addressing the gaps in current research, it hopes to contribute to a better understanding of the complex interplay between climate change and conflict in Africa.

1.2. Statement of the Problem

The migration patterns of numerous Fulani herdsmen from the North West and North East geopolitical zones to the Middle Belt region in Nigeria, as well as the movement of Orma herders to the Tana River delta in Kenya, are primarily attributed to factors such as drought, desertification, and the scarcity of arable land suitable for grazing. The movement of these herders to the Middle Belt region in Nigeria and the Tana River delta in Kenya had manifold effects. The Middle Belt region of Nigeria and the Pokomo community in Kenya predominantly consist of crop farmers. Consequently, the grazing of herds on farmlands and the surrounding environment has precipitated intractable farmer-herder conflicts characterized by violence and bloodshed. These clashes have inflicted significant human casualties, resulted in the destruction of property, and caused substantial economic losses (Adan and Pkalya, cited in Kipkemoi *et al*., 2017:601; Ajibo *et al*., 2018:157; Blench, 2018:5; Musembi, 2018:7394). Thus, it becomes imperative to examine the relationship between climate change and violent conflicts in these regions.

The intersection of climate change and violent conflict, particularly between herders and farmers, is an emerging area of concern in both scholarly research and policymaking. Despite increasing attention, several critical gaps remain in our understanding of how climate change exacerbates these conflicts, especially within the Middle Belt region of Nigeria and Tana River County in Kenya. This study seeks to address these gaps by exploring the nuanced relationships between environmental changes and socio-political stability in these regions.

While it is well established that climate change impacts environmental conditions, the specific ways in which these changes affect security dynamics in West and East Africa are less understood. This study will assess how evolving geopolitical factors, including demographic changes and environmental pressures, intersect with climate change to influence peace and security in Nigeria and Kenya. By focusing on the Middle Belt region and Tana River County, the research aims to provide empirical evidence on the dominant effects of climate change on socio-political stability. There is a notable gap

in the literature regarding the direct correlation between climate-induced environmental changes and the escalation of farmer-herder conflicts. In Nigeria, the correlation between climate effects on the core Northern region and the farmer-herder conflicts in the Middle Belt region, as well as the corresponding dynamics in Kenya's Orma community and the farmer-herder conflicts in the Tana River Delta area, remain under-explored. This study will establish these correlations, offering a deeper understanding of how climate variations contribute to these localized conflicts.

Furthermore, understanding the level of climate change awareness among stakeholders in the agricultural sector is crucial for developing effective mitigation strategies. Current research does not adequately address how this awareness, or lack thereof, influences the actions of farmers, herders, and policymakers in conflict-prone areas. This study evaluates the awareness levels in Northern Nigeria and Tana River County, examining whether informed stakeholders adopt different conflict resolution approaches. Existing policy frameworks aimed at mitigating climate change impacts and violent conflicts are often inadequately analyzed for their effectiveness. This research will scrutinize the policies in Nigeria and Kenya, assessing their success in raising climate change awareness and reducing conflict at both national and local levels. By identifying strengths and weaknesses in current policies, the study aims to contribute to more effective policy formulation and implementation.

This study addresses a significant gap in the literature by providing a comparative analysis of how climate change drives farmer-herder conflicts in Nigeria and Kenya. The insights gained from this research will enhance our understanding of the specific mechanisms through which climate change exacerbates these conflicts and the varying regional dynamics involved. By doing so, it will offer valuable perspectives on the formulation of more targeted and effective policy responses, ultimately contributing to more sustainable conflict resolution and resource management strategies in Africa. In sum, this study aims to fill the existing knowledge gaps by providing a comprehensive and empirically grounded analysis of the interplay between climate change and violent conflicts in Nigeria and Kenya. Through this comparative approach, it seeks to offer new insights that can inform both academic research and practical policymaking in the context of climate change and socio-political stability in Africa.

1.3. Aims and Objectives of the Study

The objectives of this study are fourfold:

i. The **primary objective** of this study is to explore the extent to which the effect of climate change features in the geopolitics of peace and security in West Africa and East Africa.

The **secondary objectives** of this study are to:

ii. specifically, establish the correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River County in Kenya.

iii. ascertain the level of awareness about climate change among various stakeholders in the agricultural sector in Northern Nigeria and Tana River County, Kenya; and whether awareness of the effects of climate change plays a role in the different stakeholders' approach to conflicts.

iv. examine the existing policy frameworks in the Federal Republic of Nigeria and the Republic of Kenya aimed at raising awareness about climate change and mitigating its impact on violent conflicts at both national and local levels.

1.4. Research Questions

As part of efforts to address the above-stated problems/objectives, the following questions are proffered for the study:

1.4.1. *Core Research Question*

To what extent does climate change effect features in the geopolitics of peace and security in West Africa and East Africa?

1.4.2. *Sub-questions:*

i. Specifically, what is the correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River County in Kenya?

ii. What is the level of awareness about the effects of climate change among crop farmers, herders, and policymakers in the Northern region of Nigeria and Tana River County of Kenya, and how does the knowledge about the effects of climate change play a role in the different stakeholders' approach to conflict?

iii. What are the policy frameworks in Nigeria and Kenya that create awareness about climate change and mitigate the effects of climate change on violent conflict at both national and local levels?

1.5. Research Hypotheses

Based on the avenues of enquiry, the research posits a number of predictions, namely:

1.5.1. *Hypothesis 1*

H_o: There is no significant effect of climate change on the geopolitics of peace and security in West Africa and East Africa.

H_1: There is a significant effect of climate change on the geopolitics of peace and security in West Africa and East Africa.

1.5.2. *Hypothesis 2*

H_o: There is no significant correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River Delta area in Kenya.

H_1: There is a significant correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River Delta area in Kenya.

1.6. Scope of the Study

The study covers Nigeria's core North and the Middle Belt area in the Sahel Region of West Africa and Kenya's Tana River County in the Great Lakes Region of East Africa. The reason for the selection of these locations lies in the similarity they share in the pattern of farmer-herder conflicts. More so, the two countries also ranked higher in terms of their relative security vulnerability to climate change. Busby *et al* (2013:136) assert that along with Asia, Africa is globally recognized as one of the most vulnerable continents to climate change. It should also be mentioned here that East Africa and West Africa were used interchangeably with Kenya (a regional power in East Africa) and Nigeria (a regional power in West Africa) respectively.

1.7. Significance of the Study

The significance of this study lies in uncovering the linkages between climate change and violent conflict in Africa. It seeks to shed light on a major pattern of conflict that poses perhaps the greatest challenge in the contemporary histories of Nigeria and Kenya and suggests how the lesson learned on ways of resolving violent conflicts can be applied beyond the sampled regions.

An original contribution of the study is constructing a body of knowledge that offers comparative empirical case study insights. Most published works on the crises on the crises in the Middle Belt region of Nigeria and the Tana River County of Kenya rely on various sources such as historical records, governmental reports, academic studies, and journalistic accounts (Sayne, 2012; Adamu and Ben, 2017; Conroy, 2017; IPCR, 2017; Blench, 2018; Ghanem-Yazbeck, 2018 and Ilo, Jonathan-Ichaver & Adamelokun, 2019). Conducting an empirical study on the correlation between climate change and violent conflicts in these regions of Africa makes the thesis unique.

1.8. Chapterization

The thesis is structured into seven chapters. The current chapter is the introductory chapter. Chapter Two of this thesis, as noted earlier, undertakes a comprehensive examination of the case studies, delving into specific instances and scenarios that illuminate the complexities surrounding conflicts in the Middle Belt Region of Nigeria and Tana River County of Kenya. Through an in-depth analysis of these case studies, the chapter aims to provide valuable insights into the multifaceted nature of conflicts in the studied area.

On the other hand, Chapter Three engages in a rigorous and critical review of the existing body of research concerning the intricate interplay between climate change and violent conflict. By synthesizing and evaluating a wide range of scholarly literature, this chapter seeks to elucidate the nuanced correlation, mechanisms, and dynamics linking climatic shifts to the outbreak, escalation, and perpetuation of violent conflicts. Through a meticulous examination of empirical evidence, Chapter Three contributes to a deeper understanding of the complex nexus between climate change and conflict dynamics while at the same attempting to identify the perceived gaps in the existing literature. The chapter also presents the theoretical frameworks that guide the study. Relevant theories or conceptual frameworks were discussed, which help analyze the relationship between climate change and violent conflict, in this chapter.

Chapter Four focuses on the research methodology and research design of this study, the study population, sampling method and the sample size, study locations and sites, data collection techniques, instruments, and instrumentation, validity and reliability of research instruments, method of data analysis, and ethical considerations.

Chapter Five of this thesis delves into the comprehensive analysis of gathered data, meticulously scrutinizing results and drawing insightful interpretations. This pivotal chapter is methodically crafted to address the four fundamental research questions that have been formulated to guide the study's

trajectory. Additionally, in this chapter, the formulated hypotheses were rigorously tested using appropriate statistical methods, and the results were comprehensively presented.

The primacy of the sixth chapter is a comparative case analysis of Kenya and Nigeria. The chapter aims to analyze and compare the responses from the two sets of questionnaires: SET A Questionnaire (CIPS and GCCPS) and SET B Questionnaire (OM and CCRC) to establish if there are any convergence or divergence in views between males and females within and between the two cases (Kenya and Nigeria). The chapter sets the stage for a comprehensive study exploring the relationship between climate security and demographics in the selected regions, intending to contribute to a better understanding of the complex interactions between climate change, conflict, and societal variables. The chapter also delves into the intricate realm of quantitative forecasting, where precision and statistical rigour intersect to anticipate future trends and outcomes.

Chapter Seven is the concluding chapter of this thesis. The primary purpose of the chapter is to present the discussion of research findings, conclusions, and policy recommendations. The findings of this research are based on both the reviewed literature and the analyzed quantitative and qualitative data. Based on the findings of the research, policy recommendations were made for the Economic Community of West African States (ECOWAS), the East African Community (EAC), the African Union (AU) in general and the governments of Kenya and Nigeria in particular.

1.8. Conclusion

In concluding Chapter One, a robust foundation for the study has been laid, delineating the significance of investigating the interplay between climate change and violent conflict in Africa, with a focus on the Middle Belt Region of Nigeria and Tana River County of Kenya. The shared patterns of farmer-herder conflicts in these regions have been underscored, and their heightened vulnerability to climate change is in line with scholarly observations by Busby *et al*. (2013). Moreover, the crucial role of this research in addressing pressing challenges within the contemporary histories of Nigeria and Kenya has been emphasized. To achieve this some scientifically valid research questions and hypotheses which were answered and tested respectively in Chapter 5 using primary data gathered during fieldwork have been provided.

As we transition to Chapter Two, our focus shifts towards an intensive examination of case studies. By delving deep into these case studies, we endeavour to uncover nuanced insights into the multifaceted nature of conflicts within the studied areas. Through meticulous scrutiny and interpretation of these real-world examples, Chapter Two sets the stage for a richer understanding of the dynamics

underpinning conflicts in our research areas. It is within this context that we navigate the complexities of Chapter Two, aiming to contribute valuable perspectives to the broader discourse on conflict resolution and peacebuilding in African contexts.

CHAPTER 2
HISTORICAL DYNAMICS OF CONFLICTS AND VIOLENCE IN NIGERIA AND KENYA

2.0. Introduction

The historical dynamics of conflicts and violence in Nigeria and Kenya are intricate narratives that reflect the complex tapestry of sociopolitical, economic, and cultural forces shaping these countries. From pre-colonial times to the present day, both countries have grappled with a multitude of challenges, including ethnic tensions, colonial legacies, religious divides, economic disparities, and struggles for power and resources. So, in this chapter, we delve into the political cum administrative structure, agroecological dynamics, and historical trajectories of conflicts and violence in Nigeria and Kenya, examining key events, factors, and dynamics that have influenced the course of history in these countries. We explore pre-colonial societies and the roots of inter-tribal rivalries, the struggles against European colonialism and the transatlantic slave trade, the struggles for independence, and the post-colonial violence in Nigeria and Kenya. Additionally, we analyze contemporary challenges such as ethno-religious tensions, political instability, and the threat of terrorism, all of which contribute to ongoing conflicts and violence in these two countries.

2.1. A Synopsis of the Federal Republic of Nigeria and the Republic of Kenya

Nigeria[20], officially known as the Federal Republic of Nigeria, is located between latitude 4^0N and 14^0 N of the equator and between longitude 3^0 E and 15^0 E of the Greenwich Meridian. The total land area of the country is approximately 923,768 square kilometres making the country the 31st largest country in the world in terms of land area. The main rivers in Nigeria are the Niger and Benue which converge at Kogi State and empty into the Atlantic Ocean through the Niger Delta.

[20] https://www.countryreports.org/country/Nigeria/geography.htm

Figure 2.1: The Map of Nigeria

Source: https://www.worldatlas.com/

For administrative purposes, Nigeria is divided into six geopolitical zones, namely, the North East, North West, North Central, South West, South East, and South South. As depicted in the image above, the country has thirty-six states and the Federal Capital Territory, Abuja. Most of the states that constitute North Central – Benue, Plateau, Taraba, Niger, Kogi, Nasarawa, and the Federal Capital Territory, Abuja – fall within the Middle Belt region. The region roughly delineates the predominantly Muslim North from the Christian-dominated South in Nigeria.

Also, Kenya, officially known as the Republic of Kenya, is located between latitude 5^0N and 5^0S of the equator and between longitude 34^0 and 42^0 E of the Greenwich Meridian. The total land area of the country is approximately 580,367 square kilometres making the country the 48th largest country in the world in terms of land area. The main rivers in Kenya are the Tana River, Ewaso Ng'iro, Mara River, and Galana River among others. Tana River, which is 1000 km long, is the longest in the country.

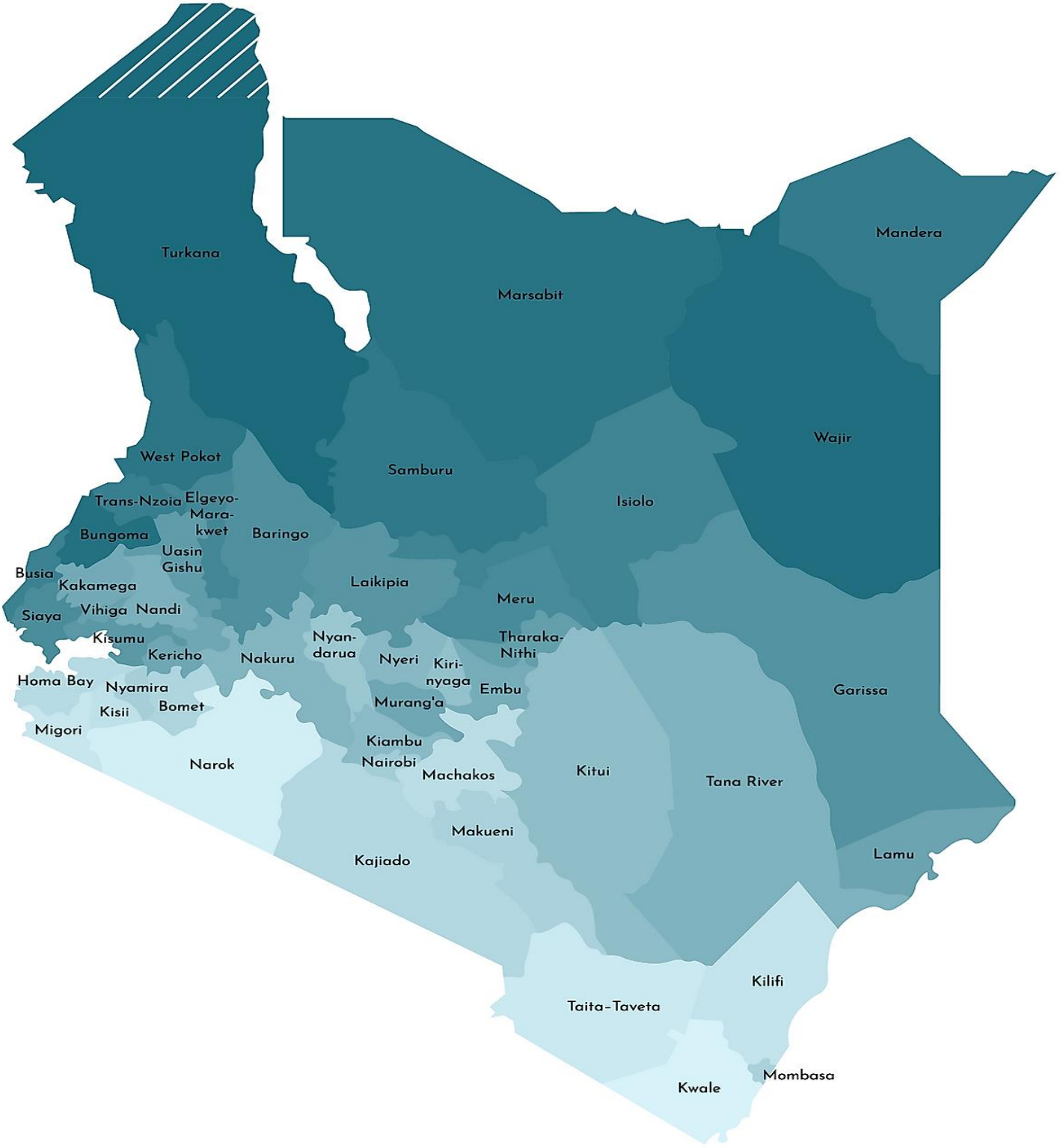

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Figure 2.2: The Counties Map of Kenya

Source: https://www.worldatlas.com/

As depicted in the image above, Kenya is divided into 47 counties, each serving as an administrative unit with distinct characteristics, governance structures, and socio-economic dynamics. These counties have been established to decentralize governance, foster local development, and ensure efficient service delivery to citizens nationwide. Among them are Baringo, Bomet, Bungoma, Busia, Elgeyo/Marakwet, Embu, Garissa, Homa Bay, Isiolo, Kajiado, Kakamega, Kericho, Kiambu, Kilifi, Kirinyaga, Kisii, Kisumu, Kitui, Kwale, Laikipia, Lamu, Machakos, Makueni, Mandera, Marsabit, Meru, Migori, Mombasa, Murang'a, Nairobi City, Nakuru, Nandi, Narok, Nyamira, Nyandarua, Nyeri, Samburu, Siaya, Taita/Taveta, Tana River, Tharaka-Nithi, Trans Nzoia, Turkana, Uasin Gishu, Vihiga, Wajir, and West Pokot[21]. Tana River County, where the primary data for this research was collected in Kenya, is located in southeastern Kenya along the Tana River. Its capital city is Hola, and the county spans approximately 35,375 square kilometres, hosting a diverse population dominated by ethnic groups such as the Pokomo, Orma, and Wardei. With its rich ecological diversity encompassing riverine ecosystems and semi-arid landscapes, the county's economy primarily revolves around agriculture, including the cultivation of maize, rice, and fruits, alongside livestock rearing and fishing (County Government of Tana River, 2013; County Government of Tana River, 2018). Nonetheless, the region faces persistent challenges such as food insecurity, limited access to healthcare and education, inadequate infrastructure, and sporadic conflicts over land and water resources (University of Nairobi, 2014).

2.2. Background on Violent Conflicts in Nigeria and Kenya

What is now recognized as Nigeria and Kenya have a long history of violent conflict, with both societies experiencing various forms of strife over the years. These conflicts can be categorized into three main periods: pre-colonial, struggles against slavery and colonialism, and post-colonial violent conflicts. During the pre-colonial era, Africa, including present-day Nigeria and Kenya, witnessed a myriad of conflicts and violence stemming from various factors (Nnoli, 1998; Besley & Reynal-Querol, 2012; Paine, 2019). In Nigeria, these conflicts encompassed inter-tribal warfare, where different ethnic groups engaged in armed confrontations over resources, territory, and power. Additionally, expansionist wars were prevalent, with powerful states such as the Oyo Empire, Benin Kingdom, and Sokoto Caliphate engaging in conquests to annex neighbouring territories. Slave raids and trade were also significant sources of conflict, as communities participated in capturing individuals for sale to European slave traders or for labour within the region. Moreover, occasional religious conflicts emerged between followers of traditional African religions and those practicing Christianity or Islam, adding to the socio-

[21] https://www.klrc.go.ke/index.php/constitution-of-kenya/165-schedules-schedules/first-schedule-counties/434-1-counties

political tensions (Smith, 1989; Osaghae & Suberu, 2005; Davidson, 2014). Similarly, in Kenya, pre-colonial conflicts mirrored those in Nigeria, featuring inter-tribal warfare driven by competition over resources and territory; clan rivalries within ethnic groups often escalated into violent disputes over leadership and resources; raids and livestock theft were common occurrences, particularly among pastoralist communities, leading to frequent clashes between rival groups and defensive fortifications, such as hilltop settlements and thorn fences, were constructed by communities to protect themselves from raids and attacks, highlighting the pervasive nature of conflict in pre-colonial Kenya (Reid, 2007; Omeje & Hepner, 2013). It is noteworthy that precolonial African military technology encompassed a diverse array of weapons and tools that were developed and utilized by various societies across the continent; they include shields, spears (with variations such as the stabbing spear, throwing assegai, and knife-throwing spear), swords, daggers, bow and arrow, spiked clubs, machetes, and firearms, introduced later by European merchants (Uzoigwe, n.d.). In sum, pre-colonial Nigeria and Kenya were marked by a multitude of conflicts and violence, shaped by inter-tribal rivalries, expansionist ambitions, economic interests, and religious differences. These conflicts not only influenced the socio-political landscapes of the time but also left lasting legacies that continue to impact contemporary society in both countries.

The second stage of violent conflicts in Nigeria and Kenya has to do with the struggle against slavery and colonial rule (Mazrui & Tidy, 1984; Fanon, 1988; Ade Ajayi, 2002). This struggle was a multifaceted and protracted process that involved various forms of resistance, including armed uprisings, political movements, and advocacy campaigns (Onebunne, 2017; Barrett, 2021). In Nigeria, communities actively resisted participation in the transatlantic slave trade, although some also participated in capturing and selling slaves. Nigeria came under British colonial rule in the late 19th century through a process of military conquest and diplomacy. The imposition of colonial rule led to resistance movements, including the resistance by the Sokoto Caliphate (Audu & Osuala, 2015), and the Ekumeku Movement in the Igbo region (Igbafe, 1971). The struggle against colonial rule intensified in the 20th century with the emergence of nationalist movements. Prominent figures like Nnamdi Azikiwe, Obafemi Awolowo, and Ahmadu Bello played key roles in advocating for Nigerian independence. Nigeria finally gained independence from British rule on October 1, 1960.

In Kenya, before European colonization, various communities in Kenya resisted the Arab slave trade, which was prevalent along the Swahili coast (Vernet, 2009; Eltis *et al*, 2011). Communities like the Kikuyu, Luo, and Maasai engaged in armed resistance to protect themselves from slave raiders. Kenya became a British protectorate in the late 19th century, leading to significant resistance from indigenous

communities. The Maasai[22], Kikuyu, and other groups waged armed resistance against British encroachment on their lands, notably during the Maasai resistance and the Kikuyu-led Kikuyu Central Association (KCA) protests[23] (Brantley, 2018). The Mau Mau movement, which emerged in the 1950s among the Kikuyu people, was one of the most significant anti-colonial uprisings in Kenya (Askwith, 1995). Led by figures like Dedan Kimathi, the Mau Mau sought to end British colonial rule and address grievances such as land dispossession and political marginalization. The British responded with brutal repression and the use of detention camps. Jomo Kenyatta, a key leader in the independence movement, played a central role in negotiating Kenya's independence, which was achieved on December 12, 1963 (Ogot & Ochieng', 1995; Gatheru, 2005; Durrani, 2018).

In the post-colonial era, both Nigeria and Kenya have experienced complex historical dynamics of conflict and violence, influenced by a multitude of factors including colonial legacies, ethnic tensions, political instability, economic disparities, and religious differences (Gilpin, 2016; Blanton *et al* 2001). These conflicts manifest across a wide spectrum, ranging from electoral violence and sectarian crises to internal insurrections, coup d'états, armed rebellions, and civil wars. Additionally, ethno-religious conflicts, violent protests and riots, militancy, terrorism, insurgency, and more recently, farmer-herder conflicts, further compound the complexities of the situation.

During Nigeria's colonial period, the British amalgamated a mosaic of diverse ethnic groups—comprising over 250 ethnic groups, speaking about 500 languages—into one nation-state, overlooking the intricate tapestry of cultural, religious, and linguistic differences that existed among them (Adeyinka & Akinsola, 2021; Siollun, 2024). This amalgamation, which occurred without due consideration for the complexities of Nigeria's societal fabric, set the stage for future inter-ethnic tensions. Notably, among the major ethnic groups—the Hausa-Fulani, Yoruba, and Igbo—a sense of discord simmered beneath the surface (Falola, 2021). The imposition of this "forced union" sowed the seeds of political discord, which manifested in post-election violence and a turbulent series of coups and countercoups. However, the most tragic consequence of these tensions unfolded in the form of a brutal civil war that ravaged the country from 1967 to 1970, claiming countless lives and leaving indelible scars on the Nigerian psyche (Bourne, 2015).

Despite the cessation of hostilities following the civil war, Nigeria's path to peace remained fraught with challenges. Post-war years witnessed a resurgence of violence in various forms, including sporadic

[22] https://www.culturalsurvival.org/publications/cultural-survival-quarterly/maasai-dilemma

[23] https://content.ucpress.edu/title/9780520235403/9780520235403_intro.pdf

outbreaks of post-election violence, simmering ethno-religious conflicts, and the emergence of militancy in the oil-rich Niger Delta region—a testament to the deep-rooted grievances and disparities that persisted across the country (Ojakorotu, 2009; Obi & Oriola, 2020; Ezeife, 2022). Furthermore, Nigeria grappled with grave human rights abuses and the rise of extremist groups such as Boko Haram and Islamic State in West Africa Province (ISWAP), whose insurgency unleashed a wave of terror across the country, particularly in the northeastern regions (David *et al*, 2015; Solomon & Hentz, 2017; Temitope *et al*, 2019). More recently, the escalation of farmer-herder clashes has added another layer of complexity to Nigeria's already volatile landscape (LeVan, 2019), highlighting the ongoing struggle to address underlying socio-economic and political grievances while fostering sustainable peace and coexistence among its diverse populace.

Kenya's history of conflict, akin to Nigeria's, bears the imprint of its colonial legacy. British colonization engendered land dispossession fostered ethnic divisions, and marginalized certain communities, notably the Kikuyu, Luo, and Kalenjin (Mwakikagile, 2001). Ethnicity assumes a pivotal role in Kenyan politics, often aligning political parties along ethnic lines. Consequently, competition for political power and resources frequently precipitates ethnically motivated violence, particularly during electoral periods. Kenya has weathered recurrent bouts of post-election violence, where simmering ethnic tensions erupt into widespread turmoil, resulting in a staggering toll of casualties and the displacement of hundreds of thousands (Klaus, 2020; Friedrich Ebert Stiftung & Centre for Conflict Research, 2001; Murunga, 2011; Becher, 2016). Furthermore, Kenya grapples with security challenges emanating from terrorist groups such as Al-Shabaab, primarily due to its involvement in military operations against the group in neighbouring Somalia. Al-Shabaab has perpetrated numerous attacks within Kenya's borders, including the infamous 2013 Westgate shopping mall siege (Macharia, 2023) and the 2015 Garissa University College massacre (Maruf & Joseph, 2018). During a research fieldwork in Kenya in 2022, this researcher bore witness to a poignant monument erected in honour of the approximately 147 individuals who lost their lives in the terrorist attacks.

Figure 2.3: Monument in Honour of Those Killed by Al-Shabaab Terrorists at the Garissa University

Source: The Researcher

2.3. Interrogating Land Tenure Systems and Climate-Related Conflict in Nigeria and Kenya

At the heart of some of these major conflicts in Nigeria and Kenya lies land-related issues. Land ownership and access to land have been contentious issues in Nigeria and Kenya. Disputes over land rights between different ethnic groups, as well as between local communities and large-scale commercial farms or government authorities, have led to conflicts and violence. Land ownership and access to land have been enduring sources of conflict and violence in Nigeria and Kenya, with empirical evidence underscoring the gravity of these issues. Numerous studies and reports have documented the intricate web of disputes that arise from competing claims over land rights, exacerbating tensions between various ethnic groups and communities (Hussein, Sumberg & Seddon, 1999; Yamano & Deininger, 2006; Home, 2011; Akinola & Wissink, 2018). For instance, in Nigeria, research conducted by local and international organizations reveals the deep-seated grievances stemming from land

disputes; highlighting how clashes between nomadic herders and settled farming communities over access to grazing land have escalated into violent confrontations, leading to loss of lives and destruction of property (Cotula, 2006; Ofuoku & Isife, 2009; Sayne, 2012; Conroy, 2017; IPCR, 2017; Blench, 2018; Brottem, 2021). Similarly, in Kenya, empirical data shed light on the multifaceted nature of land-related conflicts. Research findings indicate that disputes over land ownership, particularly in areas with high agricultural potential or valuable natural resources, have fuelled intercommunal violence and displacement (Yamano & Deininger, 2005; Shanguhyia & Koster, 2014). Moreover, studies have pointed to the role of large-scale commercial farms and government authorities in land grabbing, further exacerbating land tenure insecurity and marginalization of local communities (Boone, 2012). Furthermore, empirical validation from conflict mapping exercises, such as those conducted by the Institute for Security Studies (ISS)[24] and the International Crisis Group (ICG)[25] as well as the African Centre for Technology Studies (ACTS)[26] 2005 Conference Report, corroborate the link between land disputes and broader patterns of insecurity and instability in Nigeria and Kenya. These studies illustrate how unresolved land grievances serve as fertile ground for recruitment by extremist groups and perpetuate cycles of violence, undermining efforts towards peace and development.

So, examining the land tenure systems in Nigeria and Kenya is imperative for comprehending the fundamental causes of land-related conflicts in both countries, as it elucidates how these systems contribute to grievances and tensions among diverse stakeholders. The law that governs land ownership in Nigeria is the Land Use Act[27], formerly known as the Land Use Decree. The Act vests all land within the territory of each state in the governor of that state. The governor holds the land in trust for the people and has the responsibility of allocating land for various purposes, such as residential, agricultural, and commercial. There are several ways an individual or organization can acquire land in Nigeria and the commonest ways of acquiring landed property[28] include *Inheritance*: Property can be acquired through inheritance when it is passed down from a deceased family member to their heirs. *Probate/Letter of Administration*: This process involves obtaining legal documentation, such as a probate or letter of administration, to establish the right to inherit and own property from a deceased person. *Gift*: Property can be acquired through a gift, where the current owner voluntarily transfers ownership to another person without requiring payment in return. *Sale of Real Estate*: Purchasing property through a sale is a common way of acquiring land in Nigeria. It involves a legal agreement between the buyer and the

[24] https://issafrica.org/iss-today/nigerias-growing-insecurity-offers-expansion-opportunities-for-boko-haram

[25] https://www.crisisgroup.org/africa/west-africa/nigeria/302-ending-nigerias-herder-farmer-crisis-livestock-reform-plan

[26] For more details see the ACTS Report of the Conference on Land Tenure and Conflict in Africa: Prevention, Mitigation and Reconstruction, 9th - 10th December 2004.

[27] The document can be found online at https://faolex.fao.org/docs/pdf/nig67625.pdf

[28] https://www.mondaq.com/nigeria/real-estate/1237954/step-by-step-guide-on-property-acquisition-in-nigeria

seller, usually facilitated through a sales contract or deed of sale. However, to legally possess land in Nigeria, certain documents[29] are typically required, including an *Approved Survey Plan*: This document shows the accurate measurements, boundaries, and other details of the land as surveyed and approved by the relevant authorities. *Deed of Assignment*: The deed of assignment is a legal document that transfers ownership of the land from one party to another. It outlines the terms and conditions of the transfer. *Certificate of Occupancy (C of O)*: The C of O is an official document issued by the government that confirms the right of ownership and grants the holder certain rights to the land. *Governor's Consent*: In some cases, particularly for certain transactions involving land in urban areas, the consent of the governor is required to legally transfer or assign ownership rights. The Governor's Consent is authorization from the governor for such transactions. It's important to note that specific requirements and procedures may vary across states in Nigeria, as there can be slight differences in land-related laws and regulations.

The Republic of Kenya has a diverse range of land tenure systems, which are legal frameworks that determine how land is owned, used, and managed[30]. Here are some of the land tenure systems in Kenya: *Customary Land Tenure*: Customary land tenure refers to land that is held and governed according to traditional customs and practices of specific communities or ethnic groups. Customary land is typically communally owned and managed by the community. *Statutory Tenures*: These are of two types, namely, freehold tenure and leasehold tenure. *Freehold Tenure* is the highest form of land ownership, where an individual or entity has complete and indefinite ownership rights over the land. Freehold land can be bought, sold, inherited, and used for various purposes. *Leasehold Tenure* involves holding land for a specific period through a lease agreement with the government or landowner. Leaseholders have certain rights and obligations during the lease period. *Public Tenure:* Public land refers to land that is owned and managed by the government. It includes land designated for public use, such as parks, roads, and government buildings. Public land is held in trust by the government for the benefit of the citizens. *Reservations of Government or Trust Land*: These are specific areas of land that are reserved for government projects, public facilities, or community use. Government or trust land is typically managed by government authorities or specific trustees. *Minor Interest*: Minor interests in land refer to limited rights or claims on land, such as easements, rights of way, or mortgages. These interests do not confer full ownership but provide specific rights or benefits to the holders. *Non-Formalized De facto Tenure*: This refers to land occupation and use that may not be officially recognized or legally documented but

[29] https://mixtafrica.com/proof-of-land-ownership-in-nigeria/
[30] https://www.land-links.org/wp-content/uploads/2011/06/USAID_Land_Tenure_Kenya_Project_Brief_0.pdf

exists based on informal agreements, customary practices, or long-term occupation (Ministry of Lands, 2009).

Given the extant land tenure systems in both countries, there is a need for holistic approaches to tackle land-related conflicts. Initiatives aimed at land reform, encompassing transparent land administration systems, equitable land distribution, and conflict resolution mechanisms, are important for fostering social cohesion and sustainable development in both Nigeria and Kenya. Furthermore, the importance of inclusive governance structures that prioritize the voices and rights of marginalized communities in shaping land policies and decision-making processes cannot be overstated. Lack of access to land, and by extension water resources, has precipitated farmer-herder conflicts in the Middle Belt region of Nigeria and Tana River County of Kenya. Primarily, the disappearance of arable land for grazing and inadequate water access stems from the adverse effects of climate change. Notably, both Nigeria and Kenya confront challenges related to climatic variations, rainfall distribution, precipitation patterns, drought occurrences, and conflicts arising from resource scarcity.

For instance, Nigeria has six distinct agro-ecological zones (AEZs), viz., Mangrove Swamp and Rainforest in the South; Derived Savanna and Guinea Savanna in the Middle Belt region; whilst the Sudan Savanna and Sahel Savanna are in the core North. Some areas in the country, especially in the core North, fall within the Sahel Region of Africa. Presently, the country is experiencing changes in temperature and rainfall patterns (Adedoyin 2011; World Bank Group, 2021), a phenomenon that has significant implications for various regions across the country. Particularly notable is the Northern region, which is grappling with escalating aridity and desert encroachment (Audu & Adie, 2018). This shift in climatic conditions exacerbates the challenges already faced by communities in these areas, posing threats to livelihoods and ecosystem stability. The distribution of rainfall exhibits marked disparities across different geographical zones within Nigeria (Olaniran & Sumner, 1989). In the southern regions, precipitation levels are substantially higher, fostering lush vegetation and supporting robust agricultural activities. Conversely, the arid northern regions receive considerably less rainfall, creating conditions of water scarcity and limited agricultural productivity. Annual precipitation levels exhibit significant variation in Nigeria, ranging from over 3000mm in the southern regions to less than 500mm in the northern areas, with an average annual mean of 1200mm for the entire country (Adewole & Folorunsho, 2015), underscoring the stark contrast in climatic conditions between these regions. The northern regions of Nigeria are particularly vulnerable to the adverse effects of climate-induced droughts. Recognizing the region's susceptibility to drought and desertification, the Federal Government of Nigeria has implemented The National Policy on Drought and Desertification (Department of Climate Change, n.d.). These recurrent drought events not only result in acute food and

water shortages but also contribute to the displacement of populations as communities struggle to cope with the harsh environmental conditions. The scarcity of water resources further compounds the challenges faced by these communities, affecting various aspects of daily life, from agriculture to sanitation and hygiene. In essence, the changing climate patterns in Nigeria, characterized by increased aridity and variable rainfall distribution, pose significant socio-economic and environmental challenges, particularly for the northern regions.

Likewise, Kenya has six distinct agroecological zones, viz., Agro-Alpine, High Potential, Medium Potential, Semi-Arid, Arid, and Very Arid. The country is also witnessing notable shifts in both rainfall patterns and temperatures, precipitating a cascade of effects that manifest in unpredictable weather events and formidable challenges for agricultural practices and water resource management (Maingey *et al,* 2020). The geographical diversity of Kenya plays a pivotal role in shaping rainfall distribution, with coastal and western regions endowed with comparatively higher precipitation levels compared to the arid and semi-arid expanses of the north and east. In Kenya, the intricate interplay between topography and climatic dynamics significantly influences rainfall distribution. Coastal and western regions benefit from substantial rainfall, with annual averages surpassing 1000mm, fostering lush ecosystems and supporting diverse agricultural activities (Kenya Meteorological Department (KMD), 2020). Conversely, the northern reaches of Kenya experience considerably drier conditions, with precipitation levels plummeting to less than 250mm annually, posing formidable challenges for water availability and agricultural productivity. Moreover, Kenya grapples with the recurring menace of drought, particularly prevalent in arid[31] and semi-arid areas (United Nations Environment Programme (UNEP) & the Government of Kenya, 2006). These prolonged periods of water scarcity exacerbate existing vulnerabilities, imperiling both agricultural endeavours and pastoral livelihoods. The impact of drought reverberates across various sectors, from food security to socio-economic stability, highlighting the urgent need for resilience-building measures and sustainable resource management strategies.

The importance of these geographical and agroecological properties of both Nigeria and Kenya to this study cannot be overstated because the impact of climate change on them is highly pronounced and these effects have led to migration and creation of what has been termed ‘climate refugees’ and, by extension leading to ‘climate conflict’. Conflict frequently arises from the competition over scarce resources, notably land and water, a dynamic that is especially pronounced between herders and farmers across various regions in both Nigeria and Kenya (Mercy Corps, 2020). In Nigeria, this conflict

[31] For more detailed thematic report on the Impact of drought on the arid and semi-arid regions in Kenya see https://www.acaps.org/fileadmin/Data_Product/Main_media/20220331_acaps_thematic_report_kenyaimpact_of_drought.pdf

manifests prominently in the North Central, North East, and North West regions, where tensions between herders and farmers escalate due to competing claims over grazing lands and water sources (Brauch, *et al,* 2012). The scarcity of these resources exacerbates underlying grievances and historical animosities, contributing to recurrent outbreaks of violence and displacement. Similarly, in Kenya, analogous conflicts between herders and farmers are prevalent, particularly heightened in areas such as the Rift Valley and northern regions[32]. Here, the competition for grazing land and access to water resources intensifies existing tensions, leading to clashes and disputes over territory and resource usage. The scarcity of arable land and dwindling water sources further exacerbate these conflicts, perpetuating cycles of violence and instability. In both countries, the protracted nature of these conflicts underscores the complex interplay between socioeconomic factors, environmental degradation, and historical grievances.

2.4. Conclusion

In conclusion, the dynamics of conflicts and violence in Nigeria and Kenya are deeply rooted in a complex interplay of historical, social, political, and economic factors. From the pre-colonial era to the present day, both countries have experienced a myriad of challenges, including ethnic rivalries, colonial oppression, struggles for independence, and contemporary issues such as political instability, economic inequality, violent conflicts, and the threat of extremism. Understanding the historical context of conflicts and violence in Nigeria and Kenya is crucial for understanding the emerging threats relating to climate change, i.e., farmer-herder conflicts, and devising effective strategies to address these challenges and promote sustainable peace and development. Having explored the historical dynamics of conflicts and violence in Nigeria and Kenya, we now turn our attention to a comprehensive review of existing literature on this topic. So, in the next chapter, we will examine scholarly works, research studies, and theoretical frameworks that have contributed to our understanding of conflicts and violence in these two countries. By synthesizing and analyzing the existing body of literature, we aim to identify key themes, trends, and gaps in knowledge that will inform our subsequent analysis and discussion.

[32] https://igadcaep.org/wp-content/uploads/2024/02/FS_IP_KENYA_070723.pdf

CHAPTER 3
LITERATURE REVIEW AND THEORETICAL FRAMEWORKS

3.1. Introduction

Literature is abundant on climate change, violent conflict, and the interconnection between the two. The purpose of this chapter is to review the existing literature to identify the gaps that exist. The chapter also discusses the two theoretical frameworks that underpin this thesis: the Marxist/neo-Marxist Theoretical Framework on Ecology and Conflict, and the Environmental Security theoretical construct, both of which elucidate the connection between climate change and violent conflict. These frameworks provide support for the research problem, validate its questions, and guide the methodology. So, this chapter is organized into three sub-sections namely, conceptual review, empirical review and theoretical review. Under empirical review, literature on geopolitics, climate change, violent conflict, and the relationship between climate change and violent conflict shall be reviewed. Galvani (2017) has noted that it is important to conceptualize the key terms in research work at the beginning of the literature review. Consequently, this chapter begins with conceptual review. The major key terms and concepts that are used in this study including geopolitics, climate change, peace, security, and violent conflict will be dissected to provide a background for the empirical review.

3.2. Conceptual Review

'Geopolitics' is a term coined by Swedish political scientist, Rudolf Kjellén. The term can be described as the study of inter-state strategic relations (Dodds, Kuus & Sharp, 2013) and the process of using political power over a territory. It also denotes an interaction between geographical and environmental factors, and settings such as location, territory, borders or contiguity, and political processes (Sempa, 2002; Cohen, 2015; Klieman, 2015). For this study, geopolitics is conceptualized as the effects of geographical or ecological elements such as topographic factors[33], climatic factors[34], physiographic factors,[35] and natural disasters[36] on the political setting of a particular region, state, or country. Given the devastating impacts posed by climate change on human civilization, a state-centric geopolitical positioning should not be encouraged. The impact of climate change on the distribution of power is influenced by geography, socio-economic and political factors, and as such climate change should be

[33] Topographic factors include elevation (height), direction of slope and steepness of slope.
[34] These include temperature, light, and rainfall.
[35] Physiographic factors explicate the effects of steepness and sunlight on greenery or flora.
[36] These include floods, drought, hurricanes, volcanic eruptions, erosion, sea level rise and other geological processes.

treated as an integral part of geopolitics (Hommel & Murphy, 2013; O'Lear, 2016; O'Lear & Dalby, 2016).

Geopolitics and climate change intersect in complex ways, shaping global dynamics and influencing policy responses. Scholars highlight the multifaceted relationship between these two phenomena, emphasizing their implications for international relations, security, and sustainable development. The literature underscores the complex interplay between geopolitics and climate change, emphasizing the need for integrated approaches to address environmental challenges while mitigating geopolitical risks (Haldén, 2007; Banerji & Sen, 2012; Bosnjakovic, 2012; Qureshi, 2023). Also, research indicates that climate change exacerbates geopolitical tensions (Voubi, 2019) by altering resource distribution, migration patterns, and regional power dynamics (The White House, 2021). Rising sea levels, extreme weather events, and dwindling freshwater resources intensify competition for territorial claims, particularly in vulnerable regions like the Arctic and small island nations. Moreover, climate-induced disruptions pose significant national security risks, prompting governments to reassess their defense strategies. Studies underscore the potential for climate-related conflicts over resources, food security, and refugee crises, amplifying geopolitical instability and threatening global security architectures (Global Trends, 2019; Verbeek, 2019; von Uexkull & Buhaug, 2021).

Further still, climate change exacerbates governance challenges at the international level, hindering coordinated responses to environmental threats. Scholars explore the role of international institutions, such as the United Nations Framework Convention on Climate Change (UNFCCC), in addressing geopolitical tensions and fostering cooperation among states (United Nations, 1992; Dellmuth, *et al*, 2020; Bremberg, *et al*, 2022; Marquardt, *et al*, 2023). Lastly, despite geopolitical tensions, climate diplomacy offers opportunities for geopolitical cooperation and conflict resolution. Studies highlight the role of multilateral agreements, diplomatic negotiations, and climate-related initiatives in fostering collaboration among states, transcending traditional geopolitical rivalries (Munge, 2023; Bremberg, 2023; Saaida, 2023).

Climate change-induced violence is more pronounced in weak and fragile regions of the world than a more peaceful and politically stable regions (Halden, 2007). In corroborating this, Cohen (2015) has noted that in terms of geopolitical features and processes, Africa is the least mature region in the global geopolitical system. He further noted that of the six subregional divisions of Africa - East, West, Central, Northern, Southern, and the Horn of Africa – it is only the West and Southern Africa that have the potential to become a coherent geopolitical unit led by a regional power like Nigeria and South Africa respectively. Kenya, on the other hand, has been described as a leading nation in East Africa due to its political stability and economic growth.

The second main concept reinforcing this thesis is climate change. It is a term used to describe modification in global weather conditions due to increased temperatures. The UNFCCC conceptualized it as a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods' (UNFCCC, 2011). A more elaborate definition of climate change provided by IPCC will be adopted for this study. It defines the term as a:

change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or land use (IPCC, 2012).

The third concept that also requires some exegetical elaboration is peace. Peace is one of the cardinal principles of the United Nations Sustainable Development Goals (SDGs)[37]. According to Galtung (1969:168), peace is 'the absence of violence' and it has also been described as the cessation or absence of conflicts in a particular geographical area. For this study, peace is defined as the freedom from all forms of violent conflicts, a situation where people, regardless of their tribe, religion, political inclinations, race, social class, level of education, or occupation, have a sense of security in a particular geographical setting. Peace in this sense is antithetical to armed conflicts, insecurity, and violence.

Security, the fourth key term in this thesis, is very germane to national governments, regional intergovernmental organizations, and the international political system in general. Security is one of the most important concepts in the field of IR since it is particularly concerned with the safety and survival of states and their citizens. According to Wolfers (1952:485), 'security, in an objective sense, measures the absence of threats to acquired values, in a subjective sense, the absence of fear that such values will be attacked'. Security is one of the most contested concepts in IR, there is no consensus on its connotation. Some IR scholars have always used the term synonymously with military power. To this study, security is seen as the safety of a particular state, region, community, or the inhabitants of a geographical area.

The last main organizing term underpinning this thesis is violent conflict. Violent conflict is a complex phenomenon. Over the years, conflict has attracted the attention of philosophers, thinkers, theorists, scholars, and policymakers who try to provide pragmatic explanations for the causes and consequences of conflict in society. Conflict is seen as a social action involving a minimum of two conflicting parties

[37] https://www.un.org/sustainabledevelopment/peace-justice/

which could be individuals, groups, or states. Conflicts are situated in and linked to overall social structures. The term has been defined as a situation involving 'at least two parties using physical force to resolve competing claims or interests' (Frere and Wilen, 2015:1). Mitcheli (cited in Demmers, 2012) conceptualizes conflict as any condition in which 'two or more parties perceive that they possess mutually incompatible goals'. Galtung (1958) opines that conflict occurs because of 'contradiction and incompatibility', 'drives vs consumption', or 'actors pursuing incompatible goals'. The foregoing notwithstanding, for this study, violent conflict is conceptualized as a contest between two or more people, actors, or groups competing for incompatible goals (such as a contest over scarce resources) resulting in maiming, killings, and wanton destruction of property in a region or locality.

Climate change and the other four concepts are inextricably interconnected with the former exacerbating geopolitical tensions, security concerns, and violent conflicts, particularly in regions like Africa. The debates surrounding these concepts underscore the need for integrated approaches to address environmental challenges while promoting peace, security, and sustainable development on a global scale. Having examined the major concepts in this thesis, the next step entails a thorough review of scholarly works on climate change in IR theories, capitalism, and ecology, as well as the impacts of climate change, its implications for Africa, conflict dynamics within the continent, the correlation between climate change and violent conflict, and the delineation of actors and institutions involved in the climate change-conflict nexus in Africa. Following this review, the aim is to pinpoint the existing lacunae within the literature examined.

3.3. Empirical Review

3.3.1. Climate Change in IR Theories

It is noteworthy that International Relations scholars of the major theoretical approaches – realism/neorealism and idealism/neoliberal institutionalism (Akinboye & Ottoh, 2005) – have made efforts to explain global climate change using different theoretical underpinnings. The application of realism/neorealism to the issue of global climate change was done by Rowlands in 1996. He notes that the theorists of this persuasion would see the distribution of power among the world's States as playing a major role in how state interests shape international responses to environmental challenges. Military strength could not be ruled out in addressing the challenges posed by climate change as one actor may be able to issue threats or cajole another actor into changing its activities that contribute to climate change. More so, power defined in economic terms could be pertinent as economic sanction could be applied to any 'climate violator'. This is currently the case as trade restrictions on climate violators are an integral part of the Montreal Protocol, the Basel Convention, and the Convention on International

Trade in Endangered Species of Flora and Fauna. However, Paterson (2005) observes that neoliberal institutionalism provides the best explanation for the global climate change in the realm of International Relations. He notes that the focus on 'institutions' by neoliberal institutionalists gives us greater possibility to explain the processes that eventually produced international conventions/protocols on climate change. In this regard, the role played by international governmental institutions such as the World Meteorological Organization (WMO); the Intergovernmental Panel on Climate Change (IPCC); the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Environmental Programme (UNEP) in the provision of 'informational context in which national positions are formulated' cannot be overemphasized.

Realists and liberals frequently approach the matter of climate change from differing standpoints, influenced by their fundamental beliefs concerning international relations, the role of states, and the effectiveness of various mitigation and adaptation strategies. Concerning the causes of climate change, realists typically underscore the significance of states and power dynamics in shaping global environmental policies. They see the causes of climate change as stemming from competition for resources, imperatives of economic growth, and the pursuit of national interests, whilst spotlighting issues such as energy security, scarcity of resources, and geopolitical rivalries as contributing factors (Lieven, 2020; Paterson, 2001; Rowland, 2001). Conversely, liberals often concentrate on broader systemic issues such as market failures, unsustainable consumption patterns, and the lack of international cooperation. They attribute climate change to failures of governance, inadequate market regulation, and the shortage of robust multilateral institutions to tackle challenges posed by climate change. In mitigating the impacts of global climate change, realists are often skeptical about the efficacy of global climate agreements and often advocate for pragmatic, state-centric solutions. They prioritize national interests and economic competitiveness, advocating for technological innovation, adaptation strategies, and bilateral or regional agreements. Conversely, liberals tend to champion multilateral cooperation, international treaties, and collective action in confronting climate change, whilst endorsing initiatives such as the Paris Agreement, emissions trading schemes, development of renewable energy, sustainable development goals, environmental justice, and global carbon taxes as means to coordinate efforts and curtail greenhouse gas emissions in tackling the challenges posed by climate change (Bodansky, 2001; Rowland, 2001). These two major theoretical approaches in IR have not been able to provide a comprehensive theoretical explanation of how to better understand global climate change and its impact on international peace and security. This study could not find them relevant to the theoretical framework due to this inadequacy. Hence, it sets out to address this shortcoming by providing a methodical and empirical explanation of climate change vis-à-vis its connection to violent conflicts.

3.3.2. Capitalism and Ecology

The Marxian framework, or Marxism, critiques capitalism for its exploitation of labour, class inequality, and alienation. It advocates for revolutionary change to establish collective ownership of the means of production. In contrast, capitalism prioritizes private ownership, free markets, and individual freedom, relying on market mechanisms for economic organization and growth. Hubbard (2020) asserts that capitalism destroys the Earth's life system noting that in the views of Marx and Engels, man and nature are inseparable. He further argues that Uneven and Combined Development (UCD), which recognizes the capitalist system's reality while being ecological, can address ecological challenges within a Marxian framework. In corroborating this, Vanderheiden (2018) is of the view that advanced industrial countries are to be held responsible for anthropogenic global warming as they contribute significantly to the global emission of greenhouse gases and deforestation. Industrialization as a process of transitioning from agrarian-based economies to ones dominated by mechanized manufacturing and industrial activity, significantly contributed to global warming primarily through the increased burning of fossil fuels, deforestation, direct emissions from industrial processes, heightened energy demand, and rapid urbanization. These factors release greenhouse gases into the atmosphere, trapping heat and causing climate change.

Moore (2016) averred that the current civilization faces a critical "state shift" that goes beyond climate change and that the Anthropocene recognizes the transformative impact of human activity on the planet. Dryzek (2014) has noted that the International Commission on Stratigraphy (ICS) formally recognized the Anthropocene in 2019, the idea popularized by Nobel laureate Paul Crutzen, as a geological epoch. The relationship between the Anthropocene, Marxism, and capitalism reveals intricate connections between human activity, socioeconomic systems, and environmental impact. Within Marxist analysis, capitalism emerges as a central driver of environmental degradation, propelled by profit motives that prioritize short-term gains over sustainability. This perspective underscores the historical shift marked by capitalism, intensifying humanity's exploitation of natural resources and exacerbating ecological crises.

Discussions surrounding the Anthropocene prompt reflections on alternative socio-economic frameworks, resonating with Marxist visions of socialism and communism, which prioritize collective ownership, democratic decision-making, and ecological sustainability. Thus, the intersection of the Anthropocene with Marxism and capitalism illuminates profound implications for understanding and addressing the environmental challenges of our time. The shift to the Anthropocene epoch became necessary as a result of human ecological activities that have negatively impacted the state, market, and global governance. Chandler & Müller (2022) have opined that the Anthropocene would help scholars

and policymakers re-evaluate their traditional perspectives and develop new ways of thinking in addressing global environmental challenges. This new way of thinking should focus on the inseparability of humans and nature; it is the recognition of this interconnectedness that would help proffer a permanent panacea. Dryzek & Pickering (2018) aver that the nature of the Anthropocene is highly complex which makes it necessary for ecological reflexivity to address the current limitations being experienced by the global governance systems such as the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement in addressing environmental challenges.

3.3.3. Impacts of Climate Change

Despite all the efforts aimed at mitigating the negative impacts of climate change by intergovernmental institutions, there is still evidence in the literature to suggest that much has not been achieved (Uitto, Puri, and van den Berg, 2017). The inadequate response to the risks posed by climate change has further aggravated the precarious situation of economically disadvantaged people due to climate-exacerbated hazards that have negatively affected livelihoods by exacerbating poverty, inequality, human suffering, reduced opportunity, and poor output legitimacy (McGuigan *et al*, 2002; Rudrappan, 2011).

Busby (2016:1) opines that the lingering attempt at negotiating climate change globally has made the problem degenerate from a 'long-term threat' to an 'urgent problem'. Hall (2016:369) observes that the strongest tropical cyclone ever to make landfall, Typhoon Haiyan, hit the Philippines on November 8, 2013. He further notes that the typhoon broke all previous records for wind speed and sea surge leaving 1.9 million people homeless, concluding that the storm 'was part of a trend of increasing hydro-meteorological disasters triggered by climate change'. Hill & Martinez-Diaz (2020) observe that both policymakers and the public are worried about climate change and that no matter what the state and non-state actors do some measures of climate change are here to stay as the phenomenon has already affected the economy, national security and human health in the United States of America.

In 2010, there were devastating floods in Niger Republic that led to the displacement of about two hundred thousand people and put nearly eight million people, more than half of the country's population, at risk of starvation. The cycle of droughts and floods that affected the Niger Republic and parts of the Republic of Chad and Mali were described as unusual and could have been aggravated by anthropogenic climate change (Urama & Ozor, 2010; Busby, *et al*, 2013; Bøås, 2019). From 2008 to 2011, droughts in Djibouti resulted in economic losses amounting to 3.9 percent of the country's GDP annually. The World Food Programme (WFP) classified the floods in Mozambique as a Level-3 emergency, ranking them alongside crises in Yemen and Syria. The city of Beira, Mozambique, bore

the brunt of the devastation caused by Cyclone Idai in 2019, with ninety percent of its infrastructure destroyed.

The focus of these scholars and the grey literature reviewed in this sub-section was on the impacts of climate change, namely its adverse effects on livelihoods. The attempt by the current study to explore whether climate change is one of the drivers of violent conflict in parts of Nigeria and Kenya demonstrates that it does not merely replicate previous findings or discussions, thus asserting its originality.

3.3.4. Climate Change and Africa

Low (2016) has opined that climate change remains one of the environmental challenges that pose a great threat to all the continents of the world, including Africa, in this millennium. More so, in the IPCC 2022 Climate Report on Africa, Trisos *et al*., (2022) noted that Africa is one of the lowest contributors to GHG emissions which is the major cause of anthropogenic global warming. Yet, the continent has been adversely affected by the impact of climate change, especially widespread losses in the key development sectors as well as biodiversity loss, water shortages, reduced food production across crops, livestock, and fisheries, increased heat-related mortality, loss of labour productivity, reduced economic growth, and flooding from sea-level rise. This submission has been corroborated elsewhere when it was stated that despite making little contribution to the GHGs emission (African countries' emission rates are less than 0.5 tonnes per capita and just 3.6% of the total global emissions), the developing countries, especially countries in Sub-Saharan Africa, are the most vulnerable to the effects of climate change due to projected climate change, low adaptive and institutional capacities, and high poverty level (Kempe, 2009; Mutanga & Pophiwa, 2013; Alemu, 2014; Diop et al., 2022). Nine of the ten most vulnerable countries in the world are in Africa and they are Burundi, the Democratic Republic of Congo, Madagascar, Guinea, Liberia, South Sudan, Central African Republic, and Sierra Leone (Madeira, 2019). Thus, anthropogenic global warming has affected all the bioclimatic zones of Africa including the Mediterranean, Subtropical, Tropical, Equatorial, Savannah, Saharan, Sahelian, Sudanian, Guinean, and Guineo-Congolian, albeit to varying extents

Also, climate change affects Africa in the area of increased stress on water availability, and rain-fed agriculture thereby causing reduced agricultural production and food insecurity, health challenges, rural-urban drift, the shrinking of the Lake Chad Basin, desertification, sea-level rise, El Niño-Southern Oscillation (ENSO)-induced drought, flooding, rainfall variability, drying-up of rivers, landslides, increased cyclones, adversely affecting the environmental system in general which contribute to instability and violent conflict in the region thereby triggers humanitarian emergency in the continent

(Mutanga & Pophiwa, 2013; Madeira, 2019; Matondo *et al*., 2020; Welsh, 2021). There is a line of commonality between the reality and effects of climate change in West Africa and East Africa. Studies have revealed that despite the East African Community (EAC) facing numerous challenges, climate change remains the most devastating as it has impeded the sustainable growth of the region as a result of negative impacts of the phenomenon such as unprecedented floods and droughts, food security threat, health challenges, destruction of mangrove forests, coastal erosion and submergence of small islands, and appalling humanitarian catastrophe (East African Community, n.d.; World Wide Fund for Nature (WWFN), 2006; Jarso, 2012; Apollo & Mbah, 2021). Similarly, ECOWAS Commission, Department of Agriculture, Environment and Natural Resources, Directorate of Agriculture and Rural Development (2021) acknowledged the reality of climate change in the region but added that significant weakness in West African countries is the insufficient inclusion of climate change adaptation measures in their National Agricultural Development Policies and Strategies and that several key sectors that are particularly vulnerable to the impacts of climate change in West Africa include food security, health, water resources, forests, coastal zones, livestock, and fisheries and aquaculture.

At the national level, the Republic of Kenya and the Federal Republic of Nigeria have also borne the brunt of the crisis of anthropogenic global warming. Climate change poses a great threat to the advancement of socio-economic and environmental development of the two countries as well as the achievement of the SDGs. The main reason why the impact of climate change has been seriously felt in Kenya and Nigeria is because of weak resilient and low adaptive capacities, as well as economies that depend on rain-fed agriculture and natural resources (State Department of Environment (SDE), 2016; Department of Climate Change (DCC), 2021). Some of the effects of climate change in Kenya and Nigeria include but not limited to land degradation, erosion, increased water scarcity, mountain glacier coverage, sea-level rise, other climate change-induced frequent and severe extreme events such as droughts, floods, and high temperature as well as adverse impact on physical infrastructure (Herrero, 2010; Olaniyi *et al*., 2013; World Bank Group, 2021; World Bank Group, 2021a; and Downing *et al*., n.d.). However, Iheka (2017) has contended that there is a dearth of scholarly works on the implications of nonhuman factors on environmental challenges noting that most scholars tend to prioritize anthropogenic factors, overlooking the interrelations between human and nonhuman factors thereby giving rise to ecological crises due to the reinforcement of anthropocentrism.

3.3.5. Violent Conflicts in Africa

Climate change is not the only malaise bedevilling Africa. Violent conflict is so prevalent in Africa that there are concluded conflicts, ongoing conflicts, and new conflicts. According to Mambo (2008), Africa has witnessed several violent conflicts in the Western, Eastern, Northern, Central, and Southern regions

as well as the Horn of Africa. Stapleton (2018) has identified five dimensions of armed conflict in Africa: the first has to do with the rebellion against European imperialists in the early 20th century, including the rebellion and infamous genocide of the Herero and Namaqua people in present-day Namibia; the second is the involvement of colonized Africans in World War I (WWI) and World War II (WWII); the third is the decolonization conflicts and struggle for independence between 1950s and 1960s; the fourth is the rebellion and civil wars in the continent during Cold War; the last but not the least is the second Congolese war, which he described as the bloodiest war in any region since World War II. Some of the conflicts Stapleton has not listed that also claimed thousands of lives include insurgency, farmer-herder conflicts, militancy, banditry, and warlordism.

Fearon and Laitin (2003) argue that the main causes of armed conflicts are not a sudden change brought on by a new international system after the Cold War, but rather poverty, the slow buildup of protracted conflicts, and fragile states, which are marked by rebel recruitment, political instability, rough terrain, large populations, severe humanitarian crises, and protracted social tensions. On their part, Collier and Hoeffler (1998) identified four major causes of violent conflicts, which are initial income, ethnolinguistic fractionalization, the number of natural resources, and initial population size, and then argued as follows: first, based on the prism of utility theory, belligerents would engage in armed conflicts if they knew that what they would gain from such an armed confrontation would outweigh their losses; second, the relationship between armed conflicts and ethnic diversity is nonmonotonic as both fissiparous and homogenous societies are prone armed conflicts.

Furley (1995) has identified the quest for political power artificial state boundaries, deep-rooted ethnic and religious divisions, the shallow roots of democracy, the untried loyalty of ex-colonial armies, the adoption of foreign ideologies, glorification of charismatic leaders and one-party states, corruption, inequality, landlessness, rural deprivation, and urban squalors as some of the probable causes of armed conflict in Africa. The consequences of these conflicts include among others the following: loss of life, destruction of infrastructure, disruption of productive socio-economic activity, displacement, diversion of scarce resources towards arms procurement, appalling suffering of the innocent, exacerbation of human misery, and retardation of socio-economic development. Williams (2016) on his part noted that more than six hundred armed conflicts have taken place in Africa between 1990 and 2016 which did not spare any region from the Great Lakes region to the Sahel and the Horn of Africa, and he identified five important features or causes of these armed conflicts and they are the dynamics of neo-patrimonial systems of governance; the construction and manipulation of ethnic identities; questions of sovereignty and self-determination; the impact of natural resources; and the impact of religion.

West Africa has been entrapped in the web of bloody armed conflicts since the independence of all the countries in the sub-region. Jaye *et al*., (2011) described West Africa as the most conflict-ridden region in Africa with the most unimaginable vicious bloody ruthlessness in the modern world. Series of bloody coups d'etat and countercoups, the Liberian civil war, the Sierra Leonean civil war, the Guinean and Guinea Bissau crises, Senegal and the Casamance crises, the uprising in Cote d'Ivoire and countless conflicts in Nigeria are some of the crises that have engulfed the region (Agbu, 2006; Souare, 2006). Some of the violent conflicts in Nigeria that have led to high fatalities and destruction of properties include the Civil War (1967 – 1970); Maitatsine riots (1980 -1985); Niger Delta militancy (1990s to 2009 which ends with the proclamation of Amnesty for the militants by the late President Yar'Adua); farmer-herder crisis (2000s to Date); Boko Haram insurgency (2009 to Date) not to mention other ethno-sectarian and post-election violence (Adebajo, 2020). Nigeria has been ranked 143rd out of 163 countries on the 2022 Global Peace Index with a score of 2.725 and ranked as the 8th country in the world that is most vulnerable to the impact of terrorism with a score of 8.065 (Institute for Economics & Peace, 2022; Institute for Economics & Peace, 2023).

The violent armed conflict in East Africa rivals, if not surpasses, those in the West. This region has long been a battleground for numerous armed conflicts (Stapleton, 2022), witnessing some of the most brutal mass atrocities in modern African history. Notably, the Burundi genocide of 1972 and the Rwanda genocide of 1994 stand out, with an estimated 800,000 people reported killed (Eriksson, 1996; Forges, 2004; Scharf, 2008). The region was also home to one of the deadliest brutal dictators in modern African history, Idi Amin Dada of Uganda, who has been accused of cannibalism, extra-judicial killings, and several human rights abuses (Melady & Melady, 1977; Amnesty International, 1978). Anderson & Rolandsen (2017) have described East African countries as engaging in destructive armed conflicts starting with the armed struggle for independence and snowballing into post-independent rebellion, secession, internal insurrection, and external aggression. Some of the most notable conflicts in the region include the Burundi Civil War, the Rwandan Civil War, the South Sudan Independent War, and the subsequent civil wars, the Ugandan Civil War, and the Tanzania-Uganda crisis, just to mention a few. Kenya has had its unenviable share of armed conflicts in the region, Kumani *et al*., (2021) have noted that although the country has not experienced civil war, it has, however, been bedevilled with a series of violent conflicts. Some of the major vicious crises that the republic had include the Mau Mau Uprising of 1952 to 1960, the Shifta War of 1963 to 1967, the Garissa Massacre of 1980, the Wagalla Massacre of 1984, the Kenya-Uganda Border conflict of 1987 to 1990, the Turbi Village Massacre of 2005, and post-election violence of 2007 to 2008 to mention but a few (Okoth, 1992; Anderson, 2014; Weitzberg, 2016; Akesson, & Basso, 2022). Data from ACLED show that between 1997 and 2021 there were 7,437 armed conflicts with about 11,071 fatalities in the country (Kumani et al., 2021). In terms

of how prone Kenya is to conflict, the Institute for Economics and Peace ranked the country 120th out of 163 countries on the 2022 Global Peace Index with a score of 2.303, and 20th most vulnerable country to terrorism on the 2023 Global Terrorism Index with a score of 6.163 (Institute for Economics & Peace, 2022; Institute for Economics & Peace, 2023).

Some of the primary factors contributing to the violent conflicts in Kenya and Nigeria include, but are not limited to, inequalities, marginalization, domination, the reluctance of political elites to embrace popular participation, political pluralism, and unresolved grievances regarding citizenship and statehood (Osamba, 2005; Babalola & Onapajo, 2018). Kenya and Nigeria also had similar violent conflicts relating to farmers and herders in the Tana River Delta of Kenya and the Middle Belt region of Nigeria. The thesis set out to unravel the reasons for this farmer-herder conflict with the intent of determining if climate change is a probable cause. Knowing the reason behind the dynamics of a conflict would go a long way in reinforcing conflict resolution and peacebuilding efforts.

3.3.6. The Relationship between Climate Change and Violent Conflict

There are different scholarly debates or narratives on the question of climate change-violent conflict nexus. These scholars can be categorized into four generations based on the year the arguments came up. The first generation emerged in the early 1980s, the second in the late 1980s/early 1990s, the third in the late 1990s/early 2000s, and the fourth generation emerged between 2010 and 2019. This aspect of the literature review will be systematized in a generational order starting with the first debate.

The first attempt at establishing the link between security and the environment was made by Richard Ullman in the early 1980s. Ullman (1983) made a radical departure from the prevailing conception of security only in terms of military threat. He argued that there are other nonmilitary factors such as environmental issues that can constitute threats to national security.

Levy (1995) contends that the earliest literature on the nexus between environment and security was dominated by ‘purple-prose’ and ‘bland bromides’ noting that articles linking environment and security were highly rhetorical and did not provide any clear new conceptualizations of the term security nor offer any serious insights on the subject matter. The present study has therefore taken note of the limitation of this first scholarly debate on the environment-security nexus and attempts to fill the gaps that exist by producing a result that is based on empirical evidence.

The second generation has been described as the first wave of empirical research on the environment and armed conflicts. Notable scholars that fall within this group include Homer-Dixon, Toronto Group, Esty, Percival, Hauge, and Ellingsen. Some of their contributions are reviewed here. Homer-Dixon (1991) notes that environmental change contributes to what he called ‘acute conflicts’ such as war,

terrorism, and diplomatic and trade disputes. He further noted that poor countries will in general be more vulnerable to environmental change than rich countries; environmentally induced conflicts are likely to arise first in the developing world, asserting that environmental change may play a variety of roles as a cause of conflict both at the national and international levels.

Also, Homer-Dixon (1994) states that environmental scarcity is already a factor in many violent confrontations in developing countries. Most of the time, the violence is localized, continuing, and broad. Societies that are already suffering from a lack of water, forests, and arable land would be affected the hardest since they have fewer resources to weather the environmental storms and resulting societal upheavals.

Stub (1997) observes that environmental degradation and resource scarcities are the major causes of many conflicts and that together with other sources of tension, such as poverty, social inequality, and ethnic intolerance, environmental degradation, and resource scarcities may lead to violent conflicts.

Esty et al (1998) conducted an empirical study on over two hundred conflicts across the globe and were able to establish interconnections between environmental factors which they termed ‘independent variables’ and conflicts and crises which they termed ‘dependent variables’. Percival and Homer-Dixon (1998) argue that the interconnection between environmental scarcities and the outbreak of violent conflict is a complex one, noting that environmental insufficiency arises within a political, social, economic, and ecological setting and interacts with many of these factors to contribute to violent conflict. Hauge and Ellingsen carried out a multivariate analysis on the environment-security nexus in several countries between 1980 and 1992 and were able to establish the fact that environmental factors such as deforestation, land degradation, and scarce supply of fresh water, alone and in conjunction with overpopulation, increase the risk of violent conflict.

Homer-Dixon (1999) argued that as the world's population and economy grow exponentially, there will be greater demand for the Earth's finite resources and that indirect effects of environmental scarcity, acting in concert with other social, political, and economic stresses, would lead to social unrests like ethnic clashes, urban unrest, and other violent conflicts, as seen in Mexico and some African and Asian countries.

Brock (1997) argues that the majority of the empirical studies on the environment-security complex during the second generation were in the form of case studies on the role of the environment in violent conflict and the results of this research were highly controversial. He then throws a poser: ‘What is the referent object of environmental security or the environment, violent conflict over natural resources or the environmental quality of life?’. In corroborating Brock’s contention, Buhaug and Thiesen (2012)

observed that most of the studies on the environment-security nexus in the second generation were unsophisticated when compared to the current standard of research as they mostly relied on static measures of environmental features and suffered significantly from missing data. The sophistication of the current study in terms of methodological contribution to the debate on the relationship between climate change and violent conflict puts it in a vantage position to fill the gap that exists in the debate of second-generation scholars.

During the third debate, some scholars also made efforts to establish the relationship between climate and violent conflict. For instance, Brown, Hammill, and McLeman (2007) are of the view that climate change is one of the latest environmental drivers of violent conflict that have been identified in recent decades following others including drought, desertification, land degradation, and even ozone layer depletion. According to Barnett and Adger (2007), the direct and indirect effects of climate change on human security may raise the probability of violent conflict. This is because climate change reduces both access to and the quality of natural resources. Evans (2008) on his part, argues that there is a strong causal connection between climate change and conflict since climate change has been described as a "threat multiplier". He gives several cogent reasons to drive home his point. These include the fact that the diminishing access to water, land, or returns on the land use could increase competition for resources and in turn lead to violent conflict; the same declining access to resources could cause people to move in mass numbers thereby causing conflictual relationship in the host communities; and increased climate variability in the term of drought, flooding and other climate-related occurrences can cause loss of jobs and increase recruitment by armed groups which in turn may aggravate already tensed situation.

Mazo (2010) in his view maintains that global climate change has been a driver of instability, conflict, and collapse noting that climate has constantly emerged as one of the plethora of reasons in a multifaceted causal web underlying conflict from early history to the recent bloody conflict in the Darfur region of Sudan. Welzer (2012) corroborates the assertion of Mazo by stating unequivocally that Sudan represents the first case of a war-torn country where climate change is unquestionably one cause of violent conflict and civil war. He further avers that it is usually assumed that climate change does not have a direct effect on violent conflict but that where survival is at stake a small group can acquire explosive force as it has then turned to the question of struggle for existence.

Buhaug (2010) argues that climate change cannot be blamed for African violent conflicts noting that climate variability is a poor predictor of armed conflict in Africa. He further noted the major causes of violent conflicts in Africa are social exclusion and poverty. Buhaug *et al* (2014) also support the articulation of Buhaug when they state that empirical studies conducted so far have not successfully proved beyond any reasonable doubt that there is a correlation between climate change and violent

conflict. The lacuna that exists in the empirical studies of third-generation scholars will be filled by the current study; this study attempts to argue that climate change can be a possible trigger of conflict in Africa if the farmer-pastoralist conflicts in Nigeria's Middle Belt region and Kenya's Tana River County are systematically and empirically analyzed.

During the fourth debate, some scholars also expressed their views on what they perceived as the relationship between climate change and violent conflict. Fjelde and Uexkull (2012) state that the results of the study they conducted on the subject matter indicate that negative deviations in rainfall from the historical norm are associated with a higher risk of communal conflict, noting that there is evidence to prove that 'politically excluded ethnopolitical groups' are more at risk of communal conflict due to shortage in rainfall. Busby (2013) argues that climate change constitutes both direct and indirect threats to national security. Elsewhere he avers that climate change poses a security danger through extreme weather events and their direct effects on populations and critical infrastructure (Busby, 2016). Alvarez (2017) supports the submission of Busby by contending that climate change can stress communities, disorganize social order, and lead to an upsurge in violent conflict. According to Harrington (2023), climate change exacerbates existing stressors because of the nebulous nature of climate security, which integrates several logics of security, such as human security and more traditional state security.

3.3.7. Recent Climate Security Studies on Africa

Some scholars have also developed an interest in climate security in Africa, although most of them are not IR scholars. They have attempted at one point or the other, to link climate with security challenges being witnessed in some parts of Africa. Obi (2000) has rightly noted that since the end of the Cold War, there has been a significant increase in the interest of scholars and policymakers on the impacts of global environmental change on human security.

Adano & Daudi (2012) argued that despite Africa's low GHG emissions, climate change has negatively impacted the continent with effects such as desertification, droughts, rising temperatures, and altered precipitation patterns which eventually resulted in the conflicts between herders and farmers in the Sahel region, Nigeria, Sudan, Ethiopia, South Sudan, and Kenya. Corroborating this Alabi (2022) has noted that there has been an increase in farmer-herder clashes which have resulted not only in human fatalities but also food insecurity; the impact of climate change such as desertification and increasing droughts has been given as the main cause of the conflicts.

In Africa, climate vulnerability does lead to conflicts over scarce natural resources, those having a negative impact on human security as have been evidenced in the intrastate conflicts in Angola, Liberia,

Sierra Leone, and the Democratic Republic of Congo (DRC) thus environmental factors contribute to security risks and conflicts due to changes in environmental conditions and competition for resources (Ayodele, 2010; Mwiturubani & Wyk, 2010; Omondi, 2012). Nwauba (2018), on his part, was very emphatic about the link between climate change and national security, emphasizing the threat it poses due to its negative effects on social stability, resource competition, and overall human security. The Sahel region, according to Charbonneau (2022), is a quintessential space where climate change and violent conflict intersect, and an important case study for the question of whose security is threatened by global warming due to state fragility, inter-group inequality, a history of violent conflict, and a high reliance on rain-fed agriculture and livestock.

This submission is also not different from that of Brown, *et al*., (2007) as they claim that climate change drives conflict which has been evidenced by the farmer-herder conflict in Darfur due to climate impacts such as declining rainfall and desert encroachment. Also using the Sahel region as a case study Bronkhorst (2011) noted that slow-onset changes and quick-onset triggers are the two ways through which climate change impacts can cause conflict as has been seen in the conflicts between pastoralist, agro-pastoralist, and farmer communities in the Sahel region of Southern Kordofan.

3.3.8. The Opposing Views

On the contrary Boko et al. (2007) believe that despite general acceptance by some scholars, climate change has impacted and will continue to affect human security. They, nonetheless, argued that climate change and climate security are yet to be institutionalized as security issues.

Institute for Peace and Conflict Resolution (IPCR) also conducted a study in 2020 in which it tries to establish the relevance of climate change as a contributing factor to peace and conflict dynamics in the country and finds out, among other things, that there is no direct and conclusive link between climate change and violence (Institute for Peace and Conflict Resolution, 2020). Toeing this line of argument Smith (2012) believes that studies on environmental security and rainfall variation's impact on conflict have yielded no consensus, and Adano (2012) on his part opined that there are conflicts in the Horn of Africa which are largely attributed to climate-related resource competition. He however argued that the finding of a research he conducted shows that pastoral conflict in northern Kenya does not show an increase in violence in the region as there are more conflicts in wet years than dry years. He further argued that factors, other than climate change, such as the subdivision of grazing areas into ethnic territories are the main cause of conflicts over territory.

Baalen & Mobjörk (2017) argued that the means through which climate change impacts violent conflict has not been fully understood, therefore, suggested that the causes and dynamics of climate-related

conflicts need to be differentiated, the time and locations of violent conflicts need to be explored, the role of state policies and interventions need to be examined, and the implications of different explanations at the micro level need to be assessed if scholars must have better insights into the correlation between climate change and violent conflicts.

Benjaminsen *et al* (2012) aver that available data on conflict do not support climate variability as a trigger of violent conflict. They further note that major causes of violent conflict include agricultural encroachment, opportunistic behaviour, corruption, and rent-seeking rather than those directly related to environmental conditions and resource scarcity. Erik (2012) in corroborating Benjaminsen *et al* notes that analysis at the system level suggests that global warming, rather than acting as a driver of violent conflict, is associated with a reduction in interstate conflict. Again, he pointed out that though climate change poses challenges for citizens and policymakers, it need not be considered as constituting a threat to human security. On his part, Bretthauer (2017) argues that climate change cannot be the driver of violent conflict, noting that the outbreak of violent conflict in any resource-scarce country could be a result of other factors such as the explicit blends of social, political, and economic circumstances in those conflict-prone countries.

Levy (1995) has argued that the rhetorical premise that environmental and security issues are interwoven is likely to fade. Also, Beaumont & De Coning (2022) contended that the actual links between climate change and violence remain obscure despite significant research and the prioritization of climate security by many international forums; as a result, the climate-conflict nexus is a characteristic of complex socio-ecological systems rather than a problem that can be fixed. Theisen (2008) on his part averred that the causal relationship between the scarcity of natural resources and violent conflicts has been the subject of several studies, with conflicting results noting that while most studies have only discovered a weak link, one has shown strong evidence for eco-scarcity theory. Hauge & Ellingsen (1998) argued that while much recent research has found that the increasing scarcity of natural resources might contribute to conflict, most of this research, though, has two major methodological flaws: first, there is a lack of variation in the independent and dependent variables; second, other causes of violent conflict are not taken into consideration.

Lastly, Gleditsch (1998) believed that resource scarcity due to environmental degradation has sparked widespread concerns that violent conflict would intensify noting that these claims are illogical because studies that attempt to draw a connection between natural resources, the environment, and violent conflicts have numerous flaws. For example, most researchers focus more on definitional and polemical exercises than analysis; crucial variables, such as political and economic factors, which have a

substantial impact on conflict and mediate the influence of resource and environmental factors, are often overlooked; and some models fail to account for important contextual information.

Consequently, this current study also attempts to address these documented lapses in the debates of fourth-generation scholars. It notes with concern the submission of the scholars who criticized the fourth-generation debate. Some of these arguments are myopic and lack satisfactory generalizations. They only considered the traditional causes of violent conflicts in society without the open-mindedness to also critically examine climate change as a possible driver of violent conflicts.

3.3.9. The Neutralists

Salehyan (2008) argues that there is no consensus yet among the protagonists and antagonists on the interconnection between climate change and violent conflict. He further notes that armed conflict can only be triggered by climate change if some other social and political challenges are left unattended. Similarly, Schorlemer and Maus (2014) argue that the patterns of 'correlation' and 'causation' between climate change and violent conflicts are yet to be firmly established as both the proponents and critics are yet to prove their cases as to whether a change in climatic condition triggers violent conflict or not. Scheffran *et al* (2019) state that the effect of climate change on conflicts is often indirect, complex, and linked to other variables such as political, economic, and social conflict factors including social inequalities, low economic development, and ineffective institutions.

3.3.10. Existing Policy Frameworks in Nigeria and Kenya to Mitigate the Challenges of Climate Change and Its Effects on Violent Conflict

Kenya and Nigeria have established national policies on climate change aimed at reducing greenhouse gas (GHG) emissions and mitigating the socio-economic impacts of climate change (State Department of Environment, 2016; Department of Climate Change, 2021). These policies are designed to guide both countries in their efforts to address climate-related challenges. According to Ouma (2023), Kenya's national climate change policy includes mechanisms for synergy and implementation to guide climate mitigation and agricultural adaptation.

Similarly, Okeke, Butu, and Okereke (2023) note that Nigeria has developed several adaptation policy frameworks with ambitious plans and strategies for climate adaptation. However, they argue that Nigeria's Nationally Determined Contributions (NDC) lack a critical focus on adaptation. Moreover, other adaptation policy frameworks in Nigeria have not been fully implemented due to financial constraints, fragmentation, and technological deficiencies.

A review conducted by Ongugo et al. (2014) identified that overlapping sectoral policies in Kenya are poorly integrated and lack the necessary investment in research to generate data, information, and knowledge needed for evidence-based policy formulation and decision-making. Additionally, the reviewed policies do not adequately address the vulnerability of communities or their exposure, resilience, and adaptive capacity to the impacts of climate change. They provide little guidance for the development of landscape-level climate change mitigation measures. These findings highlight the need for Kenya to formulate an exclusive and comprehensive climate change policy and legislative framework that establishes a leading institution to spearhead the nation's efforts in climate change adaptation and mitigation.

The Life & Peace Institute (2022) suggests that Kenya should reclaim its historical position as a leader in climate policy formulation. Kenya was the first regional country to develop a national climate change strategy, and a national climate change action plan (NCCAP), and to submit their nationally determined contributions (NDC). Kenya is also currently leading in the development of a national long-term low-carbon emission development strategy.

Despite the development of several climate change policies, plans, and strategies in both countries, a comprehensive policy framework that specifically addresses the mitigation of climate change effects on violent conflict has not yet been established. This gap underscores the necessity for Nigeria and Kenya to create robust, integrated frameworks that can effectively tackle the intertwined challenges of climate change and violent conflict.

3.4. The Identified Gaps in the Literature

Some potential gaps identified in the existing literature concerning the correlation between climate change and violent conflict are as follows. First, lack of a comprehensive theoretical framework: the existing major theoretical approaches in International Relations, such as realism and idealism, have not provided a comprehensive theoretical explanation for understanding the link between climate change and violent conflict. Second, inadequate empirical evidence: while there have been attempts to establish a correlation between climate change and violent conflict, some of the empirical studies have been controversial or unsophisticated. Third, the complexity of correlation: the relationship between climate change and violent conflict is complex and multifaceted and existing literature has not fully captured the complexity of the correlation, thus further research is needed to better understand the specific pathways through which climate change influences conflict. Fourth, potential mediating factors: existing literature only mentions that climate change can act as a "threat multiplier" or exacerbate existing tensions, but they do not delve into the potential mediating factors such as governance

structures, social resilience, adaptive capacity, and conflict resolution mechanisms may interact with climate change and shape the likelihood and intensity of conflicts. The current study seeks to explore these mediating factors to gain a more comprehensive understanding of the correlation between the two variables. Lastly, lack of comprehensive policy frameworks that solely address the effect of climate change on violent conflict in Nigeria and Kenya. In sum, the gaps in the literature indicate the need for more comprehensive theoretical frameworks, rigorous empirical research, context-specific analysis, exploration of mediating factors, and a focus on long-term effects and feedback loops.

To address these gaps, this study aims to provide a comprehensive analysis of the geopolitics of climate change and violent conflicts in Nigeria and Kenya. By employing a research methodology that effectively addresses the formulated research questions and hypotheses, gathering data during fieldwork in Nigeria and Kenya from policymakers, environmentalists, academia, farmers, herders, and community leaders, and subsequently analyzing the data in a way that fills the identified gaps, this research delves into the specific impacts of climate change, incorporating local perspectives and indigenous knowledge systems. Furthermore, this study offers empirical insights through comparative case studies, thereby contributing to a deeper understanding of the complex interplay between climate change and conflict in these regions. Ultimately, this research seeks to enrich our understanding of the multifaceted nexus between climate change and the geopolitical dynamics of conflict, paving the way for informed policy interventions and sustainable peacebuilding efforts. As this study seeks to address these gaps it will help to contribute to a better understanding of the correlation between climate change and violent conflict.

3.5. Theoretical Review

The intricate relationship between ecological systems, conflict dynamics, and environmental security has garnered increasing attention within academic circles and policy discourse, as demonstrated above in the literature review. Therefore, the two theoretical frameworks underpinning this thesis are the Marxist/Neo-Marxist Framework on Ecology and Conflict and the Environmental Security Framework. The former offers profound insights into the complex connections between ecology, conflict, and environmental security, and serves as a powerful analytical tool that offers insightful perspectives on the socio-economic underpinnings of environmental degradation, resource distribution, and consequent conflicts. The latter has emerged as a critical concept in understanding the complex interplay between environmental factors and human security in the contemporary world. This framework addresses the risks posed by environmental degradation, resource scarcity, and climate change, and their potential to exacerbate conflicts, displacement, and socioeconomic inequalities. The two theoretical frameworks

would help to compensate for the shortcomings in each other, and they shall be explored consecutively, one after the other.

3.5.1. Marxist/Neo-Marxist Framework on Ecology and Conflict

Within the setting of capitalist societies, the Marxist/neo-Marxist theoretical framework on ecology and violent conflict investigates the connections between ecological problems and social conflict. Capitalist systems of production, resource exploitation, and unequal distribution are dissected from these vantage points to reveal how they fuel environmental degradation, which in turn leads to social unrest. Karl Marx set the groundwork for the Marxist worldview. He has noted that "as long as human beings exist, the history of nature and the history of human beings mutually condition each other" (Marx cited in Foster, 2020:7). Marx envisioned a society where nature is appropriated based on direct individual and social needs rather than capitalist accumulation and his notion of alienation of human labour was connected to an understanding of the alienation of human beings from nature (O'Connor, 1998; Foster, 2000). Ecological crises are viewed as fundamental flaws in the capitalist economic model. Marxists believe that environmental degradation and resource depletion are inevitable outcomes of capitalism's pursuit of profit and endless economic progress (Burkett, 1996; Burkett, 2006; Magdoff & Foster, 2011; Böhm, *et al*, 2012; Burkett, 2014) and that capitalists have gained notoriety in shifting the consequences of environmental damage onto future generations rather than bearing the costs themselves.

To put it another way, environmental deterioration makes socioeconomic inequities worse and fuels conflict. Land, water, and energy are all examples of scarce resources that can spark competition for ownership and distribution. Additionally, vulnerable populations are typically disproportionately impacted by ecological disasters, leading to social instability and resistance, which is a byproduct of the capitalist quest for profit. Marx has argued that "All progress in capitalist agriculture is a progress in the art, not only of robbing the worker but of robbing the soil…capitalist production, therefore, only develops the techniques and the degree of combination of the social process of production by simultaneously undermining the original sources of wealth – the soil and the worker" (cited in Foster, 2020:12). To solve environmental problems, Marxists believe a total economic overhaul is necessary. They support a society in which production is organized according to human and ecological needs rather than profit, and where income is redistributed, and decisions are made democratically. Foster (2000) has contended that although there is a long history of denouncing Marx for a lack of ecological concern, it is now abundantly clear, after decades of debate, that this view does not at all fit with the evidence.

The leading theorists of the neo-Marxist theoretical framework on ecological issues and violent conflict are Thomas Homer-Dixon, John Bellamy Foster, Joel Kovel, Nancy Fraser, David Harvey, Jason W. Moore, Andreas Malm, and Nafeez Ahmed just to mention a few of the key proponents. Neo-Marxist scholars, meantime, extend Marxist theory by bringing new ideas into their examination of environmental degradation and violent conflict. The neo-Marxists stress the interconnectedness of racial, gender, class, and ethnic oppressions with environmental concerns. They contend that ecological conflicts, especially in the Global South, are fallouts and made worse by capitalist globalization noting that the expansion of the global economy, population increase, energy consumption, industrialization, and urbanization engender many environmental challenges, including ozone layer depletion, global warming, tropical deforestation, desertification, elimination of coral reefs, extinction of species, the increasing toxicity of our environment and our food, desertification, shrinking water supplies and flooding, which have significantly affected human security (Foster, 1999; Foster, 2002; Harvey, 2010).

Harvey (2014) has noted that capital may flow and accumulate during environmental disasters and that 'Disaster capitalism' has several opportunities to profit from environmental disasters. Capital has never hesitated to destroy individuals for profit. Capitalism always sees nature as a vast reservoir of things and processes that can be exploited directly or indirectly to create and realize commodity values for the capitalists who only see nature as an objectified commodity.

Capitalists' accumulation has been described as the unstoppable force behind the current global ecological crises, thus addressing the environmental catastrophes requires understanding how capitalism socially constructs nature (Kovel, 2007, McBrien, 2016; Mogstad, 2016). This is because the relentless pursuit of wealth through capitalism has a corrosive and necrotic effect on the environment. It separates Earth from labour, causing extinction and violent conflict. The capitalist mode of production leads to land expropriation and degradation of society and nature is increasingly causing social strife (Foster, 2020). Parenti (2016) argued that emergencies caused by climate change, like heat waves, droughts, and floods, show how capitalism and the state interact. The state's relationship with nature is inseparable because it is anchored in territoriality, and since capitalism depends on the state's legal authority, tackling the climate problem requires the state to accept an environmental mission. This is why Moore asserted that the idea of the Capitalocene emphasizes the connections between capital, power, and nature throughout the history of capitalism, the damage that capitalism has done to the environment necessitated the need to call this present age the "Age of Capital" (or the Capitalocene) (Moore, 2015; Moore 2016).

More so, neo-Marxists draw attention to the role that neoliberal policies play in enabling multinational corporations' land grabs, environmental destruction, and social upheaval as they exploit natural

resources in poor countries and ultimately significantly affect human security (Foster, 1999; Foster, 2002; Harvey, 2010). The capitalist system, in its struggle with the planet, poses a threat to human survival. Even the conflict between ecology and capitalism is best explained by the actions of capitalist accumulation to undermine the Kyoto Protocol's efforts to reduce global warming, widely recognized as the most pressing global ecological crisis of our time. Foster, 2002; Foster, 2022). Violent ecological conflicts are seen as battles against capitalist dominance and imperialism in the neo-Marxist worldview. They contend that movements of resistance, such as environmental activism and indigenous rights movements, are crucial in the fight against capitalist exploitation and the commercialization of nature. It has been noted that the depletion of hydrocarbon energy and its environmental and economic implications are linked to worldwide social protest and political instability (Ahmed, 2017). So, reclaiming resources, combating unequal power systems, and advancing ecological justice are all goals of these movements. To address global ecological crises, neo-Marxists stress the importance of transnational movements and international cooperation. They push for changes in global economic institutions that put more emphasis on ecological sustainability and social equality, as well as the acknowledgement of environmental rights and the conservation of Indigenous knowledge and lands. The pivot around which the approach revolves is that 'environmental changes pose a severe and direct threat to security because of their potential to increase resource scarcity'. Three different causal forms of scarcity were identified as follows: demand-induced scarcity, which is a result of population growth; supply-induced scarcity, which is a consequence of degradation and environmental change; and the structural scarcity caused by an unequal distribution of access to natural resources among individuals and groups (Homer-Dixon 1999).

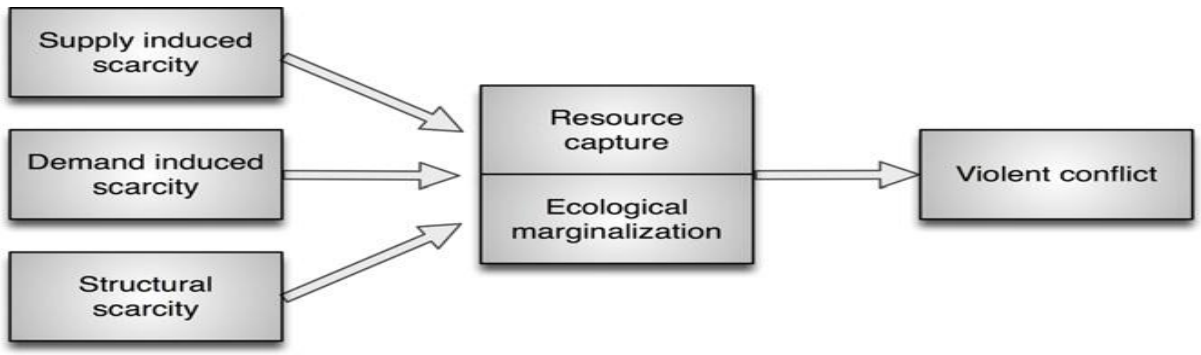

Figure 3.1: The Relationship between Environmental Change and Violent Conflict

Source: Bernauer, B¨ohmelt and Vally Koubi (2012)

Bernauer, B¨ohmelt, and Koubi (2012:2) note that demand-induced scarcity, supply-induced scarcity, and structural-induced scarcity interrelate and underpin one another to give rise to two social processes known as ‘resource capture’ and ‘ecological marginalization’. The former arises when the reduction in resources and growth in population lead to unequal access to resources while the latter arises when unequal access to resources and growth in population result in the degradation of resources. Consequently, scarcity of resources may compel the groups facing the problem to move to a new area which may trigger violent conflict between them and the natives. This has made Ahmed (2010:34), a neo-Marxian scholar, assert that climate-induced droughts, famine, and desertification increase the probability of resource conflict leading to national and international tensions over competition for scarce natural resources. He further notes that there is a causal relationship between the dynamics of the geopolitical process and the biophysical process as the latter drives geopolitical instability.

The major highlights of the Marxist/Neo-Marxist Framework on Ecology and Conflict could be summarized as follows:

Capitalist Exploitation of Nature: Marxists argue that capitalism inherently exploits both labour and nature for profit. They see environmental degradation as a result of the relentless pursuit of profit and accumulation.

Contradiction between Capital and Nature: Marxists highlight the contradiction between capitalism's need for infinite growth and the finite nature of natural resources. This leads to environmental crises such as pollution, deforestation, and resource depletion.

Class Analysis: Marxist environmentalism emphasizes the role of class in shaping environmental outcomes. The wealthy elite, who control the means of production, are seen as the primary beneficiaries of environmental exploitation, while the working class and marginalized communities bear the brunt of environmental degradation.

Capitalism's Impact on Ecology: Marxists critique capitalism for prioritizing short-term economic gains over long-term ecological sustainability. They argue that capitalist systems encourage overconsumption, waste, and the commodification of nature.

Causes of Environmental Degradation: Capitalist globalization exacerbates environmental challenges such as ozone layer depletion, global warming, deforestation, etc. Capitalism's pursuit of profit leads to the exploitation and commodification of nature.

Role of Capitalism in Ecological Crises: Capital accumulation drives global ecological crises, leading to environmental destruction and social conflict. Capitalism's mode of production results in land expropriation, degradation, and social strife.

State and Capitalism in Environmental Governance: The state's relationship with nature is inseparable, as it is anchored in territoriality and legal authority. Capitalism's damage to the environment necessitates the recognition of the present age as the "Age of Capital" (or the Capitalocene).

Neoliberal Policies and Environmental Exploitation: Neoliberal policies enable multinational corporations to exploit natural resources, leading to environmental destruction and social upheaval.

Scarcity and Violent Conflict: Environmental changes pose a severe threat to security due to their potential to increase resource scarcity. Scarcity may lead to violent conflicts over access to resources, exacerbated by unequal distribution and population growth.

Geopolitical Instability and Environmental Dynamics: There is a causal relationship between biophysical processes (e.g., climate-induced droughts, famine) and geopolitical instability, leading to national and international tensions over competition for scarce natural resources.

Marxist and neo-Marxist frameworks have been criticized for their tendency to prioritize economic factors, potentially oversimplifying environmental issues, promoting relentless economic growth at the expense of sustainability, overlooking non-human perspectives and intersectional forms of oppression, instrumentalizing environmental movements, and often neglecting Indigenous knowledge. Despite offering valuable insights, a more holistic approach is needed to effectively address ecological challenges. This is why the Environmental Security Framework has been adopted in the study to complement the inadequacies of the Marxist/neo-Marxist Framework on Ecology.

3.5.2. Environmental Security Theoretical Framework

Environmental security is a theoretical framework that examines the interconnections between environmental issues and their impact on national and global security. It recognizes that environmental challenges, such as climate change, resource scarcity, deforestation, and pollution, can have profound implications for political stability, economic development, social cohesion, and human well-being. Dalby (2009) has stated that climate change has revived environmental security discussions. Global environmental change makes civilization's ecological conditions an existential challenge for modern society. The concept of environmental security emerged in the late 1980s and early 1990s as scholars and policymakers began to recognize the potential security threats posed by environmental degradation. The traditional notion of security, which focused primarily on military threats and territorial integrity,

expanded to include non-traditional security challenges related to the environment. The concept of environmental security has gained recognition and support from various scholars, organizations, and policymakers. It is important to note that the field of environmental security is interdisciplinary, drawing on contributions from various academic disciplines, including political science, international relations, environmental studies, and geography.

While it is difficult to attribute the theory to specific individuals or groups, several notable proponents have contributed to its development and popularization, the list includes the World Commission on Environment and Development (WCED). Dalby (2022) has noted that the 1987 World Commission on Environment and Development Report on Our Common Future explicitly stated that environmental insecurity required changes in many aspects of economic life and security provision. It is asserted in the report that environmental degradation causes violent conflicts as well as political and military strife as nations have engaged in armed conflicts over renewable natural resources, energy, land, river basins, sea passageways, and other environmental resources. So, as resources grow scarcer and competition increases, such conflicts are likely to increase. (WCED, 1987).

Also, Thomas Homer-Dixon, a Canadian political scientist, has made significant contributions to the study of environmental security. His book "Environmental Scarcity and Global Security" (1999) explored the links between environmental degradation, resource scarcity, and violent conflict. Jessica Tuchman Mathews, former President of the Carnegie Endowment for International Peace, has also been a prominent advocate for integrating environmental concerns into security debates. In her influential article "Redefining Security" (1989), She emphasized the fact that environmental degradation can sometimes result in direct conflicts, especially when there is a need to share limited water resources. In a general sense, the influence of this phenomenon on the security of nations manifests itself through the adverse impacts it exerts on economic performance, therefore affecting political stability. Other scholars and organizations that have contributed to the development of this theoretical framework are Simon Dalby, Geoffrey D. Dabelko, the United Nations Environment Programme (UNEP), and the Stockholm International Peace Research Institute (SIPRI).

According to UNEP (2001), it is crucial to comprehend the intricate relationship between environmental degradation, climate change, and peace and security dynamics. This understanding is essential to implement effective measures that safeguard the environment, considering both the negative and positive impacts of these interactions.

This framework explores the connection between environmental factors, including climate change, and their potential impacts on security issues such as conflict and violence. It examines how environmental

degradation, resource scarcity, and climate-related events can contribute to social and political instability, which may escalate into violent conflict. According to SIPRI, the escalating environmental disaster poses a growing threat to global security and peace, particularly in fragile nations. Indices of insecurity, such as the frequency of conflicts, the prevalence of hunger, and the level of military expenditure, are exhibiting an upward trend. Similarly, indices about environmental degradation, climate change, biodiversity loss, pollution, and related domains are also on the rise (see Eklöw, *et al*., 2022).

The environmental security framework provides insights into the complex interplay between environmental changes and conflict dynamics. It has been argued that "in combination, the security and environmental crises are creating compound, cascading, emergent, systemic, and existential risks" (Eklöw, *et al*., 2022:41). Environmental security theory, therefore, encompasses several key dimensions: resource scarcity, climate change, environmental degradation, transboundary environmental issues, human security, and conflict prevention and peacebuilding. These dimensions are discussed below.

Resource Scarcity: Environmental security recognizes that competition over finite resources, such as water, energy, and arable land, can lead to conflicts within and between nations. As resources become scarce, there is a risk of population displacement and resource-based conflicts. Climate Change: The framework acknowledges the significant security implications of climate change; weather events and other climate-related impacts can increase the likelihood of resource scarcity, contribute to the displacement of communities, and exacerbate existing conflicts. Environmental Degradation: Environmental security emphasizes the linkages between environmental degradation, such as deforestation, desertification, biodiversity loss, and security risks. Transboundary Environmental Issues: The framework recognizes that environmental challenges often transcend national boundaries and can strain diplomatic relations as such require international cooperation and Human Security: Environmental security places a strong emphasis on human well-being and the protection of vulnerable populations. It considers the social, economic, and health impacts of environmental challenges and emphasizes the need for inclusive and sustainable development. Dalby (2002) has noted that environmental displacements that spark identity crises might set the stage for violent clashes. Conflict Prevention and Peacebuilding: Environmental security highlights the importance of integrating environmental considerations into conflict prevention and peacebuilding efforts.

The main points of the Environmental Security Theoretical Framework can be outlined as follows:

Resource Scarcity: Competition over finite resources such as water, energy, and arable land can lead to conflicts within and between nations.

Climate Change: Climate-related impacts increase the likelihood of resource scarcity and community displacement and exacerbate existing conflicts.

Environmental Degradation: Degradation such as deforestation, desertification, and biodiversity loss is linked to security risks.

Transboundary Environmental Issues: Environmental challenges often cross borders, requiring international cooperation.

Human Security: Emphasis on the protection of vulnerable populations and inclusive, sustainable development.

Conflict Prevention and Peacebuilding: Integration of environmental considerations into conflict prevention and peacebuilding efforts.

Policy Implications and Research Application: The framework informs policy and research by articulating research questions, developing conceptual understanding, specifying relevant variables, employing appropriate methodology, and discussing policy implications.

The theoretical framework of environmental security provides a lens through which policymakers and researchers can analyze and address the complex and interconnected nature of environmental challenges and human security. It underscores the importance of integrating environmental considerations into security strategies to promote long-term stability and human well-being. In applying the theoretical framework of environmental security to this study, the following key steps were taken: the research questions were clearly articulated; a clear conceptual understanding of climate change and violent conflict within the context of the study was developed; climate change indicators and types of violent conflict that are relevant to the research question were properly specified. The variables that are relevant to understanding the relationship between climate change and violent conflict such as environmental factors, socio-economic factors, political factors, and demographic factors were identified. Also, appropriate research methodology, data analysis and interpretation of findings, and the discussion of policy implications that reinforce the dynamics of this theoretical framework were advanced in the study.

3.6. Conclusion

In this chapter, the major key terms underpinning this study have been conceptualized. Also, an extensive review of the pertinent literature encompassing International Relations (IR) theoretical frameworks concerning climate change, capitalism, and ecology has been undertaken. Furthermore, a thorough examination of literature about climate change dynamics in the African context has been conducted. Additionally, the intricate relationship between climate change and violent conflict has been thoroughly explored within the scholarly discourse. Through this meticulous review, significant gaps in the existing literature have been identified, shedding light on areas warranting further investigation and scholarly attention. These identified lacunae serve as focal points for future research endeavours, aiming to enrich our understanding of the multifaceted nexus between climate change and geopolitical dynamics of conflict.

Finally, the two theoretical constructs, the Marxist/neo-Marxist approach to ecology and conflicts, and environmental security, that grounded this study have been identified and extensively discussed. While these theories will help compensate for the limitations in each other, their relevance in improving the analysis of this study cannot be overemphasized. For the most part, the Marxist/neo-Marxist theoretical frameworks explain the connection between environmental factors and armed conflict and contend that there should be a shift in the status quo and the introduction of new socio-economic models that emphasize environmental sustainability, social justice, climatic justice, and peaceful coexistence. In addition, applying an environmental security framework to an empirical study like this would result in analyzing the causal relationship between climate change and violent conflict in a comprehensive and multidimensional manner, taking into account the various environmental, social, economic, and political factors involved.

CHAPTER 4

RESEARCH METHODOLOGY

4.1. Introduction

This chapter focuses on the research design that guides and frames this study. Accordingly, it sets out who the study population is, what sampling method and sample size are used, where the study locations and sites are, what data collection methods, data instruments, and instrumentation are employed, how validity and reliability of the research instruments are dealt with, what the method of data analysis is used, and finally a reflection on the ethical considerations of the study.

4.2. Research Design

The study adopts a descriptive research design, and four main research methods were used in the study namely, i) mixed method research, ii) comparative case study research iii) triangulation, and iv) convergent synthesis design. Descriptive research is concerned with the collection of data to describe and interpret existing conditions, prevailing linkages, and ongoing processes (Vincent, *et al* 2006:117). This study collected, organized, and analyzed the collected data to describe and interpret the important situated and emergent characteristics, the interlinkages between data observations and points, as well as the prevailing conditions and processes under which this data is situated (Heiman 2006:21).

This study adopts a mixed method of social research which blends data gathering from both primary and secondary sources. Abowitz and Toole (2010:108) argue that in social science research, there is no single research method that would suffice due to inherent strengths and weaknesses in each of the methods. Therefore, mixed methods that combine quantitative and qualitative approaches in research design and data collection yield more reliable results. Quantitative research here is conceptualized as involving a systematic empirical investigation of issues using mathematical and statistical methods, whilst qualitative research is understood as the systematic and in-depth investigation of events in natural settings by collecting data with the aid of interviews, written observations, and conversations (Kanire, 2013).

More so, the study deploys a convergent synthesis design which involves the *integration* of the results from both methods to gain a more holistic view of the research topic. In mixed methods research, integration means mixing qualitative and quantitative approaches at the design (sequential or convergent designs), method (data collection and analysis), and interpretation and reporting levels (Hugo, *et al.,* 2017). Convergent design is a widely employed approach that involves the integration of qualitative and quantitative methods in a single study or research endeavour. In the context of

convergent synthesis design, operations are executed concurrently, enabling the simultaneous collection and analysis of various sorts of data. (Ngulude, 2021). The results-based convergent synthesis design has been conceptualized as a scenario that involves the separate analysis of qualitative and quantitative data using distinct synthesis procedures, the results of both syntheses are subsequently combined and presented during a final synthesis (Hugo, *et al.,* 2017). The initial step involves analyzing the quantitative data to address the core research question and the first sub-question, as well as test the two hypotheses. Also, the qualitative data gathered through KIIs were analyzed to help address sub-research questions two and three.

The study also adopts a comparative case study research method. Case study research methods can employ single or multiple cases, and 'empirically investigate a phenomenon within its real-life context'. Invariably, comparative case studies are about comparing and analyzing the similarities, differences, and patterns across cases (Goodrick, 2014). The study also employs a triangulation approach. This approach, often referred to as methodological pluralism, entails consulting different sources and utilizing different methods on the phenomenon being studied to increase the validity of findings (Danermark, 2007; Green et al, 2006). So, for this study, we will triangulate data from questionnaires, interviews, and existing records. This approach allows the findings from one type of source or data instrument to be cross-checked against those of another, thereby enhancing the reliability and validity of research findings while reducing biases.

4.3. Study Population, Sampling Method, and Sample Size

A sample is a subset of the population from which the researcher seeks to extrapolate wider or general findings. Research studies typically cannot include all the population due to time, budgetary, and manpower costs, and this is certainly the case for this study which considers the study population in two countries in Africa. Thus, sampling is used to examine a subset (Corbetta, 2003; Dhivyadeepa, 2015). Sampling techniques play a crucial role in research studies in line with aiming for i) representativeness (a well-designed sampling technique helps ensure that the selected sample accurately represents the larger population from which it is drawn); ii) generalizability (a representative sample from a larger population increases the likelihood that the findings from a study can be generalized to the target population with a certain level of confidence); iii) efficiency: (sampling techniques enable researchers to collect data from a subset of the population rather than the entire population.

Sampling techniques can be broadly classified into two categories: probability sampling and non-probability sampling. The former involves selecting individuals from a population in such a way that

each member has a known and equal chance of being included in the sample; this allows researchers to make statistical inferences about the population based on the sample while the latter does not involve random selection of individuals, and the probability of any individual being included in the sample is unknown. Non-probability sampling is often used when probability sampling is impractical or when the research objectives are more exploratory in nature. This study used a combination of probability sampling and non-probability sampling techniques. This study used three sampling techniques i) purposive sampling(a non-probability sampling technique where researchers intentionally select individuals or cases that possess specific characteristics or traits relevant to their study); ii) stratified sampling (a probability sampling technique that involves dividing the population into homogeneous subgroups or strata based on certain characteristics) and iii) random sampling (a probability sampling technique where every individual in the population has an equal chance of being selected).

The purposive sampling technique was used in selecting the study population which included government officials, environmentalists, academia, farmers, herders, and youth/community leaders was predetermined for the study. The predetermined criteria for this purposive sampling technique encompass the relevance of the selected individuals to the research topic, diversity, experience and expertise, geographical distribution, and inclusion criteria. By employing these predetermined criteria, the researcher successfully identified and selected individuals who are most pertinent and informative for the study, thereby ensuring that the sample adequately reflects a diverse array of perspectives and expertise within the target population. Additionally, stratified sampling was used in conjunction with purposive sampling on this subset population to ensure proportional representation from each category of respondents. Stratified sampling stratifies the population based on an observed set of criteria and thereafter selects samples from each stratum using a simple random sampling technique (Olorunfumi and Jimoh 2005:51). 17 government officials, 7 academia, 6 environmentalists, 15 farmers, and 13 herders were randomly selected in Nigeria and 22 government officials, academia, and environmentalists, 15 farmers and members of farmers cooperatives, and 12 herders and members of livestock associations were randomly selected in Kenya, participated in the Key Informant Interviews (KIIs) to make a sample size of 110. In addition, 174 government officials, environmentalists, and academics completed the Set A questionnaire in Nigeria, 116 government officials, environmentalists, and academics completed the Set A questionnaire in Kenya, and 423 farmers, herders, youths, and community leaders completed the Set B questionnaire in Nigeria and 205 respondents do the same in Kenya to make a sample of 918 respondents. In all, a total of 1,028 respondents participated in the study.

4.4. Study Locations and Sites

In Nigeria, the field research study sites were in the Kaduna and Sokoto states in the core North; Plateau and Benue states in the Middle Belt region of Nigeria; and Abuja FCT. Meanwhile, in Kenya, the study locations were Bohoni and Ghalamani (Both in the Pokomo community); Bula Salama, Matanya, Rebai, and Umoja (all in the Orma community); Hola (also known as Galole), the capital of Tana River County and Nairobi the capital of Kenya. The rationale behind the selection of these locations is that while some of the herdsmen in Nigeria migrated from states like Kaduna and Sokoto to the Middle Belt region, Plateau and Benue states are the most affected by the farmers-herders conflict in the region. Similarly, Orma herders in Kenya also migrate to the Tana River delta area in search of water for their herds and this often results in intermittent violent conflict in the Tana River County. Collecting data from these areas provides a conducive site in which to observe, describe, assess, and analyze the linkages between climate change, resource utilization, and conflict.

4.5. Data Sources and Instruments

Two sources of data were used in this study, being primary and secondary sources. The secondary source materials were collected from books, journal articles, the internet, and e-publications on climate change and violent conflict whilst primary data was generated through fieldwork in the form of questionnaires and Key Informant Interviews (KIIs): Questionnaires and Key Informant Interviews (KIIs) are the data instruments used for primary data collection. It is necessary to explain that both of these instruments were used to attain validity and reliability.

4.5.1. Questionnaires

Questionnaires are valuable tools in research, especially when dealing with a large and diverse group of respondents. Questionnaires consist of a set of questions that can be multiple-choice and/or open-ended. While multiple-choice questionnaires present respondents with a list of predefined options for each question, from which respondents choose the most appropriate option(s), open-ended questionnaires require respondents to provide their answers in their own words, without being constrained by predefined options. This study employed multiple-choice questionnaires due to their ability to yield concise and structured data, ideal for quantitative analysis and statistical comparisons. Additionally, they facilitate straightforward analysis, as responses are pre-coded and can be readily quantified and summarized. Questionnaires are particularly useful when dealing with a large and geographically scattered number of respondents. The literate respondents filled out the questionnaire themselves while the unlettered who could only understand Hausa or Kiswahili were assisted. Proper planning, design, and clarity of questions are essential for obtaining high-quality data and response

rates. Questionnaires can be used alone or in combination with other research tools. Questionnaires are a valuable research tool but have limitations. Response bias is common, with participants providing socially desirable responses or inaccurately recalling information. Misinterpretation of questions can also lead to incomplete or incorrect responses. Also, questionnaires often lack depth compared to interviews, as respondents may give brief or superficial answers. Hence, this study also incorporated interviews to address the limitations identified with questionnaires.

Two sets of questionnaires[38] were used in this study. The first set of questionnaires tagged 'Set A Questionnaire'- the Climate Impact on Peace and Security (CIPS), and Geopolitics of Climate Change on Peace and Security (GCCPS) - was used to elicit information on the core research question. Questionnaire A was administered to government officials, academia, members of civil society groups, and environmentalists. The second set of questionnaires tagged 'Set B Questionnaire' - Climate Change and Migration (OM), and Climate Change and Incessant Conflict (CCRC) - was used to elicit information on the first sub-question. Questionnaire B was administered to farmers, herders, community leaders, and youths' groups. There were 23 items included in the Set A Questionnaire and 26 items in the Set B Questionnaire. It is noteworthy that because of the predominant illiteracy among the respondents in this particular group, the Set B Questionnaires were translated into Hausa for the Nigerian participants and Kiswahili for the Kenyan participants. Moreover, research assistants proficient in the languages were enlisted to aid in the data collection process. The questionnaires were structured into two Sections (A and B). Section A elicits socio-demographic information while Section B elicits respondents' views on the subject matter. A four-point Likert scale listed below is used in the questionnaires:

SA - Strongly Agree; A - Agree; D - Disagree; SD - Strongly Disagree.

4.5.2. Key Informant Interviews (KIIs)

Key informants play a pivotal role in qualitative research due to their expertise and understanding of their communities or research environments. Key informants provide valuable insights not only into their own emotions and viewpoints but also into broader societal trends (Payne, & Payne, 2004; Given, 2008). They are often highly articulate and possess a deep knowledge of societal norms and obligations. The primary purpose of conducting key informant interviews is to gather comprehensive qualitative data about the community from individuals with direct experiential knowledge. These individuals can include community leaders, professionals, or residents who offer valuable perspectives on underlying

[38] See Appendices II and III for the questionnaires used for data collection for this study.

issues and potential solutions. Two common techniques for conducting key informant interviews are telephone interviews and face-to-face interviews.

Boyle and Neale (2006:3) describe an in-depth interview as a qualitative research technique that involves conducting intensive individual interviews to elicit information concerning an idea, programme, or situation from the respondent. In other words, an in-depth interview attempts to understand the world from the interviewees' point of view to unfold the meaning of their experiences and uncover their lived world before scientific explanations (Kvale and Brinkmann, 2009:1). In-depth informant interviews were conducted to generate data on the third and fourth research questions empirically.

110 interviews[39] were conducted in this study. The participants were drawn from policymakers, government officials, academia, environmentalists, climate activists, members of the All Farmers Association of Nigeria (AFAN), members of the Miyetti Allah Cattle Breeders Association of Nigeria (MACBAN), members of farmers' cooperatives in Kenya and members of livestock association in Kenya. Specifically, in Nigeria, 17 government officials, 15 farmers, 13 herders, 7 academics, and 6 environmentalists participated in the interview sessions while 22 government officials/environmentalists/NGO staffers, 15 farmers/members of farmer cooperatives, 12 herders, and 3 academics participated in the interview sessions in Kenya. Altogether, 58 interviewees and 52 interviewees were drawn from Nigeria and Kenya respectively. The interview schedules used for this study were among the materials included in the appendices.

4.6. Method of Data Analysis

The quantitative data in this study, gathered through questionnaires, is analyzed using the Statistical Package for Social Sciences (SPSS) Version 25 while the qualitative data in this study generated from in-depth interviews were thematically analyzed using Atlas.ti, a Computer Assisted Qualitative Data Software (CAQDAS). The following statistical procedures were also used: Exploratory Data Analysis (EDA); Descriptive Statistics; Correlation and Multiple Regression. Correlation analyses were used to determine the strength and nature of the relationship between and among the variables, while Multiple Regression analysis was used to explain variance components in the model under consideration. The Exploratory Data Analysis (EDA) was the medium for data cleaning and basic categorization through percentages and frequency distribution.

[39] See Appendix IV for the Interview Guide

Additionally, regression, otherwise known as the coefficient of determination (R^2), is a statistical tool that was used to measure the level of effect an independent variable (climate change) has on a dependent variable (violent conflict). To test whether the R^2 is statistically significant or not, the p-value (sig.) is compared with the level of significance used for the study. A low p-value (<0.05) indicates that the independent variable has a significant effect on the dependent variable thereby rejecting the null hypothesis (H0) while the alternative hypothesis (H1) is accepted. Conversely, a larger (insignificant) p-value (>0.05) indicates that the independent variable does not influence the dependent variable, thereby accepting the null hypothesis (H0) while the alternative hypothesis (H1) is rejected.

4.7. Validity and Reliability of the Questionnaires as a Research Instrument

This section provides an overview of several different models that determine the reliability of the questionnaires used as a research instrument in this study. These are Exploratory Factor Analysis (EFA), Kaiser-Meyer-Olkin (KMO) test, Barlett's test of Sphericity, Principal Component Analysis (PCA), Kaiser's criterion, and communalities. Exploratory Factor Analysis (EFA) assesses the construct and content validity of the questionnaires and the 'loading' of items within each questionnaire. The exploratory factor analysis (EFA) was performed on 4 dataset questionnaire banks employed in this study, specifically: the Climate Impact on Peace and Security (CIPS), Geopolitics of Climate Change on Peace and Security (GCCPS), Climate Change and Migration (OM), and Climate Change and Incessant Conflict (CCRC).

Exploratory Factor Analysis is a statistical method used to reduce data to a smaller set of summaries. It uses various extraction methods, but mostly used is the Principal Component Analysis which is the default extraction method in data reduction when using SPSS. It is usually used in the reduction of items for questionnaires (especially into subgroups that will be easily explainable). In this study, EFA was conducted to determine the extent to which observed variables are related to the unobserved variable or construct. In Factor Analysis ("factor or component" are used interchangeably), factors represent the clumps or groups in which items form during the EFA. A factor is the same as an unobserved variable. Factors, therefore, are the subgroups of items formed based on the reduction technique that was carried out (Pallant, 2011). For data to be used in an EFA, some preliminary tests must be done to assess the suitability of the data. In SPSS, the correlations matrix is produced utilizing the Kaiser-Meyer-Olkin (KMO) test, and Barlett's test of Sphericity is also carried out. In EFA, inspection of the correlations between the items in the scale should generally be above 0.3 (Tabachnick and Fidell, 2007).

The KMO test of sampling adequacy determines if the data is fit for the EFA test to be conducted. Field (2009) stated that the KMO value lies between 0 and 1, Kaiser (1970) recommends that values above 0.5 are barely acceptable, while values between 0.8 and above are suitable. Bartlett's test of sphericity measures the null hypothesis, and it is mostly used to state the correlation matrix is an identity matrix. A correlation matrix is said to be an identity matrix when the entire diagonal is one and other elements zero (Field, 2009). If the Bartlett's test is significant, then the data can be used for the test. Factor Extraction Method involves determining the smaller number of subgroups (Factors) that could be retained based on the analysis and the interrelationships between the items in the groups. There are various methods of factor extraction such as the Principal Component Analysis (PCA) method, Maximum Likelihood Method, and Principal Axis Factoring amongst others. The extraction methods commonly used are the Principal Component Analysis (PCA) and the Maximum Likelihood Method. For this study, the principal component analysis was used. In deciding the number of factors to retain, various tests are carried out using SPSS, Kaiser Criterion, and Scree Plot.

Kaiser's criterion popularly known as the Kaiser-Guttman rule or Eigenvalue rule computes the Eigenvalues for a correlation matrix of a set of items and then determines how many variables have values greater than one (Warne & Larsen, 2014). The disadvantage of this test is that it sometimes retains too many factors. Hence the need to scree plots to streamline or increase the number of factors to retain. Cartell's scree plot plots the graph of the eigenvalues obtained for the correlation matrix of the items in the scale. It is recommended by Cartell (1966) that factors (i.e., the number of dots before the slope) above the elbow of the graph should be retained. Eigen values can simply be defined as the number of vectors in the correlation matrix. Simply put, the eigenvalue for each factor tells how much variance in the variable is explained by the factor to which it belongs.

In Exploratory factor analysis, the Rotation of variables is usually done to simplify the interpretation of the factors obtained in the result. Sometimes, when an EFA result is presented, it presents the factors in a rather more difficult way to determine the underlining structure, this rotation which is embedded in SPSS helps to shuffle the items so that one can easily determine what they are representing. The items loading unto the various factors extracted are rotated, items loading unto their factors means the questions with the same underlining structure coming together to form a factor. This will aid the researcher in naming the factors extracted There are two rotation methods in SPSS. They include Orthogonal (Uncorrelated) and Oblique (correlated). The orthogonal rotation method results in a solution where the factors are not correlated, while the Oblique rotation method results in factors that are correlated. An example of an orthogonal rotation method is Varimax rotation, while Direct Oblimin is an example of an Oblique rotation method.

Communalities are the proportion of each variable variance that could be explained by the factors. It is usually the sum of the squared factor loadings for the variables. Communalities are communities, signifying the part each item is playing in the factor it belongs to. So, if an item (statements/questions in the questionnaire) has a communality value of .60 (60%), and another has a value of 0.2 (20%), we say the item with a higher percentage belongs more to that community than the item with 0.2 communality value. In essence, the communality value helps to determine if an item in a factor is part of that group. Observed variables are usually items or statements in a questionnaire. In the Path diagram, a rectangular box is used to denote observed variables. The observed variables are also known as measurement variables.

The latent or unobserved variables are the underlying structure of the observed variables. For example, the factors in the EFA are described as latent or unobserved variables. In Path Analysis, it is represented by the oval shape. The oval is also used to represent error terms that may influence the model that is being built. Measurement error, according to the business dictionary, is the difference between the actual value and the value obtained by the measurement. Sometimes, these errors could be caused by factors such as the mood of the respondent at the time the measurement is being taken. Lastly, in confirmatory factor analysis, the major interest is the extent to which the hypothesized model adequately describes the sample data. This model fit process is determined by goodness of fit indices such as the chi-square test, CMIN/DF (the minimum discrepancy (which is the chi-square) divided by the degree of freedom), RMR (Root mean square residual), GFI (Goodness of Fit Index), AGFI (Adjusted Goodness of Fit Index), NFI (Normal Fit Index), CFI (Comparative fit Index), TLI (Tucker-Lewis Index), and RMSEA (Root Mean Squared Error of Approximation) (Cucos, 2022).

Table 4.1: Fit Indexes Recommended by Hair, *et al* (2010).

Test	Satisfactory Fit	Good Fit
χ^2 Value (CMIN) compare to the independent model	χ^2 Value should be smaller tha independent model χ^2	
χ^2 divided by df (CMIN/DI	< 5.0	
P value	>0.05	
RMR	≤ 0.02	
GFI	>0.90	> 0.80
AGFI	>0.90	> 0.80
NFI	>0.90	> 0.80
CFI	>0.90	> 0.80
TLI	>0.90	> 0.80
RMSEA	< 0.05	< 0.08

Having had a brief explanation of the terms to be used in this section, the EFA result is presented in the sections following.

4.7.1. Exploratory Factor Analysis and Reliability for the Scale Climate Impact on Peace and Security (CIPS)

The 14 items in the CIPS scale were subject to principal component analysis (PCA) using SPSS version 25. The suitability of the data for the factor analysis was done before the main factor analysis, inspection of the correlation matrix revealed that most of the items correlated above 0.3, The Kaiser-Meyer-Olkin value was above .60 and the Bartlett's Test of sphericity reached statistical significance (0.00), thus supporting the factorability of the correlation matrix. The PCA test revealed the presence of 2 factors with eigen values above 1. The factors explained 34.01% and 19.29 % for factor 1 and factor 2 respectively. An inspection of the scree plot also supported the retention of the two-factor loading. The two components explained a total of 54.30% after the rotation. These two components showed several strong loadings, as most of the variables loaded strongly into one component. The summary of the EFA for the CIPS scale is presented in Table 4.2. below.

Table 4.2. Rotated Component Matrix for PCA with Varimax Rotation for CIPS Scale

Items	Items Labels	Component		
		1	2	comm unali es
CIPS4	Migration caused by climate change often generate crises between the migrant herders and the host cro farmers	0.76		0.58
CIPS10	The relative scarcity of grazing land due to clima change often results in direct competition for resourc between the herder and the farmer	0.74		0.59
CIPS3	Climate change leads to environmental degradation ar consequently triggers migration by herders	0.69		0.48
CIPS12	Relative deprivation, as a result of scarcity, increas tension/friction between the farmer and the herder	0.66		0.53
CIPS1	Climate change aggravates existing environment stressors and increases strains between the crop farm and nomadic herder in my region	0.64		0.51
CIPS2	Droughts and frequent floods induce hostility betwe the crop farmer and nomadic herder in competition f scarce natural resources.	0.63		0.42
CIPS5	The interaction between climate change and other caus of conflict often increases the incidence of viole conflict in my region/county	0.58		0.52

CIPS8	Overdependence on natural resources makes Africa countries highly prone to the adverse impact of climate change		0.51		0.36
CIPS6	Unresolved grievances, poverty, and a legacy of violence are often brewed by climate change.			0.79	0.65
CIPS13	The scarcity of natural resources is a cause of insecurity in my region/county			0.79	0.62
CIPS14	Resource degradation triggers herder-farmer conflicts.			0.57	0.61
	Variance explained		34.01	19.29	
	Reliability Statistics	Alpha Values	0.833	0.675	
		Inter-item correlation mean	0.350	0.357	

Reliability: 0.854; 3 items (7, 9 and 15) factored out

Table 4.2. shows that all the items loaded strongly (items loading strongly means that the items will load with a very high score in its factor and very low or not at all in other factors) to their respective factors and the communalities values indicate that the items correlated moderately with their respective factors, thus the two factors can equally be used as a single scale when analyzing data. The reliability value for each factor was determined using the Cronbach Alpha reliability test. The Table shows that factor one had a reliability index of 0.833 with an inter-item correlation mean of 0.350, while factor 2 has a reliability index of 0.675 with an inter-item correlation mean of 0.357. The whole CIPS scale yielded a reliability index of 0.854 after items 7, 9, and 15 were factored out. The communalities values of all the items were above 0.3 and indicated that the items are all related.

Model Fitness for CIPS

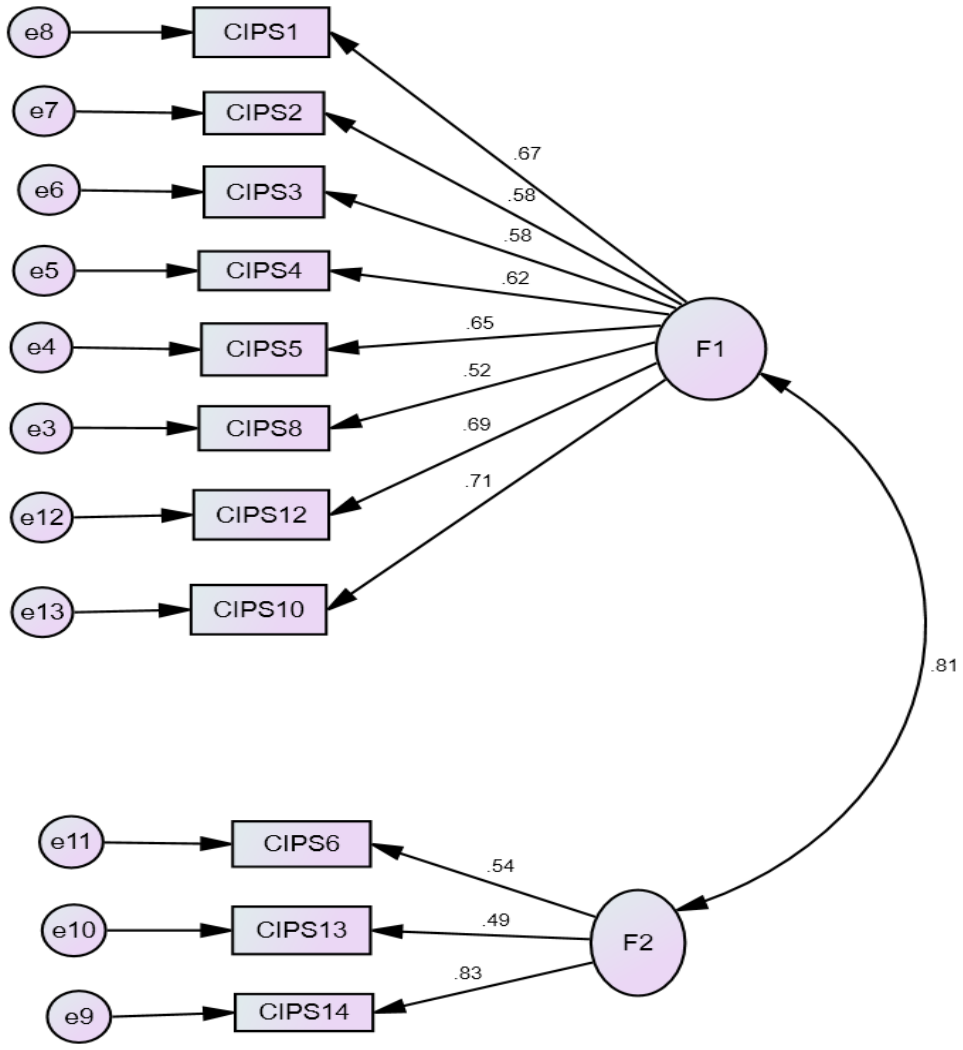

Figure 4.1: Path Diagram for Two Factor Solution of CIPS Scale

Figure 4.1. represents the hypothesized model for the CIPS scale which comprises two factors. Factor 1 has eight items and factor 2 has three items. Each observed variable as seen in **Figure 4.1**. is regressed into its factor and both factors are shown to be inter-correlated. The fitness Indices are presented in **Table 4.3.**

Table 4.3: Fitness Indices of CIPS Scale

Test	Recommended Value on Ha *et al*	Obtained Value
χ^2 Value (CMIN) compare to the independent model	χ^2 Value should be small than independent model χ^2	95.84(910.52)
χ^2 divided by df (CMIN/DI	< 5.0	2.23
Degree of Freedom (df)	Should be positive	43
P value	>0.05	0.000
NFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.895
CFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.937
TLI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.904
RMSEA	< 0.05(good fit) < 0.08 (an acceptable fit)	0.068

No GFI, AGFI, and RMR because of missing values

Table 4.3. shows that the model has a positive degree of freedom (43) and minimum iteration was achieved which is an indication that the observed variables produced a good result without the problem of multi-collinearity. The chi-squared value is large (95.84; ρ = 0.000) which is not an indication of a good fit but compared to the independent model the 2 value is smaller. Since the chi-squared test implies that the hypothesized data did not fit the model, other fit indexes were also examined to determine if the hypothesized data will not fail to be rejected (since the chi-squared test is biased towards a large sample). The test values that were examined are CMIN/DF, NFI, CFI, TLI, and RMSEA. Table 4.5 shows that the Comparative Fit Index (CFI) is 0.937 which is above the recommended 0.90; the Normal Fit Index (NFI) is 0.895 and TLI is 0.904 which is just at the threshold of the recommended value. The RMSEA is 0.068 and it is a little bit above 0.05. The values of the various fit indices indicate that the hypothesized Model is a good fit for the Observed Model. Hence the Data is said to be an acceptable Fit for the two Factor Model of the CIPS scale. The CIPS scale is therefore confirmed valid and reliable.

4.7.2. Exploratory Factor Analysis and Reliability for the Scale Geopolitics of Climate Change on Peace and Security (GCCPS)

The six items in the GCCPS scale were subject to principal component analysis (PCA) using SPSS version 25. Most of the items correlated above 0.3, the Kaiser-Meyer-Olkin value was above .60 and the Bartlett's Test of sphericity reached statistical significance (0.00). The PCA test revealed the presence of a factor with eigen values above 1. These factors explained 41.78%. An inspection of the

scree plot also supported the retention of the only factor loading. The summary of the EFA for the GCCPS scale is presented in **Table 4.4**.

Table 4.4: Rotated Component Matrix for PCA with Varimax Rotation for GCCPS Scale

Items	Items Labels	Compon nt	commun lities
GCCPS6	Climate crises in East Africa/West Africa could stra international relations	0.708	0.501
GCCPS7	Multilateral support for East Africa/West Africa c climate change has been relatively low.	0.704	0.495
GCCPS8	In formulating adaptation policies by countries in Ea Africa/West Africa, developed nations need to off technical supports	0.640	0.410
GCCPS4	Youths in my area need to be carried along in the proce of building a peaceful and conducive environment	0.630	0.397
GCCPS2	There are currently climate change-related humanitaria crises in East Africa/West Africa.	0.598	0.357
GCCPS5	Peace-building skills are necessary for confli transformation	0.589	0.347
	Reliability	0.72	
	Total Variance explained	41.78%	

Table 4.4. shows that all the items loaded to the factor and the communalities values indicate that the items correlated moderately with its factor. The reliability value was calculated using the Cronbach Alpha reliability test. The Table shows that the scale has a reliability index of 0.72. The communalities values of all the items were above 0.3 indicating that the items are all related.

Model Fitness for GCCPS Scale

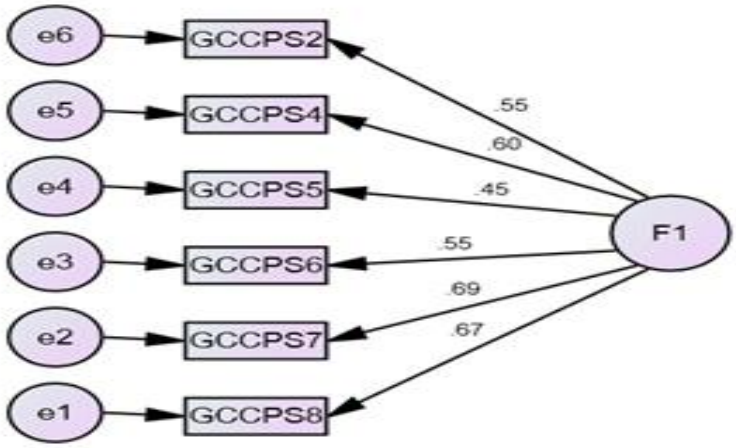

Figure 4.2: Path Diagram Solution of GCCPS Scale

Figure 4.2. represents the hypothesized model for the GCCPS scale which has six items. Each variable as seen in Figure 4.2 egressed well into its factor. The fitness Indices are presented in **Table 4.5**.

Table 4.5: Fit Indices for GCCPS Scale

Test	Recommended Value on Hair *et al* an others	Obtained Value
χ^2 Value (CMI compared to t Independent model	χ^2 Value should be smaller tha independent model χ^2	13.654(317.626)
χ^2 divided by (CMIN/DF)	< 5.0	1.517
DF		9
P value	>0.05	0.135
RMR	≤ 0.02	0.024
GFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.983
AGFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.960
NFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.957
CFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.985
TLI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.974
RMSEA	< 0.05(good fit) < 0.08 (an acceptable fit)	0.004

Table 4.5. shows that the model has a positive degree of freedom (43) and minimum iteration was achieved. The chi-squared value is small (13.65; $\rho = 0.135$) which is an indication of a good fit. Since the chi-squared test implies that the hypothesized data did fit the model as well as other fit indices (RMR is 0.024 which is at the threshold, Goodness of Fit Indices (GFI) is 0.98 which is satisfactory, Adjusted Goodness of Fit indices (AGFI) of 0.96 is also satisfactory, CFI is 0.985 and above the recommended 0.90; NFI is 0.957 and TLI is 0.974 which is also a satisfactory fit. The RMSEA is 0.004 which is also a satisfactory fit) hence the hypothesized Model is a good fit for the Observed Model. The GCCPS scale is therefore confirmed valid and reliable.

4.7.3. Exploratory Factor Analysis and Reliability for the Scale Climate Change and Migration (OM)

The suitability of the 16 items for the factor analysis was done before the main factor analysis. Inspection of the correlation matrix revealed that most of the items correlated above 0.3, the Kaiser-Meyer-Olkin value was above .60 and Bartlett's Test of Sphericity reached statistical significance (0.00), thus supporting the need for Factor Analysis. Using the PCA test, the result revealed the presence of 4 factors with eigen values above 1. The first factor explained 20.36%, the second factor explained 14.32%, the third factor explained 11.43% and the last factor explained 19.29 % after the rotation. An inspection of the scree plot also supported the retention of the four factors loading. The four components explained a total of 57.48% after the rotation. These four components showed several strong loadings, as most of the variables loaded strongly into one component. The summary of the EFA for OM scale is presented in Table 4.6.

Table 4.6: Rotated Component Matrix for PCA with Varimax Rotation for OM Scale

Items	Items Labels		Component				Communalities
			1	2	3	4	
OM2	Changing rainfall patterns affect agricultur production which leads to mass emigration		0.831				0.706
OM13	The nomadic nature of herders would drastical reduce if water and arable land were sufficient available in their communities for grazing		0.792				0.633
OM14	Climate change displaces vulnerable people ar increases their rate of migration		0.657				0.659
OM6	The movement of herders is caused by a shortag of arable land for grazing		0.617				0.596
OM1	Rainfall variability often leads to mas displacement and emigration		0.478				0.504
OM5	The negative effect of climate change on means livelihood often leads to out-migration of herder		0.472				0.413
OM11	The host communities of migrant herders a always prepared and willing to receive them			0.856			0.761
OM12	The relationship between the migrant herders ar their host communities is always cordial			0.795			0.676
OM10	Migration by herders when there is a change climatic conditions is properly planned			0.592			0.562
OM3	The unavailability of water resources does n make herders look for resources elsewhere			0.532			0.572
OM15	Cattle grazing on farmland often triggers confli between crop farmers and herders				0.763		0.608
OM4	Climate change causes migrants to always mov towards areas where water and grasses a available in sufficient quantity				0.559		0.513
OM16	Increased migration and high pastoralist mobili rates lead to farmer-herder conflicts in Africa				0.516		0.454
OM7	Climate change gives rise to the dearth of grazir pasture in some parts of my country					0.743	0.598
OM8	Herders in my region/county often migrate another location where there is sufficient wat and grazing land due to climate stressors lik drought					0.648	0.546
OM9	Strained relationships between farmers ar herders are always triggered by insufficie pasture for grazing and water during prolonge dry season					0.494	0.398
	Variance explained		20.358	14.31	11.436	11.370	
	Reliability	Cronbach's alph	0.787	0.710	0.529	0.607	
		Inter-correlation mean	0.375	0.388	0.268	0.342	

Reliability: 0.750., Total Variance explained 57.479%

Table 4.6. shows that all the items loaded strongly to their respective factors and the communalities values indicate that all the items in the OM scale correlated moderately with their respective factors, thus the four factors can equally be used as a single scale when analyzing data. The reliability value for each factor was determined using the Cronbach Alpha reliability test. The table also shows that factor one had a reliability index of 0.787 with an inter-item correlation mean of 0.375, while factor 2 has a reliability index of 0.710 with an inter-item correlation mean of 0.388, factor 3 has a reliability index of 0.529 with an inter-item correlation mean of 0.268 and factor 4 has a reliability index of 0.607 with an inter-item correlation mean of 0.342. The whole OM scale yielded a reliability index of 0.750. The communalities values of all the items were above 0.3 and show that the items are all related.

Model Fit for the OM Scale

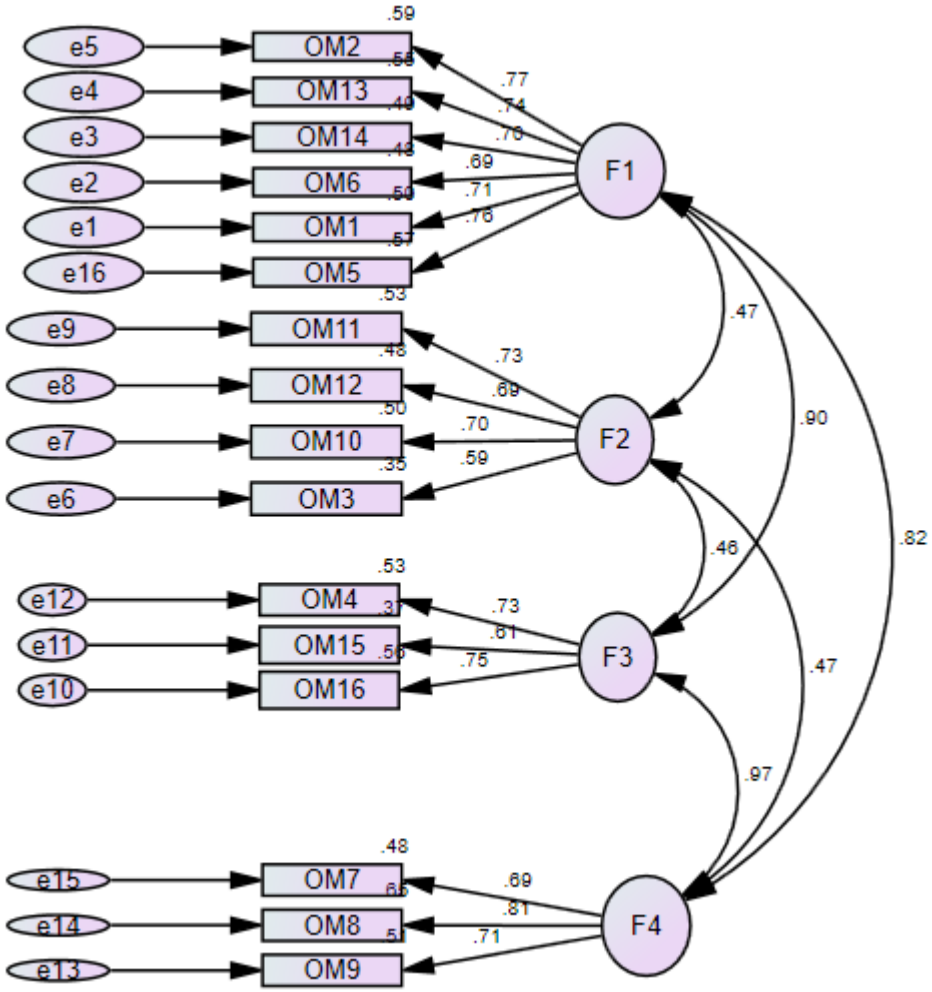

Figure 4.3: Path Diagram Solution of OM Scale

Figure 4.3. represents the hypothesized model for the OM scale which comprises four factors. Factor one has six items highly regressed to its factor, factor two has 4 items with regression values above 0.4,

Factor 3 has three items and factor 4 has 3 items also. Each observed variable as seen in Figure 4.11 is regressed into its factor and all factors are shown to be inter-correlated. The fitness Indices are presented in **Table 4.7**.

Table 4.7: Fitness Indices for OM Scale

Test	Recommended Value on Ha et al and others	Obtained Value
χ^2 Value (CMIN) compare to the Independent model	χ^2 Value should be small than independent model χ^2	820.10(5234.96)
χ^2 divided by df (CMIN/DI	< 5.0	8.368
DF		98
P value	>0.05	0.000
NFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.843
CFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.859
TLI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.827
RMSEA	< 0.05(good fit) < 0.08 (an acceptable fit)	0.107

Table 4.7. shows that the model has a positive degree of freedom (98) and minimum iteration was achieved which is an indication that the observed variables produced a good result without the problem of multi-collinearity. The chi-squared value is quite large (820.10; $\rho = 0.000$) which is not an indication of a good fit, but compared to the independent model, the χ^2 value is smaller. Since the chi-squared test implies that the hypothesized data did not fit the model, other fit tests were also examined to determine if the hypothesized data would fit the model (since the chi-squared test is biased towards a large sample). The test values that were examined are CMIN/DF, NFI, CFI, TLI, and RMSEA. The Table shows that NFI is 0.843; CFI is 0.859; and TLI is 0.827 which all suggest a good fit. The RMSEA is 0.107 and is above the 0.05. The values of the various fit indices at least indicate that the hypothesized Model is a good fit for the Observed Model. Hence the Data is said to be an acceptable Fit for the four Factor Model of the OM scale. The OM scale is therefore valid and reliable.

4.7.4. Exploratory Factor Analysis and Reliability for the Scale Climate Change and Incessant Conflict (CCRC)

The suitability of the 10 items in the CCRC scale for the factor analysis was done before the main factor analysis, inspection of the correlation matrix revealed that most of the items correlated above 0.3, the

Kaiser-Meyer-Olkin value was above .60 and the Bartlett's Test of Sphericity also reached statistical significance (0.00), thus supporting the need for Factor Analysis. Using the PCA test, the result revealed the presence of three factors with eigen values above 1. The first factor explained a variance of 23.655%, the second factor explained a 20.021% variance, and the third factor explained an 18.051% variance after the rotation. An inspection of the scree plot also supported the retention of the four factors loading. The three components explained a total of 61.727% after the rotation. These three components showed several strong loadings, as most of the variables loaded strongly into one component. The summary of the EFA for the CCRC scale is presented in **Table 4.8**.

Table 4.8. Rotated Component Matrix for PCA with Varimax Rotation for CCRC Scale

Items	**Items Labels**	**Component**			Comm
		1	2	3	nalitie
CCRC7	Aggressive competition for scarce natural resourc leads to farmer-herder conflicts	.843			0.722
CCRC2	Most of the places affected by climate chang related conflicts have a pre-existing ten atmosphere	.749			0.696
CCRC3	Places affected by climate change-related conflic have a limited capacity to survive during clima shifts	.727			0.717
CCRC11	The high level of unemployment among the youth makes them available for use as instruments violence	.491			0.517
CCRC6	There are always criminal elements in the area whe farmer-herder crises are prevalent		.763		0.604
CCRC8	Climate change often leads to degradation of lar and vegetation in locations where there competition for survival and rivalry for natur resources		.712		0.523
CCRC9	Mutual understanding/Peaceful coexistence amid climate change can forestall farmer-herder conflict		.667		0.569
CCRC4	Climate change increases vulnerability to conflicts			0.813	0.665
CCRC1	There is a political to relationship between clima change and farmer-herder conflicts in n region/county			0.656	0.624
CCRC5	Drought has a direct correlation with violence			0.504	0.536
Variance explained		23.65	20.021	18.051	
Reliability	Cronbach's Alpha	0.760	0.618	0.601	
	Inter-correlation mean	0.431	0.350	0.332	

Reliability: 0.753; Total Variance explained: 61.727

Table 4.8. shows that all the items loaded strongly to their respective factors and the communalities values indicate that all the items in the CCRC scale correlated moderately with their respective factors,

thus the three factors can equally be used as a single scale when analyzing data. Table 4.8. also shows that factor one had a reliability index of 0.760 with an inter-item correlation mean of 0.431, while factor 2 has a reliability index of 0.618 with an inter-item correlation mean of 0.350, and factor 3 has a reliability index of 0.601 with an inter-item correlation mean of 0.332. The whole CCRC scale yielded a reliability index of 0.753. The communalities values of all the items were above 0.3 and show that the items are all related.

Model Fit for CCRC Scale

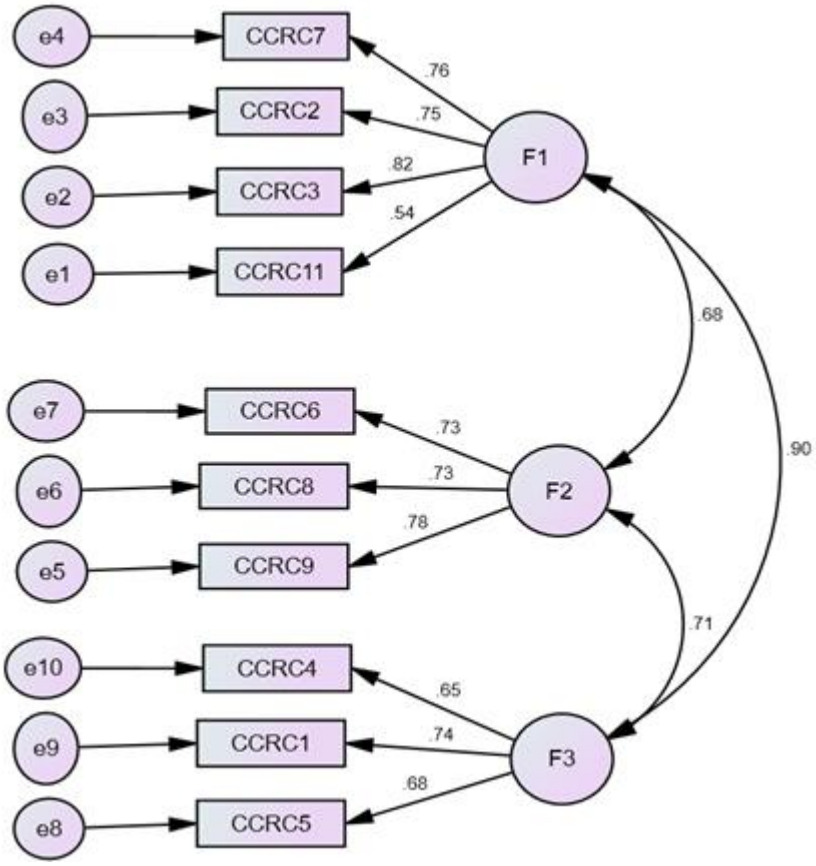

Figure 4.4: Path Diagram Solution for CCRC Scale

Figure 4.4 represents the hypothesized model for the CCRC scale which comprises three factors. Factor one has four items highly regressed to its factor, factor two has three items with regression values above 0.7, and factor 3 also has 3 items. Each observed variable is seen in Figure 4.4. is regressed into its factor and all factors are shown to be inter-correlated. The fitness Indices are presented in **Table 4.9.**

Table 4.9: Fit Indices for CCRC Scale

Test	Recommended Value on Ha et al and others	Obtained Value
χ^2 Value (CMIN) compare to the independent model	χ^2 Value should be small than independent model χ^2	402.25(2939.014)
χ^2 divided by df (CMIN/DI	< 5.0	12.57
DF		32
P value	>0.05	0.00
NFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.863
CFI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.872
TLI	>0.90 (satisfactory fit) > 0.80 (suggest good fit)	0.820
RMSEA	< 0.05(good fit) < 0.08 (an acceptable fit)	0.134

Table 4.9. shows that the model has a positive degree of freedom (32) and minimum iteration was achieved which is an indication that the observed variables produced a good result without the problem of multi-collinearity. The chi-squared value is quite large (402.25; $\rho = 0.000$) which is not an indication of a good fit but compared to the independent model the χ^2 value is also smaller. Since the chi-squared test implies that the hypothesized data did not fit the model, other fit indexes had to be used to determine the fitness. The test values that were examined are CMIN/DF, NFI, CFI, TLI, and RMSEA. The Table shows that NFI is 0.863; CFI is 0.872; and TLI is 0.820 which all suggest a good fit. The RMSEA is 0.134 and is above 0.05. The values of the various fit indices at least indicate that the hypothesized Model is a good fit for the Observed Model. Hence the Data is said to be an acceptable Fit for the three three-factor model of the CCRC scale. The CCRC scale is therefore valid and reliable.

4.8. Descriptive Statistics and Test of Normality

In testing for the Normality of the variables, a Shapiro-Wilk test was conducted using R Statistics Software, the result is presented in **Table 4.10**.

Table 4.10: Descriptive Statistics and Kolmogorov-Smirnov Test for Normality

Study Variables	Mean	Std. Deviation	Shapiro-Wilk	P value
CIPS	34.9850	5.81343	0.889	$4.53* 10^{-13}$
GCCRC	19.8195	3.24435	0.819	$2.2* 10^{-16}$
OM	47.23	6.39	0.702	$2.2* 10^{-16}$
CCRC	30.92	9.91	0.782	$2.2* 10^{-16}$

Table 4.10 shows that the mean values of the variables studied were within the range of scores expected. The Shapiro-Wilk Statistic reveals that all the variables of the study violated the assumption of normality as all the results were significant. In accessing the normality of a variable, the p-value must be greater than 0.05 (that is not significant), although according to Tabachnick and Fidell (2007), this is quite common in large samples (+200 sample).

From the above validity and reliability test as well as the test of normality, it has been proven beyond doubt that the research instruments (questionnaires) used for this study passed the normality test and they are as well valid and reliable.

4.9. Ethical Considerations

Ethical considerations are crucial in designing a research study. The section sets out some of the ethical issues dealt with in the study ranging from seeking informed consent from key informants to contemplating the risks of conducting research in conflict-prone zones.

Conflict regions are volatile and prone to instability, and this constitutes a major problem when conducting research. The Middle Belt Region in Nigeria still experiences intermittent violence, while the warring parties in the Tana River County of Kenya have sheathed their swords at least for now. Instability creates vulnerability and precarity among populations caught amid the conflict, so conducting research in such settings requires careful consideration of the research methods, instruments, and a greater ethics of care in seeking out informed consent (Ford, *et al,* 2009). In light of this, the researcher took into consideration the potential harm-benefit ratio for participants, ensuring that the benefits of the research would outweigh any potential risks to those involved. Further, the

researcher strictly observed ethical guidelines about the protection of the rights and well-being of research participants in conflict situations. Some other measures were undertaken to ensure ethical procedures and conduct were followed in this study, namely:

1. Data Collection in Conflict Areas: Recognizing the vulnerability of people in conflict areas, the researcher excluded extremely vulnerable individuals from the research. In Nigeria, due to ongoing conflict, local research assistants and enumerators familiar with the terrain were used for data collection to mitigate risks and improve the safety of the participants and researchers.
2. Adaptation of Research Instrument Items: in developing the questionnaires and interview guides for this study, some items were adapted from other sources. These adaptations were made to ensure relevance and suitability to the specific aims and objectives of this study. It is important to note that while efforts were made to maintain the integrity of the adapted items, some modifications were implemented to better align the items with the context of this research.
3. Insecurity Precautions: In the northern part of Nigeria where the conflict was still escalating, approval for the researcher's presence and for conducting research was obtained from relevant associations, such as the All Farmers Association of Nigeria (AFAN) and the Miyetti Allah Cattle Breeders Association of Nigeria (MACBAN), before undertaking fieldwork.
4. Research Permit: The researcher obtained approvals from relevant authorities, ministries, NGOs, and associations in both Nigeria and Kenya. In Kenya, he obtained a research permit from the National Commission of Science, Technology, and Innovation (NACOSTI) that granted him approval to conduct research in the country (see Appendices VI to XX for various approval letters. The researcher supplied all the relevant approvals from granting bodies with copies of the research proposal, research instruments, and 'conditional clearance' from the University of the Witwatersrand Human Research Ethics Committee (HREC) Non-Medical (with ethical approval pending on the outcome of obtaining the necessary in-country research permits).
5. Ethics Clearance: The approvals and research permit obtained from the relevant authorities in Nigeria and Kenya played a crucial role in applying for ethics clearance from the University of the Witwatersrand's Human Research Ethics Committee Non-Medical (HREC-NM). This step was taken to ensure that the research conducted adhered to the ethical standards and guidelines set by the university's ethics committee. With the issuance of the Ethics Clearance Certificate (Protocol Number: H21/04/08), the researcher gained official approval from the university to proceed with the fieldwork in both Nigeria and Kenya. This certificate assured the participants and other stakeholders that the research had undergone a rigorous ethical review and met the necessary ethical requirements for conducting research involving human subjects.

6 Data Collection and Analysis: Due to time constraints and language barriers, research assistants and enumerators were recruited during the fieldwork in both Nigeria and Kenya. Their involvement was duly noted in the ethics application form submitted to the Human Research Ethics Committee Non-Medical (HREC-NM). Additionally, the analysis of both quantitative and qualitative data was done by experts proficient in the use of SPSS, R, and Atlas.ti.

7 Informed Consent: Before conducting interviews or administering questionnaires, the participants' informed consent was sought. They were informed about the research objectives, their rights to decline participation, and their ability to withdraw from the study at any stage. Further, participants were offered confidentiality and anonymity in the reporting of data. Questionnaires, Participant Information forms, and Consent sheets were translated into local dialects where English was a language barrier.

8 Anticipated Consequences: Participants were informed about the potential risks, discomfort, or adverse effects that might arise from their participation and were offered the right of withdrawal based on this. They were also provided with contact details of counsellors in case they needed psychological support due to the emotional impact of the conflict settings, the questionnaires, and the interviews.

9 Cultural Sensitivity: The research process was adapted to conform to the norms, customs, and sensitivities of the people in the study areas. This was done to ensure that the research was respectful of the participants' cultural context.

10 Data Storage and Use: Participants were informed about the storage and usage of the information they volunteered. This transparency ensures that participants are aware of how their data will be handled.

The points highlighted above state the researcher's commitment to conducting ethical research while considering the well-being and rights of the participants in both Nigeria and Kenya. They demonstrate the importance of cultural sensitivity, informed consent, and proactive measures to address potential risks associated with conducting research in conflict-affected areas.

4.10. Conclusion

This chapter provides a comprehensive elaboration of the methodical framework employed in the study. It encompasses a thorough explanation of various methodological components involved in the research process, including the overall approach and framework used to conduct the study. Additionally, it delves into the systematic way data were gathered, analyzed, and interpreted to address the research objectives and questions. The chapter also outlines the descriptive, correlational, and mixed-methods structure of

the study. Furthermore, it discusses the target population, sample size, and sampling method employed. The tools or methods employed to collect data from participants, such as surveys, questionnaires, and interviews, are also detailed. Moreover, the chapter explores the validity and reliability of the research instruments employed. Ethical considerations about the research process were also addressed. The subsequent chapter centres on the analysis of the data gathered during the fieldwork and the exposition of the findings derived from the investigation. The process encompasses the utilization of statistical analytic techniques, the interpretation of collected data, and the effective communication of findings using visually informative tools such as tables, graphs, and charts.

CHAPTER 5

MAPPING CLIMATE CONFLICT: QUANTITATIVE TRENDS AND QUALITATIVE INSIGHTS FROM AFRICAN PERSPECTIVES

5.1. Introduction

This chapter is a pivotal part of this thesis as the data gathered, using questionnaires and interview schedules, during fieldwork in Nigeria and Kenya were analyzed and the results presented here. The data collected during the fieldwork were analyzed using different methods. Quantitative data, which involved numerical measurements and statistical analysis, were analyzed using Statistical Package for the Social Sciences (SPSS). On the other hand, the qualitative data, which consisted of non-numeric information such as interview transcripts were analyzed using ATLAS.ti. This chapter centers on answering the four research questions. The core research question (To what extent does climate change effect features in the geopolitics of peace and security in West Africa and East Africa?) and sub-question 1 (Specifically, what is the correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River County in Kenya?) were answered using quantitative methods, which involve examining relationships between the independent variable (climate change) and the dependent variable (violent conflict) using statistical analysis. This method also allowed testing of the two hypotheses formulated for the study.

Sub-research question 2 (What is the level of awareness about the effects of climate change among crop farmers, herders, and policymakers in the Northern region of Nigeria and Tana River County of Kenya, and how does the knowledge about the effects of climate change play a factor in the different stakeholders' approach to conflict?) and Sub-research question 3 (What are the policy frameworks in Nigeria and Kenya that create awareness about climate change and mitigate the effects of climate change on violent conflict at both national and local levels?) were answered using qualitative methods, which involved interpreting and analyzing non-numeric data to gain insights into participants' experiences, perspectives, and behaviours. As noted in Chapter 4, the study adopts a convergent synthesis design. So, the initial step involves analyzing the quantitative data to address the core research question and the first sub-question, as well as test the two hypotheses. Also, the qualitative data gathered through KIIs were analyzed to help address sub-research questions two and three. The analysis begins by examining the socio-demographic characteristics of the participants who completed the Set A and Set B Questionnaires, and those who participated in the interview sessions.

5.2. SET A QUESTIONNAIRE DEMOGRAPHIC PROFILE

Table 5.1: Socio-Demographic Profile of Respondents for Set A

Category	Subcategory	KENYA		NIGERIA		TOTAL	
		N	%	N	%	N	%
Gender	Male	52	58.4%	114	64.4%	166	62.4%
	Female	37	41.6%	59	33.3%	96	36.1%
Age	19-28 years	16	18.0%	14	7.9%	30	11.3%
	29-38 years	37	41.6%	60	33.9%	97	36.5%
	39-48 years	29	32.6%	56	31.6%	85	32.0%
	49-58 years	7	7.9%	38	21.5%	45	16.9%
	59-68 years	0	0	4	2.3%	4	1.5%
	69-78 years	0	0	2	1.1%	2	0.8%
Sub county/geopolitical zones	Bura/Northwest	1	0.4%	53	19.9%		
	Galole/Northeast	29	10.9%	10	3.8%		
	North central			106	39.8%		
Religious Affiliation	Christianity	16	18.0%	124	70.1%	140	52.6%
	Islam	15	16.9%	53	29.9%	68	25.6%
Educational Qualification	Primary	0	0	1	0.6%	1	0.4%
	Secondary O-level	2	2.2%	4	2.3%	6	2.3%
	A-level/Vocational/Professional	15	16.9%	3	1.7%	18	6.8%
	Degree or equivalent	55	61.8%	85	48.0%	140	52.6%
	Postgraduate	11	12.4%	83	46.9%	94	35.3%
	Others	4	4.5%	0	0	4	1.5%
Occupation	Civil/Public Servant	49	55.1%	146	82.5%	195	73.3
	Environmentalist/NGO Staffer	38	42.7%	28	15.8%	66	24.8
	Other	1	1.1%	2	1.1%	3	1.1
Current Location	Nairobi/Makurdi	2	2.2%	27	15.3%	29	10.9
	Hola/Sokoto	76	85.4%	20	11.3%	96	36.1
	Tana River County/Kaduna	5	5.6%	35	19.8%	40	15.0
	Chewani/Abuja	1	1.1%	72	40.7%	73	27.4
	Jos			21	11.9%	21	7.9
No. of year respondents have been living in current location	Below 10 years	40	44.9%	35	19.8%	75	28.2%
	11-20 years	28	31.5%	66	37.3%	94	35.3%
	21-30 years	12	13.5%	55	31.1%	67	25.2%
	31-40 years	5	5.6%	12	6.8%	17	6.4%
	41- 50 years	1	1.1%	5	2.8%	6	2.3%
	Above 50 years			1	.6%	1	0.4%

Table 5.1. shows the socio-demographic profile of the respondents to the SET A instrument used for this study. Based on gender, 52 (58.4%) of the respondents in Kenya were males while 37 of them representing 41.6% were females. In Nigeria 64.4% were male and 33.3% were female respondents. In all, there is a total of 62.4% of male respondents and 36.1% of female respondents. 1.5% of the respondents did not indicate their gender. The result is presented graphically in **Figure 5.1**.

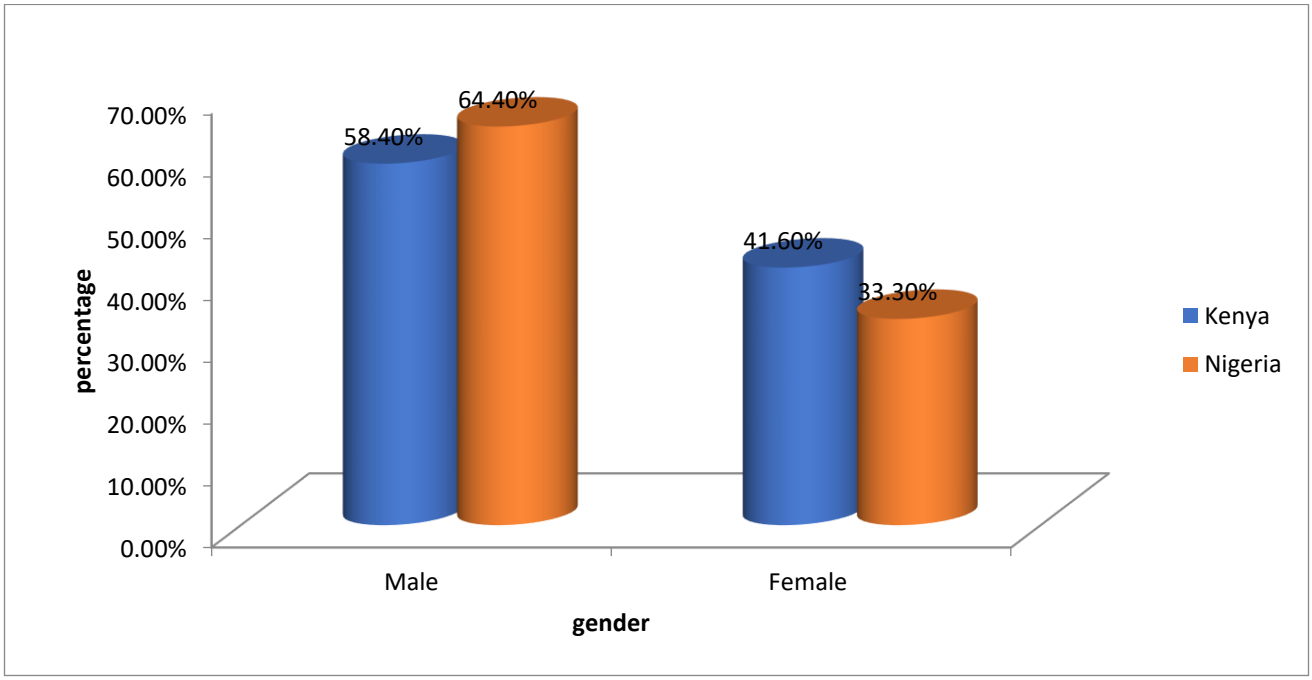

Figure 5.1: Gender of the Respondents per Country.

Figure 5.1. shows that in both countries of study, there were more male respondents than female. Nigeria had higher male respondents than Kenya, while the female respondents in Kenya were higher than those from Nigeria.

More so, the Age range of the respondents was between 19 years and 78 years. In Kenya, 18% were between the ages of 19 and 28%, 41.6% were between 29 and 38 years, 18% were between 39 and 48 years, and 7.9% between ages 49 and 58. In Nigeria, the age of respondents spanned from 19 to 78 years. 7.9% were between 19 and 28 years, 33.9% were between 29 and 38 years, 31.6% were between 39-48 years, and 21.5% were between 49 and 58 years. As the age of the respondents grew older, the percentage of respondents reduced; 2.3% were between 59 and 68 years and 1.1% were between 69 and 78 years. The result is presented graphically in **Figure 5.2.**

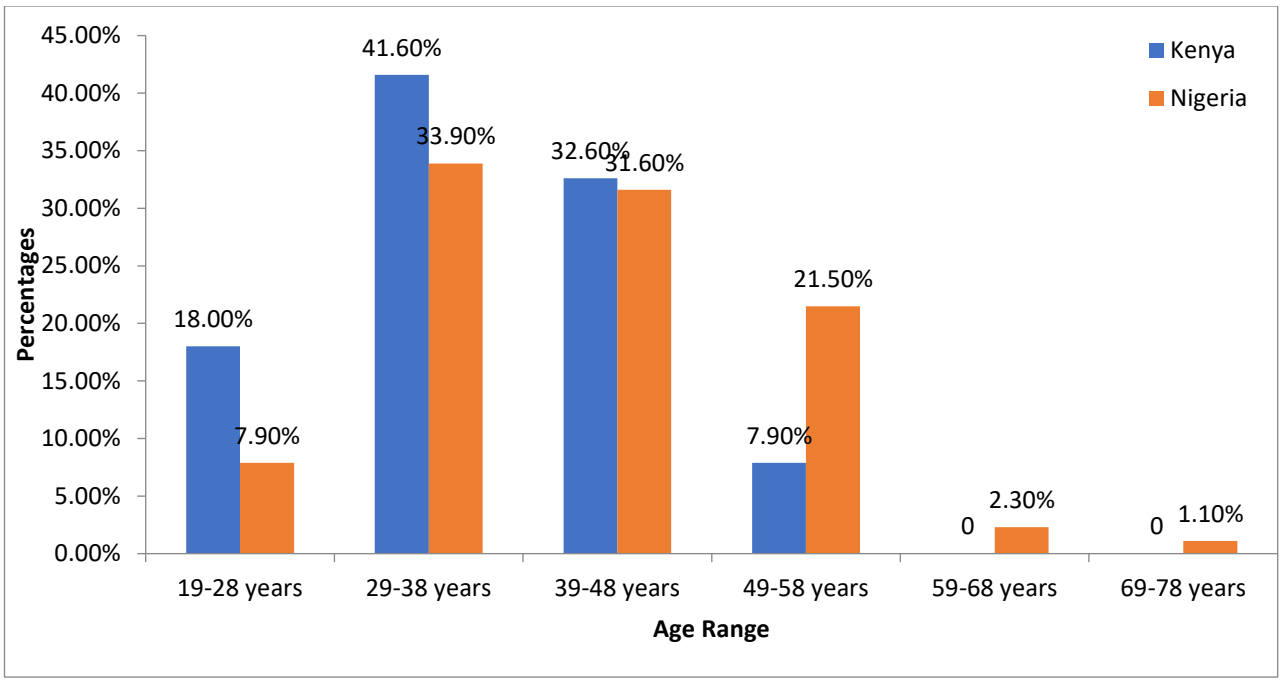

Figure 5.2: Age Range of Respondents

The **Figure 5.2**. shows that Kenya had more respondents between the ages of 19-28 years, 29-38years and 38-48 years than Nigeria, while Nigeria had more respondents between the ages of 49-58 years, 59-68 years, and 69-78 years.

Table 5.1. also shows that only 0.4% indicated that they were from the Bura sub-county in Kenya while 10.9% indicated that they were from the Galole sub-county. The majority of the respondents did not disclose the sub-county they reside. In Nigeria 19.9% of the respondents resided in the Northwest geopolitical zone of the country, 3.8% in the Northeast region, and 39.8% in the North Central geopolitical zone. The sub-counties or regions for the countries' samples were presented graphically in **Figure 5.3.**

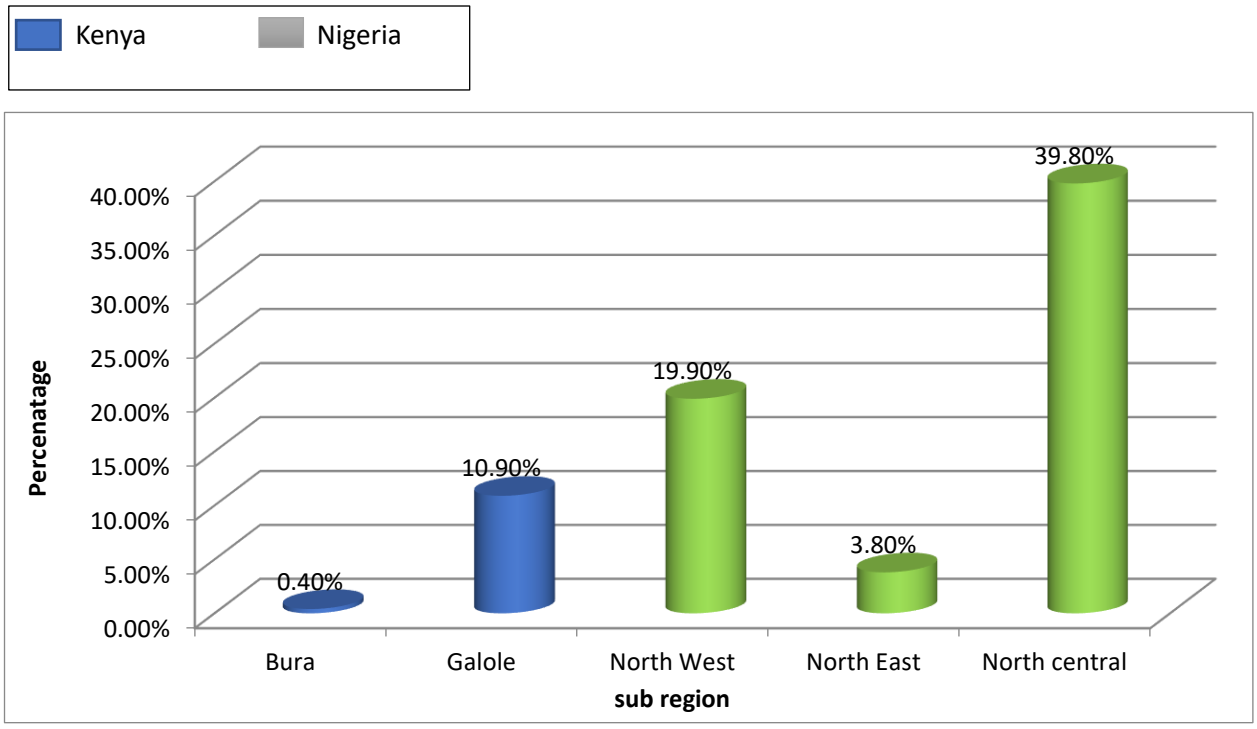

Figure 5.3: Percentage of Respondents in the Subregions of Sampled Countries

In Kenya 18.0% of the respondents were Christians and 16.9% were Muslims, while in Nigeria, 70.1% of the respondents were Christians and 29.9% were Muslims. Based on the educational qualifications of the respondents in Kenya, 2.2% had secondary education as the highest educational qualification, 16.9% had A level, 61.8% were degree holders, 12.4% had studied up to postgraduate level and 4.5% had other forms of education that were not listed in the instrument. A similar pattern of results was obtained in Nigeria, 0.6% had only primary education, 2.3% studied up to secondary school, 1.7% had A level or other forms of professional training, 48% were degree holders and 46.9% of the respondents had studied up to postgraduate level. **Figure 5.4** shows the comparison of the education level between Kenya and Nigeria.

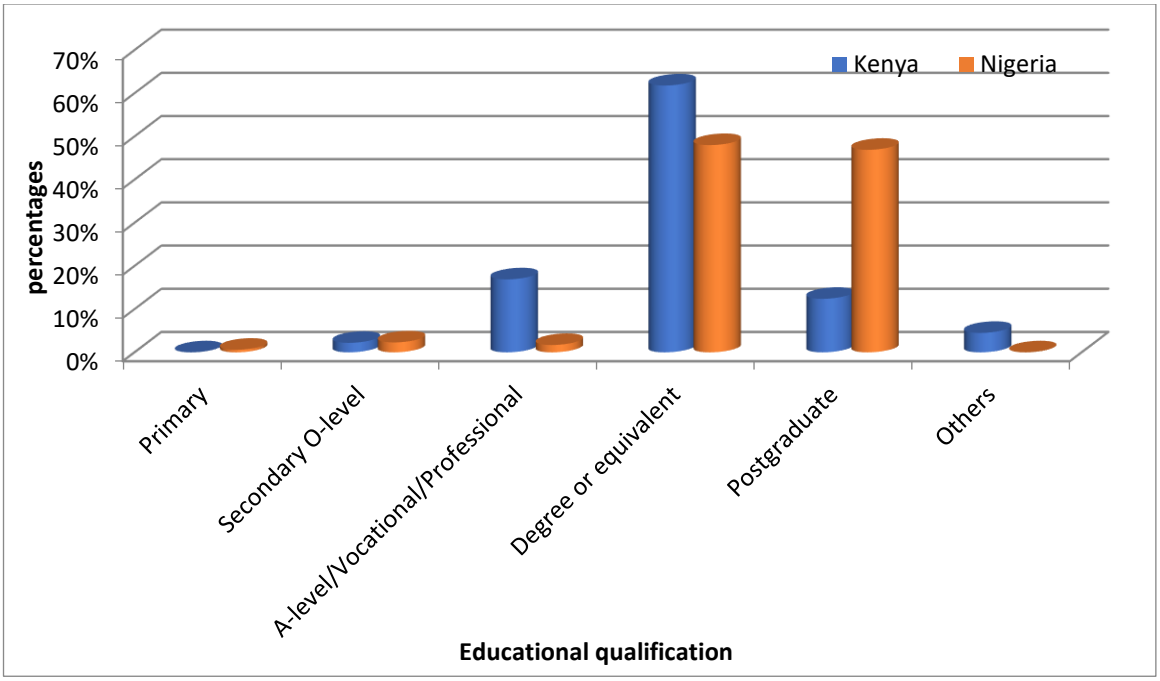

Figure 5.4: Comparison of the Education Level between Kenya and Nigeria

Figure 5.4. shows that in Kenya a higher percentage of the respondents had A level and Degree than those in Nigeria, while Nigeria had more respondents who had postgraduate certificates.

Based on their occupation, 55.1% of the respondents in Kenya were civil or public servants, 42.7% were environmentalists or NGO staff and 1.1% were involved in other forms of occupation. In Nigeria, 82.5% were civil servants, 15.8% were environmentalists or NGO staff and 1.1% had other forms of occupation.

Also, based on their current location, 2.2% of the respondents had resided in Nairobi, 85.4% in Hola, 5.6% in Tana River County, and 1.1% in Chewani; 15.3% had resided in Makurdi, 11.3% in Sokoto, 19.8% in Kaduna, 40.7% in Abuja and 11.9% reside in Jos. On how long the respondents had lived in their various locations, **Table 5.1**. also shows that in Kenya, 44.9% had lived in their present location for less than 10 years, 31.5% had lived between 11 to 20 years, 13.5% between 21 to 30 years, 5.6% between 31 and 40 years, while1.1% had lived in their current location for not less than 49 years. In Nigeria, 19.8% had resided in the current location for less than or about 10 years, 37.3% for about 11 to 20 years, 31.3% for about 21 to 30 years, 6.6% had resided in their various locations for about 31 to 40 years, 2.8% had resided in their current location for about 41 to 50 years and the remaining 0.6% had resided in their current location for more than 50 years. **Figure 5.5**. shows the comparison of how long respondents had lived in their current location in Kenya and Nigeria.

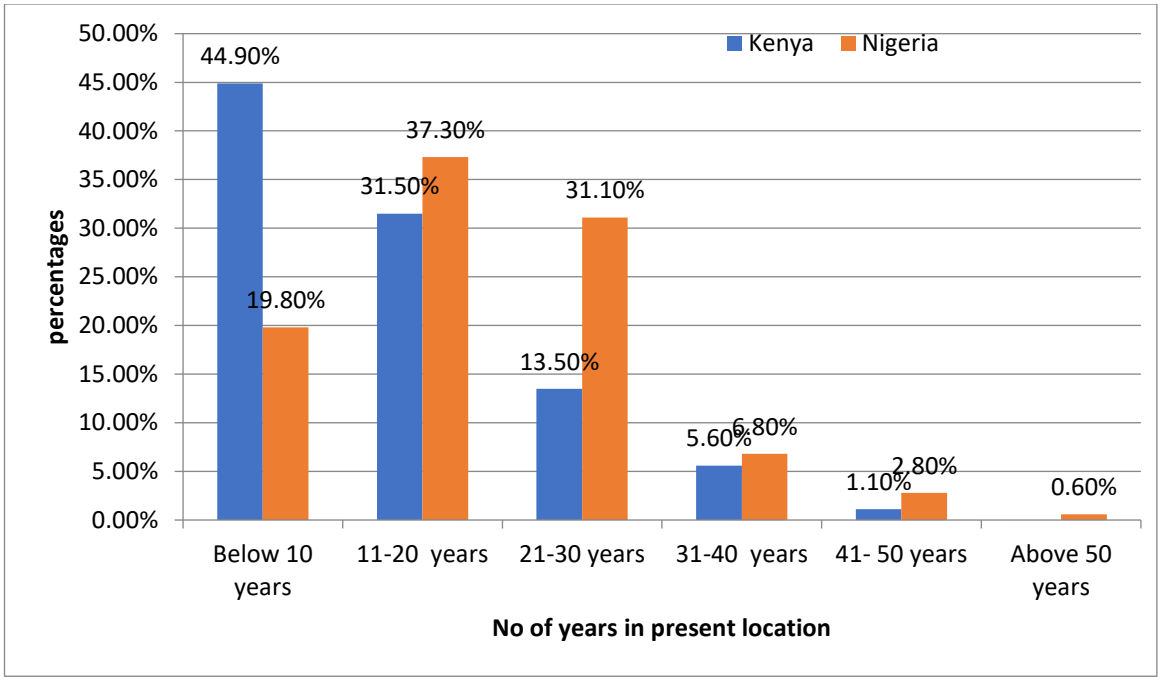

Figure 5.5: Percentage of Respondents' Number of Years in Current Location.

Figure 5.5. shows that there were more Kenyans who had lived for less than 10 years in their current location of residence than those in Nigeria. However, for those who have lived up to 30 years and above in their current locations, we have more Nigerians. In essence, Nigerians tend to stay longer in a particular location than Kenyans.

5.3. SET B QUESTIONNAIRE DEMOGRAPHIC PROFILE

Table 5.2: Socio-Demographic Profile of Respondents for Set B

Category	Subcategory	KENYA		NIGERIA		TOTAL	
		N	%	N	%	N	%
Gender	Male	123	56.4%	357	84.0%	480	74.7%
	Female	93	42.7%	65	15.3%	158	24.6%
Age	19-28 years	73	33.5%	20	4.7%	93	14.5%
	29-38 years	54	24.8%	155	36.5%	209	32.5%
	39-48 years	55	25.2%	118	27.8%	173	26.9%
	49-58 years	18	8.3%	78	18.4%	96	14.9%
	59-68 years	9	4.1%	39	9.2%	48	7.5%
	69-78 years	5	2.3%	10	2.4%	15	2.3%
	79-88years	2	0.9%	1	.2%	3	0.5%
	Above 88years	0	0	1	.2%	1	0.2%
Sub county/geopolitical zones	Bura/Northwest	4	1.8%	208	48.9	212	33.0%
	Galole/Northeast	214	98.2%	5	1.2	219	34.1%
	Garsen/North central	0	0%	208	48.9	208	32.3%
Religious Affiliation	Christianity	23	10.6%	162	38.1	185	28.8%
	Islam	193	88.5%	253	59.5	446	69.4%
	Traditional			7	1.6	8	1.2%

Educational Qualification	No formal Education	46	21.1%	23	5.4%	69	10.7%
	Primary	79	36.2	113	26.6%	192	29.9%
	Secondary O-level	67	30.7	146	34.4%	213	33.1%
	A-level/Vocational/Professional	16	7.3	54	12.7%	70	10.9%
	Degree or equivalent	8	3.7	78	18.4%	86	13.4%
	Postgraduate			7	1.6%	7	1.1%
	Others			2	.5%	2	0.3%
Occupation	Community Leader	8	3.7	9	2.1	17	2.6%
	Crop Farming	85	39.0	178	41.9	263	40.9%
	Nomadic Herding	92	42.2	163	38.4	255	39.7%
	Religious leader	4	1.8	43	10.1	47	7.3%
	Security agent	2	.9			2	0.3%
	Other	14	6.4	29	6.8	43	6.7%
Current Location	Nairobi/Makurdi	0	0	59	13.9	59	9.2%
	Hola/Sokoto	8	3.7	161	37.9	169	26.3%
	Tana River Count /Kaduna	1	.5	102	24.0	103	16.0%
	Chewani/Abuja	14	6.4			14	2.2%
	Kalaule/Jos	1	.5	66	15.5	67	10.4%
	Bononi	18	8.3	0	0	18	2.8%
	Galamani	20	9.2	0	0	20	3.1%
	Wachakone	25	11.5	0	0	25	3.9%
	Matanya	36	16.5	0	0	36	5.6%
	Bula Salama	11	5.0	0	0	11	1.7%
	Rebai	45	20.6	0	0	45	7.0%
	Umoja	19	8.7	0	0	19	3.0%
	Bahati	6	2.8	0	0	6	0.9%
No. of year respondents have been living in current location	Below 10 years	25	11.5%	25	5.9%	50	7.8%
	11-20 years	65	29.8%	158	37.2%	223	34.7%
	21-30 years	76	34.9%	120	28.2%	196	30.5%
	31-40 years	29	13.3%	48	11.3%	77	12.0%
	41- 50 years	13	6.0%	49	11.5%	62	9.6%
	Above 50 years	6	2.8%	16	3.8%	22	3.4%

Table 5.2 shows the socio-demographic profile of the respondents to the SET B instrument used for this study. Based on gender, 123 (56.4%) of the respondents in Kenya were males while 93 of them representing 42.7% were females. In Nigeria, 84% were male and 15.3% were female respondents. In all, there is a total of 74.7% of male respondents and 24.6% of female respondents. The result is presented graphically in **Figure 5.6.**

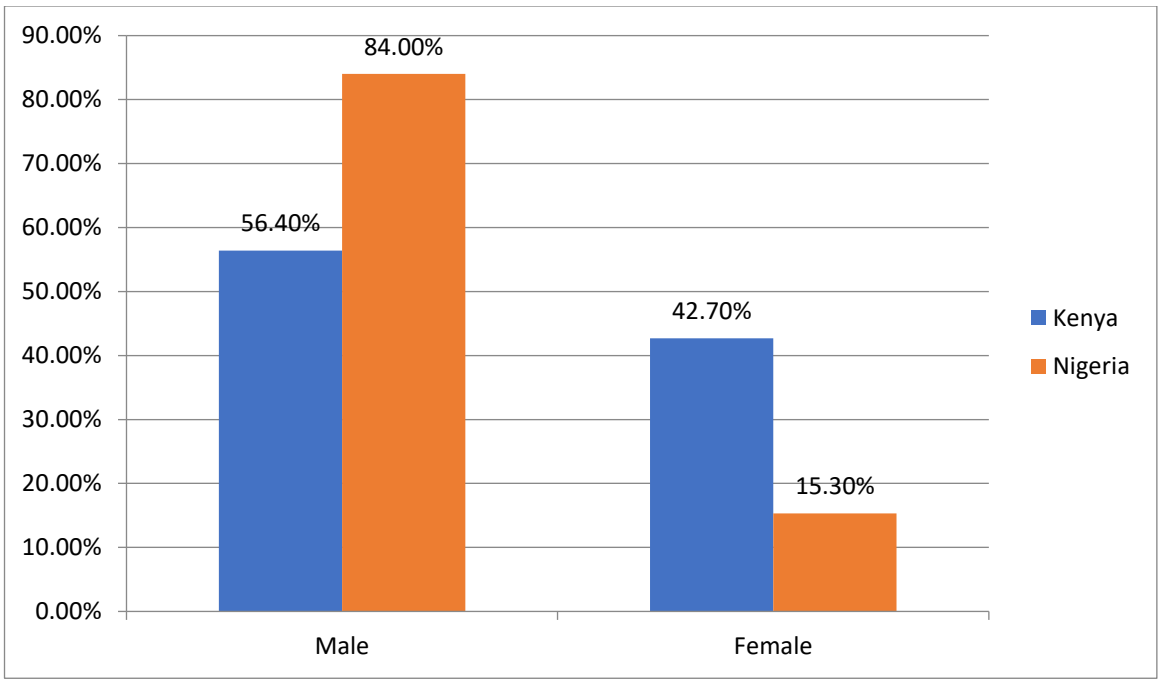

Figure 5.6: Gender of the Respondents per Country.

Figure 5.6. shows that Nigeria had more male respondents than Kenya, while for females, Kenya had a higher number of respondents than Nigeria.

The Age range of the respondents was between 19 and 88 years. In Kenya, 33.5% of the respondents were between the ages of 19 and 28 years, 24.8% were between 29 and 38 years; 25.2% were between 29 and 48 years, 8.3% were between 49 and 58 years; 4.1% were between the ages of 59 and 68 years; 2.3% of the respondents were between the ages of 69 and 78 years and the remaining 0.9% were between the ages of 79 and 88 years of ages. In Nigeria, only 4.7% of the respondents were between the ages of 19 and 28 years, 36.5% were between the ages of 29 and 38 years; 27.8% between 39 and 48 years; 18.4% were between the ages of 49 and 58 years; 9.2% were between 59 and 68 years, 2.4% of the respondents were between the ages of 69 and 78 years, 0.2% were between the ages of 79 and 89 years as well as above 88 years. The result is presented graphically in **Figure 5.7.**

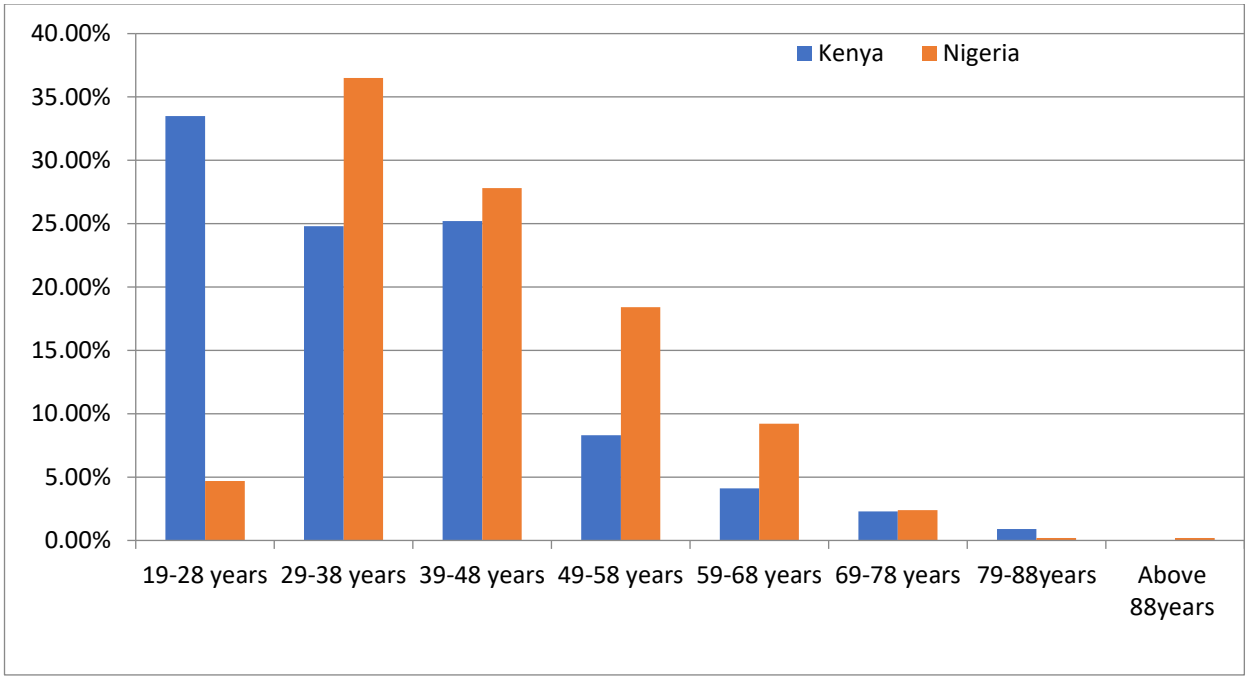

Figure 5.7: Age Range of Respondents

Figure 5.7. shows that Kenya had a higher proportion of young respondents between the ages of 19 and 28 years, while Nigeria had a higher proportion of older respondents from 29 years and above.

Table 5.2. also shows that only 1.8% indicated that they were from the Bura sub-county in Kenya while 98.2% indicated that they were from the Galole sub-county. In Nigeria, 48.9% resided in the North West geopolitical zone, 1.2% in the North East region, and 48.9% in the North Central geopolitical zone. In Kenya 10.6% of the respondents were Christians and 88.5% were Muslims, while in Nigeria, 38.1% of the respondents were Christians 59.5% were Muslims and 1.6% were traditionalists. Based on the educational qualifications of the respondents in Kenya, 21.1% had no formal education, 36.2% had primary education, 30.7% had secondary education as their highest educational qualification, 7.3% had A level or vocational studies or other forms of professional certificates, only 3.7% of the respondents in Kenya were degree holders. In Nigeria, 5.4% of the respondents did not have any form of formal education; 26.6% had only primary education, 34.4% studied up to secondary school, 12.7% had A level or other forms of professional training, 18.4% were degree holders and 1.6% of the respondents have studied up to postgraduate level and 0.5% claimed that they had other forms of education. **Figure 5.8.** shows the comparison of the education level between Kenya and Nigeria.

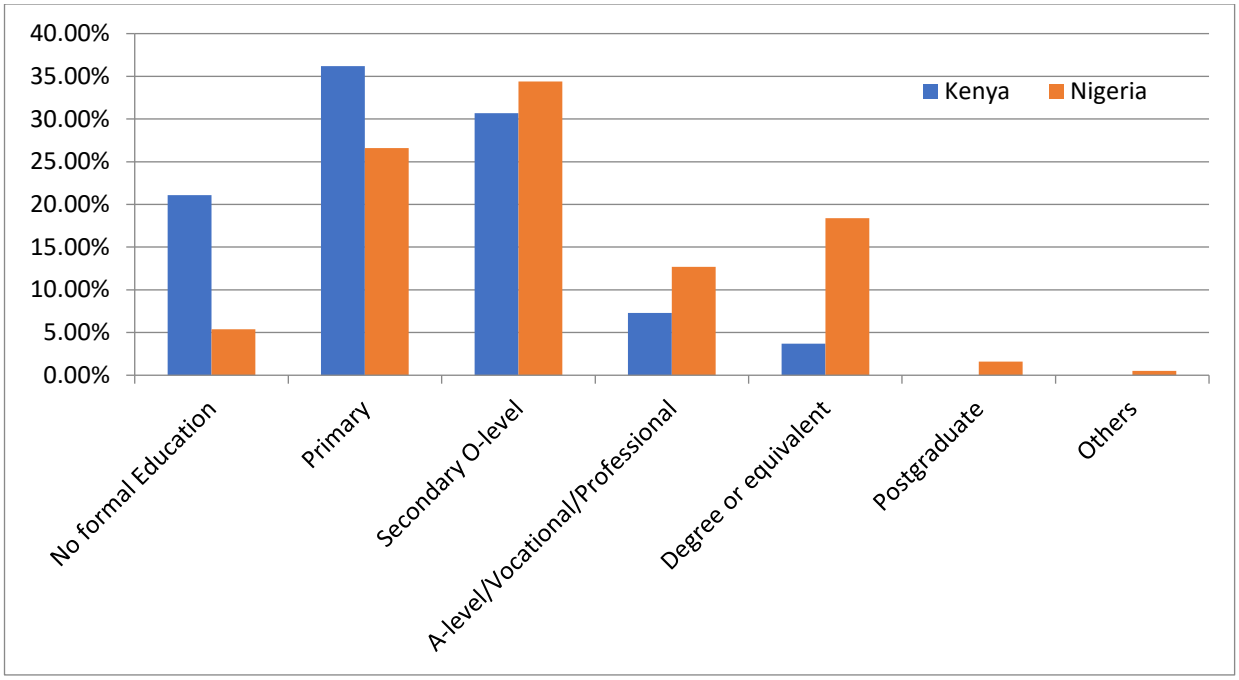

Figure 5.8: Comparison of the Education Level between Kenya and Nigeria

Figure 5.8. shows that Kenya had a higher percentage of respondents with primary education, while Nigeria had its highest percentage of respondents with secondary education.

Based on their occupation, in Kenya, 3.7% of the respondents claimed to be community leaders, 39% were crop farmers, 42.2% were herders, 1.8% were religious leaders, 0.9% were security agents and the remaining 6.45% were involved in other forms of occupation. In Nigeria, 2.1% were community leaders, 41.9% were crop farmers, 38.4% were herders, 10.1% were religious leaders and 6.8% were doing other occupations not listed in the research instrument. Based on their current location, the respondents in Kenya were drawn from 13 different locations in the country while in Nigeria,13.9% resided in Makurdi, 37.9% in Sokoto, 24% in Kaduna, 40.7% and 15.5% in Jos.

On how long the respondents had lived in their various locations, **Table 5.2.** shows that in Kenya, 11.5% had lived in their present location for less than 10 years, 29.8% for 11 to 20 years, 34.9% between 21 to 30 years, 13.3% between 31 and 40 years, while 6% had lived in their current location for not less than 49 years and 2.8% for over 50 years. In Nigeria, 5.9% had resided in their current location for less than or about 10 years, 37.2% for 11 to 20 years, 28.2% for 21 to 30 years, 11.3% for 31 to 40 years, 11.5% for 41 to 50 years and the remaining 3.8% for more than 50 years. **Figure 5.9.** shows the comparison of how long respondents have lived in their current location in Kenya and Nigeria.

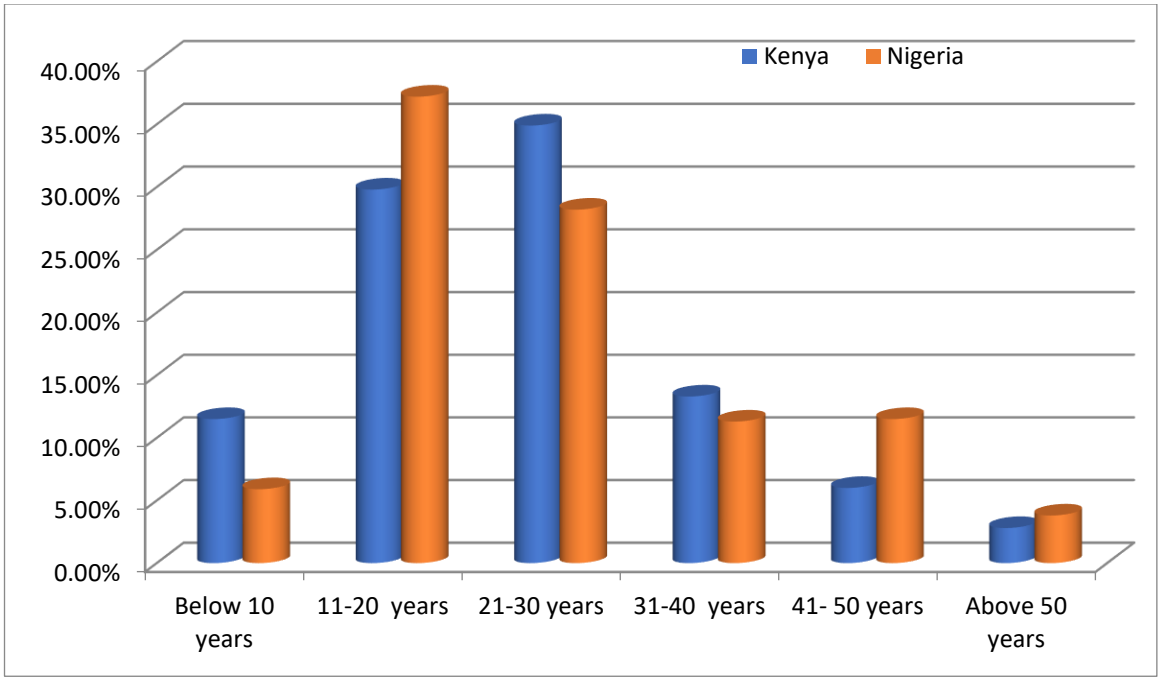

Figure 5.9: **Percentage of Respondents' Number of Years in Current Location.**

Figure 5.9. shows that there were more Kenyans that had resided in their current location for between 21 and 30 years, however, in Nigeria, a higher percentage had lived between 11 to 20 years in the present location of residence.

5.4. Key Informants' Status/Biodata

Table 5.3: Key Informants' Status/Biodata

Category	Subcategory	KENYA		NIGERIA		TOTAL	
		N	%	N	%	N	%
Occupation	Civil/Public Servant/NGO Staffer	22	42.3%	23	39.7%	45	82%
	Academia	03	5.7%	07	12.1%	10	17.8%
	Farmers/AFAN/KNFF	15	28.8%	15	25.9%	30	54.7%
	Herders/MACBAN/NLBAK	12	23.8%	13	22.4%	25	46.2%

The above table depicts the status of the interviewees from Kenya and Nigeria. Based on their occupation, 42.3% of the total interviewees in Kenya were civil/public servants or NGO Staffers/environmentalists, 5.7% were academia, 28.8% were farmers and 23.8% were herders. Similarly, in Nigeria, 39.7% of the total interviewees were civil/public servants or NGO Staffers, 17.8% were academic, 54.7% were farmers and 46.2% were herders. The result is presented graphically in **Figure 5.10.** below.

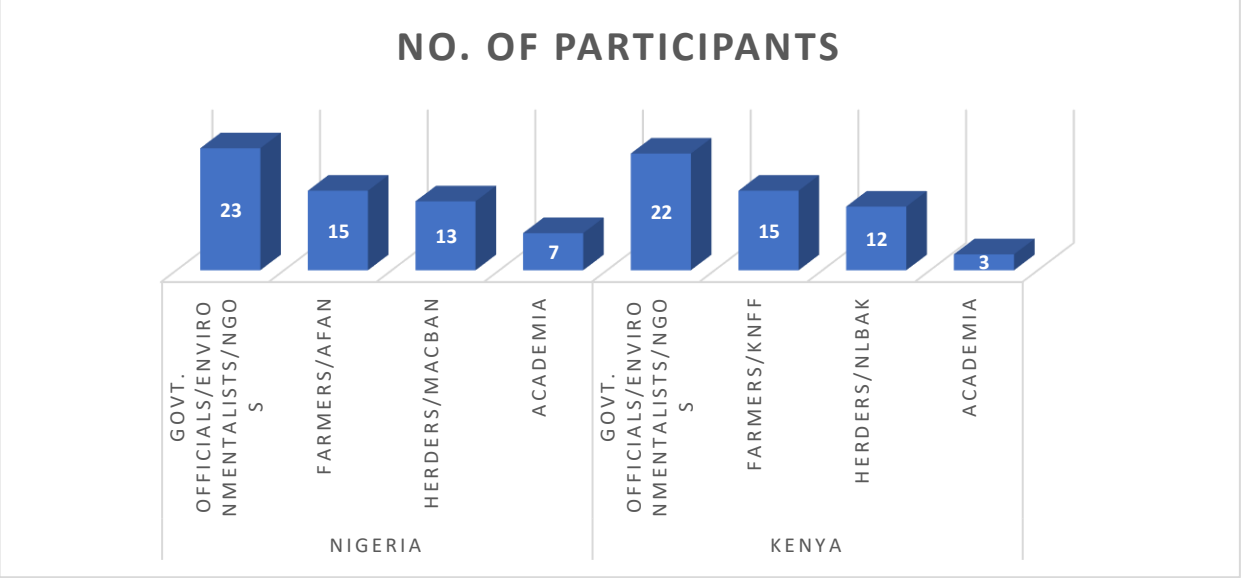

Figure 5.10: Number of Participants

5.5. Answering the Quantitative Research Questions and Testing the Hypotheses

5.5.1. The Core Research Question:

To what extent does climate change effect features in the geopolitics of peace and security in West Africa and East Africa?

To answer the core research questions, a Pearson Product Moment Correlation (PPMC) was conducted. The relevance of PPMC lies in its ability to quantify, summarize, and explore relationships between variables, making it a fundamental tool in statistical analysis and research across various domains. So, the result is presented in **Table 5.4**

Table 5.4: Descriptive Statistics and PPMC Values between CIPS and GCCPS in East Africa and West Africa

Location	Item	Mean	SD	R-value	Effect size
Kenya	GCCPS	20.4382	2.34499	0.500	0.25 (25%)
	CIPS	36.4494	4.31175		
Nigeria	GCCPS	19.5085	3.57885	0.592	0.351 (35.1%)
	CIPS	34.2486	6.32144		
Both Countries	GCCPS	19.8195	3.24435	0.585	0.342 (34.2%)
	CIPS	34.9850	5.81343		

Table 5.4. shows that in Kenya, there was a positive correlation between the effects of climate change and the geopolitics of peace and security (r = 0.500). In Nigeria, a similar result was recorded as the effect of climate change featured a positive influence on the geopolitics of peace and security (r = 0.592). With both countries combined, it was obvious that in East and West Africa, climate change had

a significant effect on the geopolitics of peace and security (r = 0.585). Climate change had an effect of 25% in Kenya, 35.1% in Nigeria, and 34.2% in both countries.

5.5.2. Sub-question 1

Specifically, what is the correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River County in Kenya?

Table 5.5: Descriptive Statistics and PPMC Values between OM and CCRC in East Africa and West Africa

Location	Item	Mean	SD	R-value
Kenya	Climate Change ar Migration	45.64	11.45	0.551
	Incessant Conflict	28.90	8.15	
Nigeria	Climate Change ar Migration	48.04	8.94	0.508
	Incessant Conflict	31.95	4.98	
Both Countries	Climate Change ar Migration	47.23	6.39	0.535
	Incessant Conflict	30.92	9.91	

Table 5.5. shows that in Kenya there is a positive correlation between the effects of climate change in Kenya's Orma community and the farmer-herder conflicts in the Tana River delta area (r = 0.551). In Nigeria also there is a significant correlation between the effects of climate change in Nigeria's core North and the farmer-herder conflicts in the Middle Belt region (r = 0.508). In both countries, the migration of herders as a result of climate change is positively correlated with incessant conflict in other areas of the countries (r = 0.535).

5.5.3. Research Hypotheses 1

H_o: There is no significant effect of climate change on the geopolitics of peace and security in West Africa and East Africa.

H_1: There is a significant effect of climate change on the geopolitics of peace and security in West Africa and East Africa.

Table 5.6: Regression Analysis on the Effect of Climate Change on the Geopolitics of Peace and Security in East Africa.

Independer Variable	dependent Variable	F	df	R	T	b	Beta (β)	Std. Erro r	ρ
Climate change	Peace ar security	28.93	1, 87	0.50	5.38	0.27	0.50	0.05	0.0

$R^2 = 0.250$; Adjusted $R^2 = 0.241$

Table 5.6. shows that in East Africa, climate change had a significant effect on peace and security (R = 0.500, p = 0.00). Climate change explained a variance of 0.25 (25%) in peace and security in Kenya. The Adjusted R^2 values (which provide a better estimate of the true population values) indicate that in Kenya i.e., East Africa, climate change effects account for 24.1% of the state of peace and security. The F Value indicates that the linear regression model is statistically significant [F (1, 87) = 28.93; ρ = 0.00]. Based on this, the null hypothesis 1 as regards East Africa is rejected and the alternative hypothesis which states that there is a significant effect of climate change on the geopolitics of peace and security in East Africa is accepted.

Table 5.7: Regression Analysis on the Effect of Climate Change on the Geopolitics of Peace and Security in West Africa

Independer Variable	Dependent Variable	F	df	R	t	b	Beta (β)	Std. Erro	ρ
Climate change	Peace ar security	94.60	1, 175	0.592	9.73	0.33	0.59	0.034	0.0(

$R^2 = 0.351$; Adjusted $R^2 = 0.347$

Table 5.7. shows that in West Africa, climate change had a significant effect on peace and security (R = 0.592, p = 0.00). Climate change explained a variance of 0.351 (35.1%) in peace and security in Nigeria. The Adjusted R^2 value (which provides a better estimate of the true population values) indicates that in Nigeria, climate change accounts for 34.7% of the state of peace and security. The F Value indicates that the linear regression model is statistically significant [F (1, 175) = 94.60; ρ = 0.00]. Based on this, the null hypothesis 1 as regards West Africa is rejected and the alternative hypothesis 1 which states that there is a significant effect of climate change on geopolitics of peace and security in West Africa is accepted.

Table 5.8: Regression Analysis on the Effect of Climate Change on Geopolitics of Peace and Security in West Africa and East Africa.

Independer Variable	Dependent Variable	F	df	R	t	b	Beta (β)	Std. Erro	ρ
Climate change	Peace ar security	137.41	1, 26	0.585	11.7	0.32	0.58	0.028	0.0(

$R^2 = 0.342$; Adjusted $R^2 = 0.340$

Table 5.8. shows that in East and West Africa, climate change had a significant effect on peace and security (R = 0.585, p = 0.00). Climate change in East and West Africa explained a variance of 0.342 (34.2%) in geopolitics of peace and security in East and West Africa. The Adjusted R^2 value indicates that climate change accounts for 34% of the state of peace and security in East and West Africa. The F Value indicates that the linear regression model is statistically significant [F (1, 246) = 137.41; ρ = 0.00]. Based on this, the null hypothesis 1 is rejected and the alternative hypothesis 1 which states that there is a significant effect of climate change on the geopolitics of peace and security in East Africa and West Africa is accepted.

5.5.4. Research Hypothesis 2

H_o: There is no significant correlation between climate change and farmer-herder conflicts in the Tana River Delta area in Kenya.

H_1: There is a significant correlation between climate change and farmer-herder conflicts in the Tana River Delta area in Kenya

Table 5.9: Regression Analysis on the Effect of Climate Change on Farmer-Herder Conflicts in the Tana River Delta Area

Independer Variable	Dependent Variable	F	df	R	t	b	Beta (β)	Std. Erro	ρ
Climate Change ar Migration	Incessant Conflict	94.12	1, 21	0.551	9.70	0.39	0.55	0.040	0.0(

$R^2 = 0.303$; Adjusted $R^2 = 0.300$

Table 5.9. shows that in East Africa, the effect of climate change on the Orma community in Kenya had a significant effect on farmer-herder conflicts in the Tana River Delta area (R = 0.551, p = 0.00). The effect of climate change on the community explained a proportion of 30.3% of the incessant conflict in Tana River County. The Adjusted R^2 values indicate that in Kenya, climate change accounts for 24.1% of the farmer-pastoralist conflicts in the Tana River Delta area. The F Value indicates that the linear regression model is statistically significant [F (1, 216) = 94.12; ρ = 0.00], therefore the null

hypothesis 2 is rejected while the alternative hypothesis which states that there is a significant correlation between climate change and farmer-herder conflicts in the Tana River Delta area in Kenya is accepted.

Table 5.10: Regression Analysis on the Effect of Climate Change on the Farmer-Herder Conflicts in the Middle Belt Region

Independer Variable	Dependent Variable	F	df	R	t	b	Beta (β)	Std. Erro	ρ
Climate Change ar Migration	Incessant Conflict	147.30	1,423	0.508	12.17	0.28	0.50	0.023	0.00

$R^2 = 0.258$; Adjusted $R^2 = 0.257$

Table 5.10 shows that in West Africa, the effect of climate change in Nigeria's core North had a significant impact on the farmer-herder conflicts in the Middle Belt region (R = 0.508, p = 0.00). The effect of climate change in Nigeria's core North explained a proportion of 25.8% of farmer-herder conflicts in the Middle Belt region. The Adjusted R^2 values indicate that in West Africa, the effect of climate change in Nigeria's core North accounts for 25.7% of the farmer-herder conflicts in the Middle Belt region. The *F* Value indicates that the linear regression model is statistically significant [F (1, 423) = 147.30; ρ = 0.00], to this end, the null hypothesis 2 is rejected, and the alternative hypothesis which states that there is a significant correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria is accepted.

Table 5.11: Regression Analysis on the Effect of Climate Change on Farmer-Herder Conflicts in the Middle Belt Region of Nigeria and Tana River Delta Area of Kenya

Independer Variable	Dependent Variable	F	df	R	t	b	Beta (β)	Std. Erro	ρ
Climate Change ar Migration	Incessant Conflict	257.43	1,641	0.53	16.04	0.34	0.53	0.022	0.00

$R^2 = 0.287$; Adjusted $R^2 = 0.285$

Table 5.11. shows that in Nigeria and Kenya, climate-induced migration had a significant effect on the farmer-herder conflicts in the Middle Belt region and Tana River delta area respectively (R = 0.535, p = 0.00). Climate-induced migration explained a proportion of 28.7% of farmer-herder conflicts in these studied regions. The Adjusted R^2 values indicate that in the Middle Belt region and Tana River delta area, climate migration accounts for 28.5% of the farmer-herder conflicts. The *F* Value indicates that the linear regression model is statistically significant [F (1, 641) = 257.43; ρ = 0.00], thus the null hypothesis 2 is rejected, and the alternative hypothesis which states that: there is a significant

correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River Delta area in Kenya is accepted.

5.6. Answering the Qualitative Research Questions

5.6.1. SUB-QUESTION II:

What is the level of awareness about the effects of climate change among crop farmers, herders, and policymakers in the Northern region of Nigeria and Tana River County of Kenya, and how does the knowledge about the effects of climate change play a role in the different stakeholders' approach to conflict?

This research question is double-barrelled. The research question would be split into two: the first part centered on *What is the level of awareness about the effects of climate change among crop farmers, herders, and policymakers in the Northern region of Nigeria and Tana River County of Kenya?* The second part focused on *how the knowledge about the effects of climate change plays a role in the different stakeholders' approach to conflict.* We start with the first part.

5.6.1.0. Sub-Question II – Part I: *What is the level of awareness about the effects of climate change among crop farmers, herders, and policymakers in the Northern region of Nigeria and Tana River County of Kenya?*

In Nigeria, responses generated on the awareness of respondents about the effect of climate change among the stakeholders produced two subthemes, namely, awareness about understanding of climate change, and awareness about the effect of climate change.

Concerning the responses generated on the first theme from the farmers and herders during the interview sessions, most of the respondents acknowledged that they had adequate knowledge about the meaning of climate change. However, some expressed the view that there was no orientation on climate change.

- ***Awareness about the meaning of climate change*** - As expressed by one of the respondents, climate change "*…is a weather condition of a particular area, that affects that area whether positive or negative*" (Farmer 1 /Kaduna/ Nigeria). Another respondent, who had a B.Sc. Ed in Agriculture explained that "*climate change is a natural changes that occur may be timely or seasonal and it includes elements of weather like temperature, relative humidity,*

sunlight e.t.c (Farmer 3/Sokoto/Nigeria). One of the herders explained that "*climate change is something that is caused by change of weather which have resulted in deficiencies in farms, forest, rivers and many more*" (Herder 3/Sokoto/Nigeria).

Summarily, some of the interviewees had an idea about the meaning of climate change, although few of the respondents declined to have knowledge about climate change.

- ***Lack of awareness orientation*** - As generated by some of the respondents, there was no awareness programme about climate change in their area. One of the respondents categorically expressed that "…*in the rural area where I come from I am sure 95% of the people will tell you they don't know, no awareness, they don't know what climate change is*" (Farmer 1/Plateau/Nigeria). One of the herders also asserted that "*there are no awareness campaigns*" (Herder 3/Benue/Nigeria). Other responses also supported his assertion as revealed in the excerpts below:

  I don't think we have that full knowledge because if there is that full knowledge by stakeholders' necessary steps should have been taken so that necessary things or plans should have been put in place but because it varies so also our understanding varies (Farmer 2/Plateau/Nigeria). *To the best of my knowledge, there is no awareness campaign carried out in rural communities* (Farmer 2/Sokoto/Nigeria). *There is not much awareness on the side of the stakeholders so they handle it negatively* (Farmer 3/Benue/Nigeria). *To be honest, no, it hasn't been carried out because people are still lacking that knowledge that is the truth* (Farmer 2/Plateau/Nigeria). *Sincerely speaking awareness campaigns carried out in rural communities are not enough government needs to redouble its efforts* (Herder 5/Sokoto/Nigeria).

Both the farmers and herders expressed that there is a lack of awareness orientation on climate change in the regions. However, one of the respondents mentioned that the "*government and all relevant stakeholders including health personnel are trying their best in orientating people on the effect of climate change* (Herder 1/Sokoto/Nigeria).

More so, concerning the responses generated on the second theme, the respondents expressed their various perceptions about the influence of climate change on their health, income, and the community.

1. ***Effect on health*** - In the opinion of the respondents, climate change has brought about health damage to both the farmers and herders. One of the respondents from Benue affirmed that "*climate change has caused a lot of health damage*" (Farmer 3/Benue/Nigeria). Another respondent stated that "*human livelihood is affected in the*

negative form and if you don't eat well it affects your health" (Farmer 2/Kaduna/Nigeria).

2. ***Effect on income*** - Another effect of climate change as expressed by the respondents is that it causes low production which will consequently lead to low income. One of the crop farmers explained that "*basically I would say it has affected farmers largely negatively, because talking about income or output on farm produce, it affected them negatively because of the timing of their seasons" (*Farmer 2/Plateau/Nigeria). Another respondent also asserted that climate change "…*has affected the rate of production, livestock, and the farmers' output is not like before due to the weather condition we are facing in the last few years*" *(*Farmer 1/Kaduna/Nigeria). Other respondents also affirmed the effect of climate change on their income as revealed in the following transcripts: *there is a decline in agricultural production … Climate change has a huge effect on human livelihood because it has caused a decline in agricultural production (*Farmer 1/Kaduna/Nigeria). *when there is a low amount of rainfall there is susceptibility to food shortage (*Farmer 4/Sokoto/Nigeria).

3. ***Effect on society*** - The respondents also pointed out that climate change also influences society at large. According to the respondents, climate change can bring about, seasonal changes, an increase in deforestation, herders' migration, security threats, and farmer-herder clashes.

   (1) ***Seasonal changes*** - Respondents also expressed that climate change causes seasonal changes such as a reduction in rainfall. According to a respondent, "*climate change causes deficiencies in terms of rainfall we are receiving (*Farmer 2/Sokoto/Nigeria). Another respondent affirmed that "*because year in year out the amount of rainfall we are receiving is always decreasing… whenever there is low rainfall there must be a drought plant will be dry in which animals cannot eat (*Farmer 3/Sokoto/Nigeria). The expression is similar to a respondent who asserted that:

   > *certainly, there are changes because in the past people knew that when it is May the farming season starts but recently, seasons have not started by May though it does fluctuate in May and, June but this time season starts in April and so it has affected farmers (*Farmer 2/Plateau/Nigeria).

(2) ***Increased desertification*** - Respondents also complained that climate change affects the vegetation. There can be an "*increase in desertification because of decline in rainfall*" *(*Farmer 2/Kaduna/Nigeria). Another respondent added that "*the environment is affected; you find out that there are draughts, deforestation, there are no more shades" (*Farmer 1/Plateau/Nigeria). "*Climate change causes the loss of natural resources, especially as a result of deforestation, soil erosion, and desert encroachment" (*Farmer 4/Sokoto/Nigeria).

(3) ***Herders/Farmers' migration*** - One of the effects of climate change as identified by the respondents is that herders are forced to migrate from their ancestral land to another place in search of wetlands. In the words of one of the farmers, "*Due to the climate change, they are forced to leave the environment they found themselves to the new environment and because they are not willing to cooperate with the people residing in the environment they come to meet and so there are clashes" (*Farmer 2/Plateau/Nigeria). Another respondent explained that:

> *because climate change affects the availability of water, and green plants which serve as food for herders for the herds, it also means that their cattle over time will be lean because the cattle are not well nourished and because they are lean…Climate change leads to migration, the northwest and the northeast as we have said are the worst hit, and in the course of the years once the northwest and northeast become dried, you find herders in tens of thousands moving down south with their cattle (*Farmer 1/Plateau/Nigeria).

One of the respondents from Kaduna expressed the view that climate change leads to "*…migration, the truth is that it is the major problems that lead to conflict in the country, because herders will be the ones to change the environment (*Farmer 1/Kaduna/Nigeria). Other respondents also affirmed similar views about herders' migration as follows: *Climate change may not lead to violent conflicts; it does not bring conflict per se but the individual moving because of the effect of climate change causes conflict (*Farmer 2/Kaduna/Nigeria). *Climate change causes migration because Fulani herdsmen have to move from one place to another, especially during the dry season when there is nothing for them to feed their animals (*Farmer 1/Sokoto/Nigeria). *Climate change leads to a lot*

*of migration, and that is a major problem that can hardly be accepted (*Herder 2/Sokoto/Nigeria)

Another respondent also mentioned that farmers also migrate because of climate change. "*…Due to change of weather, over flooding which sometimes lead to the destruction of farm products, farmers will have to migrate to find another place which is suitable for them to carry out their farming activities" said a respondent from Sokoto" (*Farmer 2/Sokoto/Nigeria). His view was similar to another respondent who said climate change can "*lead to migration, especially when it causes overflooding, soil erosion, and food shortage*".

The correlation between climate change and migration has been firmly established through the rigorous quantitative analysis above. The data reveals a compelling link between environmental factors, such as rising temperatures, extreme weather events, and diminishing resources, and the movement of populations. As the planet undergoes significant ecological shifts, communities are forced to confront the consequences of these changes, often leading to displacement and migration. Hence, the result of this qualitative analysis has further confirmed the facts established during the quantitative analysis.

(4) ***Security threat*** - The issue of insecurity was also linked with climate change by the respondents. It was mentioned as an indirect effect of climate change. The respondents explained that some of the migrated herders caused trouble in their new locations. In the words of a respondent, "*It's a threat to security due to mass migration/movement of herders (*Farmer 1/Benue/Nigeria). Another respondent affirmed that "*It is a threat to security because when herders want to migrate as a result of climate change to another land or area, it leads to security threat because of some herders bad practice and character (*Farmer 1/Kaduna/Nigeria). A respondent from Plateau also expressed that climate change can lead to

> *… threat to security because it brings about heated competition between farmers and herders, like we have seen in most parts of central Nigeria over the years, we have seen that happened in Plateau state, Benue state, parts of Kaduna state and recently we have seen that happened in Zamfara and Sokoto states (*Farmer 1/Plateau/Nigeria).

The responses of these respondents lay credence to the results of the analysis of the core research question where it has been proven that climate change, indeed, has a significant effect on peace and security in West Africa.

(5) ***Farmer-Herder clashes*** - The respondents believed that climate change has been causing clashes between farmers and herders. This is because migrated herders usually intrude into farmland and cause damage to the growing plants. In the words of one of the respondents, "*There is a lot of crises between farmers and Fulani herdsmen due to the activities of climate change*" *(*Farmer 4/Sokoto/Nigeria). A respondent from Benue affirmed that "*there is always a conflict between them (i.e., farmers and herders) because of climate change (*Herder 1/Benue/Nigeria). Another herder from the region affirmed that the "*Farmer/herder relationship doesn't look good at all, they always have a crisis"* (Herder 3/Benue/Nigeria)

A farmer from Plateau likewise explained that climate change.

> *...will bring about a clash, here I am now having my farm, I have tilted the ground, have gotten fertilizers and my plants are growing up, and here is a herder, climate change has made bushes, there is no more water and plants and because animals are moved by green wherever they see green they are attracted there so they see my plants and touched and that becomes a problem (*Farmer 1/Plateau/Nigeria)

Another respondent expressed that:

> *Currently, we are battling with such calamity, the conflict between migrant herders and local farmers led to the loss of many lives and properties, sometimes they used to take over our farmlands in which we could commence any agricultural activity until we paid for ransom (*Farmer 1/Sokoto/Nigeria).

These responses support the results of the sub-research question I and the research hypothesis II as elaborated in the quantitative analysis above.

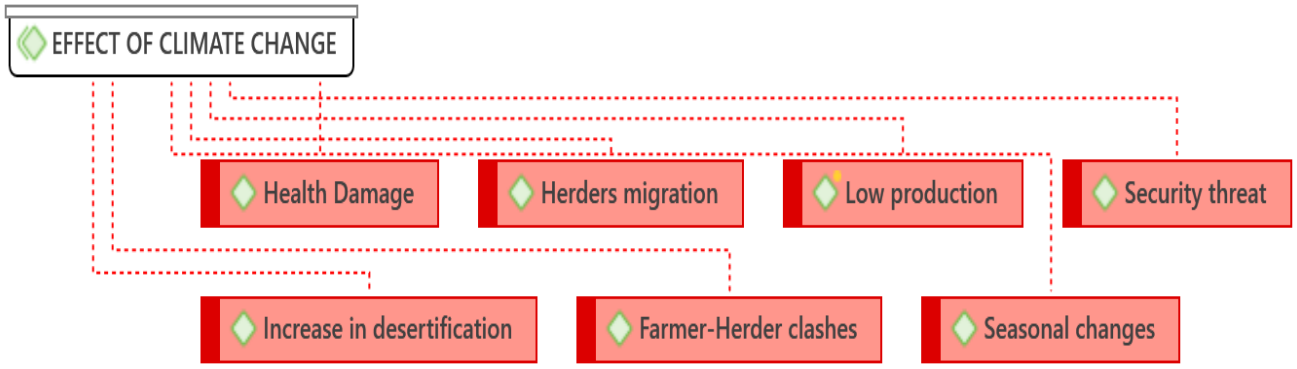

Figure 5.11: Effect of Climate Change on Farmers and Herders in Nigeria.

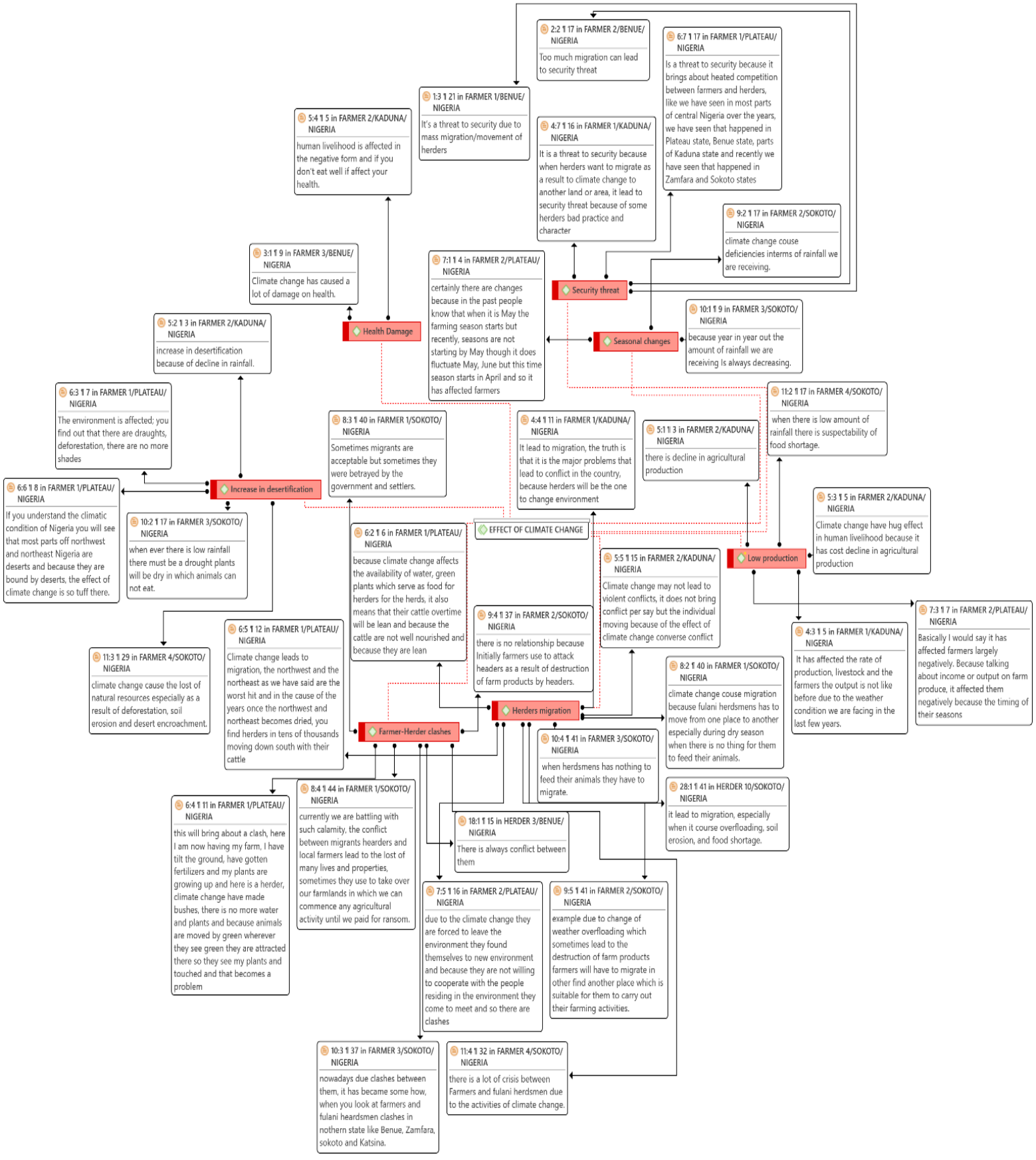

Figure 5.12: Responses Generated on the Effect of Climate Change on Farmers and Herders in Nigeria.

Also, in Kenya, responses generated on the awareness of respondents about the effect of climate change among the stakeholders produced the same subthemes as Nigeria, namely, awareness about understanding climate change, and awareness about the effect of climate change.

Regarding the responses generated on the first theme, data extracted from the farmers and herders during the interview sessions revealed that most of the respondents acknowledged that they had adequate knowledge about the meaning of climate change. However, they further expressed that there was no orientation on climate change in their community. Almost all the respondents acknowledged they have an adequate understanding of climate change. Below are some excerpts generated from the respondents:

> *This is how the change of weather has affected our normal way of life and farming… my area has witnessed some great changes in weather and rain patterns, trees are being cut down, and farms are not producing the way they used to* (Farmer 4/Bohoni/Kenya). *Yes, it usually changes in rain and draught patterns…In my area, I have seen so many changes in wind velocity, short rains, and also high levels of temperatures* (Farmer 3/Ghalamani/Kenya). *It's about long-term shifts in temperature and weather patterns… drought, famine, rainfall, and changes in temperature* (Herder 11/Kenya).
>
> *I have heard about it and in my opinion, this is one of the most important attributes in our daily lives which is not given the attention it deserves, because looking around, our surroundings have changed so much for the past few years… I have noticed the changes in the farms, also as you see, our river has dried up, people are cutting down trees, and rains have become minimal, it's a sad state of affairs* (Herder 6/Kenya).

- ***Climate change awareness orientation*** - Some of the respondents asserted that in their communities, there have been campaigns about climate change for farmers and herders.

  > *Some of the government organizations are teaching us new ways to farm and adjust to the changes we are seeing in our area* (Farmer 4/Bohoni/Kenya). *As the farmers' cooperative, we have been incorporated in such awareness by various institutions…* (Farmer 1/Cooperatives/Kenya). *Yes, some of the NGOs do these campaigns* (Farmer 3/Ghalamani/Kenya). *They have some Community-Based organizations that are teaching us about these climate changes* (Farmer 3/TRC/Kenya). *There are*

campaigns through local radio stations (Herder 4/Kenya). *I feel like the government has tried to use the media to sensitize the people about climate change and some institutions have done their best to reach people* (Herder 8/Kenya).

However, few of the respondents expressed that there was a deficiency in the campaign for climate change. *I can't lie but I have never heard of such a campaign* (Farmer 2/Bohoni/Kenya). *No campaign in rural areas about awareness of climate change and I have never heard of any Climate change campaign* (Herder 2/Kenya). *No campaign in rural areas* (Herder 12/Kenya)

More so, concerning the responses generated on the second theme, the respondents expressed their various perceptions about the influence of climate change on their health, income, and the community in general.

Effect on health - The respondents complained that climate change had a negative effect on the health of the community people. As expressed by one of the respondents, "*Due to the scorching, most of our kids have developed eye problems due to excess light*" (Farmer 2/Bohoni/Kenya). Likewise, another farmer asserted "*As a farmer I can't rely on rains anymore, on health we get severe colds in some of the months of the year…"* (Farmer 3/Ghalamani/Kenya). Another respondent also mentioned that because of climate change their

"health has been jeopardized, [they] can't afford a balanced diet meal (Farmer 4/TRC/Kenya). One of the herders also complained that "*change in the air has caused various respiratory diseases* (Herder 8/Kenya).

Effect on source of livelihood - One major adverse effect of climate change among the farmers and herders as identified by the respondents is the negative effect on their source of livelihood. The majority of the respondents complained that they experienced low production which led to low income and a low standard of living as confirmed from the excerpts below.

As a farmer, my income has been affected because I used to sell my produce but nowadays it's barely enough to feed my family (Farmer 1/Bohoni/Kenya). *This change has affected us mostly on the income side because we used to sell our produce to cater to our day-to-day lives, now we harvest less or none at all*

(Farmer 4/Bohoni/Kenya). *Prolonged droughts affect our farms so much, that we haven't been harvesting like we used to* (Farmer 2/Ghalamani/Kenya). *We are not getting enough produce from our farms, we plant, and our crops end up drying up because there is not enough water and irrigation is expensive* (Farmer 1/TRC/Kenya). *Currently, we have not been able to farm hence we are forced to look for other survival means, so our income has been greatly affected* (Farmer 3/TRC/Kenya). *The farmers have been suffering and struggling financially because they are fully dependent on the rains which have been scarce for the past years* (Farmer 1/Cooperatives/Kenya). *It has negative impacts on the pastoral communities mostly during the dry season killing their source of livelihood which is cattle and animal products like meat and milk* (Herder 3/Kenya). *It had negative effects on the pastoralists mostly on their source of livelihoods which is livestock* (Herder 11/Kenya).

Effect on society **-** Aside effect on individuals, most of the respondents also enumerated the effect of climate change on society generally as buttressed below.

Insufficient rain and scarce resources - Another effect of climate change as experienced by the respondents was insufficient rain which has led to low production. One of the farmers complained "*As a farmer, I can't rely on rains anymore, on health we get severe colds in some of the months of the year*" (Farmer 3/Ghalamani/Kenya). Another farmer also affirmed that as farmers, "*We are not getting enough produce from our farms, we plant and our crops end up drying up because there is not enough water and irrigation is expensive*" (Farmer 1/TRC/Kenya). It was also expressed by one of the herders that climate change caused "*limited or scarce resources like water and arable land of grazing*" (Herder 3/Kenya).

Herders/Farmers' migration - The respondents were of the view that because of climate change, farmers and herders migrate from their locations to other places to seek better land for farming or pasture for their cattle. One of the farmers asserted that climate change "…*causes movement of herders who sometimes graze on our farmers' farms*" (Farmer 2/Cooperatives/Kenya). Other respondents gave similar expressions as revealed in the quotations below.

It does lead to migration, though it brings up tension (Farmer 4/Bohoni/Kenya). *Sometimes it does lead to migration and the host communities are hostile* (Farmer 1/Ghalamani/Kenya). *They migrate to better places; their acceptance depends on the host communities* (Herder 1/Kenya). *Causes migration which along the way one community can offend the other* (Herder 8/Kenya)

Farmer-herder conflict - Respondents further expressed that the migration of farmers and herders does lead to conflicts in the community. According to one of the farmers, "the migrant herders have given the farmers a hard time because they can't manage their vast livestock" (Farmer 1/TRC/Kenya). Another farmer affirmed that "*...the herders always attack us and our farms*" (Farmer 2/Ghalamani/Kenya). Also, the herders affirmed that "*Climate change always leads to rivalry due to scarce resources*" (Herder 2/Kenya). Another herder also expressed a similar view that "*Climate change always leads to rivalry when it has negative impacts*" (Herder 3/Kenya).

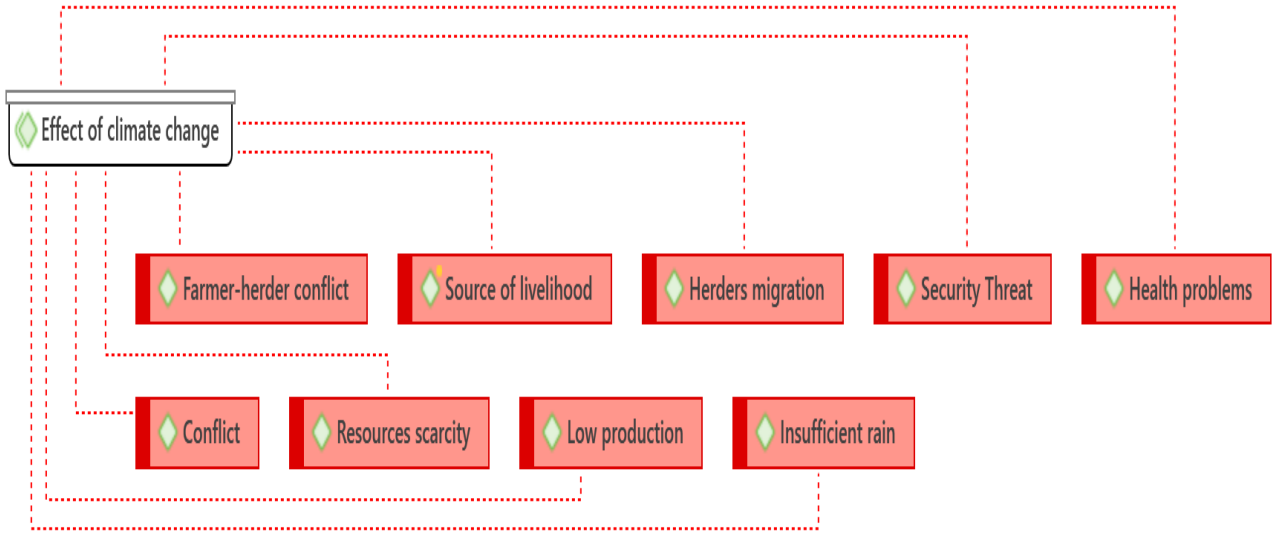

Figure 5.13: Effect of climate change on farmers and herders in Kenya.

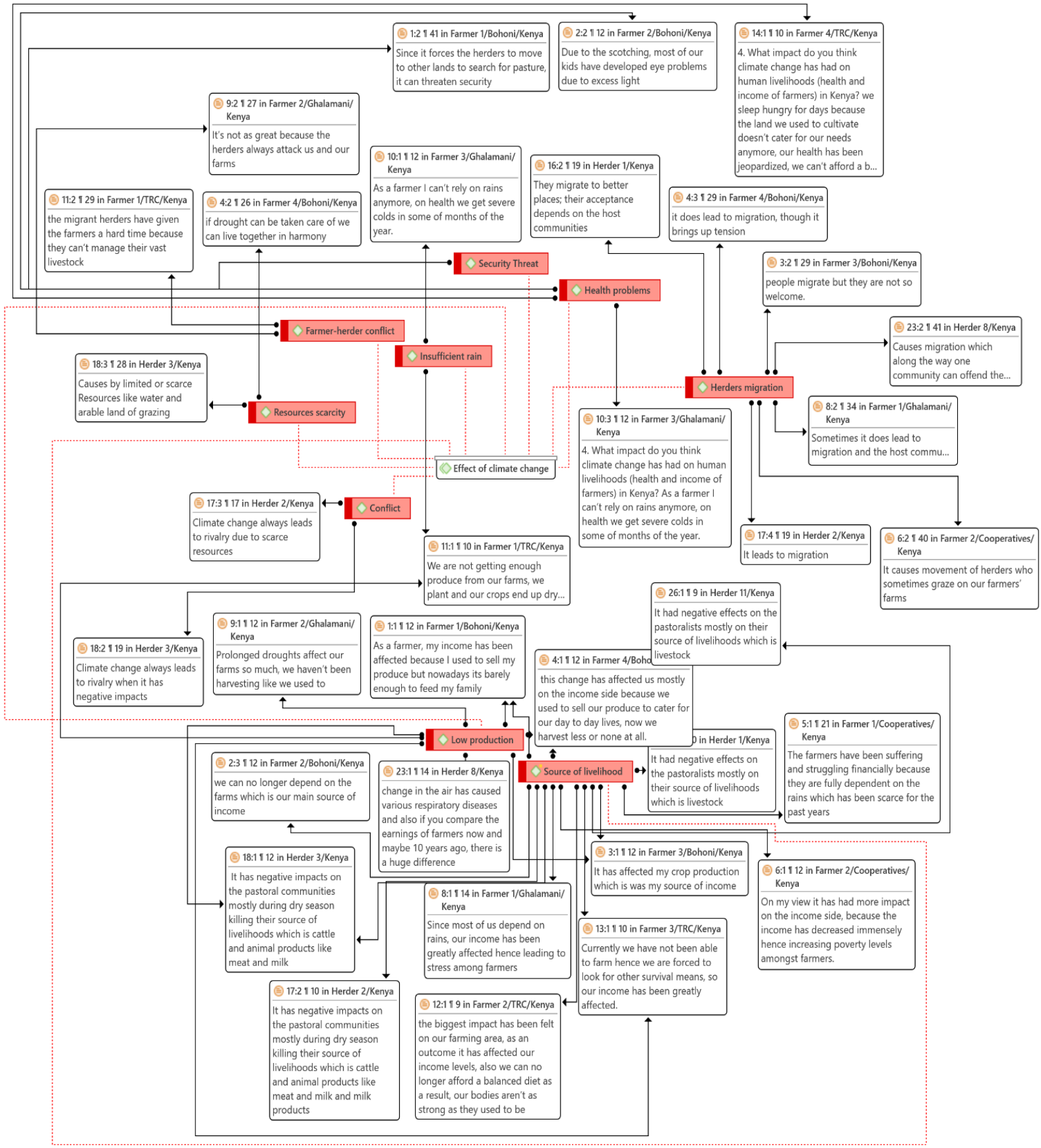

Figure 5.14: Responses generated on the effect of climate change on farmers and herders in Kenya.

5.6.1.1. Sub-Question II – Part II:

How does knowledge about the effects of climate change play a role in the different stakeholders' approach to conflict?

During the interview sessions in Nigeria, the respondents expressed their views on how knowledge about the effects of climate change can play a role in the different stakeholders' approach to conflict. As presented in **Figure 5.15**, from responses generated during the interview sessions, knowledge about the effects of climate change will: increase the level of climate change awareness among the stakeholders; bring about proper planning for climate change; aid the adoption of mitigation or preservative measures; and aid conflict mitigation among stakeholders.

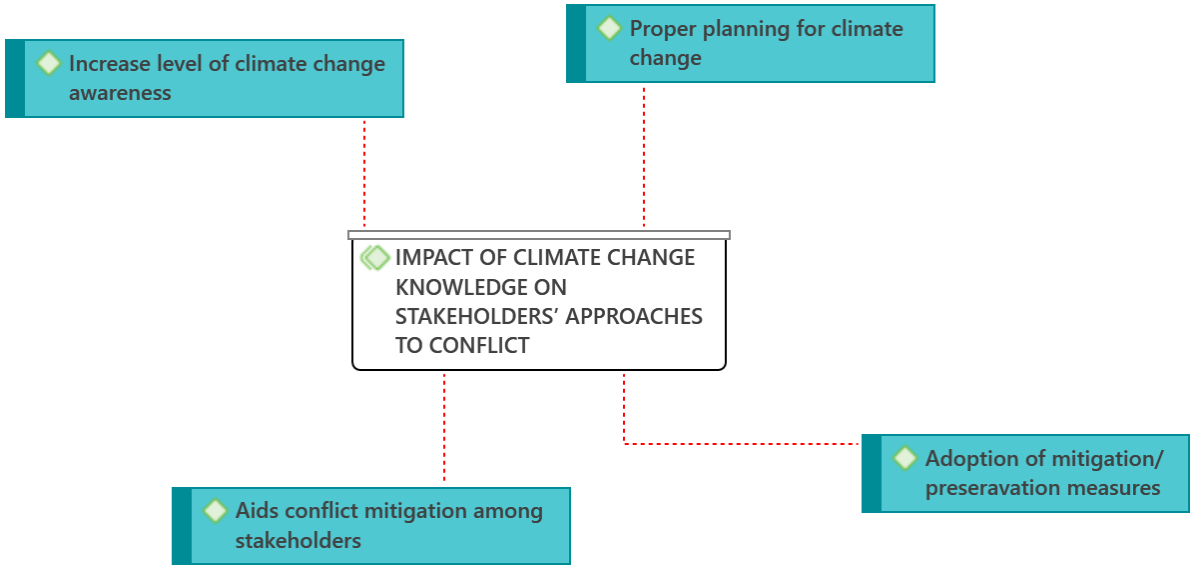

Figure 5.15: Impact of climate change knowledge on stakeholders' approaches to conflict in Nigeria

Increased level of climate change awareness among the stakeholders - In the opinion of one of the respondents, "*At the moment some stakeholders are not even aware what climate is all about*" (ACADEMIC 2/BENUE/NIGERIA). Hence, another respondent expressed that "*…when sensitization is done properly, one will know how to approach certain issues that we have*" (POLICYMAKER 1/PLATAEU/NIGERIA). Also, one of the policymakers said, "*I think the knowledge is increasing and people are becoming more aware of it and taking steps to both mitigate and adapt to it…"* (POLICYMAKER 2/ABUJA/NIGERIA).

Proper planning for climate change - The respondents also affirmed that knowledge of climate change will aid the proper planning of policymakers for the prevention of climate change effects. Below are excerpts from the respondents:

> *So, their knowledge of what climate change is all about will help them develop policies that would holistically address some of the challenges as a result of climate change* (ACADEMIC 2/BENUE/NIGERIA). *If you are knowledgeable about a particular event, it helps in managing its negative effects.* (ACADEMIC 1/KADUNA/NIGERIA). *So, when you know, you can do evidence-based planning to be able to address issues if you are not ignorant* (POLICY MAKER 1/ABUJA/NIGERIA). *Knowing climate change will give the leaders direction* (POLICY MAKER 1/KADUNA/NIGERIA).

Adoption of mitigation or preservative measures - In the opinion of one of the Policy Makers, "*...the knowledge is increasing, and people are becoming more aware of it and taking steps to both mitigate and adapt to it"* (POLICY MAKER 2/ABUJA/NIGERIA). This reveals that knowledge will enable the stakeholders to take appropriate steps to mitigate negative effects through proper adaptation. Another respondent also viewed that the knowledge "*...will enable the government to advise the farmer on the type of crop they should plant"* (POLICY MAKER 1/KADUNA/NIGERIA). Yet another respondent asserted that "*Stakeholders are aware of the effects of climate that leads to migration of herders for greener pasture from the north to the south"* (POLICY MAKER 1/BENUE/NIGERIA).

Conflict mitigation among stakeholders - One of the negative effects of climate change is that it causes conflicts among stakeholders. Hence, according to the respondents, adequate knowledge will alleviate conflicts among the stakeholders. This is evident from the generated quotations from the respondents.

> *Climate change activities can be used to resolve conflicts. When you approach those persons who are involved, you empower them, you make them understand that they belong to this part of society that they are thinking that they don't belong to* (POLICY MAKER 3/ABUJA/NIGERIA). *The knowledge they have about the effect of climate change affects their knowledge…their approaches to conflict* (POLICY MAKER 7/ABUJA/NIGERIA). *If you understand what climate change is, stakeholders will come together and address it without looking at it politically* (MINISTRY WORKER 2/MALE/BENUE/NIGERIA). *We will be able to see the drivers of these conflicts*

and we will be able to address them with the approach of improving their activities to be more profitable to both farmers and herders (POLICY MAKER 2/KADUNA/NIGERIA). *Well, if people had had knowledge about climate change and how to go about their activities on the soil where they lived at least it would have curtailed a lot of problematic indices where when we talk of clans clashes and farmers and herders clashes* (POLICY MAKER 2/PLATAEU/NIGERIA).

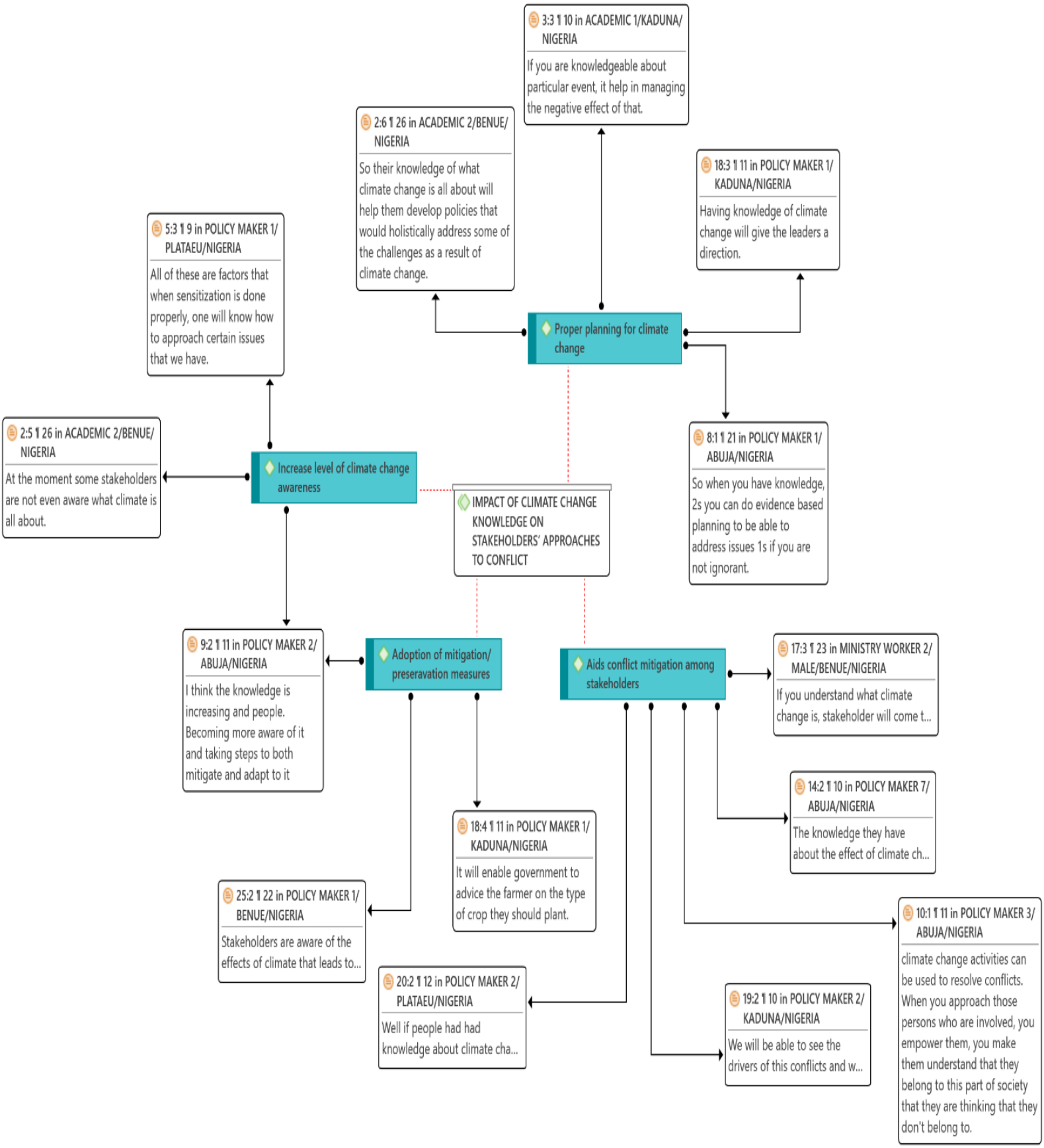

Figure 5.16: Responses generated on the impact of climate change knowledge on stakeholders' approaches to conflict in Nigeria.

As presented in **Figure 5.16.** from responses generated during the interview sessions among stakeholders in Kenya, knowledge about the effects of climate change will: increase the level of climate change awareness; enhance better approaches to climate change; encourage peaceful settlement of conflicts among stakeholders; enhance proper planning for climate change; and aids adoption of adaptation/preservation measures.

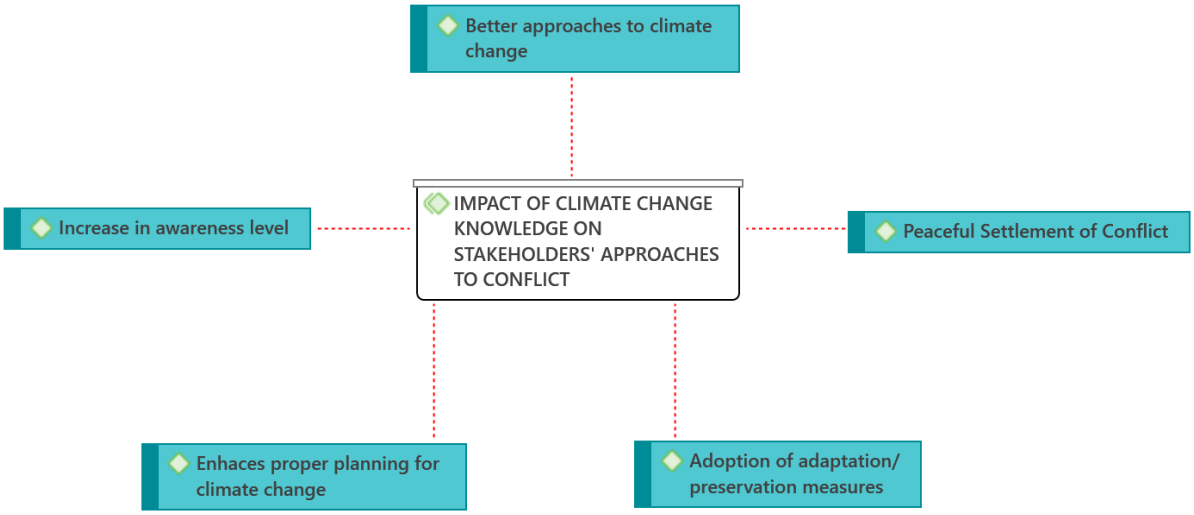

Figure 5.17: Impact of Climate Change Knowledge on Stakeholders' Approaches to Conflict in Kenya.

Encourage peaceful settlement of conflicts among stakeholders - In addition, respondents asserted that proper knowledge about climate change will resolve conflicts among stakeholders.

> *With the right knowledge in place, handling conflicts and resolving them will never be an issue since there is the availability of well-educated key personnel* (KENYA TRC 1). *The knowledge helps in identifying the proper interventions and means of resolving the would-be conflicts* (KENYA TRC 10). *The knowledge helps in identifying the best approach to tackling the conflicts* (KENYA TRC 12). *It helps identify the appropriate approach to addressing conflicts* (KENYA TRC 13). *There will be a whole different approach to conflicts whereby the most appropriate modes could be used* (KENYA TRC 19). *Knowledge makes handling conflicts more effective* (KENYA TRC 7). *With the stakeholders equipped with the desired knowledge on the impacts of climate change then the tackling of the conflicts becomes easier as the gaps will be easily highlighted* (KENYA TRC 8).

Enhance proper planning for climate change - Respondents expressed that adequate knowledge about climate change will enhance proper planning to mitigate the effects of climate change. Below are generated excerpts from the Policy Makers:

> *Helps in coming up with contingency plans like the distribution of animal feeds during drought, and water trucking to the affected communities to avoid would be conflicts* (KENYA TRC 16). *I help in identifying the right interventions* (KENYA TRC 17). *Helps in coming up with alternative ways of establishing healthy living and cohesion among the herders and livestock* (KENYA TRC 18). *It enables proper management and interventions* (KENYA TRC 20). *It helps in the preparation for emergency response at the most appropriate time* (KENYA TRC 3). *As the stakeholders we can formulate rules and regulations, also we can tackle the issues mostly appropriately and more technologically* (KENYA TRC 4)

- **Bring increase in awareness level** - It was expressed by a respondent that knowledge of climate change "…*will bring about awareness from both mitigation and adaptation as the funders working together on the problem...*" (KENYA UoN Agric 1).
- **Enhance better approaches to climate change** - It was viewed by one of the respondents that the knowledge will "… *help the stakeholders in addressing climatic change more conveniently and appropriately*" (KENYA TRC 11).
- **Aids adoption of adaptation/preservation measures** - Respondents also expressed that adequate knowledge would enhance the proper adoption of adaptation and preservation measures. According to a respondent, "*If people know what climate change is all about, they should undertake board mitigation and adaptation measures*" (KENYA UoN Agric 1). Also, another respondent added that "*...knowledge helps farmers to conserve what they have. They have food for animals, CD and also harvest water* (KENYA UoN Agric 2). While one of the TRC interviewees asserted that "*knowledge of climate change could help in coming up with countermeasures of climate change effects"* (KENYA TRC 5).

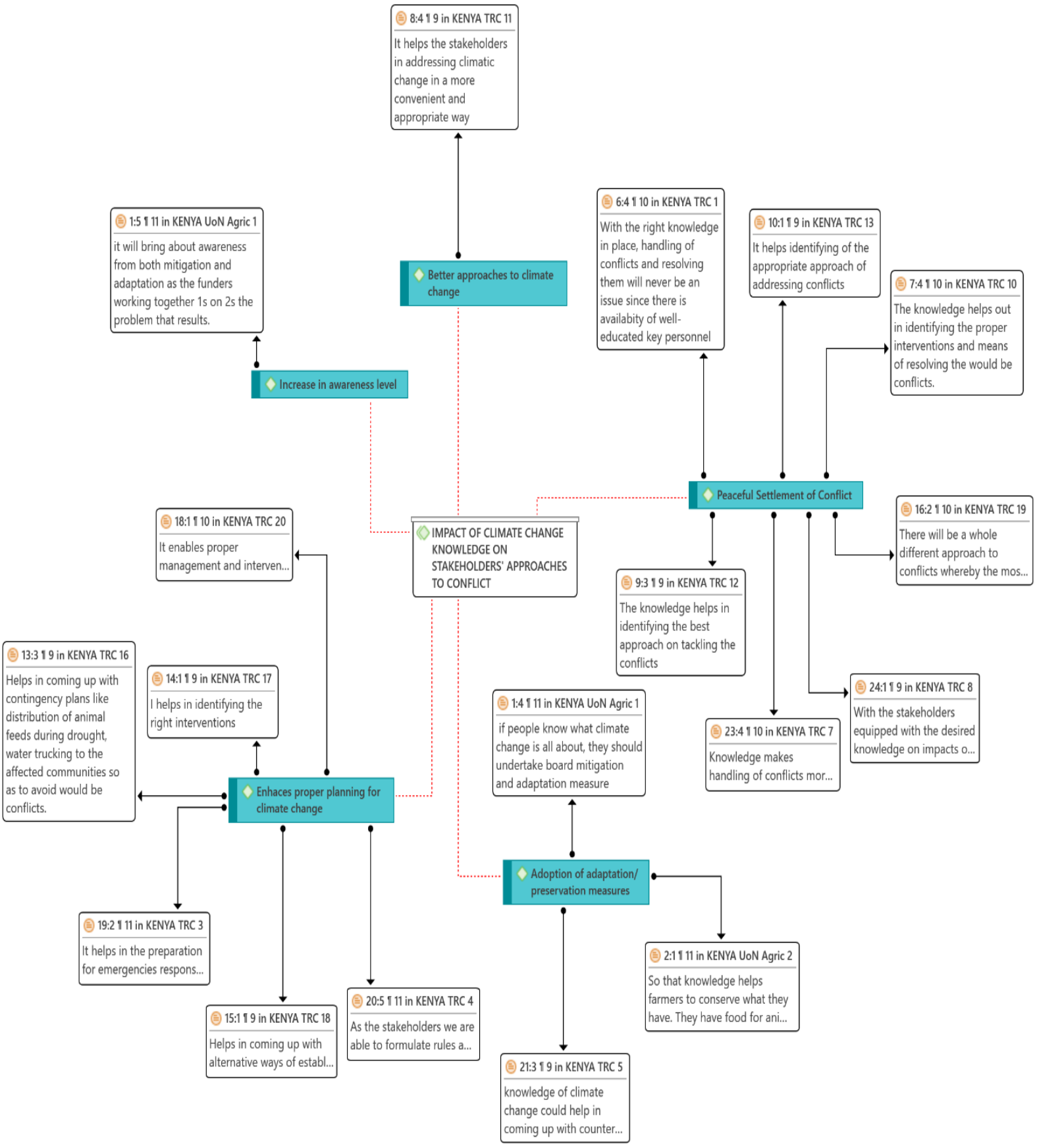

Figure 5.18: Responses generated on the impact of climate change knowledge on stakeholders' approaches to conflict in Kenya.

5.7. Sub Research Question III:

What are the policy frameworks in Nigeria and Kenya that create awareness about climate change and mitigate the effects of climate change on violent conflict at both national and local levels?

During the data collection procedure in Nigeria, in-depth sessions were held with academics, policymakers, and environmental activists to generate their views about available policies put in place to mitigate the effects of climate change on violent conflict in the concerned regions. The respondents expressed their understanding of policies related to climate change and suggested steps to control climate-induced violence. The respondents had divergent opinions about the policy framework available for creating awareness about climate change and mitigating the effects of climate change on violent conflict. Some of the respondents viewed that policies are available; some expressed the view that policies were available but not implemented while some believed that policies were not available.

- **Availability of policy**

  As revealed from the responses generated especially from the policymakers, the policy was formulated to control the effect of climate change. "*We formulate policy. Those policies have been implemented at stable and that implementation at the state level*" (POLICYMAKER 7/ABUJA/NIGERIA). Similarly, another policymaker expressed that "*there are national policies, there are policies on water resources and there is policy on water sanitation"* (POLICYMAKER 2/KADUNA/NIGERIA). "*I think the policy was reviewed recently; I think last year. The implementation plan is also in the policy document, and it's supposed to run for five years. So, there is a policy and the document itself has an implementation plan or strategy*" explained one of the policymakers from Abuja (POLICYMAKER 2/ABUJA/NIGERIA). However, one of the academics stated "*I believe they do but I have no idea of the content of the document* (ACADEMIC 2/KADUNA/NIGERIA).

  Two of the academics asserted that there are adaptation policies in the North.

  > *…in the North, there is the green belt initiative where Neem trees are being planted and other varieties of trees to cool the environment* (ACADEMIC 2/BENUE/NIGERIA)

  > *Adaptation policies encourage farmers to engage in mulching, and irrigation to cool the soil and ensure all-year-round farming* (ACADEMIC 2/BENUE/NIGERIA)

- **Documented Policy without implementation**

  Some of the respondents asserted that although policies were available, there were implementation issues. One of the policymakers expressed that there are policies "*...but the implementation is the problem. Nigeria always comes up with good policies, but the problem has always been the implementation, the agencies responsible for implementing these laudable policies have always not lived up to expectations* (POLICYMAKER 2/PLATAEU/NIGERIA). Likewise, one of the ministry workers asserted "*Our country has national climate change policy. However, implementation is weak across the country* (MINISTRY WORKER 2/MALE/BENUE/NIGERIA). Another respondent also affirmed that there is a climate change "*policy because Mr. President just attended one in Kenya. The problem is implementation* (POLICY MAKER 1/BENUE/NIGERIA). In the words of one of the academics, "*I think I have seen one, national climate change policy. Though I have not gone through it. If the implementation were in place all these would have been solved*" (ACADEMIC 1/KADUNA/NIGERIA).

- **Non-availability of documented policy**

  However, contrary to the above assertions, some of the respondents expressed the view that there was no policy on climate change, while some stated that they had not seen any documented policy on climate change as presented from excerpts generated from the responses.

  > *I am not aware of any climate change policy document by Nigeria as I speak* (ACADEMIC 2/BENUE/NIGERIA). *None that I know of* (POLICY MAKER 1/PLATAEU/NIGERIA). *There is no policy document to my knowledge* (POLICY MAKER 1/KADUNA/NIGERIA). *I have not seen one. It may exist, I don't know* (POLICY MAKER 2/KADUNA/NIGERIA). *There is no policy on climate change in Nigeria* (POLICY MAKER 2/BENUE/NIGERIA). *I have not seen one. It may exist, I don't know* (POLICY MAKER 1/KADUNA/NIGERIA)

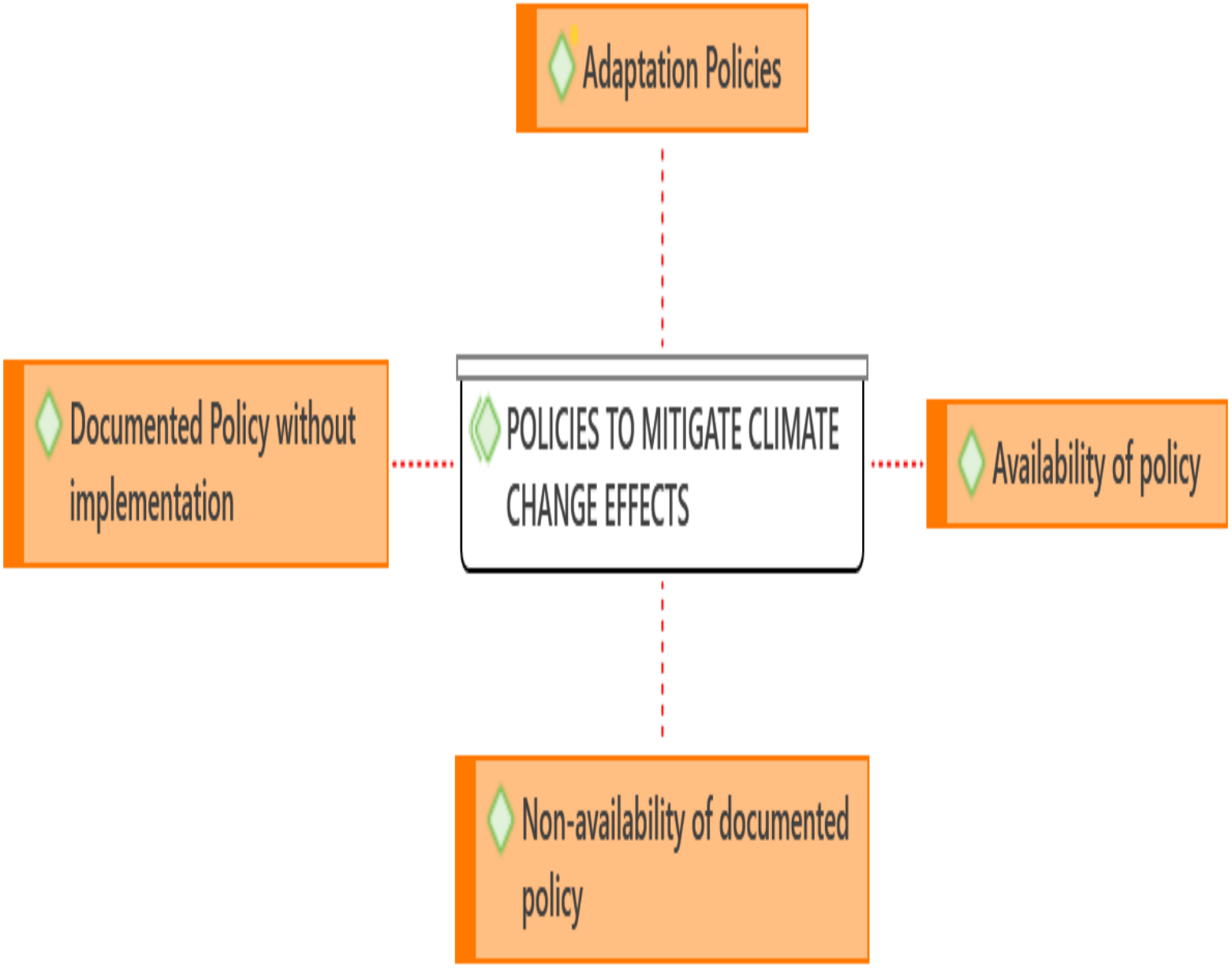

Figure 5.19: Policies to mitigate climate change effect in Nigeria.

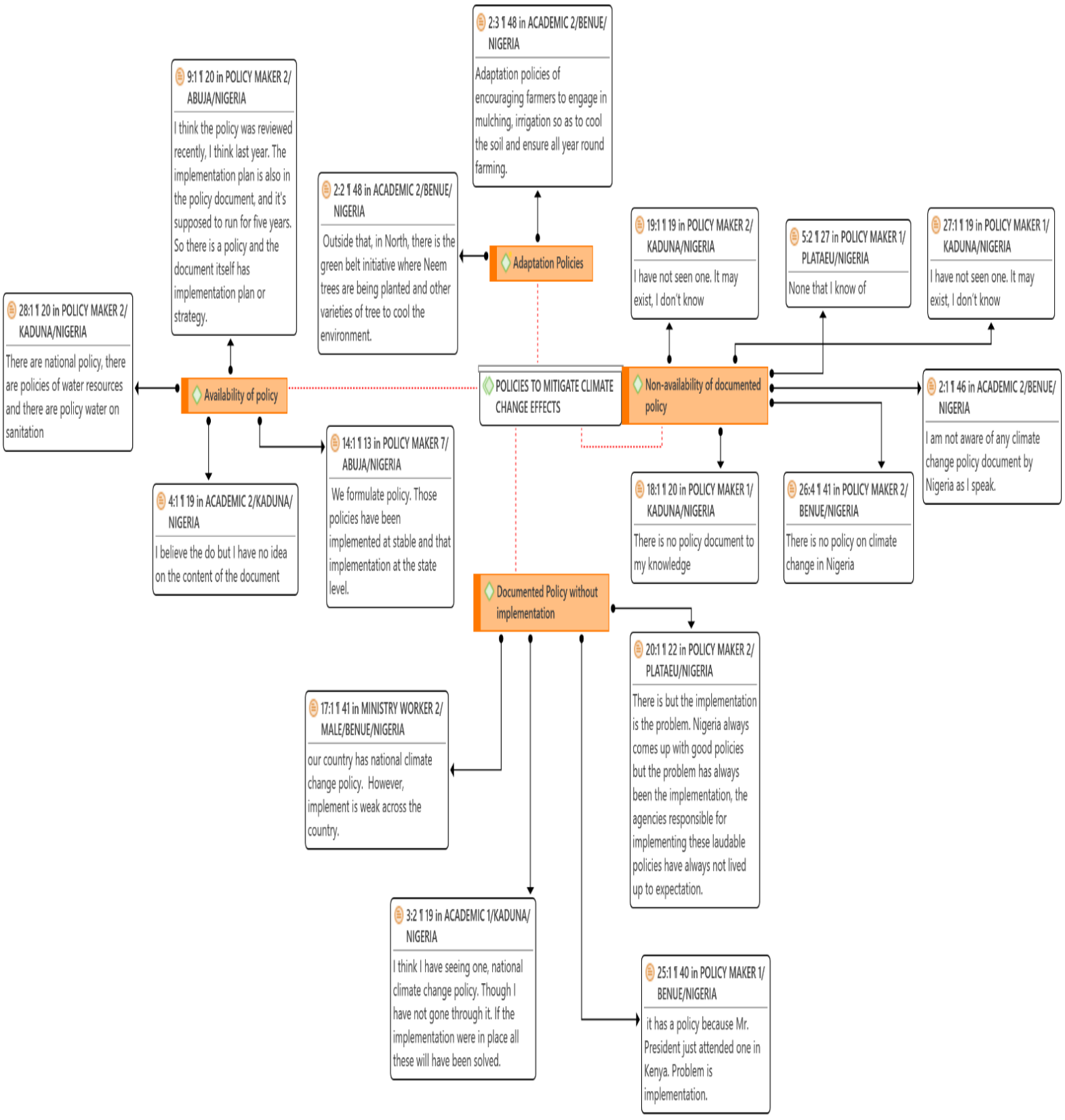

Figure 5.20: Responses generated on policies to mitigate climate change effect in Nigeria.

Also, in-depth interview sessions were held with academics, policymakers, and environmental activists in Kenya which generated their detailed views about available policies put in place to mitigate the effects of climate change on violent conflicts in the concerned areas. The respondents expressed their understanding of the reality of climate change, and policies related to climate change, and suggested steps to control climate change-induced violence. In response to their views about the policy framework available for creating awareness about climate change and mitigating the effects of climate change on violent conflict, almost all the respondents were of the opinion that policies were available, but no implementation was put in place. While few of the respondents only expressed that policies were available.

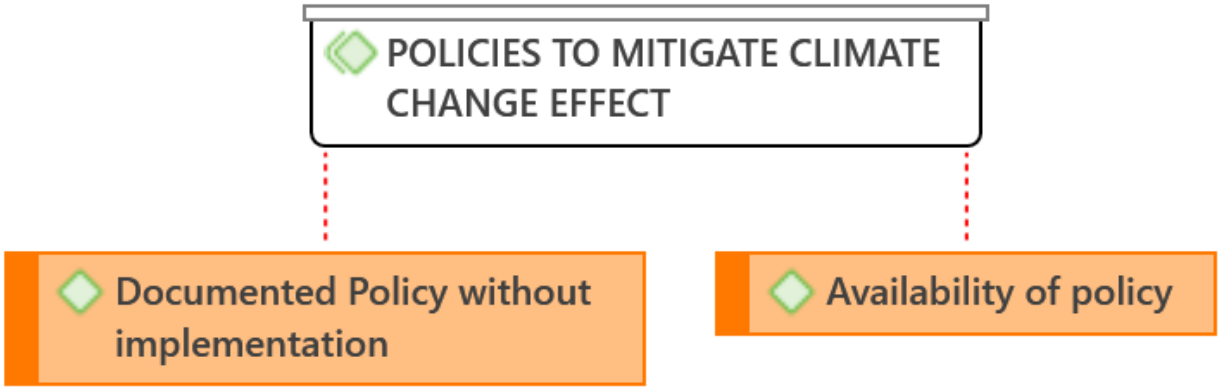

Figure 5.21: Policies to mitigate climate change effect in Kenya.

- **Availability of policy** - Few of the respondents affirmed that in their regions, there is the existence of policy on climate change. In the words of one of the respondents, "*Climate has a policy document, which was adapted by name. So, they usually have policies on how to manage the environment and it has an official climate change*" (KENYA UoN Agric 1). Another respondent also asserted that "*there's a policy on climate change* (KENYA TRC 5) while it was also explained by another respondent that they "*...have agricultural policies which are being implemented to help farmers and pastoralists in modern farming*" (KENYA TRC 3)
- **Documented Policy without implementation** - However, the majority of the respondents complained that although there are policies, the implementation is not in place. The following are excerpts generated from the responses.

  Policies are there but the problem is that they are not implemented (KENYA TRC 1). *Policies are there but not sure they're implemented* (KENYA TRC 10). *There are policies available but unfortunately, they have never been implemented* (KENYA TRC 11). *Policies are there but they are not yet implemented* (KENYA TRC 12). *We*

do have but not yet been implemented (KENYA TRC 15). *The government has formulated various policies in the wake of climate change but unfortunately, it seems none has been implemented so far* (KENYA TRC 4). *We have such policies, but they are not yet implemented* (KENYA TRC 7).

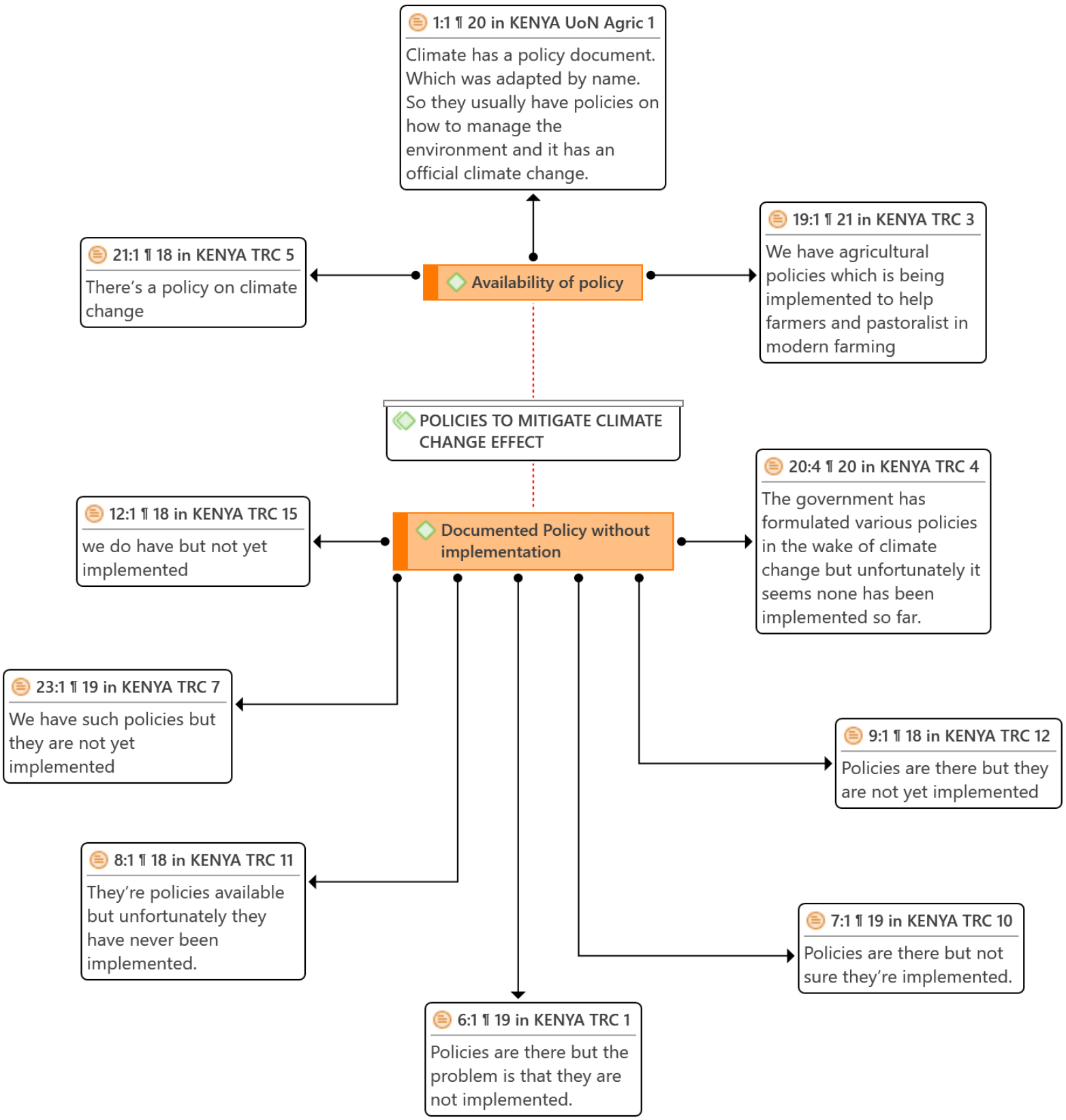

Figure 5.22: Responses generated on policies to mitigate climate change effect in Kenya.

The comprehensive discussion of these findings, including a synthesis of the quantitative trends and qualitative insights, will be presented in Chapter 7. This final analysis will not only summarize the key patterns and themes identified in this chapter but also draw broader conclusions about the geopolitics of climate change and violent conflict in Nigeria and Kenya. Through this holistic approach, we seek to contribute to the academic discourse and inform policy interventions aimed at mitigating the impacts of climate change and promoting sustainable peace in these regions.

5.8. Conclusion

This chapter delves into the meticulous process of analyzing data, interpreting its implications, and effectively presenting the findings. The journey begins with a thorough examination of the demographic profiles of the survey participants from Kenya and Nigeria. Utilizing the powerful analytical tool, SPSS, a quantitative analysis unfolds, meticulously dissecting the data and revealing insights. Each result is carefully interpreted, shedding light on the nuances and implications inherent in the data. Moreover, the study's hypotheses undergo rigorous testing using Pearson Product Moment Correlation (PPMC), facilitating a deeper understanding of the relationships between variables. These statistical analyses form the backbone of the chapter, providing a robust foundation upon which to build subsequent discussions.

In tandem with quantitative analysis, qualitative data undergoes an equally rigorous examination, facilitated by the sophisticated software, Atlas.ti. This qualitative analysis unfolds sequentially, capturing the essence of the narratives and uncovering invaluable insights buried within the qualitative responses. The culmination of these analyses yields a plethora of thought-provoking findings, which serve as catalysts for further discussion and exploration in Chapter 7. However, before delving into the rich tapestry of insights unearthed, we now move to the next chapter, Chapter 6 which offers a comparative case analysis of Nigeria and Kenya. This comparative exploration offers a nuanced understanding of the similarities, differences, and unique dynamics present within each context, setting the stage for a deeper dive into the findings presented in the subsequent chapter.

CHAPTER 6

INTERSECTING REALITIES: A COMPARATIVE CASE STUDY OF KENYA AND NIGERIA

6.1. Introduction

This chapter provides a comparative case analysis of Kenya and Nigeria, drawing upon the results obtained. It selects specific demographic criteria (such as gender, age, educational qualification, and location) from the participants' responses and assesses the similarities and differences in findings between the two cases. The focus of this chapter is on the comparative analysis of climate security in the two countries, aiming to explore how certain demographic indices such as gender, age, educational qualification, and location impact or are impacted by climate security in these regions. Furthermore, the chapter undertakes quantitative forecasting, a vital element of predictive analytics, which offers a structured method for predicting future trends using historical and statistical data. In situations where uncertainties are prevalent, precise forecasting is essential for making strategic decisions. Therefore, the forecasting was conducted using comprehensive regression analyses to examine the impacts of climate change on peace, security, and conflicts in East Africa and West Africa.

The chapter aims to analyse and compare the responses from two sets of questionnaires: SET A Questionnaire (CIPS and GCCPS) and SET B Questionnaire (OM and CCRC), to establish whether there is convergence or divergence in views between males and females within and between the two cases (Kenya and Nigeria); examine differences in views based on age ranges or levels of education within and between the two cases; and investigate whether the duration of someone's residence in a particular location contributes to the "start date or period" or "escalation" of climate-induced conflict in the region. Through this comparative case analysis, the thesis seeks insights into how various demographic variables and geographical aspects influence perceptions and experiences of climate security in Kenya and Nigeria. The chapter sets the stage for a comprehensive study exploring the relationship between climate security and demographics in these regions, aiming to contribute to a better understanding of the complex interactions between climate change, conflict, and societal variables. The analysis will commence by examining the relationship between CIPS and GCCPS based on gender.

6.2. Perceptions

Table 6.1: Relationship between CIPS and GCCPS based on Gender.

Location	Gender	r	P value
Kenya	Male	0.400	0.003
	Female	0.617	0.000
Nigeria	Male	0.573	0.000
	Female	0.668	0.000
Both countries	Male	0.552	0.000
	Female	0.669	0.000

Table 6.1 above presents an analysis of the relationship between climate change and the geopolitics of peace and security, specifically focusing on the opinions of men and women in Kenya and Nigeria.

In Kenya, the table reveals a significant relationship between climate change and the geopolitics of peace and security, as perceived by both men and women. This implies that both genders believe that climate change has an impact on the geopolitical dynamics related to peace and security in the country, although, the r values indicate that the female respondents in Kenya have a stronger view of the relationships (r = 0.617) than the male counterparts (r = 0.400).

Similarly, in Nigeria, both men and women share a convergent view regarding the relationship between climate change and the geopolitics of peace and security. This suggests that both genders agree that climate change affects the geopolitical landscape and has implications for peace and security in Nigeria. Just like in Kenya, comparing the relationship values of CIPS and GCCPS, the female respondents view on the impact of climate change on the geopolitical dynamics related to peace and security in the country (r = 0.668) is higher than that of their male counterparts (r = 0.573).

When comparing the views of men and women in both countries, the table indicates a convergence of opinion. This means that the perceptions of the effect of climate change on the geopolitics of peace and security are similar between men and women in both Kenya and Nigeria.

Table 6.2: Relationship between CIPS and GCCPS based on Age.

Location	Age Range(s)	R	P value
Kenya	19 - 28 years	0.445	0.084
	29 - 38 years	0.632	0.000
	39 - 48 years	0.435	0.018
	49 - 58 years	0.602	0.152
Nigeria	19 - 28 years	0.903	0.000
	29 - 38 years	0.313	0.015
	39 - 48 years	0.825	0.000
	49 - 58 years	0.329	0.044
	59 - 68 years	0.383	0.617
Both countries	19 - 28 years	0.782	0.000
	29 - 38 years	0.395	0.000
	39 - 48 years	0.759	0.000
	49 - 58 years	0.351	0.018
	59 - 68 years	0.383	0.617

Table 6.2. presents an analysis of the relationship between climate change and the geopolitics of peace and security, specifically focusing on the opinions of respondents aged 19 years and above in Kenya and Nigeria.

In Kenya, the table reveals a significant relationship between climate change and the geopolitics of peace and security, as perceived by participants of different age groups. The data presented indicates that only age groups 29 - 38 years and 39 - 48 years believe that climate change has an impact on the geopolitical dynamics related to peace and security in the country. The r values indicate that the age group 29 - 38 years in Kenya has a stronger view of the relationships (r = 0.632) than the age group 39 - 48 years (r = 0.435). On the other hand, the age groups 19 - 28 years and 49 - 58 years do not believe (that is, they share a divergent view) that climate change has an impact on the geopolitical dynamics related to peace and security in the country. Although, the r values indicate that the age group 49 - 58 years in Kenya has a stronger view of the relationships (r = 0.602) than the age group 19 - 28 years (r = 0.445).

In Nigeria, however, age groups 19 - 28 years; 29 - 38 years; and 39 - 48 years all share a convergent view regarding the relationship between climate change and the geopolitics of peace and security. This suggests that age groups 19 - 48 years agree that climate change affects the geopolitical landscape and has implications for peace and security in Nigeria. However, unlike in Kenya, comparing the relationship values of CIPS and GCCPS, the respondents of age groups 19 - 28 years view the impact of climate change on the geopolitical dynamics related to peace and security in the country (r = 0.903) is highest, closely followed by age groups 39 - 48 years (r = 0.825), while the other age groups have

far lesser relationship values, in descending order: 59 - 68 years (r= 0.383); 49 - 58 years (r= 0.329) and 29 - 38 years (r= 0.313). However, 59 - 68 years alone share a divergent view.

When comparing the views of the different age groups in both countries, the data obtained in Kenya is similar to what was obtained in Nigeria, as the table indicates a convergence of opinion for age groups: 19 - 28 years; 29 - 38 years; 39 - 48 years and 49 - 58 years. This means that the perceptions of the effect of climate change on the geopolitics of peace and security are similar for age groups 19- 58 years in both Kenya and Nigeria combined. Only age groups 59 - 68 years share a divergent view when combining the data for both Nigeria and Kenya.

Table 6.3: Relationship between CIPS and GCCPS based on Educational Qualification.

Location	Educational Qualification	R	P value
Kenya	A level/professional	0.919	0.000
	Degree or equivalent	0.505	0.000
	Postgraduate	0.383	0.246
	Others	0.254	0.746
Nigeria	A level/professional	0.999	0.030
	Degree or equivalent	0.378	0.000
	Postgraduate	0.736	0.000
Both Countries	Secondary	0.924	0.008
	A level/professional	0.983	0.000
	Degree or equivalent	0.423	0.000
	Postgraduate	0.724	0.000
	Others	0.254	0.746

Table 6.3. presents an analysis of the relationship between climate change and the geopolitics of peace and security, specifically focusing on the opinions based on educational qualifications in Kenya and Nigeria.

In Kenya, the table reveals a significant relationship between climate change and the geopolitics of peace and security, as perceived by participants of different educational qualifications. The data presented indicates that only respondents with A level/professional qualifications as well as those with a degree or equivalent believe that climate change has an impact on the geopolitical dynamics related to peace and security in the country (convergent view), although, the r values indicate that the respondents with A level/Professional qualifications in Kenya have a stronger view of the relationships (r = 0.919) than those with Degree/equivalent (r = 0.505). On the other hand, those with postgraduate and other qualifications do not believe (that is they share a divergent view) that climate change has an impact on the geopolitical dynamics related to peace and security in the country. Although, the r values indicate that postgraduates in Kenya have a stronger view of the relationships (r = 0.383) than other qualifications (r = 0.254).

In Nigeria, however, all the groups that participated (A level/professional, degree/equivalent, and postgraduates) share a convergent view regarding the relationship between climate change and the geopolitics of peace and security. This suggests that irrespective of their qualifications, they agree that climate change affects the geopolitical landscape and has implications for peace and security in Nigeria. However, unlike in Kenya, comparing the relationship values of CIPS and GCCPS, the respondents with A level/professional qualifications view on the impact of climate change on the geopolitical dynamics related to peace and security in the country (r = 0.999) is the highest, followed by postgraduate (r = 0.736), and those with Degree/equivalents (r= 0.378).

When comparing the views of the different educational qualifications in both countries, the data obtained in Kenya is in line with what is obtained in Nigeria, as the table indicates a convergence of opinion for all educational qualifications from the least to the highest (secondary, A level/professional, degree/equivalent, postgraduates, and others). This means that irrespective of educational qualifications, the respondents have a convergent view, except for those with other unidentified qualifications, who share a divergent view when combining the data for both Nigeria and Kenya.

Table 6.4: Relationship between CIPS and GCCPS based on Location.

Location	Region/Subcounty	r	P value
Kenya	Galole	0.494	0.006
Nigeria	North West	0.653	0.000
	North East	0.137	0.505
	North Central	0.614	0.000

Table 6.4. presents an analysis of the relationship between climate change and the geopolitics of peace and security, specifically focusing on the opinions based on locations in Kenya and Nigeria.

In Kenya, the table reveals a significant relationship between climate change and the geopolitics of peace and security, as perceived by participants of different educational qualifications in only one location (Galole).

In Nigeria, however, data for three locations were recorded, of which two share a convergent view (North West and North Central) regarding the relationship between climate change and the geopolitics of peace and security, while the North East share a divergent view. In comparing the relationship values of CIPS and GCCPS, similarly, North West and North Central views on the impact of climate change on the geopolitical dynamics related to peace and security in the country, North West (r = 0.653) is higher than North Central (r = 0.614).

Table 6.5: Relationship between OM and CCRC based on Gender.

Location	Gender	R	P value
Kenya	Male	0.576	0.000
	Female	0.578	0.000
Nigeria	Male	0.613	0.000
	Female	0.269	0.030
Both countries	Male	0.605	0.000
	Female	0.449	0.000

Table 6.5. above presents an analysis of the relationship between migration and incessant conflict, specifically focusing on the opinions of men and women in Kenya and Nigeria.

In Kenya, the table reveals a significant relationship between migration and incessant conflicts, as perceived by both men and women. This implies that both genders believe that climate-induced migration has an impact on incessant conflicts in the country, although, the r values indicate that the female respondents in Kenya have a slightly stronger view of the relationships (r = 0.578) than their male counterparts (r = 0.576).

Similarly, in Nigeria, both men and women share a convergent view regarding the relationship between migration and incessant conflicts. This suggests that both genders agree that climate-induced migration exacerbates incessant conflicts in Nigeria. Unlike in Kenya, comparing the relationship values of OM and CCRC, the male respondents' view on the impact of climate-induced migration on incessant conflicts in the country (r = 0.613) is higher than that of their female counterparts (r = 0.269).

When comparing the views of men and women in both countries, the table indicates a convergence of opinion. This means that the perceptions of the effect of climate-induced migration on incessant conflicts between men and women in both Kenya and Nigeria are similar.

Table 6.6: Relationship between OM and CCRC based on Age.

Location	Age Range(s)	r	P value
Kenya	19 - 28years	0.694	0.000
	29 - 38 years	0.364	0.007
	39 - 48 years	-0.056	0.685
	49 - 58 years	0.285	0.252
	59 - 68 years	-0.011	0.978
	69 - 78 years	0.984	0.002
Nigeria	19 - 28 years	-0.299	0.200
	29 - 38 years	0.743	0.000
	39 - 48 years	0.585	0.000
	49 - 58 years	0.222	0.050
	59 - 68 years	0.632	0.000
	69 - 78 years	0.738	0.015
Both countries	19 - 28 years	0.603	0.000
	29 - 38 years	0.230	0.024
	39 - 48 years	0.399	0.000
	49 - 58 years	0.230	0.024
	59 - 68 years	0.612	0.000
	69 - 78 years	0.970	0.000

Table 6.6. presents an analysis of the relationship between migrations and the incessant conflicts, specifically focusing on the opinions of respondents aged 19 years and above in Kenya and Nigeria.

In Kenya, the table reveals a significant relationship between migration and incessant conflicts, as perceived by participants of different age groups. The data presented indicates that only age groups 19 - 28 years and 29 - 38 years believe that migration has an impact on incessant conflict in the country, although, the r values indicate that the age group 19 - 28 years in Kenya has a stronger view of the relationships ($r = 0.694$) than the age group 29 - 38 years ($r = 0.364$).

In Nigeria, however, all the age groups above age groups 19 - 28 years share a convergent view regarding the relationship between migration and incessant conflicts except only age groups 19 - 48 years that have a divergent view. However, unlike in Kenya, comparing the relationship values of OM and CCRC, the respondents of age groups 29 - 38 years view the impact of climate-induced migration on incessant conflicts in the country ($r = 0.743$) as the highest, closely followed by age groups 69 - 78 years ($r = 0.738$), while the other age groups have far lesser relationship values. However, 19 - 28 years alone have a divergent view.

When comparing the views of the different age groups in both countries, the data obtained in Kenya is slightly similar to what is obtained in Nigeria, as the table indicates a convergence of opinion for all

age groups: 19 - 78 years. This means that there are positive perceptions of the effect of climate-induced migration on incessant conflicts in both Kenya and Nigeria combined.

Table 6.7: Relationship between OM and CCRC based on Educational Qualification

	No formal education	0.957	0.000
	Primary	0.392	0.000
	secondary	0.466	0.000
	A level/professional	-0.067	0.805
	Degree	0.978	0.000
	No formal education	0.184	0.399
	Primary	0.540	0.000
	Secondary	0.499	0.000
	A level/professional	0.329	0.015
	Degree	0.463	0.000
	Postgraduate	0.581	0.172
	No formal education	0.901	0.000
	Primary	0.458	0.000
	Secondary	0.503	0.000
	A level/professional	0.217	0.071
	Degree	0.685	0.000
	Postgraduate	0.581	0.172

Table 6.7. presents an analysis of the relationship between migration and incessant conflicts, specifically focusing on the opinions based on educational qualifications in Kenya and Nigeria.

In Kenya, the table reveals a significant relationship between migrations and incessant conflicts, as perceived by participants of different educational qualifications. The data presented indicates that only respondents with A level/professional qualifications had a divergent view on the impact climate-induced migration has on incessant conflicts in the country, all other respondents with other forms of qualification (no formal, primary, secondary, and degree) had a convergent view. However, the r values indicate that the respondents with no formal education and those with degree qualifications in Kenya had a stronger view of the relationships (r = 0.957 and 0.978, respectively) than those with other qualifications.

In Nigeria, however, all the groups that participated except those without a formal education and those with postgraduates' qualifications share a convergent view regarding the relationship between migration and incessant conflicts. This suggests that irrespective of their qualifications, the majority of the participants agree that climate-induced migration affects incessant conflicts in Nigeria. However, unlike in Kenya, comparing the relationship values of OM and CCRC, the respondents with postgraduate qualifications view the impact of climate-induced migration on incessant conflicts in the

country (r = 0.581) is the highest, followed by primary (r = 0.544), and those with no formal education are the least (r= 0.184).

When comparing the views of the different educational qualifications in both countries, the table indicates a convergence of opinion for all educational qualifications except (A level/professional and postgraduates) for both Nigeria and Kenya.

6.3. Quantitative Forecasting

In this section, we try to establish the fact that it is possible to project the effects of climate change on the geopolitics of peace and security in Africa using regression analysis. In the light of this, the research hypotheses for this study were revisited.

Table 6.8: Regression Analysis on the Effect of Climate Change on the Geopolitics of Peace and Security in East Africa.

Independer Variable	dependent Variable	F	df	R	T	b	Bet (β)	Std Err r	ρ
Climate change	Peace and security	28.9	1, 8	0.50	5.3	0.2 2	0.5 0	0.05	0.0

$R^2 = 0.250$; Adjusted $R^2 = 0.241$

In evaluating the predictive power of climate change on peace and security in Kenya, the *b* value of 0.272 indicates that for every unit change in climatic condition in Kenya, there will be a significant positive corresponding 0.272-unit change in peace and security of Kenya. The exact probability that the observed value of *t* would occur if the value of *b* in the population were 0 is 5.38 (p = 0.00). The *t*-statistic measures how many standard errors the coefficient is away from zero (the hypothesized value). Generally, any *t*-value greater than +2 or less than - 2 is acceptable. The higher the *t*-value, the greater the confidence we have in the coefficient as a predictor. Since this observed significance is less than .05, then it is agreed that the result reflects a genuine effect. It can therefore be said that the probability of the *t*-value occurring if the values of *b* in the population were 0 is less than 0.00. Since the *b* value is different from 0, it can therefore be concluded that climate change has a significant effect ($p < .001$) on peace and security in Kenya.

Table 6.9: Regression Analysis on the Effect of Climate Change on the Geopolitics of Peace and Security in West Africa

Independer Variable	Dependent Variable	F	df	R	t	b	Bet (β)	Std. Erro	ρ
climate change	Peace and security	94.60	1, 17	0.59	9.7	0.33	0.59	0.03	0.0

$R^2 = 0.351$; Adjusted $R^2 = 0.347$

In evaluating the predictive power of climate change on peace and security in Nigeria, the *b* value of 0.335 indicates that for every unit change in climatic condition in Nigeria, there will be a significant positive corresponding 0.335-unit change in peace and security of Nigeria. The exact probability that the observed value of *t* would occur if the value of *b* in the population were 0 is 9.73 (p = 0.00). Since this observed significance of the *t* value is less than .05, then it is agreed that the result reflects a genuine effect. It can therefore be concluded that climate change has a significant effect ($p < .001$) on peace and security in West Africa.

Table 6.10: Regression Analysis on the Effect of Climate Change on Peace and Security in West Africa and East Africa.

Independer Variable	Dependent Variable	F	df	R	t	b	Bet (β)	Std. Erro	ρ
Climate change	Peace and security	137.4	1, 26	0.58	11.7	0.32	0.58	0.02	0.0

$R^2 = 0.342$; Adjusted $R^2 = 0.340$

In evaluating the predictive power of climate change on peace and security in East Africa and West Africa, the *b* value of 0.272 indicates that for every unit change in climatic condition in Kenya and Nigeria, there will be a significant positive corresponding 0.272-unit change in the peace and security of East Africa and West Africa. The exact probability that the observed value of *t* would occur if the value of *b* in the population were 0 is 5.38 (p = 0.00). Since this observed significance of the *t* value is less than .05, then it is agreed that the result reflects a genuine effect. It can therefore be concluded that climate change in East Africa and West Africa has a significant effect ($p < 0.00$) on peace and security in East Africa and West Africa.

Table 6.11: Regression Analysis on the Effect of Climate Change on Kenya's Orma Community and the Farmer-Herder Conflicts in the Tana River Delta Area

Independer Variable	Dependent Variable	F	df	R	t	b	Beta (β)	Std. Erro	ρ
Climate Change and Migration	Incessant Conflict	94.12	1, 216	0.551	9.70	0.39	0.55	0.040	0.00

$R^2 = 0.303$; Adjusted $R^2 = 0.300$

In evaluating the predictive power of the effect of climate change on the Orma community, the *b* value of 0.392 indicates that for every unit change in climatic condition in the Orma community, there will be a significant positive corresponding 0.392-unit change in the farmer-herder conflicts in the Tana River area. The *t* value is 5.38 (p = 0.00), thus the observed significance is less than .05, then it is agreed that the result reflects a genuine effect. Thus, the probability of the *t*-value occurring if the values of *b* in the population were 0 is less than 0.00. Since the *b* value is different from 0, it can therefore be concluded that the adverse effect of climate change on the Orma community would have a significant impact ($p < .001$) on farmer-herder violent conflict in the Tana River Delta area in Kenya.

Table 6.12: Regression Analysis on the Effect of Climate Change in Nigeria's Core North and the Farmer-Herder Conflicts in the Middle Belt Region

Independer Variable	Dependent Variable	F	df	R	t	b	Beta (β)	Std. Erro	ρ
Climate Change and Migration	Incessant Conflict	147.3	1,42	0.50	12.13	0.28	0.50	0.02	0.0

$R^2 = 0.258$; Adjusted $R^2 = 0.257$

The *b* value of 0.283 indicates that for every unit change in the effect of climate change in Nigeria's core north, there will be a significant positive corresponding 0.282-unit change in the farmer-herder conflicts in the Middle Belt region. The *t* value is 12.137 (p = 0.00), and the observed significance is less than .05, it is therefore agreed that the result reflects a genuine effect, thus the probability of the *t*-value occurring if the values of *b* in the population were 0 is less than 0.00. Since the *b* value is different from 0, it can therefore be concluded that the adverse effect of climate change on Nigeria's core North would have a significant contribution ($p < .001$) to farmer-herder conflicts in the Middle Belt region.

Table 6.13: Regression Analysis on the Effect of Migration as a Result of Climate Change on Farmer-Pastoralist Conflicts in the Middle Belt Region of Nigeria and Tana River Delta Area of Kenya

Independer Variable	Dependent Variable	F	df	R	t	b	Beta (β)	Std. Erro	ρ
Climate Change and Migration	Incessant Conflict	257.43	1,641	0.535	16.04	0.34	0.53	0.022	0.00

$R^2 = 0.287$; Adjusted $R^2 = 0.285$

The *b* value of 0.392 indicates that for every unit change in climate-induced migration in the Middle Belt region in Nigeria and the Tana River Delta Area of Kenya, there will be a significant positive corresponding 0.392-unit change in the farmer-herder conflicts. The *t* value is 12.137 (p = 0.00), and the observed significance is less than .05, it is then agreed that the result reflects a genuine effect, thus the *b* value is different from 0, the effect of climate change in the Northern part of Nigeria and Orma community in had a significant impact ($p < .001$) on farmer-herder conflicts in the studied region.

6.4. Conclusion

A comprehensive discussion of these findings from the above analysis will be presented in the next chapter. However, it should be noted that the location analysis of the Set B instrument (OM and CCRC) was not conducted. The reason was that the locations of respondents for this particular instrument were much, and the N was very scanty thereby giving false positive results. So, variables with N less than 3 were not considered. Nonetheless, a comparative case analysis was conducted based on gender, age, and educational qualification. Regarding gender, it could be inferred from the analysis above that there is a shared understanding among men and women in Kenya and Nigeria of the impact of climate change on the geopolitical dynamics of peace and security as well as the impact of climate-induced migration on incessant conflicts. Concerning age, it could be concluded, based on the above analysis, that there is a shared understanding among most younger respondents in both Kenya and Nigeria regarding the impact of climate change on the geopolitical dynamics of peace and security than other age group. This is quite understandable as several studies have revealed that young people are among the most vulnerable groups to climate change. Other categories in this bracket are the women/girls, and the poor. It is also noteworthy that this category of people is more knowledgeable about the meaning, causes, crises, and contradictions of climate change. Also, they are the major participants in any violent conflicts occasioned by climate-induced migration. Lastly, regarding educational qualification, it could be inferred from the analysis that there is a shared understanding among all respondents in these countries regarding the impact of climate change on the geopolitical dynamics of peace and security and the impact of climate-induced migration on incessant conflicts except those at the extremes of

education. This as well is also empirically valid as most of the respondents were experts on climate change and drawn from government ministries, departments, and agencies, climate change-oriented NGOs, academia, youth organizations, officials of farmers, and herders' associations just to mention a few. Some of them had experiential knowledge about the effects severe climatic conditions have had on violent crises.

In addition, the quantitative forecasting conducted on the effect of climate change on peace and security in Africa, particularly in East and West Africa, reveals compelling evidence of a significant relationship. The findings underscore the profound impact of climatic shifts on geopolitical dynamics, highlighting both the vulnerability of communities and the urgency of addressing climate change as a crucial factor in maintaining regional stability. Specifically, the analyses demonstrate that climate change influences peace and security outcomes in Kenya and Nigeria, affecting not only overall regional stability but also exacerbating conflicts within specific communities such as Tana River County in Kenya and the Northern region of Nigeria. Furthermore, the correlation between climate-induced migration and farmer-pastoralist conflicts emphasizes the interconnectedness of environmental and social factors in driving tensions and violence. Notwithstanding the foregoing, the next and final chapter presents the comprehensive findings of the study and the suggested policy recommendations.

CHAPTER 7

RESEARCH FINDINGS, DISCUSSION, POLICY RECOMMENDATIONS, AND CONCLUDING INSIGHTS

This is the concluding chapter of this thesis. The previous chapters, particularly chapters five and six, laid the foundation upon which the current chapter is built. In other words, the information presented in the previous chapters is very crucial for understanding the conclusions and findings that were discussed in this concluding chapter. The primary purpose of this chapter is to present the discussion of research findings, projections, policy recommendations, and conclusions. The findings of this research are based on both the reviewed literature and the analyzed quantitative and qualitative data. To have a comprehensive discussion of the findings, there was a need for the research objectives, questions, and hypotheses, that were initially formulated at the beginning of this study, to be revisited. This became necessary to ensure that the conclusions drawn align with the original goals of this research. More so, efforts were made to determine whether the gaps identified earlier in the research have been adequately addressed through the research process. This highlights the intention to evaluate the extent to which the study contributes to filling gaps in existing knowledge or understanding. Based on the findings of the research, policy recommendations were made that are considered useful for the Economic Community of West African States (ECOWAS), the East African Community (EAC), the African Union (AU) in general, and the governments of the Republic of Kenya and the Federal Republic of Nigeria in particular. The policy recommendations aimed at addressing the potential impacts of climate change on conflict dynamics in the studied regions.

7.1. Revisiting the Research Objectives/Questions and Hypothesis

7.1.1 *The Core Research Question*

As noted in Chapter 5, this question was answered quantitatively using correlation analysis to assess the relationship between climate change and the geopolitics of peace and security. This core research question revolves around the relationship between the effects of climate change and the geopolitics of peace and security in West Africa and East Africa. The question seeks to understand the extent to which climate change contributes to the geopolitical dynamics related to peace and security in these regions. It aims to explore the relationship between the effects of climate change and the geopolitics of peace and security in West Africa and East Africa. The underlying hypothesis indicates that climate change has a positive influence on the geopolitical situation related to peace and security in these regions. This agrees with the submission of a lot of scholars. For instance, Brown, Hammill, and McLeman (2007)

argued that climate change is one of the latest environmental drivers of violent conflict that has been identified in recent decades.

The research findings indicate a significant positive correlation between climate change and the geopolitics of peace and security in both Kenya and Nigeria. These findings align with existing literature that underscores the profound impact of climate change on geopolitical stability and conflict in Africa. Regarding the analysis of data from Kenya, the study found a moderate positive correlation ($r = 0.500$) between climate change and geopolitics of peace and security, with climate change accounting for 25% of the variance. This aligns with studies by Opiyo *et al.* (2014), who highlighted that climate variability and change exacerbate resource scarcity, leading to conflicts over water and pasture in Kenya's arid and semi-arid regions. The work of Schilling *et al.* (2012) also supports this finding, as they documented how climate-induced droughts and floods have intensified inter-ethnic conflicts in northern Kenya.

Also, a stronger positive correlation ($r = 0.592$) was found in Nigeria, with climate change accounting for 35.1% of the variance in geopolitical peace and security. This finding resonates with the literature on the linkage between climate change and the Boko Haram insurgency. According to Okpara *et al.* (2015), shrinking Lake Chad has exacerbated livelihood insecurity, fostering conditions conducive to the rise of Boko Haram. Similarly, Hendrix and Salehyan (2012) found that climatic variations significantly influence the likelihood of conflict in Nigeria, particularly in regions dependent on agriculture and pastoralism.

The correlation coefficients for Kenya and Nigeria indicate the strength and direction of the relationship between the effects of climate change and the geopolitics of peace and security. A positive correlation implies that as the effects of climate change increase, there is a tendency for the geopolitical situation related to peace and security to be adversely affected. This also concurs with Barnett and Adger (2007) when they asserted that the direct and indirect effects of climate change on human security may raise the probability of violent conflict.

The analysis combining both Kenya and Nigeria shows a significant positive correlation between climate change and the geopolitical aspects of peace and security in Africa. This indicates that climate change explains a significant portion of the variability in peace and security dynamics in the studied regions. This is also in line with Evans (2008) who noted that there is a strong causal connection between climate change and conflict since climate change has been described as a “threat multiplier”.

So, when combining data from both countries, the significant positive correlation ($r = 0.585$) and effect size (34.2%) reinforce the broad consensus in the literature that climate change is a critical driver of

geopolitical instability in Africa. The IPCC reports have consistently pointed out that Africa is highly vulnerable to climate change impacts, which exacerbate existing social, economic, and political tensions, leading to conflicts. Buhaug (2010) and Raleigh & Urdal (2007) further support these findings by emphasizing that climate change intensifies resource competition, migration, and social fragmentation, contributing to the risk of violent conflicts. The findings of this study corroborate existing literature that highlights the significant role of climate change in shaping the geopolitics of peace and security in Africa. The correlations observed in Kenya and Nigeria illustrate the broader regional pattern where climate change exacerbates resource scarcity and social tensions, leading to increased conflict potential.

7.1.2 ***Research Hypothesis 1***

Ho: There is no significant effect of climate change on the geopolitics of peace and security in West Africa and East Africa.

H1: There is a significant effect of climate change on the geopolitics of peace and security in the West Africa and East Africa.

The first research hypothesis focuses on the impact of climate change on the geopolitics of peace and security in West Africa and East Africa. The result of the hypothesis testing reveals that climate change has a significant effect on peace and security in East Africa and West Africa. This is in tandem with an empirical study conducted on over two hundred conflicts across the globe by Esty *et al* (1998) in which they were able to establish interconnections between environmental factors which they termed 'independent variables' and conflicts and crises which they termed 'dependent variables'. Also, a former Secretary-General of the United Nations, Ban Ki-moon (Ramos, 2013:739) noted that climate change does not only aggravate a threat to international peace and security, but it is also a threat to global peace. This submission has also been corroborated by a former President of the United Nations General Assembly and Chairperson of the African Union Commission, Jean Ping (Keating, 2009:11) when he notes that, among other impacts, climate change will fundamentally affect agricultural activities, increase the prevalence of diseases and poverty, and increase water stress and subsequently trigger conflicts and war.

So, based on the findings emanating from the testing of this first hypothesis, it can be concluded that there is a significant effect of the geopolitics of climate change on peace and security in both East Africa and West Africa, as well as when considering them together. In essence, the results indicate that climate change is not just an environmental challenge, it is intertwined with geopolitics and security.

Acknowledging this connection and acting upon it can contribute to more resilient and peaceful societies in East and West Africa, and potentially serve as a model for other regions facing similar challenges.

7.1.3. Sub-Research Question I:

The first sub-research objective seeks to specifically establish the correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River County in Kenya; while sub-research question I states that: Specifically, what is the correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River County in Kenya?

Addressing this research question involves exploring the potential correlation between the effects of climate change and farmer-herder conflicts in specific regions of Africa, namely the Tana River delta area of Kenya and the Middle Belt region of Nigeria. Correlation analysis was conducted to explore the potential relationships between climate change effects and farmer-herder conflicts in the studied regions. The findings indicate a significant positive correlation between climate change and farmer-herder conflicts in both the Middle Belt region of Nigeria and Tana River County in Kenya. These results align with and add to the existing body of literature that explores the links between climate change, migration, and conflict in Africa. The positive correlation ($r = 0.551$) between climate change and farmer-herder conflicts in the Tana River delta area is consistent with studies such as those by Witsenburg and Adano (2009). They documented how climatic variability, particularly drought, leads to resource scarcity, prompting migration and conflict between herders and farmers in Kenya. According to Schilling *et al.* (2012), the Tana River region has experienced increased tensions and violent conflicts as herders migrate in search of water and pasture, often encroaching on agricultural lands. Also, the significant positive correlation ($r = 0.508$) between climate change and farmer-herder conflicts in the Middle Belt region is supported by research from scholars like Okpara *et al.* (2016). They noted that climate change-induced desertification and diminishing water resources in northern Nigeria drive herders southward into the Middle Belt, leading to clashes with farmers over land and water. Odoh & Chilaka (2012) similarly highlighted how the changing climate exacerbates competition over resources, increasing the frequency and intensity of farmer-herder conflicts in Northern Nigeria.

So, concerning the analysis of data based on this first sub-question, it was established that there is a positive correlation between the effects of climate change in Kenya's Orma community and the farmer-herder conflicts in the Tana River Delta area. The implication of this is that as the effects of climate change increase in the Orma community, there is a tendency for the conflicts between crop farmers and

herders to also increase in the Tana River Delta area. Similarly, there is a significant positive correlation between the effects of climate change in Kaduna and Sokoto States (Nigeria's core North) and the farmer-herder conflicts in Benue and Plateau States in the Middle Belt region of Nigeria. This implies that as the impact of climate change intensifies in the core North, the farmer-herder conflicts tend to intensify in the Middle Belt region. This is in line with Fjelde and Uexkull (2012) who stated that the results of the study they conducted indicate that negative deviations in rainfall from the historical norm are associated with a higher risk of communal conflict. Busby (2013) corroborated this when he argued that climate change constitutes both a direct and indirect threat to national security. Elsewhere, he avers that climate change poses a security danger through extreme weather events and their direct effects on populations and critical infrastructure (Busby, 2016). Alvarez (2017) supports the submission of Busby by contending that climate change can stress communities, disorganize social order, and lead to an upsurge in violent conflict.

The combined positive correlation ($r = 0.535$) between climate change-induced migration of herders and incessant conflict across both countries is corroborated by broader regional studies. The IPCC reports consistently emphasize that Africa's vulnerability to climate change exacerbates resource scarcity, leading to heightened competition and conflict (IPCC, 2014). Research by Raleigh and Kniveton (2012) also supports these findings, noting that climate change-driven migration often leads to conflicts as migrating groups encounter resistance from local populations over access to scarce resources. The findings also concur with Dalby (2002) who noted that environmental displacements that spark identity crises might set the stage for violent clashes. In supporting this, Homer-Dixon (1991) noted that environmental change contributes to war, terrorism, and diplomatic and trade disputes. Elsewhere, Homer-Dixon (1994) argued that environmental scarcity is already a factor in many violent confrontations in developing countries. Hauge and Ellingsen carried out a multivariate analysis on the environment-security nexus in several countries between 1980 and 1992 and were able to establish the fact that environmental factors such as deforestation, land degradation, and scarce supply of fresh water, alone and in conjunction with overpopulation, increase the risk of violent conflict.

More so, the findings of the positive correlation between climate change and farmer-herder conflicts in both the Middle Belt region of Nigeria and Tana River County in Kenya can be examined through the lens of Marxist and Neo-Marxist theoretical frameworks, which emphasize the interplay between environmental factors, resource scarcity, and socio-economic inequalities in driving conflict. Marxist theory posits that ecological degradation and resource scarcity are intrinsically linked to the capitalist mode of production, which prioritizes profit over sustainable resource management. This framework

suggests that environmental degradation, driven by capitalist exploitation, disproportionately affects marginalized communities, exacerbating existing socio-economic inequalities and leading to conflict. In the context of Kenya and Nigeria, climate change-induced resource scarcity (such as water and pasture) can be seen as a byproduct of broader capitalist exploitation and industrial activities contributing to global warming. The marginalized herder communities, already economically disadvantaged, are forced to migrate in search of resources, leading to conflicts with farmers over the limited available resources.

Neo-Marxist theories expand on classical Marxist thought by incorporating issues of global inequality and the role of the state and transnational actors in perpetuating ecological degradation. This perspective emphasizes the uneven distribution of environmental harms and the role of global capitalism in exacerbating environmental crises. The conflicts in the Middle Belt region of Nigeria and Tana River County in Kenya can be interpreted through this lens. Climate change, driven largely by industrial activities in the Global North, disproportionately impacts the Global South, creating conditions for conflict. The herder-farmer conflicts can thus be seen as manifestations of global ecological inequality, where the poorest and most vulnerable communities bear the brunt of environmental degradation caused by global capitalist processes. The significant relationship between climate change and conflict aligns with Marxist theories that ecological degradation, driven by capitalist exploitation, disproportionately affects marginalized communities, leading to conflict over scarce resources (Bunker, 1988). Neo-Marxist theories, which emphasize global inequality and the uneven distribution of environmental harms, are also supported. Climate change, driven by industrial activities in the Global North, disproportionately impacts the Global South, creating conditions for conflict as seen in Kenya and Nigeria (Roberts and Parks, 2007).

The significant correlation between climate change and farmer-herder conflicts in Kenya ($r = 0.551$) aligns with the Marxist view that ecological degradation leads to resource scarcity and conflict. The migration of herders into the Tana River Delta area due to climate-induced droughts exemplifies how marginalized groups are pushed into conflict over dwindling resources. Also, the positive correlation between climate change and conflicts in Nigeria's Middle Belt region ($r = 0.508$) reflects the Neo-Marxist perspective on global ecological inequality. The southward migration of herders due to desertification in northern Nigeria highlights the uneven impact of climate change, which disproportionately affects already marginalized communities, leading to increased competition and conflict over resources. Combined Analysis ($r = 0.535$): The overall positive correlation between climate change-induced migration and incessant conflict across both countries underscores the neo-Marxist critique of global capitalism's role in creating and exacerbating ecological crises. The conflicts

can be seen as local manifestations of global ecological injustice, where the environmental impacts of global capitalist activities are felt most acutely by vulnerable populations in the Global South.

It is noteworthy that the analysis of data based on the above research question provides insights into the complex interplay between climate change and geopolitical dynamics in the context of peace and security in Nigeria and Kenya. The finding suggests that climate change does indeed have a positive correlation with the geopolitics of peace and security in both countries. This implies that as the effects of climate change intensify, they can contribute to shifts in geopolitical dynamics that impact peace and security situations. However, correlation does not imply causation. "Correlation does not imply causation" is a fundamental principle in statistics and research that reminds us of the distinction between two types of relationships that can be observed between variables: correlation and causation. Correlation refers to the statistical association or relationship between two variables. When two variables are correlated, changes in one variable tend to correspond with changes in the other variable. Correlation is measured using correlation coefficients, with the most common one being the Pearson Product Moment Correlation (PPMC). Causation, on the other hand, refers to a cause-and-effect relationship between two variables. It means that changes in one variable directly led to changes in the other variable. Establishing causation requires more than just observing a correlation. It involves demonstrating that changes in one variable are not only associated with changes in the other variable but that changes in the first variable cause changes in the second variable. So, while there is a statistical relationship, it's important to consider other factors that could also be influencing the geopolitical landscape. This finding is in tandem with Schorlemer and Maus (2014) who argued that the patterns of 'correlation' and 'causation' between climate change and violent conflicts are yet to be firmly established as both the proponents and critics are yet to prove their cases as to whether a change in climatic condition triggers violent conflict or not. Percival and Homer-Dixon (1998) argued that the interconnection between environmental scarcities and the outbreak of violent conflict is complex one and that environmental insufficiency arises within a political, social, economic, and ecological setting and interacts with many of these factors to contribute to violent conflict. Also, Stub (1997) observed that environmental degradation and resource scarcities are the major causes of many conflicts and that together with other sources of tension, such as poverty, social inequality, and ethnic intolerance, environmental degradation and resource scarcities may lead to violent conflicts. Scheffran *et al* (2019) corroborated this when they stated that the effects of climate change on conflicts are often indirect, complex, and linked to other variables such as political, economic, and social conflict factors including social inequalities, low economic development, and ineffective institutions. Boko *et al.* (2007) argued that climate change and climate security are yet to be institutionalized as security issues. Also, the Institute for Peace and Conflict Resolution in a study finds out, among other things, that there is no

direct and conclusive link between climate change and violence *(*Institute for Peace and Conflict Resolution, 2020). Toeing this line of argument Baalen & Mobjörk (2017) noted that the means through which climate change impacts violent conflict has not been fully understood.

7.1.4. Research Hypothesis 2

Ho: There is no significant correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River Delta area in Kenya.

H1: There is a significant correlation between climate change and farmer-herder conflicts in the Middle Belt region of Nigeria and farmer-herder conflicts in the Tana River Delta area in Kenya.

This second hypothesis is related to the relationship between climate change effects and farmer-herder conflicts in Kenya and Nigeria. The analysis is conducted through regression models, focusing on different regions and their respective conflicts: For the Orma Community and Tana River delta area in Kenya: The effect of climate change on the Orma community was discovered to have a significant influence on farmer-pastoralist conflicts in the Tana River delta area. Also, in the Core North and Middle Belt Region of Nigeria, the effect of climate change in core North significantly contributes to farmer-pastoralist conflicts in the Middle Belt region. The findings that climate change significantly influences farmer-herder conflicts in both Kenya's Tana River Delta area and Nigeria's Middle Belt region align with and extend existing literature on the nexus between climate change, migration, and conflict in Africa. The significant effect of climate change on conflicts in the Tana River delta area ($R = 0.551$) supports studies like those of Witsenburg and Adano (2009) and Schilling et al. (2012). These scholars have documented how climatic variability, particularly drought, leads to resource scarcity, prompting migration and conflict between pastoralists and farmers in Kenya. The finding that climate change explains 30.3% of the variance in conflicts in Tana River County (Adjusted R^2: 30.0%) reinforces the view that environmental changes exacerbate competition over limited resources. This aligns with the work of Adaawen *et al.* (2019) who found that drought-induced migration in Kenya leads to increased resource competition and conflict.

The significant impact of climate change on conflicts in Nigeria's Middle Belt region ($R = 0.508$) is consistent with research by Tarif (2022), who highlighted that climate change-induced desertification in northern Nigeria drives herders southward, leading to clashes over land and water in the Middle Belt. The finding that climate change explains 25.8% of the variance in conflicts in Nigeria (Adjusted R^2: 25.7%) supports Raleigh and Urdal's (2007) assertion that environmental stress can significantly increase the risk of conflict, particularly in regions with pre-existing socio-economic tensions. The combined analysis showing that climate-induced migration significantly affects farmer-herder conflicts

in both regions (R = 0.535) echoes broader regional studies. The IPCC (2014) consistently emphasizes Africa's vulnerability to climate change and how this exacerbates resource scarcity, leading to heightened competition and conflict. The finding that climate-induced migration explains 28.7% of the variance in conflicts in both Kenya and Nigeria (Adjusted R^2: 28.5%) aligns with Hendrix and Salehyan's (2012) research. They demonstrated that climatic extremes, such as droughts, are linked to increased conflict risk due to migration and resource competition.

Based on the findings, there is a statistically significant and moderate positive correlation between the effects of climate change and farmer-herder conflicts in the studied regions in Kenya and Nigeria. This suggests that as climate change effects worsen, the conflicts between farmers and herders tend to increase in these areas. Additionally, the migration of herders due to climate change is linked with heightened conflicts in their destination areas. This finding also aligns with the result of testing this second hypothesis. While the findings suggest that there is a statistical relationship between these variables, other factors not considered in the analysis could be influencing the conflicts as well. Factors such as socioeconomic conditions, political stability, land disputes, and cultural dynamics could also play significant roles in the conflicts. This aligns with Salehyan (2008) who argued that there is no consensus yet among the protagonists and antagonists on the interconnection between climate change and violent conflict and further noted that armed conflict can only be triggered by climate change if some other social and political challenges are left unattended to. Also, Beaumont & De Coning (2022) contended that the actual links between climate change and violence remain obscure despite significant research and the prioritization of climate security by many international forums.

The findings of significant relationships between climate change and farmer-herder conflicts in both Kenya and Nigeria can also be effectively analyzed through the lens of the environmental security theoretical framework. This framework emphasizes the interconnectedness of environmental factors and security, asserting that environmental degradation can undermine human security and exacerbate conflicts. The significant impact of climate change on conflicts in Kenya's Tana River delta (R = 0.551) and Nigeria's Middle Belt region (R = 0.508) underscores the idea that environmental degradation threatens human security. Scholars like Mathews (1989) argue that resource scarcity due to environmental changes directly threatens livelihoods, particularly for vulnerable communities reliant on agriculture and pastoralism. The finding that climate change explains over 30% of the variance in conflict in Kenya and nearly 26% in Nigeria illustrates how environmental factors can directly contribute to insecurity and conflict, aligning with the views of Homer-Dixon (1999), who posits that resource scarcity can lead to social tensions and violence.

The result of the hypothesis testing agrees with Charbonneau (2022) who described the Sahel region as a place where climate change and violent conflict intersect, and an important case study for the question of whose security is threatened by global warming due to state fragility, inter-group inequality, a history of violent conflict, and a high reliance on rain-fed agriculture and livestock. This submission is also in line with Brown *et al.* (2007) as they claimed that climate change drives conflict which has been evidenced by the farmer-herder conflict in Darfur due to climate impacts such as declining rainfall and desert encroachment. Also using the Sahel region as a case study Bronkhorst (2011) noted that slow-onset changes and quick-onset triggers are the two ways through which climate change impacts can cause conflict as has been seen in the conflicts between pastoralist, agro-pastoralist, and farmer communities in the Sahel region of Southern Kordofan.

More so, the results showing that climate-induced migration significantly affects farmer-herder conflicts (R = 0.535) reflect the environmental security perspective that competition over dwindling resources can lead to conflict. As herders migrate due to climate change, they encroach on agricultural lands, leading to heightened tensions. This finding is supported by the work of Baechler (1999), who emphasizes that environmental stress can exacerbate competition, leading to violent conflicts. The data demonstrate that both regions are experiencing increased resource competition as climate change impacts water availability and grazing lands, confirming the environmental security framework's assertion that environmental challenges can compromise stability and security. The environmental security framework also considers the socio-political contexts in which environmental degradation occurs. The findings highlight that the conflicts in both Kenya and Nigeria are not only about resources but are also deeply rooted in socio-economic inequalities and historical grievances. This aligns with the works of Nassef *et al.,* 2023; and Odidi, 2024, who emphasize that environmental factors intersect with political and social dynamics to shape conflict outcomes. The farmer-pastoralist conflicts can be seen as a manifestation of broader socio-political issues exacerbated by environmental stress, reinforcing the idea that environmental security must incorporate political dimensions to fully understand the risks of conflict.

7.1.5. Sub Research Question II

The second sub-objective ascertains the level of awareness about climate change among various stakeholders in the agricultural sector in Northern Nigeria and Tana River County, Kenya; and whether awareness of the effects of climate change plays a role in the different stakeholders' approach to conflicts; while the sub-research question II state that: What is the level of awareness about the effects of climate change among crop farmers, herders, and policymakers in the Northern region of

Nigeria and Tana River County of Kenya, and how does the knowledge about the effects of climate change play a role in the different stakeholders' approach to conflict?

The qualitative analysis of awareness regarding climate change among farmers, herders, and policymakers in Northern Nigeria and Tana River County, Kenya, reveals critical insights that resonate with existing literature on climate change awareness and its implications for agricultural communities. The respondents' basic understanding of climate change aligns with findings from Adger *et al*. (2003), who emphasize that awareness and understanding of climate variability are essential for communities that depend on agriculture and pastoralism. While many respondents articulated a definition of climate change, the varying levels of knowledge reflect the complexity and multifaceted nature of climate education, as highlighted by Mastrorillo *et al*. (2016), who found that agricultural communities often possess fragmented knowledge about climate issues.

In the Northern region of Nigeria and Tana River County of Kenya, there is a level of awareness about the effects of climate change among stakeholders in the agricultural sector and policymakers. The responses from the respondents in both regions reveal two main themes regarding their awareness: awareness about understanding climate change and awareness about the effects of climate change. This agrees with González JB (2022) who claimed that the recent African survey data shows that 56% of the continent's population is aware of climate change. This has also been corroborated by two surveys conducted by the Pew Research Center in 2020 and 2022. The first survey[40] shows that people, globally, remain concerned about the potential effects of climate change and that approximately 70% of respondents across fourteen countries surveyed believe that climate change represents a significant threat to their respective nations. The second survey[41] conducted in nineteen countries shows that concern about climate change has grown around the world.

The findings also indicate a significant gap in awareness initiatives, which is consistent with literature documenting inadequate climate change education in rural regions. It has been noted that some rural communities in Kenya often lack access to climate education resources, resulting in limited understanding and preparedness for climate impacts. This lack of orientation is particularly concerning given the increasing vulnerability of these communities to climate change, as noted by Iskander *et al.* (2023)., who argue that awareness programmes are critical for building resilience. The respondents'

[40] https://www.pewresearch.org/short-reads/2020/10/16/many-globally-are-as-concerned-about-climate-change-as-about-the-spread-of-infectious-diseases/

[41] https://www.pewresearch.org/short-reads/2023/08/09/what-the-data-says-about-americans-views-of-climate-change/#:~:text=Concern%20over%20climate%20change%20has,change%20as%20a%20major%20threat.

acknowledgment of insufficient awareness programmes suggests potential implications for decision-making related to climate adaptation and mitigation strategies. Research by Cradock-Henry (2017) emphasizes that a lack of awareness can hinder farmers' ability to make informed decisions, ultimately impacting agricultural productivity and food security. This highlights the need for targeted educational campaigns that can empower communities to adapt to changing climate conditions. The mixed perceptions regarding government efforts in climate education align with findings from Bulmer & Yáñez-Araque (2023), who discuss the importance of multi-stakeholder engagement in climate awareness initiatives. While some respondents noted that efforts were being made, the overall sentiment was one of inadequacy. This suggests that while governments and organizations may be attempting to address climate awareness, the effectiveness and reach of these efforts need to be evaluated and improved. The presence of local definitions of climate change among respondents echoes the arguments made by Leach and Mearns (1996) about the significance of incorporating local knowledge and perspectives in climate discussions. The respondents' insights indicate a need for integrating local understandings with scientific knowledge to create more relevant and effective climate education programmes.

As regards the stakeholders' approach to conflicts, the responses from interview sessions highlight several key themes and insights about how the knowledge about the effects of climate change in Nigeria and Kenya influences various aspects of stakeholders' behaviour, decision-making, and approaches to conflict. In both Nigeria and Kenya, the analysis highlights the critical role of knowledge about climate change in shaping stakeholders' attitudes to conflict. The key themes identified from the responses underscore the importance of awareness, planning, conflict resolution, and sustainable practices. This agrees with Adano & Daudi (2012) who argued that despite Africa's low GHG emissions, climate change has negatively impacted the cPontinent with effects such as desertification, droughts, rising temperatures, and altered precipitation patterns which eventually resulted in conflicts between herders and farmers in the Sahel region, Nigeria, Sudan, Ethiopia, South Sudan, and Kenya. Corroborating this Alabi (2022) has noted that there has been an increase in farmer-herder clashes; the impact of climate change such as desertification and increasing precipitation has been given as the main cause of the conflicts.

7.1.6. Sub Research Question III

The last objective examines the existing policy frameworks in the Federal Republic of Nigeria and the Republic of Kenya aimed at raising awareness about climate change and mitigating its impact on violent conflicts at both national and local levels; *while the sub-question III states that: What are the*

policy frameworks in Nigeria and Kenya that create awareness about climate change and mitigate the effects of climate change on violent conflict at both national and local levels?

The findings from this qualitative analysis relating to the last research question align with and expand upon existing literature on climate change policy, awareness, and conflict mitigation in Africa. The respondents had divergent opinions about available policy frameworks for creating awareness about climate change and mitigating the effects of climate change on violent conflict. Some of the respondents agreed that policies were available, some were of the view that policies were available but not implemented while some expressed the fact that policies were not available. So, three themes were identified here, and they are the availability of policy, documented policy without implementation, and non-availability of documented policy.

Numerous studies indicate that while many African countries have developed national policies addressing climate change, actual implementation often falls short (Patt et al., 2010; Mastrorillo et al., 2016). The findings reflect this trend, where policymakers acknowledge the existence of policies yet highlight implementation gaps. The mention of specific initiatives, such as the Green Belt Initiative[42], echoes literature on local adaptation strategies that aim to address climate resilience. These initiatives often serve as case studies in the discourse on sustainable agricultural practices. Also, existing literature consistently points to bureaucratic inefficiencies and a lack of political will as significant barriers to effective policy implementation (Clement, B. *et al.* (2023). The respondents' emphasis on these issues reinforces findings that highlight the importance of governance and institutional capacity in climate policy success. The observed gap between policy formulation and actual practice is well-documented. Studies suggest that well-crafted policies often fail due to insufficient resources, lack of stakeholder engagement, and inadequate monitoring and evaluation frameworks (Boko et al., 2007).

The disconnect between the existence of policies and stakeholder awareness is a significant theme in climate change literature. Research indicates that low levels of awareness among rural populations hinder effective climate action and adaptation (Mastrorillo et al., 2016; Measham *et al.* (2011). This finding emphasizes the need for improved communication strategies to enhance awareness of climate policies. The positive acknowledgment of climate change policies in Kenya, contrasted with the skepticism in Nigeria, reflects findings from comparative studies that highlight regional differences in

[42] For more information on the Green Belt Initiative by the Government of Malawi see: https://www.resakss.org/sites/default/files/Malawi%202011%20Government%20of%20Malawi%20Greenbelt%20Initiative.pdf

policy development and implementation across Africa (Alves *et al.,* 2020). While some countries may have more robust frameworks, others struggle with basic awareness and enforcement. The similar issues of policy implementation in both countries highlight a broader regional challenge, reinforcing studies that show that even where policies exist, effective execution remains a critical hurdle (Santos *et al.* (2022).

Similarly, Okeke, Butu, and Okereke (2023) note that Nigeria has developed several adaptation policy frameworks with ambitious plans and strategies for climate adaptation. However, they argue that Nigeria's Nationally Determined Contributions (NDC) lack a critical focus on adaptation and that other adaptation policy frameworks in Nigeria have not been fully implemented due to financial constraints, fragmentation, and technological deficiencies. Also, a review conducted by Ongugo et al. (2014) identified that overlapping sectoral policies in Kenya are poorly integrated and lack the necessary investment in research to generate data, information, and knowledge needed for evidence-based policy formulation and decision-making.

7.2. Comparative Case Analysis

The findings from the comparative case analysis provide valuable insights into the perceptions of climate change, migration, and conflict in Kenya and Nigeria, aligning with and expanding upon existing literature in several key demographic areas such as gender, age, educational qualification, and geographic location. Regarding gender perspectives, the analysis indicates that women in both Kenya and Nigeria express a stronger belief in the relationship between climate change and peace and security than men. This is consistent with literature that emphasizes women's unique vulnerabilities to climate impacts and their roles as key stakeholders in peacebuilding efforts. For instance, studies have shown that women are often more directly affected by environmental degradation, which influences their perceptions of security and conflict dynamics (Nussbaum, 2011).

From age perspectives, the findings reveal that younger age groups in Kenya are less likely to believe in the impact of climate change on geopolitical dynamics, whereas younger and middle-aged groups in Nigeria recognize this relationship. This aligns with existing research that shows younger populations may have varying levels of awareness and concern regarding climate issues, often shaped by educational and socio-economic factors (Mastrorillo et al., 2016). Also, regarding educational qualification perspectives the divergence in views based on educational qualifications in Kenya — where those with higher qualifications show skepticism — contrasts with Nigeria's consensus across educational backgrounds. This reflects findings from the literature indicating that higher education does not always correlate with greater environmental concern; in some contexts, it may lead to critical

assessments of environmental narratives (Gifford, 2011). On geographic location perspectives, in Kenya, perceptions vary significantly by location, with only one area reflecting a significant relationship, while Nigeria shows convergent views in multiple regions. This highlights the importance of local contexts in shaping perceptions of climate-related issues. The literature often discusses how geographic and socio-political contexts influence vulnerability and adaptive capacity (Adger et al., 2005). The divergence in Nigeria's North East, where conflict is more pronounced, aligns with studies indicating that areas experiencing ongoing conflict may perceive climate change impacts differently due to immediate socio-economic pressures (Mastrorillo et al., 2016).

Finally, the findings on migration and conflict indicate a convergence of opinion regarding climate-induced migration and conflict in both countries, with women in Kenya showing slightly more concern than men. This finding is supported by the literature, which indicates that climate-induced migration can exacerbate existing tensions and conflicts, particularly in vulnerable regions (Boas, 2015). The recognition of this relationship highlights the need for policies that address the complexities of migration in the context of climate change and conflict, supporting integrated approaches that consider both human security and environmental sustainability.

7.3 Quantitative Forecasting

The quantitative forecasting findings provide a predictive framework for understanding the potential impacts of climate change on peace and security dynamics in East and West Africa. By employing regression analysis, this study establishes relationships that not only reflect current conditions but also offer insights into future trends. The significant relationships identified - particularly the b values of 0.272 for Kenya and 0.335 for Nigeria - suggest that as climate conditions continue to change, we can anticipate an escalating influence on peace and security in these regions. Literature indicates that ongoing climate variability will likely lead to increased resource scarcity, exacerbating tensions (Mastrorillo et al., 2016). Future projections suggest that if climate change continues at the current rate, conflicts driven by resource competition may rise significantly, potentially doubling the frequency of violent events in vulnerable regions (Hsiang et al., 2013).

Also, the predictive power of climate change in Nigeria, with a higher R^2 value, signals that West Africa may face more acute challenges compared to East Africa. As climate impacts intensify, existing vulnerabilities - such as poverty, governance issues, and historical grievances - could become magnified, leading to a potential increase in conflict incidents (Reuveny, 2007). If these trends continue,

we might foresee a future where areas like Nigeria's Middle Belt become hotspots for violence, reflecting the projections that climate change could exacerbate existing fault lines (Boas, 2015).

Additionally, the findings concerning the Orma community and Nigeria's core north suggest that localized conflicts over resources will likely become more pronounced as climatic conditions worsen. Research supports the notion that as environmental pressures grow, we can predict an increase in confrontations between pastoral and agricultural communities (Turner et al., 2015). Projections indicate that if current climatic trends persist, these communities may experience a significant uptick (a slight upward trend) in conflict-related incidents, particularly in regions where governance structures are weak, and resources are dwindling.

Finally, the analysis showing a *b* value of 0.392 for climate-induced migration reinforces the predictive literature that associates climate change with increased migration flows. Future scenarios suggest that as more individuals migrate due to environmental pressures, competition for resources in host communities could escalate, potentially leading to heightened conflict (Black et al., 2011). Predictive models indicate that climate-induced migration could double in some areas by 2050 (Beyer & Milan, 2023), significantly impacting social dynamics and conflict potential in both the Tana River Delta and the Middle Belt region.

7.4. Policy Recommendations

The above findings emphasize the need for comprehensive strategies that integrate climate resilience, conflict prevention, and sustainable development to address the challenges faced by communities in the studied regions. Highlighted below are the policy recommendations meant to address the effects of climate change in the context of Kenya and Nigeria. These recommendations are aimed at resolving or preventing conflicts that may arise between farmers and herders due to the changing climatic conditions. The respondents, including farmers, herders, academics, policymakers, and community leaders, have suggested several approaches to manage the challenges posed by climate change and its impacts on agriculture, migration, and resource sharing. Buttressed below are the expanded explanations of these policy recommendations.

Integration of Climate Adaptation Strategies with Conflict Prevention Efforts: The correlations observed in Kenya and Nigeria illustrate the broader regional pattern where climate change exacerbates resource scarcity and social tensions, leading to increased conflict potential. These results underscore the urgent need for integrated climate adaptation and conflict prevention strategies to mitigate the adverse impacts of climate change on geopolitical stability in Africa. Integrating climate adaptation

strategies with conflict prevention efforts presents a multifaceted approach aimed at addressing the interconnected challenges of environmental degradation and societal conflict. By intertwining these two critical agendas, policymakers can effectively tackle the complex dynamics that exacerbate tensions and vulnerabilities across African regions. Incorporating climate adaptation strategies into conflict prevention initiatives involves acknowledging the intricate relationship between environmental stressors, resource scarcity, and the escalation of conflicts.

Decision-Making and Policy Implementation: The findings from this analysis resonate with established research, highlighting the complexities of climate change policy in Nigeria and Kenya. They underscore the critical need for enhanced implementation strategies, stakeholder engagement, and awareness-raising efforts to bridge the gap between policy and practice in addressing climate-induced violence. Strategies could also include promoting sustainable agricultural practices, improving resource management, and enhancing community resilience to climate impacts. Findings have also indicated that despite the development of several climate change policies, plans, and strategies in both countries, a comprehensive policy framework that specifically addresses the mitigation of climate change effects on violent conflict has not yet been established. This gap underscores the necessity for Nigeria and Kenya to create robust, integrated frameworks that can effectively tackle the intertwined challenges of climate change and violent conflict. The foregoing also highlights the need for both countries to formulate an exclusive and comprehensive climate change policy and legislative framework that establishes a leading institution to spearhead the nation’s efforts in climate change adaptation and mitigation.

Awareness Programme: The findings from the qualitative analysis highlight significant gaps in climate change awareness and education among farmers and herders in Northern Nigeria and Tana River County, Kenya. This situation mirrors existing literature that emphasizes the critical need for comprehensive awareness initiatives tailored to the specific contexts of vulnerable communities. Enhanced education and outreach efforts are essential to empower these stakeholders, enabling them to adapt to and mitigate the impacts of climate change effectively. The findings from the analysis also indicate that a lack of awareness can hinder farmers' ability to make informed decisions, ultimately impacting agricultural productivity and food security. This highlights the need for targeted educational campaigns that can empower communities to adapt to changing climate conditions. It could be emphasized that since most of these farmers and herders are not literate, concerted efforts should be made to incorporate local languages and contexts into the awareness programme.

Indigenous Approach and Inclusivity: since the findings highlight the need for enhancing adaptive capacity and resilience in the face of climate change impacts, building an Indigenous approach to

climate adaptation and resilience at the regional and local levels can help communities cope with changing environmental conditions, reducing the potential for conflicts over scarce resources or other climate-related stressors. The respondents' insights indicate a need for integrating local understandings with scientific knowledge to create more relevant and effective climate education programmes. The analysis also indicates that women in both Kenya and Nigeria express a stronger belief in the relationship between climate change and peace and security than men. So, women's perspectives can be critical in shaping effective adaptation and resilience strategies, suggesting a need for inclusive policymaking. Findings also highlight critical demographic differences in perceptions of climate change and conflict suggesting the necessity for nuanced, context-specific interventions that consider gender, age, education, and geographic factors to enhance understanding and foster resilience against the challenges posed by climate change and related conflicts in Kenya and Nigeria.

Curbing Migration: The findings on migration and conflict indicate a convergence of opinion regarding climate-induced migration and conflict in both countries, with women in Kenya showing slightly more concern than men. The recognition of this relationship highlights the need for policies that address the complexities of migration in the context of climate change and conflict, supporting integrated approaches that consider both human security and environmental sustainability. Curbing migration effectively can help prevent the displacement of communities and reduce conflicts between new migrants and the host communities. To achieve this, respondents recommended transitioning from traditional agricultural practices to more innovative and business-oriented approaches, and the need to maintain territorial integrity. While the former involves adopting modern agricultural techniques, technologies, and market-oriented strategies to improve agricultural productivity and reduce conflicts over resources, the latter has to do with encouraging farmers and herders to stay within their respective territories while providing necessary resources like ranches for herders. This approach can help prevent conflicts arising from territorial disputes and reduce the need for extensive migration.

Future Projection: The quantitative forecasting findings provide a predictive lens through which to view the future implications of climate change on peace and security in East and West Africa. The established relationships suggest a troubling trajectory: as climate conditions deteriorate, the potential for conflict is likely to rise, particularly in regions already vulnerable to socio-political tensions. This predictive analysis underscores the urgent need for proactive policy measures that anticipate these challenges, aiming to build resilience and mitigate conflict in the face of ongoing environmental change. Such foresight will be critical in informing adaptive strategies that address both climate change and its socio-political ramifications in the coming decades.

Special Judicial Commission: Most of the participants in the Key Informant Interviews agreed with the notion that the inclination towards destructive self-help practices mostly derives from a perceived lack of trust in the judicial systems of Kenya and Nigeria. Although there is a desire for expeditious administration of justice among the farmers and herders, the legal systems in Kenya and Nigeria are not designed to accommodate such promptness. Hence, the establishment of a special judicial panel with the exclusive purpose of addressing and mitigating farmer-herder tensions before they erupt into a full-fledged conflict may be seen as adequate in this context.

Farmer/Herder Annual Dialogue: there is a pertinent need to organize, on an annual or biennial basis, the Farmer/Herder Dialogue which will serve as a crucial platform for fostering understanding, collaboration, and conflict resolution between farmers and herders. This symposium or conference convened either at the local or national level, will provide a structured environment where both parties can come together to address the complexities of their relationship and work towards sustainable solutions. During the symposium, farmers and herders would engage in open and constructive dialogue, sharing their perspectives, concerns, and aspirations. Through facilitated discussions, workshops, and panel sessions, participants can explore a range of topics, including land use practices, resource management, grazing rights, and conflict resolution mechanisms. No doubt, this Farmer/Herder Annual Dialogue will provide a platform for the exchange of best practices and innovative approaches to coexistence.

7.5. Contribution to Knowledge

The thesis makes several notable contributions to knowledge regarding the relationship between climate change and geopolitical dynamics, particularly in the context of peace and security in West Africa and East Africa. First, the thesis conducts a quantitative analysis to assess the correlation between climate change and peace/security dynamics in the studied regions. By empirically examining this relationship, the thesis contributes to filling gaps in existing literature and provides concrete evidence to support the argument that climate change is intertwined with geopolitics and security. Second, the findings of this study align with established theories and empirical studies that suggest a link between climate change and violent conflict. By corroborating previous research, the thesis strengthens the theoretical foundation in this area and adds credibility to existing frameworks. Third, through specific case studies in Kenya and Nigeria, the thesis offers a focused analysis of the impact of climate change on farmer-herder conflicts in these regions. This regional focus adds depth and nuance to the understanding of how climate change interacts with local dynamics to shape conflict patterns. Fourth, by discussing policy frameworks for creating awareness about climate change and mitigating its impact on violent conflict, the thesis offers practical recommendations for addressing these challenges at the policy level.

This contributes to bridging the gap between research findings and actionable policy interventions. Finally, the thesis also highlights gender and age perspectives in understanding the impact of climate change on geopolitical dynamics. By examining differences in perception among men, women, and different age groups, the thesis enriches the analysis with insights into diverse perspectives and experiences.

7.6. Implications for Future Research

The results of the analyzed data in this thesis can drive further research and advocacy efforts on the connections between climate change, conflicts, and their impacts on vulnerable communities. This information can inform policy decisions and interventions.

While correlation is an important tool for identifying relationships between variables, it is crucial to be cautious when inferring causation based solely on correlation. Additional evidence, experimentation, and careful analysis are necessary to make valid claims about causal relationships. So, to establish a causal relationship between climate change and violent conflict, there is a need for further research that employs controlled experiments or uses sophisticated statistical techniques to control for confounding variables. Experimental designs with random assignment and manipulation of variables would help, in no small measure, in establishing causation in this regard. In a nutshell, considering potential confounding variables and conducting more in-depth analyses could provide a richer understanding of the relationship.

Also, there is a need to conduct an in-depth investigation into how climate change influences the dynamics of peace and security in other regions of Africa. The investigation could be conducted using Pasteur's quadrant model of scientific research. The significance of this model for advancing our understanding of how climate change contributes to violent conflicts cannot be overstated as it is characterized by dual motivations of fundamental understanding and practical problem-solving (Nagaoka, 2016). In this context, the model is proposed as a framework for studying the impact of climate change on violent conflicts in other regions of Africa such as North Africa, Central Africa, and Southern Africa. The investigation should not only aim to unearth the fundamental principles driving the relationship between climate change and conflicts, but it should also have a practical orientation, seeking solutions to real-world problems arising from these interactions. This approach is deemed crucial due to the intricate and multifaceted nature of climate security, and employing this model could lead to more nuanced insights and more effective strategies for managing the potential security challenges posed by climate change in other regions of Africa.

7.7. Conclusion

The main purpose of this study is to investigate the causal connection between climate change and instances of violent conflicts in Africa. The study focuses on specific incidents of clashes between farmers and herders in Kenya (East Africa) and Nigeria (West Africa). These cases serve as examples to explore the broader relationship between climate change and conflict. By analyzing both quantitative and qualitative data using advanced tools, the study provides insights into the underlying dynamics. It highlights a significant positive correlation between climate change and the geopolitics of peace and security in both East Africa and West Africa, confirming the significant role of climate change in shaping these geopolitics. The observed correlations in Kenya and Nigeria illustrate a broader regional pattern where climate change exacerbates resource scarcity and social tensions, increasing the potential for conflict.

The study also reveals a statistically significant correlation between climate change and farmer-herder conflicts in Tana River County in Kenya and the Middle Belt region of Nigeria. Utilizing regression models, the research demonstrates that climate change plays a considerable role in exacerbating these conflicts. In Kenya, the impact on the Orma community notably contributes to tensions between farmers and herders, while in Nigeria, climate change significantly drives migration in the Core North, influencing clashes over resources in the Middle Belt region. It should be noted, however, that while this study demonstrates a statistical relationship, it acknowledges that other socio-economic and political factors also influence conflict dynamics.

Furthermore, the qualitative analysis reveals varying levels of climate change awareness among farmers, herders, and policymakers in both regions. Despite some understanding of climate change, there are significant gaps in education and awareness initiatives, underscoring the urgent need for comprehensive climate education, particularly in rural areas. The comparative case analysis of Kenya and Nigeria reveals significant insights into the perceptions of climate change, migration, and conflict across different demographics, including gender, age, educational qualification, and geographic location. The analysis reveals that women in both countries are more likely to recognize the connection between climate change and security, aligning with their heightened vulnerability to environmental impacts. Younger individuals in Kenya show less concern about the geopolitical effects of climate change compared to their Nigerian counterparts, indicating variations in awareness influenced by socioeconomic and educational factors. Additionally, educational backgrounds reveal divergent views, with higher skepticism in Kenya despite higher qualifications, contrasting with Nigeria's consensus.

Geographic differences underscore the importance of local contexts in shaping perceptions of climate issues, with conflict-prone areas perceiving greater impacts.

Moreover, quantitative forecasting provides a predictive framework for understanding the future impacts of climate change on peace and security in East and West Africa. Regression analysis reveals significant relationships between climate change and violent conflict, suggesting an escalating influence as climate conditions worsen. Nigeria faces more acute challenges, with existing vulnerabilities likely to be magnified, potentially increasing conflict incidents in areas like the Middle Belt region. Climate-induced migration is expected to double in some areas by 2050, significantly impacting social dynamics and conflict potential in both the Tana River Delta in Kenya and the Middle Belt region in Nigeria.

Addressing these complex dynamics requires integrated approaches that consider both human security and environmental sustainability, emphasizing the importance of governance, local contexts, and comprehensive climate adaptation and mitigation strategies.

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APPENDICES

APPENDIX I: Ethics Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Emupenne

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H21/04/08**
PROJECT TITLE	The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives
INVESTIGATOR(S)	Mr O Emupenne
SCHOOL/DEPARTMENT	Social Science/
DATE CONSIDERED	16 April 2021
DECISION OF THE COMMITTEE	Approved Risk Level: Low
EXPIRY DATE	05 July 2024

DATE 06 July 2021 **CHAIRPERSON** J. Knight
(Professor J Knight)

cc: Supervisor : Dr M Small

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to submit an amendment of the protocol to the Committee. **I agree to completion of a regular progress report. For Minimal and Low studies, this is due annually on 31 December. For Medium and High Risk studies, this is due twice annually on 30 June and 31 December.**

Type text here

Signature

14 / 01 / 2022
Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX II: SET A QUESTIONNAIRE (NIGERIA AND KENYA)

International Relations

School of Social Sciences • Private Bag 3, Wits, 2050, South Africa • Tel: +2711717-4382 • Fax: +2711717-4399 E-mail: Social.IR@wits.ac.za

PERSONAL INFORMATION SHEET (PIS)

Dear Participant**,**

My name is Olanrewaju Emupenne, and I am a PhD student in the Department of International Relations at the University of the Witwatersrand, Johannesburg, South Africa. As part of my studies, I have to undertake a research project entitled *The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives* under the supervision of Dr. Michelle Small. The primary objective of this study is to explore, in the context of the new geopolitical realities in Africa, the extent to which the effect of climate change has impacted on peace and security in West Africa and East Africa.

As part of this project, I would like to invite you to take part in answering this questionnaire. This activity will take about 30 minutes. All responses will be used for research purposes only and treated with utmost confidentiality. You will not be required to write your name or any other vital particulars on this questionnaire as the responses provided will be completely anonymous and information given will be secured and not disclosed to anyone else. Your responses will inform understandings about the experiences of climate change and violent conflict in Nigeria and Kenya.

Please note that there will be no personal costs for your participation in this study, you will not receive any direct benefits from participation but there are no disadvantages or penalties if you do not choose to participate or if you withdraw from the study. Your participation in this study is voluntary, you may withdraw at any time or not answer any question if you do not want to. I will be using a pseudonym to represent your participation in my final research report.

If you have any questions during or afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report which will be available online through the university website. If you wish to receive a summary of this report, I will be happy to send it to you. The data collected from this research will be stored in hard disk and will be kept for 7 years.

If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0)117171408, email hrecnon-medical@wits.ac.za.

Thank you for considering participation in this research project.

Your Sincerely,

Researcher: Olanrewaju Ojo Emupenne, 1656029@students.wits.ac.za, +27606305665; +2348039526869

Supervisor: Dr Michelle Small, Michelle.Small@wits.ac.za +27(0)117174487

Instruction: For each item below please tick [√] the appropriate response.

SECTION A: SOCIO-DEMOGRAPHIC PROFILE

1:

	Male	Female
Gender		

2:

	19 – 28 years	29 – 38 years	39 – 48 years	49 – 58 years	59 – 68 years	69 – 78 years	79 – 88 years	Above 88 years
Age								

3:

	Kenya	Nigeria
Country of residence		

4:

	Bura	Galole	Garsen	Witu
Sub County				

4a:

	North West	North East	North Central
Geopolitical Zone/County			

5a:

	Boni	Dagodie	Kambas	Kikuyus	Luos	Pokomo	Orma	Sheekhaal	Waata	Wardey	Others (Pls Specify)
Ethnic Group											

5a:

	Bassa	Birom	Fulani	Hausa	Idoma	Jukun	Kengawa	Mada	Run	Tarok	Tiv	Others (Pls Specify)
Ethnic Group												

6:

	Christianity	Islam	Traditional	Others (Pls Specify)
Religious affiliation				

7:

	No formal qualification	Primary	Secondary/O-Level	A-Level/ Vocational/Professional	Degree or equivalent	Postgraduate	Others (Pls Specify)
Highest Qualification							

8:

	Civil/Public servant	Community Leader	Environmentalist/ NGO Staffer	Crop Farming	Nomadic Herding	Religious leader	Security agent	Others (Pls Specify)
Occupation								

9:

	Pls Specify
Your current location	

10:

	Below 10 years	11 – 20years	21 – 30 years	31 – 40years	41 – 50years	Above 50 years
How long have you been living in this area/location?						

SECTION A: CLIMATE IMPACTS ON PEACE AND SECURITY

Please take note that: 1=Strongly disagree; 2=Disagree; 3=Agree; and 4 Strongly agree

S/N	ITEM	1- Strongly disagree	2- Disagree	3- Agree	4- Strongly agree
CIPS1	Climate change aggravates existing environmental stressors and increases strains between the crop farmer and nomadic herder in my region.				
CIPS2	Droughts, frequent floods induce hostility between the crop farmer and nomadic herder in competition for scarce natural resources.				
CIPS3	Climate change leads to environmental degradation and consequently triggers migration by herders.				
CIPS4	Migration caused by climate change often generates crises between the migrant herders and the host crop farmers.				
CIPS5	The interaction between climate change and other causes of conflict often increases the incidence of violent conflict in my region/county.				
CIPS6	Unresolved grievances, poverty, and legacy of violence are often brewed by climate change.				
CIPS7	Climate change does not increase the risk of civil conflicts in my region.				
CIPS8	Overdependence on natural resources makes African countries highly prone to the adverse impact of climate change.				
CIPS9	Climate change does not affect peace and security in my region.				
CIPS10	Relative scarcity of grazing land due to climate change often results in direct competition for resources between the herder and the famer.				
CIPS12	Relative deprivation, as a result of scarcity increases tension/friction between the farmer and the herder.				
CIPS13	Scarcity of natural resources is a cause of insecurity in my region/county.				
CIPS 14	Resource degradation triggers herder-farmer conflicts.				
CIPS 15	Social stability does not have anything to do with natural resources.				

SECTION B: GEOPOLITICS OF CLIMATE CHANGE ON PEACE AND SECURITY

Please take note that: 1=Strongly disagree; 2=Disagree; 3=Agree; and 4 Strongly agree

S/N	ITEM	1- Strongly disagree	2- Disagree	3- Agree	4- Strongly agree
GCCPS1	The geopolitics of climate change is dominated by efforts to reduce/prevent emission of greenhouse gases in East Africa/West Africa.				
GCCPS2	There are currently climate change-related humanitarian crises in East Africa/West Africa.				
GCCPS3	The intervention by the government of my country in responding to escalation of climate-related conflict in my region/county is not swift.				
GCCPS4	Youths in my area need to be carried along in the process of building a peaceful and conducive environment.				
GCCPS5	Peacebuilding skills are necessary for conflict transformation.				
GCCPS6	Climate crises in East Africa/West Africa could strain international relations.				
GCCPS7	Multilateral supports for East Africa/West Africa on climate change have been relatively low.				
GCCPS8	In formulating adaptation policies by countries in East Africa/West Africa, developed nations need to offer technical supports.				

THANK YOU

APPENDIX III: SET B QUESTIONNAIRE (NIGERIA AND KENYA)

Instruction: For each item below please tick [√] the appropriate response.

SECTION A: SOCIO-DEMOGRAPHIC PROFILE

1:

	Male	Female
Gender		

2:

	19 – 28 years	29 – 38 years	39 – 48 years	49 – 58 years	59 – 68 years	69 – 78 years	79 – 88 years	Above 88 years
Age								

3:

	Kenya	Nigeria
Country of residence		

4:

	Bura	Galole	Garsen	Witu
Sub County				

4a:

	North West	North East	North Central
Geopolitical Zone/County			

5:

	Boni	Dagodie	Kambas	Kikuyus	Luos	Pokomo	Orma	Sheekhaal	Waata	Wardey	Others (Pls Specify)
Ethnic Group											

5a:

	Bassa	Birom	Fulani	Hausa	Idoma	Jukun	Kengawa	Mada	Run	Tarok	Tiv	Others (Pls Specify)
Ethnic Group												

6:

	Christianity	Islam	Traditional	Others (Pls Specify)
Religious affiliation				

7:

	No formal qualification	Primary	Secondary/O-Level	A-Level/ Vocational/Professional	Degree or equivalent	Postgraduate	Others (Pls Specify)
Highest Qualification							

8:

	Civil/Public servant	Community Leader	Environmentalist/ NGO Staffer	Crop Farming	Nomadic Herding	Religious leader	Security agent	Others (Pls Specify)
Occupation								

9:

	Pls Specify
Your current location	

10:

	Below 10 years	11 – 20 years	21 – 30 years	31 – 40 years	41 – 50 years	Above 50 years
How long have you been living in this area/location?						

SECTION A: CLIMATE CHANGE AND MIGRATION

Please take note that: 1=Strongly disagree; 2=Disagree; 3=Agree; and 4 Strongly agree

S/N	ITEM	1- Strongly disagree	2- Disagree	3- Agree	4- Strongly agree
OM1	Rainfall variability often leads to mass displacement and emigration.				
OM2	Changing rainfall patterns affect agricultural production which lead to mass emigration.				
OM3	Unavailability of water resources does not make herders to look for resources elsewhere.				
OM4	Climate change causes migrants to always move towards areas where water and grasses are available in sufficient quantity.				
OM5	Negative effect of climate change on means of livelihood often lead to out-migration of herders.				
OM6	Movement of herders is caused by shortage of arable land for grazing.				
OM7	Climate change gives rise to dearth of grazing pasture in some part of my country.				
OM8	Herders in my region/county often migrate to another location where there is sufficient water and grazing land due to climate stressors like drought.				
OM9	Strained relationships between farmers and herders are always triggered by insufficient pasture for grazing and water during prolonged dry season.				
OM10	Migration by herders when there is a change in climatic conditions is properly planned.				
OM11	The host communities of migrant-herders are always prepared and willing to receive them.				
OM12	The relationship between the migrant-herders and their host communities is always cordial.				
OM13	The nomadic nature of herders would drastically reduce if water and arable land are sufficiently available in their communities for grazing.				
OM14	Climate change displaces vulnerable people and increases their rate of migration.				
OM15	Cattle grazing on farmland often triggers conflict between crop farmers and herders,				
OM16	Increased migration and high pastoralist mobility rate lead to farmer-herder conflicts in Africa.				

SECTION B: CLIMATE CHANGE AND INCESSANT CONFLICTS

Please take note that: 1=Strongly disagree; 2=Disagree; 3=Agree; and 4 Strongly agree

S/N	ITEM	1- Strongly disagree	2- Disagree	3- Agree	4- Strongly agree
CCRC1	There is a political to the relationship between climate change and farmer-herder conflicts in my region/county.				
CCRC2	Most of the places affected by climate change-related conflicts have pre-existing tensed atmosphere.				
CCRC3	Places affected by climate change-related conflicts have limited capacity to survive during climate shifts.				
CCRC4	Climate change increases vulnerability to conflicts.				
CCRC5	Drought has a direct correlation with violence.				
CCRC6	There are always criminal elements in the area where farmer-herder crises are prevalent.				
CCRC7	Aggressive competition for scarce natural resources leads to farmer-herder conflicts.				
CCRC8	Climate change often leads to degradation of land and vegetation in locations where there is competition for survival and rivalry for natural resources.				
CCRC9	Mutual understanding/Peaceful coexistence amidst climate change can forestall farmer-herder conflicts.				
CCRC11	High level of unemployment among the youths makes them available for use as instruments of violence.				

THANK YOU

International Relations

School of Social Sciences • Private Bag 3, Wits, 2050, South Africa • Tel: +2711717-4382 • Fax: +2711717-4399 E-mail: Social.IR@wits.ac.za

Dear Sir/Madam,

Survey on the Nexus between Climate Change and Violent Conflict in East Africa and West Africa

My name is Olanrewaju Emupenne, and I am a PhD student in the Department of International Relations at the University of the Witwatersrand, Johannesburg, South Africa. As part of my studies, I have to undertake a research project. The research I am undertaking is on the connection between climate change and conflict. The study is entitled *The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives* under the supervision of Dr Michelle Small. The primary objective of this study is to explore, in the context of the new geopolitical realities in Africa, the extent to which the effect of climate change has impacted peace and security in West Africa and East Africa.

As part of this project, I would like to invite you to take part in an interview. This activity involves asking and answering questions and will take about 40 minutes. With your permission, I would also like to audio record the interview using a digital device. This recording will be stored in a hard disk and only the researcher will have access to this recording. It will be deleted after 7 years.

Please note that there will be no personal costs for your participation in this study, you will not receive any direct benefits from participation but there are no disadvantages or penalties if you do not choose to participate or if you withdraw from the study. You may withdraw at any time or not answer any question if you do not want to. The interview will be completely confidential and anonymous as I will not be asking for your name or identifying information, and the information you give to me will be held securely and not disclosed to anyone else. I will be using a pseudonym to represent your participation in my final research report.

If you have any questions during or afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report which will be available online through the university website. If you wish to receive a summary of this report, I will be happy to send it to you. The data collected from this research will be stored in hard disk drive (HDD) and will be kept for 7 years.

If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical):

Telephone: +27(0)117171408
email: hrecnon-medical@wits.ac.za

Your Sincerely,

Researcher:

Olanrewaju Ojo Emupenne,
1656029@students.wits.ac.za,
+27606305665; +2348039526869

Supervisor:

Dr Michelle Small
Michelle.Small@wits.ac.za
+27(0)117174487

Interview Guide for Policy Makers in the Ministries, Departments and Agencies (MDA)/EAC Climate Projects Head/ECOWAS Project Coordinator/ Environmentalists/Climate Activists/Academia

1. What is your opinion about climate change?
2. What is the level of awareness about the effects of climate change among the stakeholders in the agricultural sectors in your country/region?
3. What is your office doing to create awareness campaigns about climate change in urban areas?
4. What is your office doing to create awareness campaigns about climate change in rural communities?
5. What impact(s) do you think climate change has had on your country/region?
6. Do you think climate change can lead to violent communal conflict?
7. Could climate change be a threat to security?
8. How does the knowledge of the effects of climate change play a role in the different stakeholders' approach to conflict in your country/region?
9. Could the resort to destructive self-help over land and water disputes by farmers and herders be a consequence of lack of confidence in the nation's judicial system?
10. What do you think should be done to tackle climate change?
11. Does your country/agency have a climate change policy document?
12. If yes, what is the implementation plan for the policy on climate change?

Interview Guide for Farmers/Farmers Associations/Cooperatives/Herders/Cattle Breeders Associations/ Council of Elders/Youth Leadership

1. Have you ever heard about *climate change*? If yes, what is your opinion about it?
2. What is the level of awareness about the effects of climate change among the stakeholders in the agricultural sectors in your country/region?
3. To the best of your knowledge, are climate change awareness campaigns carried out in rural communities/urban areas?
4. Do you think climate change can lead to violent conflict?
5. How does the knowledge of the effects of climate change play a role in the different stakeholders' approach to conflict in your country/region?
6. Does climate change lead to migration?
7. What other factors account for crises and disputes among farmers and herders?
8. Could the resort to destructive self-help over land and water disputes by farmers and herders be a consequence of lack of confidence in the nation's judicial system?
9. What do you think should be done to tackle climate change?
10. Do you think government is doing enough to tackle climate change?

MOI UNIVERSITY

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OFFICE OF DEPUTY VICE-CHANCELLOR
(Academic, Research and Extension)
Peace & Reconciliation Center

Tel: (0321) 43001-8
(053) 43620
Fax: (053) 43047

P.O Box 3900-30100
ELDORET
KENYA

Date: 12TH April, 2021

Mr. Olanrewaju Emupenne
Department of International Relations
University of Witwatersrand
Johannesburg,

Dear Mr. Emupenne,

RE: ACCEPTANCE OF AFFILIATION TO PEACE INSTITUTE MOI UNIVERSITY

Following your request for affiliation to Moi University for your proposed PhD research on **The Geopolitics of Climate Change and Violent Conflicts in Africa; The Nigerian and Kenyan perspectives,** I am pleased to inform you that your application has been accepted. You will be stationed at Peace Institute for the entire Research period commencing during your research period in Kenya.

This offer is based on your statement regarding your PhD at Witwatersrand, Republic of South Africa and the understanding that your research is relevant to our work. This offer is subject to you fulfilling the following:

1. You will arrange your own accommodation and upkeep
2. You will also arrange for your own medical insurance
3. Willingness to observe Moi University regulations regarding research

During your affiliation, you will be able to access University Library and meet Moi University professors. You will also be expected to update the University about your research in Kenya. I take this opportunity to wish you well during your stay in Kenya.

Yours Sincerely,

DULO NYAORO
COORDINATOR, PEACE INSTITUTE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **318280**

Date of Issue: **09/September/2021**

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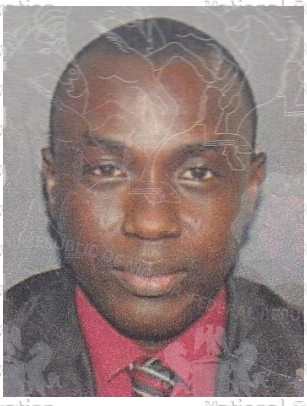

This is to Certify that Mr.. Olanrewaju Ojo Emupenne of University of the Witwatersrand, has been licensed to conduct research in Tanariver on the topic: The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives for the period ending : 09/September/2022.

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FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

DEPARTMENT OF AGRICULTURAL LAND AND CLIMATE CHANGE MANAGEMENT SERVICES (AL&CCMS)

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Ref. No: ALR-1998/I

Date: 24th September, 2021 20____

Mr. Olanrewaju Ojo Emupenne

School of Social Sciences

Private Bag 3,Wits, 2005,

South Africa.

RE: PERMISSION TO CONDUCT RESEARCH AT THE FEDERAL MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT (FMARD)

Please refer to your letter on the above subject matter dated 18th August, 2021.

2. I am directed to convey the Permanent Secretary's approval for **MR OLANREWAJU OJO EMUPENNE** to conduct research titled **"THE GEOPOLITICS OF CLIMATE CHANGE AND VIOLENT CONFLICTS IN AFRICA: THE NIGERIAN AND KENYAN PERSPECTIVES"** in the Ministry as follows:

i. Distribution of questionnaire, and
ii. Conduct of physical interview.

3. The research should be conducted between 1st -30th October, 2021

4. For further clarification you may contact C. A Bikom on cybikom2012@gmail.com, 07038283159 or Mustapha Iyabo on iyabo2020@yahoo.com.

5. Thanks.

Mustapha Iyabo
CLRO
For: Permanent Secretary

AGRICULTURAL RESEARCH COUNCIL OF NIGERIA

ARCN/I/08/S.36/I/132 1st November, 2021

School of Social Sciences,
University of Witwatersrand,
Johannesburg, South Africa.

Attention: Olanrewaju Emupenne

Dear Sir,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT THE AGRICULTURAL RESEARCH COUNCIL OF NIGERIA.

Sequel to your letter dated 23rd September, 2021 on the above subject matter;

2. I am directed to convey the approval of the Executive Secretary for you to conduct research at the Agricultural Research Council of Nigeria as part of your study titled: "*The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives*".

3. The study is expected to be carried out by interview and administration of questionnaire to members of staff as requested in your letter.

4. Please, accept the assurances of the Executive Secretary's highest regards.

Dr. Aliyu Shuaibu Madugu
Head, Planning, Research and Statistics Department
For: Executive Secretary

Agricultural Research House, Plot 223D, Cadastral zone B6, Mabushi, P.M.B. 5026, Wuse - Abuja.

FEDERAL MINISTRY OF ENVIRONMENT

Environment House

Independence Way South, Central Business District, Abuja - FCT.
Tel: 09-2911 337 Email: ea@ead.gov.ng, www.ead.gov.ng

ENVIRONMENTAL ASSESSMENT DEPARTMENT

Ref: FMEnv/EA/EIA/Vol. 1/4089/xx

Date: 17th September, 2021

Olanrewaju Ojo Emupenne
Department of International Relations,
University of Witwatersrand,
Johannesburg,
South Africa

RE: PERMISSION TO CONDUCT RESEARCH AT THE FEDERAL MINISTRY OF ENVIRONMENT (FMEnv) AS WELL AS THE DEPARTMENTS OF CLIMATE CHANGE AND ENVIRONMENTAL ASSESSMENT.

I am directed to acknowledge the receipt of your letter on the above subject matter.

2. I am further directed to inform you that the Environmental Assessment (EA) Department would provide to you any information that deems fit in order to facilitate the completion of your Doctor of Philosophy (PhD) in ***"The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives"***.

3. Please do not hesitate to contact the Department should you need other information in the future about you Doctoral Programme.

4. Please accept the assurance of the Honourable Minister in this regard.

Date

Dr. Musa Gashau
For: Honourable Minister

FEDERAL MINISTRY OF ENVIRONMENT

HEADQUARTERS, MABUSHI, ABUJA.

Ref No. FMENV/DDA/CWH/753 Date 28th January, 2022

Olanrewaju Ojo Emupenne
Department of International Relations
School of Social Sciences
University of Witwatersrand,
Johannesburg,
South Africa

Re- Permission to conduct research at the Department of Desertification, Land Degradation and Drought Management

I am directed to convey an approval for your request for permission to conduct research at the Department of Desertification, Land Degradation and Drought Management

2. Consequently, you may wish to carry out your research activities on the 8th of February or any other date that is convenient to you.

3. Accept the warm regards of the Director and best wishes.

Williams E O.
For: **Director, (DLD&DM)**

IPCR

INSTITUTE FOR PEACE AND CONFLICT RESOLUTION
MINISTRY OF FOREIGN AFFAIRS
Plot 496, Abogo Largema Street
Off Constitution Avenue Central Business District
P.M.B 349 Garki, Abuja - Nigeria
Website: www.ipcr.gov.ng Email: info@ipcr.gov.ng
Tel: +234 817 431 8635

IPCR/DG.1/350/1654/19 1st February, 2022

Olanrewaju Ojo Emupenne
Department of International Relations
School of Social Sciences
PrivateBag 3, Wits, 2050
South Africa

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT THE INSTITUTE FOR PEACE AND CONFLICT RESOLUTION

Please refer to your letter on above subject matter.

I write to inform you that the Director General has directed me to convey his approval of your request to conduct research in Institute. Please note that the research is restricted to interviews and the administration of questionnaires to relevant research staff on the theme of the research.

Please accept, Mr. Olanrewaju, the best wishes of the Director General in your research endeavour.

Dr. Joseph Ochogwu
Ag. Director, Research & Policy Analysis
For: Director General/Chief Executive

ALL FARMERS ASSOCIATION OF NIGERIA
(AFAN)
Suite A22, Hawthorn Suites by Wyndham, No. 1, Uke Street, Area 11, Garki, Abuja, Nigeria.
Tel: +234 803 787 3326; E-mail: afanigeria2014@gmail.com

AFAN/UWSA/RESEARCH/2021/01
18th August, 2021

Mr. Olanrewaju Emupenne,
Department of International Relations,
University of Witwatersrand,
Johannesburg,
South Africa.
1656029@students.wits.ac.za
+234 803 952 6869

Dear Sir,

RE: PERMISSION TO CONDUCT RESEARCH AT THE ALL FARMERS ASSOCIATION OF NIGERIA (AFAN) SECRETARIATS

We write in response to your letter dated July 15, 2021 on the above subject matter; and listed hereunder are our representatives in the States you mentioned.

1.	Prince Yandev Amaabai Y.	Benue State	:	0803 668 7416
2.	Alhaji Nuhu Aminu	Kaduna State	:	0803 649 1568
3.	Mrs. Aisha N. Bashir	Plateau State	:	0902 011 1196
4.	Dr. Murtala Gagadu	Sokoto State	:	0806 025 8158

Thank you.

18/08/2021

Arc. Kabir Ibrahim
National President
All Farmers Association of Nigeria (AFAN)

CC: Dr. Michele Small
Michelle.Small@wits.ac.za

MIYETTI ALLAH CATTLE BREEDERS
ASSOCIATION OF NIGERIA (MACBAN) RC.NO - 3500

NATIONAL HEADQUARTERS: NO. 5 Lugard Street Asokoro Abuja, E-mail: miyettiallahnigeria@gmail.com
BRANCH OFFICE: Livestock House Mando - Kaduna P.O. Box 9065, Kaduna State - Nigeria

OUR REF: Ref. YOUR REF: DATE: August 18, 2021

Mr. Olanrewaju Ojo Emupenne,
Department of International Relations,
School of Social Sciences,
University of the Witwatersrand,
Johannesburg, South Africa.

Research Title: *The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives*

PERMISSION TO CONDUCT RESEARCH AT THE *MIYETTI ALLAH* CATTLE BREEDERS ASSOCIATION OF NIGERIA (MACBAN)

Your letter dated July 28, 2021, on the above-mentioned subject matter refers.

I hereby grant you permission to do research at the Miyetti Allah Cattle Breeders Association of Nigeria (MACBAN).

This approval allows you to invite 200 herders from the states of Benue, Kaduna, Plateau, and Sokoto to participate in the study.

Fifty (50) herders from each state will be allowed to fill out questionnaires, while twenty (20) members of the Executive Council from the national secretariat and state chapters will be available to participate in the interview session.

The association will be delighted to get the research report once the study is completed.

I wish you the very best in your studies.

Baba Othman Ngelzarma
National Secretary

REPUBLIC OF KENYA

MINISTRY OF EAST AFRICAN COMMUNITY AND REGIONAL DEVELOPMENT

STATE DEPARTMENT FOR EAST AFRICAN COMMUNITY

OFFICE OF THE PRINCIPAL SECRETARY

Telephone: +254-20-2245741/2211614/2245752
Fax No: +254-20-2229650
Mobile: 0729111108/0733208888
Wireless: +254-20 2603599/20 2603733
e-mail:ps@meac.go.ke; psmeac2020@gmail.com
Website: www.meac.go.ke

Co-op Bank House Building
Haile Selassie Avenue
P.O. Box 8846-00200 City Square
NAIROBI, KENYA

Ref: SDEAC/ADM/PS/001 **Date: 24TH JUNE, 2022**

Olanrewaju Ojo Emupenne
School of Social Sciences
Private Bag 3, Wits
2050
South Africa

PERMISSION TO COLLECT DATA

I refer to your request to conduct research at the State Department for East African Community, for your project entitled; "The Geopolitics of Climate change and Violent conflicts in Africa: The Nigerian and Kenyan Perspectives".

I write to inform you that your request has been approved.

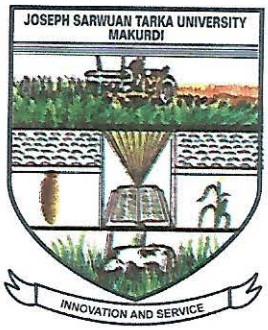
You are however required to share the findings of your study with the State Department for East African Community by depositing a copy of your findings with the undersigned on completion of your study.

Dr. Kevit Desai, CBS
PRINCIPAL SECRETARY

JOSEPH SARWUAN TARKA UNIVERSITY
MAKURDI - NIGERIA
OFFICE OF THE REGISTRAR

VICE-CHANCELLOR:
Professor Anande Richard Kimbir (KSM)
B.Sc. M.Sc. (Jos) Ph.D (Ibadan)
MNMS, MMAN

ACTING REGISTRAR:
Mr. Shiaondo Alexander Ugaseh
B.A (Jos), MPA (FUAM);
FIPMA, MANUPA



Private Mail Bag 2373
Makurdi, Nigeria.
Tel: 0812 508 2693
E-mail: registrar@uam.edu.ng
registrar.uam@gmail.com
http://www.uam.edu.ng

Our Ref: R/JOSTUM/ADM/54

Date: 1st February, 2022

Olanrewaju Ojo Emupenne, *MNIM*
PhD Candidate: International Relations,
University of the Witwatersrand,
Johannesburg, South Africa.

Dear Mr. Emupenne,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT THE FEDERAL UNIVERSITY OF AGRICULTURE, MAKURDI, BENUE STATE, NIGERIA

Kindly refer to your correspondence to the Vice-Chancellor dated 23rd September, 2021 on the above subject.

I have been directed by the Registrar to acknowledge receipt of your correspondence under reference above and to convey to you the Vice-Chancellor's approval of your request to conduct research in the Federal University of Agriculture, Makurdi now known as Joseph Sarwuan Tarka University, Makurdi - Nigeria.

I am also to forward to you the following nominated staff of the University who have specialized in Climate Change and Environmental issues to participate in the study:
(i) Dr. C.O. Eche; ceche@uam.edu.ng
(ii) Prof. S. A. Shomkegh; sshomkegh@uam.edu.ng

Meanwhile, the listed staff of the University have been duly informed of their nomination and they have consented to participate in the study. You may wish to contact them accordingly.

Thank you.

Yours Sincerely,

Emmanuel Iorliam Tyo
Deputy Registrar (RO)
For: Acting Registrar

UNIVERSITY OF ABUJA
ABUJA, NIGERIA

University for National Unity,
The UofA of Nigeria!

Vice Chancellor
Professor Abdul-Rasheed Na'Allah
BA (Hons), MA (Ilorin); PhD (Alberta)
Email:abdulrasheed.naallah@uniabuja.edu.ng

P.M.B 117, Abuja
Federal Capital Territory
Nigeria

Office of the Vice-Chancellor

UA/VC/ADM/09

18th October, 2021

Olanrewaju Ojo Emupenne
Department of International Relations
School of Social Sciences
Private Bag 3
Wits, 2050
South Africa

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT THE UNIVERSITY OF ABUJA, ABUJA, FCT – NIGERIA

Your letter dated October 7, 2021 on the above subject matter refers please.

I am directed to convey to you, the University of Abuja's approval to conduct a study on "The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan perspective". This approval is dependent at no expenses to the University and your submission on paragraph 4 of your letter.

By this letter you (Olanrewaju Ojo Emupenne), have the Universiy's permission to carryout the study entitled "The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan perspectives." You may also interview staff and administer questionnaires within a period of six (6) months.

Wishing you a successful study.

Accept the Vice-Chancellor's best wishes.

Longji-Grey, Lawre (Mrs.)
lawre.longji-grey@uniabuja.edu.ng + 234 803 6450 058
Chief Confidential Secretary, Vice-Chancellor's Office

UNIVERSITY OF NAIROBI
OFFICE OF ASSOCIATE VICE-CHANCELLOR
(Research, Innovation and Enterprise)

P.O. Box 30197-00100
Nairobi, Kenya
Website: uonresearch.uonbi.ac.ke

Tel: +254-2-4913164
Email: avcrie@uonbi.ac.ke

UON/RIE/3/5/Vol.XX

June 23, 2022

Olanrewaju Ojo Emupenne
School of Social Sciences
Private Bag 3, Wits
2050
South Africa
Email: 1656029@students.wits.ac.za

Dear Mr. Olanrewaju

PERMISSION TO COLLECT DATA

I refer to your request to conduct research at the University of Nairobi, for your project entitled: ***"The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives."***

I write to inform you that your request has been approved.

You are however required to share the findings of your study with the University of Nairobi by depositing a copy of your findings with the Director Library & Information Services on completion of your study.

Yours sincerely,

PROF. M. JESANG HUTCHINSON
ASSOCIATE VICE-CHANCELLOR (AG.)
(RESEARCH, INNOVATION AND ENTERPRISE)
AND
PROFESSOR OF HORTICULTURE

Copy to: Director, Library and Information Services

SKB/cg

GARISSA UNIVERSITY

OFFICE OF THE DEPUTY VICE CHANCELLOR

P.O. Box 1801 – 70100,
Garissa, Kenya.

Email:dvc.fap@gau.ac.ke
Website:www.gau.ac.ke

Our Ref: GaU/ASA/EXT/1/6/22 **Date:** 16th June, 2022

To;

Olanrewaju Ojo Emupenne - Researcher

EMAIL: 1656029@students.wits.ac.za

SUBJECT: PERMISSION TO CONDUCT A RESEARCH IN GARISSA UNIVERSITY

Following your request for permission to conduct research at the Garissa University, Kenya, vide memo June 16, 2022. I am pleased to inform you that you are permitted to conduct your research titled '*The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives;* in Garissa University within three (from 16/06/2022 to 18/06/2022). When carrying out your study please liaise with Director Research and Extension (Prof. J.M. Huho)

Thank you.

Prof. Irura Ng'ang'a, PHD

DEPUTY VICE-CHANCELLOR ASA

Cc VC.

Nigeria Network of Non-Governmental Organisations
(No.7977 Established in October 1992)
Email: nnngo@nnngo.org Website: www.nnngo.org

NIGERIA
15, Rahmat Crescent,
Ogudu GRA, Lagos,
Nigeria.
Tel: 0906 946 0107
0802 836 7748

ENGLAND
92 Ashridge Way
Morden SM4 4ED
Tel: 0208 545 0098
Mob: 07930 714 810

The University of Witwatersrand,
Johannesburg,
South Africa.

22 September, 2021

To whom it may concern,

The Office of the Executive Director of the Nigeria Network of NGOs presents it complements to the department of International Relations, University of Witwatersrand and is pleased to confirm that Mr. Olanrewaju Emupenne has been granted permission to undertake his research on **The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives** with members of the Network and Executives within the duration of his programme and timelines set by the University.

This permission covers interviews and questionnaire administration.

The Network would welcome a copy of his final research when completed as we find the topic useful to our work.

Do not hesitate to contact me on email seyi@nnngo.org and telephone +2348028367748 should you need further clarification.

Accept the assurances of my best wishes.

Sincerely,

Oyebisi, B. Oluseyi
Executive Director, Nigeria Network of NGOs.

NATIONAL YOUTH COUNCIL OF NIGERIA

Ref. September 16, 2021

Olanrewaju Ojo Emupenne,
Department of International Relations,
University of the Witwatersrand,
Johannesburg, South Africa.

Dear Sir,

RE: PERMISSION TO CONDUCT RESEARCH AT THE NATIONAL YOUTH COUNCIL OF NIGERIA (NYCN)

The above subject refers.

I am glad to notify you that your proposal to do research at the National Youth Council of Nigeria on *The Geopolitics of Climate Change and Violent Conflicts in Africa: Nigerian and Kenyan Perspectives* has been granted.

You may ask the national excos and youths from the Benue, Kaduna, Plateau, and Sokoto State chapters to engage in this research.

For further action, please see the contact information of our National Secretary (08067331748) to effectively liaise with youth coordinators in the states concerned.

Once the study is done, the National Youth Council would want a copy of the research report.

Yours faithfully,

SOLOMON ADODO
President

No. 4b, Epe Close, Off Sokoto Street, Beside Area 1 Shopping Complex, Garki, Abuja.
Tel: +234 (0) 818 946 9601, +234 (0) 803 690 5961 website: www.nycn.ng | email: presidencynycn@gmail.com