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NEXUS BETWEEN CLIMATE CHANGE AND CONFLICT: A CASE STUDY OF
NORTH CENTRAL NIGERIA

BY

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ABSTRACT

In recent decades' climate change has been one of the major interesting research subjects due to the role it plays on the economy and the society as a whole. Understanding the role of climate change in our society is of vital importance, both for the economy and the society. Recent developments around climate change have heightened the need for more research; Climate change predictions by the Intergovernmental Panel on Climate Change (IPCC) have identified Nigeria as a climate change-conflict prone country. Nigeria's climate is likely to experience shifts and/or changes in temperature, sea level and rainfall in the twenty-first century. A causal mechanism links climate change with communal conflict in most parts of Nigeria, poor adaptive responses to climate shift could cause shortages of resources such as land, water and food. Shortages tend to create negative impact like hunger, joblessness and poverty. In the case of poor responses, the situation can open the door for conflict. Inadequate analysis about climate change has clouded the picture of how climate change can affect Nigeria's resource base and environment.

This thesis examined theoretically and empirically the nexus between climate change and conflict in north central Nigeria. More fundamentally, the study analyzed and showed how climate change plays a role in the worsening incidence of conflict between Fulani herdsmen and farmers in northern Nigeria. Analysis of the study is anchored on the environmental and conflict theory. The study argued that much as it's believed that the immediate cause of the conflict between Fulani herdsmen and farmer conflict is resource scarcity and the remote cause is climate change, which through desertification and drought has led to resource scarcity and worsened conflict between the two groups, ethnicity also emerged as a cause of the conflict between the two groups. Both qualitative and quantitative methods were used to collate Primary data for the research. A well semi-structured questionnaire and key informant interviews were used to elicit relevant information. The information collected include possible adaptation strategies and constraints peculiar to the study area, perceptions on climate change, socio-economic and environmental characteristics of the study area and possible approaches to solving conflicts.

DECLARATION

I Barbara Member Jika declare that the entirety of the research work carried out and contained therein is my original piece of work, that I am the authorship owner thereof. I have not previously in part or in entirety submitted this piece of work for obtaining any qualification. All sources have been acknowledged appropriately.

(3417099)

Date:-----

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DEDICATION

I dedicate this Thesis to my Sons Master Ngusha Emmanuel Jika and Master Vershima Samuel Jika; thank you so much for your understanding and good behaviour whilst I was studying, I look forward to making up for the lost time.

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ACRONYMS AND ABBREVIATIONS

IPCC	Intergovernmental Panel on Climate Change
LGA	Local Government Area
UNSC	United Nations Security Council
AR4	Fourth Assessment Report
UK	United Kingdom
NGO	Non-governmental Organization
ENCOP	Environmental and Conflict Project
GECHS	Global Environmental Change and Human Security
COP2	Conference of Parties
TAR	Third Assessment Report
FAR	Fourth Assessment Report
GHG	Green House Gas
CO ₂	Carbon Dioxide
CH ₄	Methane
H ₂ O	Water vapour
IDP	Internally Displaced Persons
US	United States
UNEP	United Nations Environmental Programme
NIMET	Nigeria Meteorological Agency Nigeria

CHAPTER ONE: INTRODUCTION

1.1 Background of study

Climate change is one of the most significant current discussions amongst researchers; it refers to any significant change in the measure of climate lasting for an extended period of time. There are four elements contained in the concept of climate change: Temperature change, sea level rise, precipitation change and extreme mega events. There are two consequences over the changing elements of climate change; an increase in the number of natural disasters like storms, floods and tropical cyclones and scarcity of resources like water, agricultural land and food. Three social effects are bound to emanate from the consequences: political instability, migration and economic instability, these social effects can cause intra-state conflict. The knowledge of climate change is important for understanding its relationship with conflict.

The past two decades have seen increasingly rapid advances in the area of climate change. Looking at the 2007 Intergovernmental Panel on Climate Change (IPCC) report and other research literatures on the impact of climate change on the globe, no region of the world is entirely spared; most likely poor nations in the western tropical African region will be highly affected by the impact of climate change. On a global level series of meetings and conferences are been held on climate change. Recently the Paris United Nations climate conference presented itself as a historic opportunity that would put the world on the right course to meet the climate change challenges (United Nations, 2015).

Interest on the impact of climate change has not only increased amongst scholars and academia but Think Tanks and in the public and politics of the world. United Nations Security Council (UNSC) in April 2007 held a debate on the impact of climate change on peace and security (UNSC, 2007). The Intergovernmental Panel on Climate Change predicts the high risk associated with climate change degrading the environment (IPCC, 2007). Though the implication of this prediction on induced migration and conflict over landed resources is uncertain scholars such as (Reuveny, 2007; Roma, 2008) observe that climate change induced migration is associated with many climate change-to-conflict scenarios. Some scholars argue about the violent effect of climate change as it depends on the scope of degradation and how it influences induced migration.

Experts are at cross-roads over the actual links between climate change and conflict. Areas prone to climate change like the arid northeast and northwest part of Nigeria experience acute dryness of soil and luxuriant growth of grass and flora is not supported. The northeast and northwest part of Nigeria is characterized by a drop in rainfall, increased heat and dryness, making the environment arid, with depleted quantity of water, fauna and flora resources. This has caused a population drift from the northeast and northwest region of Nigeria to the southern parts of the country where water, flora and fauna resource are available for pastoral and arable farming needs of the people.

There has been an increasing amount of literature and according to experts our world is confronted by climate change, a serious economic and environmental challenge in the twenty first century. It is a threat multiplier with adverse and chronic effects on poverty, health and has the capacity to induce conflict. Climate change impact has its unique effects in developing countries like Nigeria that rely on agriculture. The study examines the nexus between climate change, scarce resources and conflict. The characteristic of the northeast region of Nigeria causes a seasonal drift of nomadic cattle herdsman down to the north central part of Nigeria. In recent times, this movement has recorded many violent conflicts between the indigenous farming communities and Fulani herdsman. This can be related to increasing desertification and population pressure over landed resources. This forces grazers from their original homelands and depleted grazing fields to other southern parts of the country in search of greener pastures. This southern drift to a large extent accounts to the rising conflict between farmers in north central Nigeria and pastoral Fulani herdsman that occurred in June 2001.

Recommendations for specific adaptation measures will be made in this study; the study will also outline the basic and most possible causal mechanism that links climate change and conflict. So far Nigeria's government has not been successful in tackling the conflict between farmers in north central and Fulani herdsman from the northeast and northwest.

1.2 Problem statement

According to IPCC, climate change is rapidly advancing as global warming causes severe and extreme weather events like storms, heat waves, droughts and rise in sea levels. The IPCC Fourth Assessment Report (AR4) predicts a rise in temperatures of 2-7degree Celsius by 2100, unless counteracted (IPCC, 2007). The study presents an exhaustive review of these studies and suggests a direction for future developments.

Over time states in north central Nigeria have experienced violent conflicts that resulted to loss of lives. There was the Jos crisis in Plateau state, the Bauchi crisis and most recently the Benue and Nassarawa conflicts between the Fulani herdsmen and farmers. Most likely the phenomenon of climate change is not a leading factor explaining the conflict in these areas. Quality of leadership, poverty, inequality, population pressure and lack of opportunities are other factors that can be considered for serious scrutiny to explain the cause of conflict. But with profound information about the impact of climate change it is worth considering climate change as a factor to the cause of conflict.

The degree of conflict between herders/pastoralist and farmers has grown over the years, the situation has grown from insignificant to extremely tense. The conflict between pastoralist and farmers far outweighs all other types of resource conflicts, both in frequency and importance. Pastoralists are known for keeping livestock in Nigeria; the most well-known herders are the Fulani tribe, there are also Shuwa, Koyam and Uled Suleiman in the northeast (Blench, 2004). These nomads as they are referred to, have permanent homes in the north. But most often these young men travel with their cattle from the north down to the south for greener pastures. Herders move along a seasonal cycle, during the rainy season they stay in the north to cultivate their farms and during the dry season they drift down south in search of flora and fauna.

Over time, herders and farmers in both regions started to clash over land use, this conflict has exacerbated over a period of time. Some communities in the north central regions of Nigeria have recorded many conflicts recently, between the indigenous farming communities and nomads. This can be related to increasing desertification and population pressure over land resources in the northern fringes of the country. This forces grazers from their original homelands and depleted grazing fields to other southern parts of the country in search of greener pastures. This southern drift to a large extent accounts to the rising conflict between farmers and the pastoral Fulani people that occurred in June 2001 (IRIN-WA 18 July, 2001). What are the factors responsible for this conflict and what has exacerbated the situation? What is responsible for disrupting the peaceful understanding and co-existence between the herders and the farmers? Could it be that farmers do not want herders and their cattle trampling over their farms? What are the challenges that are faced by herders and farmers?

In the context of a modern state, conflict in this form is ethically undesirable and unacceptable. Correspondingly, Blench (2004) posits that the mere presence of conflict

undermines the process of development, especially in the area of production. It creates a sense of fear and promotes tension and poverty amongst resource users, making them unwilling to invest for the future. If a farmer believes that a herder is going to uproot his crops he will not plant; if a herder thinks that a farmer will attack and slaughter his cattle he will stop all productive activities in order to guard his cattle.

The absence of theoretical and descriptive literature on the current situation highlights the need for a project research, case study and situation analysis of the problem. In this study climate change and conflict is analysed, this will contribute to underpin future policy frameworks. It is topical and important for this research project to be carried out, to make reasonable contribution to existing knowledge. The main theory underpinning and informing this study is that climate change has a link to conflict. This research will determine whether the conflict in north central Nigeria is solely linked with climate change or there are other factors responsible for the conflict. The outcome of this study will contribute to government and other non-governmental organizations efforts in addressing the issue of conflict in the affected areas; this could be via recommendations of adaptation measures.

1.3 Rationale and Research Question

One of the most significant current discussions about climate change is climate change and conflict. There is so much research on climate change and conflict, yet the uncertainties of the two fields remain a challenge, making the gaps in our existing knowledge appear daunting. This study presents an exhaustive investigation of climate change and conflict, suggesting a direction for future development. Alarming reports published by high profile individuals and groups claim that climate change will have adverse and enormous impacts on the society; Robert Kaplan (1994) talks about deforestation, soil erosion rising sea levels, developments that will cause migration and group conflicts. More alarmingly in those lines, Thomas Homer-Dixon argues that climate change will cause guerrilla and gang warfare, terrorism, genocide and produce insurgencies (Homer-Dixon, 2007). In a report to the pentagon Schwartz and Randall reported on the implications of climate change to include the risk of reverting to a state where humanity would battle constantly over diminishing resources (Schwartz & Randall, 2003). With more caution the Fourth Assessment Report (AR4) of the UN's Intergovernmental Panel on Climate Change and United Kingdom (UK) Treasury commissioned Stern Review (2006), are more reserved about their conclusions about the link between climate change and conflict, however they warn about the

consequences of climate change. How far apart is the relationship between climate change and conflict?

This study makes a contribution to a systematic theoretical and empirical assessment of the potential security implication of climate change, demonstrating the concern about conflict. This study also shows that this issue is researchable and caution will be taken in drawing conclusions and recommendations. This research is warranted despite the uncertainties that have arisen and disseminated by governments and Non-Governmental Organisations (NGOs).

1.4 Research Aims and Objectives

The aim of this research is to investigate the potential link between climate change and violent conflict in the context of northern Nigeria. The study aims to contribute to the climate change and conflict debate.

Objectives

- ✓ To observe the perception of respondents in north-central Nigeria on climate change and its effect.
- ✓ To determine the relationship between climate change and conflict between Fulani herdsmen and farmers in north central Nigeria.
- ✓ To explain the socio economic effects of conflict on the development of a country
- ✓ To suggest appropriate measures and strategies that can be used by pastoralist, farmers, community leaders and government in reducing the problems associated with climate change in northern Nigeria.

This study focused on Nigeria as a case study, to investigate the nexus between climate change and conflict in north-central Nigeria. The knowledge of the relationship between climate change and conflict is important for an understanding of the conflict between Fulani herdsmen and farmers. The aim of this study was to assess the impact of climate change on the conflict affected areas. The overall goal of this research was to contribute to the already existing body of knowledge and research by various scholars and academia on climate change and conflict. It recognises that climate change implications have yet to be fully manifested, it equally explored past works on the effects of climate change on conflict. Similarly, the study explored the concept of climate change and how it affects economic development in the affected areas. The relationship between climate change and conflict has

been investigated by many researchers using different methodologies, yet recent developments have heightened the need for even further researches in the field.

Will pastoralist from the northern part of Nigeria be able to adapt to environmental problems? What are the possible ways of adapting to environmental problems? Will people stay back in affected areas and bear the cost; or mitigate changes or leave affected area? Will a country such as Nigeria be able to mitigate such environmental problems looking at the lack of expertise and resources? What is the possibility that pastoralist and farmers will dialogue and have an understanding for co-existence? What are the possible strategies that government can embark on to tackle climate change and end the conflict between Fulani herdsmen and farmers? The main question of this master thesis is formulated as:

Is climate change the cause of conflict in north central Nigeria?

Answering this question will help give a clear pathway into climate change and conflict in north central Nigeria and the impact on economic growth.

1.5 Significance of the study

In recent decades, climate change has been one of the major interesting research subjects due to its importance and role in the society; economically, socially and politically. The significance of this study is to accomplish its aim and to respond to a recent call for research. To have a clear insight of the relationship between climate change and conflict in northern Nigeria could unveil a framework for climate change related conflicts in other parts of Nigeria and will pave a way for constructive solutions in order to prevent and avoid future conflicts. It is therefore important in this study to have insight on the causes and origin of the conflict between Fulani herdsmen and farmers. Insight into the causes and origin will create the opportunity to prevent social mechanisms that can lead to conflict. This would be of significant social relevance not just for Nigeria but for neighbouring African countries and the world as a whole.

1.6 Theoretical perspective

The concept of climate change and conflict can be traced to Homer-Dixon's theoretical and empirical studies on population, environmental degradation and violent conflict, which emanates from the Malthusian theory by Thomas Robert Malthus (1766-1834). The assumption is that population pressure is closely linked to potential scarcity of renewable resources. According to the assumption by Homer Dixon (2007) states that:

“Resource scarcity is the product of an insufficient supply, too much demand or an unequal distribution of a resource as a result of environmental hazards forces some sector of a society into a condition of deprivation and violence” (Odoh and Chilaka, 201 2).

The theory argues that intrastate conflict can occur as a result of resource scarcity (Gleditsch & Urdal, 2002). Homer-Dixon distinguishes among two causes of scarcity; Supply-induced scarcity, which is as a result of degradation and depletion of natural resources, if not sustained, may not be able to regenerate. Demand-induced scarcity is primarily caused by population growth, as a result of a constant resource base. The availability of resources per person diminishes as number of persons sharing the resources increases and increase in demand per capita (Homer-Dixon, 1990, 1991, 1994, 1999).

There is a consensus among the social scientist that increase in resource scarcity can lead to social, economic and political effects that will increase the likelihood of internal violent conflict. This is reviewed by; (Smith, 2006; Westing, 2002; Cooper, 1999). Homer-Dixon predicts that it can also lead to constrained economic and agricultural productivity causing poverty. Homer-Dixon found that population drift can occur because of unliveable environmental conditions (push factor) or migrant’s economic outcome is likely to become better in areas with more resources availability (pull factors). Homer-Dixon focuses specifically on the relationship between environmental scarcity, ethnic clashes and civil strife. As a Malthusian scholar the theory focuses majorly on population variables.

The Cornucopian’ criticise Homer-Dixon and other neo-Malthusian theorist for their pessimistic relationship between population, natural resources and scarcity. The Cornucopian raised several concerns about the theory and suggested adaptation to the problem of climate change. To the Cornucopian’ humanity has the capacity to overcome resources scarcity through technology and the application of knowledge, concluding that humans can adapt to scarcity (Gleditsch & Urdal, 2002).

1.7 The scope

In order not to defeat the purpose of this study and for time management thematic areas about climate change will be addressed specifically, based on the scope of study, which is climate change and conflict. Thematic areas such as ‘causes of climate change’ and the scientific approach of climate change will be mentioned but will not be discussed in details. This

master's thesis focuses on the possible relationship between climate change and conflict. This study acknowledges the non-climatic factors that can relate to violent conflict, the researcher focuses majorly on the climatic factors that are linked to violent conflict. The researcher will work within the scope of the study to avoid any form of complexity.

Most assessments relate environment and conflict in combination with other conflict enhancing factors which will not be a priority in this study. A few claim direct links between climate change and violent conflict, for others; economic, political, and social factors can join with environmental scarcity to lead to violent conflict (Homer-Dixon, 1999). Bottom line is that climate change is not the only factor responsible for violent conflict. Though one agrees with this assertion, it is also possible that some violent conflicts are caused primarily by climate change. The call to address this from a specific case study emphasises my position.

1.8 Structure of essay

The study is structured into six chapters. Chapter one is an overview and background to the study, with a clear rationale as to why the researcher has gone into the study, how topical and useful this piece of research is to conduct. A general insight to the research problem on the issue of conflict between the Fulani herdsmen in northern Nigeria and farmers in the south of the northern part of Nigeria is investigated. The aims and objectives are stated, and a theoretical perspective from Homer-Dixon originating from the Malthusian theory by Thomas Robert Malthus (1766-1834) is discussed.

Chapter two and three covers the literature review in two parts. The first part explores the arguments by different scholars on the different methodologies to be used in analysing the relationship between climate change and conflict. It will analyse and summarise the issues around the choice of methodology and why such methodology or methodologies were chosen by different researchers. Chapter two also explores how the link between environmental resources and conflict has engaged the minds of different scholars such as Homer-Dixon and the Toronto group, Zurich group around Bächler and Spillman, Gleditsch and the Oslo group and Irvin group around Matthew. In reviewing the nexus between climate change and conflict few conclusions emerge. This chapter provides the foundation for my research. The second part which is the chapter three looks at the theoretical issues surrounding the study, the geographical location of the study is also explored. The chapter show cases an understanding of the concepts and ideas of the area of work. This conceptual framework will consider the

issues, arguments and solutions surrounding the problem, from the perspective of other researchers.

Chapter four is the methodology and methods that inform and can enable the researcher to investigate the question and subject area, it also explains why such a methodology is used and for what purposes. I base my research methodology on the previous works of Odoh and Chilaka (2012), using the purposeful sampling method to administer questionnaires, with in-depth interview as follow-up. Chapter five will analyse the data collected and findings. Chapter six concludes and provides recommendations.

As a whole, the outcome of this dissertation offers an alternative approach for researchers, on how they can go about linking climate change and conflict, with specific emphasis on Fulani herders and farmers in Northern Nigeria

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CHAPTER TWO

2.1 SECTION ONE: LITERATURE REASEARCH-METHODOLOGICAL ISSUES

2.1.1 Introduction:

There have been several studies reporting on climate change and a large and growing body has investigated climate change and conflict. A considerable amount of literature has been published on climate change and conflict. This first part of the literature review will cover the arguments by different researchers on the nexus between climate change and conflict. It will also analyse the methodology used in determining the relationship between climate change and conflict. Debate around the environment, population, conflict and economic impact remain the subject of intense debate among scholars. Scholarship and policy attention is devoted to researching on the linkages among the four variables, it can be argued that both policy and research communities have made significant progress. The findings and policy lessons remain subject to further debate (Schwartz and Deligiannis, 2000).

Section two interrogates and scrutinises the various theories, concepts and ideas of climate change, identifying the gaps, issues and debates amongst scholars, politicians, scientist and think tanks. It's a basic research that addresses the theoretical issues relevant to the topic.

Climate change and conflict is encapsulated in the literature of environmental conflict. The literature dates back to the 1970s but was debated upon and systematically studied in the 1990s by different scholars on the causal links between environment degradation and conflict. Four internationally renowned and established conflict researchers have dealt with environmental issues and the dynamics of violent conflict. Each scholar's argument is based on the depth of study and findings. Pioneers of this study were the Toronto group around Homer-Dixon, and the Environment and Conflict Project (ENCOP) around Bächler and Spillmann. They undertook empirical studies of the assumed relationship between environmental degradation and armed conflict in the early 1990s before Nils Petter Gleditsch from the international Peace Research Institute, Oslo and The Global Environmental Change and Human Security (GECHS) headed by Matthew.

2.1.2 Schools of thought on Environmental degradation and conflict

In the early 1990s, leading figure Thomas Homer-Dixon and his colleagues from the University of Toronto wrote an article on environment degradation and violent conflict. Homer-Dixon defines environmental scarcity as “a lack of renewable resources caused by resource depletion, increased demand and unequal distribution”. According to this group a constraint on economic and agricultural productivity, disrupted institutions and social segmentation can raise ethnic clashes and sub-national insurgencies. The assumption is that population pressure is closely linked with potential scarcity of renewable resources. The theory argues that intrastate conflict can occur as a result of resource scarcity. Homer-Dixon predicts that an increase in resource scarcity can lead to social effects that will increase the likelihood of internal violent conflict, constrained economic and agricultural productivity causing poverty. The finding is consistent with findings of other studies by Smith (2006); Westing (2002); Cooper (1999). This is supported by Malone (1996), his study reveal that the depletion of agricultural land and water may have a greater social and economic impact than other forms of environmental changes such as stratospheric ozone depletion.

Research into the relationship between environmental scarcity and conflict proves its complexity. Gleditsch and Urdal (2002) argue that most of the postulated events are cited as empirical evidence, according to them these calls for a research program. In as much as

Homer-Dixon places much emphasis on the causal effect of renewable resource scarcity, my argument is that not all renewable resource scarcity can be linked to conflict, such a conclusion can be applied to specific case studies and not in general. Homer-Dixon concentrated his study on developing countries, whereas developed countries are constantly faced with a rising number of conflicts. What is the possibility of linking those conflicts to environmental scarcity?

With the aim of finding out how conflicts induced by environmental problems progress within and between states, developing countries were selected by the Toronto group due to the assumed link between environment stress and conflict in developing countries. The Toronto group did not only concentrate on scarcity of renewable resources and environmental changes but also on a few selected case studies in developing countries. However, there is no reliable evidence that conflict is induced by environmental problems. Nevertheless, other studies are to be found providing detailed information. The number of qualitative case studies conducted by Homer Dixon was not just based on assumption but also focused on countries in a particular region and not areas in a particular country.

Very similar to the Toronto group was the ENCOP project with further research on the link between environmental scarcity and conflict in 1996. Their study also focused on developing countries dealing with environmental and conflict issues, the assumption behind the ENCOP project was slightly twisted compared to Homer-Dixon, and one may say the assumption made was rather less subjective and more specific to target areas. The group argued that environmental change may indirectly lead to conflict in an environment potentially prone to socio-economic conflict to a point of violent escalations. This leaves room for probability and more research in that area. According to this view conflict is not necessarily an irreversible consequence of environmental change but is rather motivated by social or political factors (Bächler and Spillman, 1996).

ENCOP further met its aim by devising a typology of conflict that links certain environmental degradation to its socio-economic consequences and the parties affected by the conflict. The conflict typology is divided into six categories; (1) conflict arising from distant sources (2) migration conflict (3) international water conflict (4) ethno-ecological conflict (5) centre-periphery conflict (6) regional, cross border and demographically-induced conflict. The outcome of the ENCOP typology shows that contextual factors determine whether competing actors will settle for a violent or a peaceful solution other than resource

degradation. Unlike the Toronto group the ENCOP project by the Zurich group identified important socio-economic factors responsible for environmentally induced conflicts to be; influence from past conflict, group identities, a lack of societal procedure and mechanism for regulating conflict, and organising and arming of parties to a conflict. One tends to support the view of the ENCOP group as it categorises conflict arising from different sources and not just environmental scarcity alone. This view explains in detail the different scenarios that may trigger conflict to arise.

Climate change Scarcity of renewable resources such as degradation of agricultural land, deforestation, and degradation of water resources play a vital role in Homer Dixons research, though in the end no connection and no evidence between scarcity of resources and escalation of conflict were found. However, Dixon's studies show that a combination of environmentally induced resource scarcity, economic, political and social factors can result to destabilized states and societies likely to cause conflict. Saying the scarcity of environmental resources has already lead to violent conflicts in developing countries (Homer-Dixon, 1990, 1991, 1994, 1999).

One will not completely argue with Homer-Dixon that there are no links between environmental scarcity and conflict. But emphasis should be made regarding the fact that environmental resources do not deplete at the same time, neither are they consumed and distributed at the same time. In assuming the link between environmental scarcity and conflict Homer-Dixon failed to consider certain factors such as depletion of renewable resources, consumption of resources and their distribution. I argue that though there are cases that conflict may arise from scarcity of renewable resources not necessarily from every renewable resource. I agree with Homer-Dixon in terms of disrupted institutions, this can easily trigger conflict, especially when no dialogue is taking place.

Many researchers have argued about the relationship between environmental changes and conflict. From the mid-1990s two additional approaches to environmental degradation and conflict have been developed with the aim to criticize the work of Homer-Dixon and ENCOP. The main representatives were the group of scholars around Gleditsch and Matthew's Global Environmental Change and Human Security (GECHS) project in Irvine, California that focuses on adaptive capacity of human societies, both works are based on quantitative studies. A prominent critique enunciated by fellow peace researcher Nils Petter Gleditsch from the international Peace Research Institute, Oslo was proposed. He identifies

problems of theory, conceptualisation, and methodology with the work of the Toronto Group. Gleditsch embarked on an independent quantitative research approach to critically engage with the studies of Homer-Dixon and the ENCOP Group. His aim was to counter the excessive and complex qualitative model approach (Gleditsch, 1998); his critique builds upon criticisms posed by sceptics of environmental conflict research (Ronnfeldt, 1997; Levy, 1995; and Deudney, 1991).

Gleditsch argues that Homer-Dixon (1991, 1994) employs a very complex theoretical scheme in the case studies used by Homer-Dixon. These case studies have been reproduced in a number of publications from the Toronto group (Howard & Homer-Dixon, 1995; Kelly & Homer-Dixon, 1995) with several imprecise variables in place. Such a comprehensive scheme according to Gleditsch (1998) would make empirical testing very difficult. Gleditsch contends that the methodology violates the quasi-experimental methodology rules, used by social scientists. Though he identifies other problems in environment–conflict research this is his starting point. As a result, Gleditsch does not regard the detailed findings of the Toronto Group, the Zurich Group and any other research that does not meet his standards of evidence (Environmental Changes & Security Project Report, 2000). One critical outlook for his assertion is in the methodology. An alternative quantitative approach in the selection of case studies will not be enough for a valid data analysis.

His argument is based on the assumption that where there is an abundance of resources conflict is bound to occur. As such Gleditsch provides an alternative quantitative approach in regard to the deficiency in the selection of case studies. His emphasis is that environmental degradation is not the only responsible factor to the escalation of conflict; other variables that may contribute include economic and political factors (Hauge & Ellingsen, 1998). Gleditsch raised cogent reasons for his assertion, especially about other very important variables that can have strong influence on conflict, notably economic and political factors.

Another critique group of Homer Dixon in support of Gleditsch is the Global Environmental Change and Human Security (GECHS) set up at the Centre for Unconventional Security Affairs at the University of California in Irvine is headed by Matthew. Matthew took a different turn, the aim of his critique at environment and conflict was to foster a new theoretical perspective focused more on humans and societies been able to adapt long term. Matthew's examination of the impacts of environmental change on societies and individuals, turned out to be his theoretical starting point. Matthew noted the lack of qualitative frames

and foundations in research and quantifiable empirical research; he therefore recommends that the range of methods and instruments used be extended for better understanding of the interconnections and impacts involved (Matthew et al., 2004; Matthew & Fraser, 2002).

On the other hand, a response to Gleditsch critique is argued by Schwartz, Deligiannis, & Homer-Dixon (2000) saying, Gleditsch's proposed approach is a methodological straightjacket that would, if widely adopted, severely constrain research in the field (Schwartz, Deligiannis, & Homer-Dixon, 2000). As such a methodological pluralism approach using a statistical and quasi experimental methodology is suggested by Gleditsch. A proposed model by de Soysa and Gleditsch share some resemblance to that of Homer-Dixon. Of the two, Homer-Dixons model is more elaborate covering social effects apart from agriculture decline that lead to violent conflict. In trying to avoid the problem of complexity de Soysa and Gleditsch have produced a derivative and less explanatory literature than its progenitor.

Despite the critique and fundamental objections towards each other's theoretical perspective of the environment and conflict literature, there seems to be a considerable degree of agreement when it comes to the main research findings. A number of issues show that significant differences do exist, albeit findings are somewhat contradictory. There is a consensus that environmental degradation is not the decisive factor of the cause of conflict; there are other complex causes of conflict. Apart from Matthews approach three of the approaches express the multi causality of observed conflicts. There is also a consensus in regard to location of the conflict; these conflicts are said to occur within states as intrastate conflicts. If at all they are categorised as cross-border conflicts, they are generally not classified as interstate conflicts in terms of wars between countries, but rather as regional clashes between states bordering on same lakes and rivers. All approaches are keen on the problem solving capacity of a state or society with regard to occurrence and management of conflicts. They explain the high probability of conflict occurring in states or societies where political and societal institutions are weak, they are also considered as future crisis hotspot.

In as much as there is no concrete evidence that environmental degradation is directly responsible for violent conflict, However, it cannot be ruled out that environmental degradation can lead to conflict; the link remains a plausible possibility. Attempts to improve upon or refute Homer-Dixons work have been productive, in the sense that our understanding of the complex ways in which environmental scarcity interact with social systems is further

improved. One's suggestion could be that more extensive fieldwork be undertaken in areas facing environmental scarcities and adjust our environmental – conflict theories using less variables and keeping it less complex, but in the light of this detailed empirical evidence. Also one may agree with Mathews' suggestion for humans and societies to be able to adapt to long term strategies in combating environmental issues as an option for further research.

These arguments pose some very crucial questions:

How can individuals and societies adapt to climate changes and, where necessary strategize and build upon climate changes? At what point should adaptation or mitigation occur? What is the evidence that humans and society need to adapt to climate changes? How inclusive is the strategy of adaptation, does it protect both the environment and the people? How effective is the process of adaptation to tackling the issues of conflict? And finally who is responsible for the process of adaptation?

IJSER

2.2 SECTION TWO: THEORETICAL PERSPECTIVE

2.2.1 Climate change and conflict

Various scenarios of climate change impact have been reported in recent times, a panel of the Centre for Strategic and International Studies asserts that climate change is likely to “affect virtually every aspect of modern life” and the potential of creating new conflicts and great national security challenges, that policy makers in this or any other generation is likely to confront (Scheffran & Battaglini, 2011). The German Advisory Council on Global Change on the same magnitude reports without counteraction that, climate change has the ability to overstretch adaptive capacities of many societies in decades to come. This could result to destabilization, conflict, and jeopardy of national security, social and economic stability. The German Government Ministry found that there is mounting evidence that climate change impact can contribute to increasing the potential for conflict, interacting with socio-economic factors, this argument is further extended by the German Advisory Council on Global Change (WBGU, 2007).

The United Nations Security Council debates over the impact of climate change on peace and security, warning that climate change poses as much danger to the world as war (UNSC, 2007). Both the Secretary -General Ban Ki-moon and former UN Under-Secretary-General for Humanitarian affairs, Jan England link the Darfur conflict in Sudan to climate change, they argue that similar environmental challenges are causing conflicts in other African countries (Ban, 2001).

In line with Homer-Dixon, the Nobel Prize Committee also views that climate change may impact large scale migration that leads to competition over scarce resources, and as a result the likelihood of violent conflicts and wars between and within states (Nobel, 2007). In contrast Meierding (2013) believes that scholars have failed to identify a consistent relationship between climate change and conflict in a systematic and cross national analyses, even after half a decade’s work. Meierding’s view is in line with the climate change- conflict views of other scholars (for overviews; Bernauer, Böhmelt, and Koubi 2012; Gleditsch 2012; Scheffran, Buhaug, Gleditsch, and Theisen 2008; Salehyan 2008; Brzoska, Kominek, Link, and Schilling 2012).

In 2003 a report to the US department of Defence presented a grim future scenario of massive social disturbances as a result of climate change, the authors argue that their scenario is plausible and should be looked into with due consideration (Schwartz & Randell, 2005). As

such, in 2007 the United Kingdom as chair of the security council put the issue of climate change on the agenda, arguing that impacts of climate change such as sea level changes, drought and rising temperatures cannot be ignored (UN, 2007).

Non-Governmental Organisations (NGOs) are not left out; they have also joined the argument. Christian Aid, a charity organisation has warned that 184 million people could die and about one billion will be forcefully displaced in Africa as a result of climate change effects at the end of the 21st century (Christian Aid, 2006). Highly placed officials in international organisations for research on the environment such as the director of international Geosphere-Biosphere Programme (IGBP) Kevin Noone, commented that “most conflicts have something to do with the climate” (Nordås & Gleditsch, 2007). Others who have identified the link between conflict and climate change; we find Sachs (2005), Homer-Dixon (2001) and Swart (1996). While others such as Barnett (2001), Suhrke (1997) and Bachler (1999) are sceptical of this link.

Why does climate change remain a complex and uncertain future development? Despite various research literatures and increasing attention about climate change. People are questioning if at all there is a climate change and the effects that are associated with climate change are true. Discussions on the social effect of climate change focus mostly on possible negative effects large and small. Globally the effects of climate change will vary considerably both by sector and geographically. Although global net effect of climate change seems likely to be negative (Scheffran & Battaglini, 2011).

It is possible to totally agree with the uncertainty of climate change and support the view that more research on the impact of climate change on the globe be carried out for a better understanding of what threat climate change poses. Hitherto there are theories and concepts supporting the role of climate change on the society, this must be well researched and proven before putting the entire globe on an edge. My perception is that the concept of climate change has put a scare on a large scale on the entire globe and has also caused anxiety amongst leaders that could probably take advantage of the scenario. I agree that climate change over a long period of time may have caused some significant effects; on the other hand, the whole concept could be exaggerated at some points.

As such climate change has what it takes to unite the international community to come together and adopt a global, dynamic and coordinated climate policy that will prevent conflict and further lines of division over distribution of resources and management of migration

between and within countries (WBGU, 2007). Brugger, Morton and Dessai (2015) support this view and arguing on the proximal (local threat) and distant risk perceptions of climate change. Local perception of climate change may be effective in promoting personal adaptation actions.

However, to gain a broader endorsement for policy support will entail looking at distant risk of climate change. Brugger, Morton and Dessai argue that localising climate change will not engage the right people. This view supports the most recent climate change conference COP2 in France. While many will focus on endorsement which at this point in time is necessary, I perceive that the perception some people have about climate change will not warrant their endorsement, some people are still uncertain about climate change and will either give the benefit of doubt or be indifferent about it.

2.2.2 The premise providers

So far the IPCC a leading scientific and intergovernmental body under the auspices of the United Nations is dedicated to the task of providing the world with an objective, scientific view of climate change and its impact? It is the most important source laying the premises for climate change debate. Despite the growing concern about the security implication of climate change on the environment and possible violent conflict arising, climate change as a cause of conflict is a contentious issue in the current debates. The Third Assessment Report (TAR) of the International Panel for Climate Change firmly establishes climate change as a political issue (IPCC, 2001). The Fourth Assessment Report (FAR) has estimated the likelihood that climate change is human induced (IPCC, 2007) human activities have significantly contributed to the rising temperatures in recent times. The IPCC has also outlined probable effects of climate change on nature. These in turn are likely to impact on human activities. Looking at the Third Assessment Report (TAR) the issue of conflict as an outcome of climate change is not emphasised, the issue is hardly dealt with in the IPCC reports. Out of the many themes on climate change; adaptation, impacts, uncertainties, vulnerabilities, industry and ecosystems, conflict as an outcome of climate change is barely mentioned (IPCC, 2001).

Not everyone agrees that there is a direct link between climate change and conflict; some argue that there is an indirect link between climate change and conflict as impoverishment and human insecurity may arise as a result of climate change. Popovski (2009) would rather link political and economic causes to conflict, believing that every conflict has many causes. But ever since the IPCC and other influential scientific assessments started leading a forum

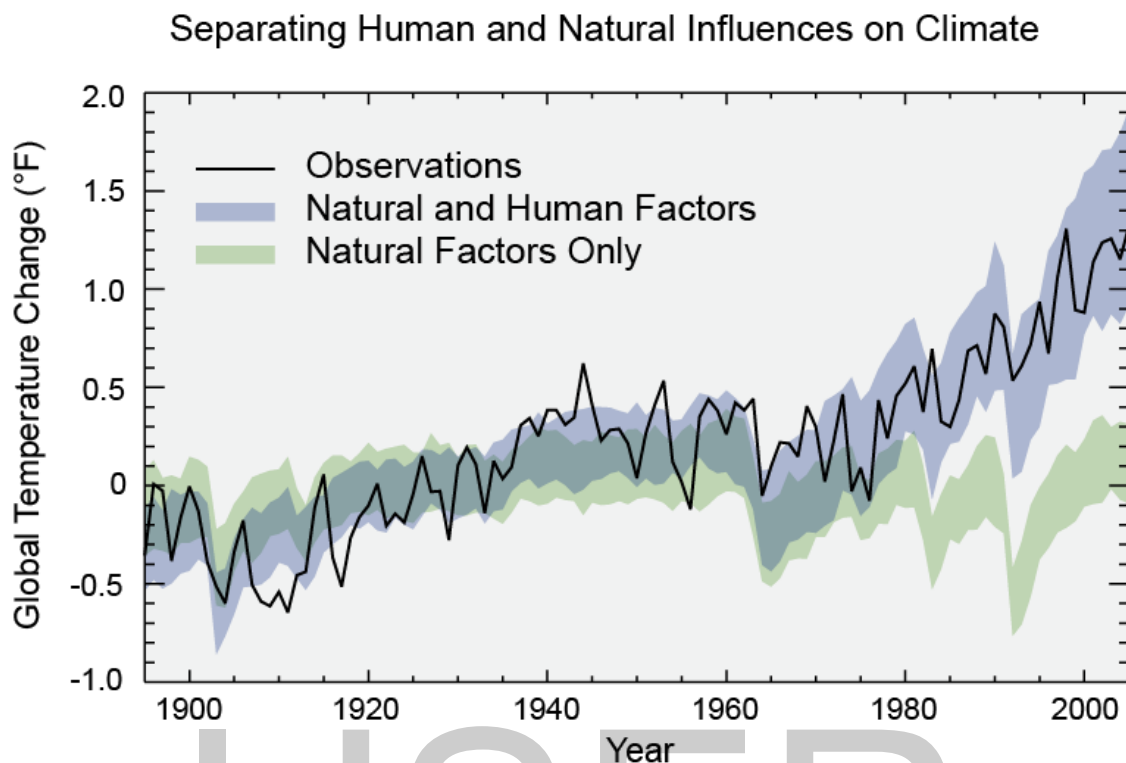
for climatic analysis, so much assertion about the relationship between climate change and conflict has risen and caused a stir in the debate.

2.2.3 Understanding Climate Change

Climate change is triggered by two factors that cause a sustained change to the amount of incoming and outgoing energy, they include Human activities (anthropogenic) and Natural processes (biogeographically) (Odjugo, 2010). Odjugo explains the natural process to involve astronomical and extra-terrestrial factors that involve changes in the orbital procession and amount of solar radiation. While human activities such as burning fossils, urbanisation and industrialisation, gas flaring and agriculture deplete the ozone layer, reducing the absorption of carbon from the atmosphere. The prospect of human induced climate change illustrates that humanity is in a position to exercise a significant influence on the global environment. Global climate change will profoundly have implications for the quality of life of people. This is a warning about the possible harmful consequences of climate change (Nordås & Gleditsch, 2007). Deforestation, water pollution and land use alterations are proven to reduce the amount of carbon sinks. Man's impact on climate change is associated to the increase in carbon dioxide emission that causes a man-made global warming, with recommendations for emission reduction, adaptive and mitigating measures where necessary.

Figure 1. Below shows a model accounting for the effect of both natural and human processes to explain global warming observed over the past century. The observation records that natural variation of climate change system over a wide range of time scales prior to the industrial revolution of 1700s can be explained in association to natural causes such as volcanic eruption, changes in solar energy and natural changes in greenhouse gas (GHG). Recently climate changes, however, are not linked to natural processes alone. Researches argue that natural effects alone do not explain the observed warming, especially warmings from the mid-20th century. It is then extremely likely that human activities have been the dominant cause of warming's, due to human industrial activities of adding heat trapping gases such as Carbon dioxide (CO₂), Methane (CH₄) and water vapour (H₂O) into the atmosphere (greenhouse effect) (United States Environmental Protection Agency, 2014).

Figure 1. Separating human and natural influences on climate



Source: U.S. National Climate Assessment. (2014)

Critically neither this study nor the literatures used prove that human activities are responsible to climate changes, but it is based on this scientific background that premise providers have set the pace of climate change and its impact on the environment. Though the study does not justify the argument it will serve as a reference to the study in the outcome.

In some cases, changes in temperature result to lower ozone levels near the earth's surface, leading to a significant increase of smog in cities. This is due to the emission of carbon dioxide. On a general scale challenges in atmospheric temperature as explained by Roma, (2008) could also affect cloud formation and dissipation. Warmer temperatures near the ground could cause the evaporation of lower clouds. As heat rises farther into the atmosphere higher clouds are formed and absorb more heat as the heated air rises and cools. The higher the cloud the more heat it traps near the earth's surface, rise in atmospheric temperature leads to a cycle that holds more heat over time. Some past studies have shown that the impact of climate change on the society can have adverse effect, therefore the recommendation for global climate policy as proposed by (WBGU, 2007; Brugger, Morton and Dessai, 2015) is necessary.

2.2.4 Causal pathways to conflict

Literature relating the causal chain between climate changes and conflict is not backed up by peer reviewed studies unlike the science in the climate change debate. The head line hitters from government to think tanks cite many relevant sources that tend not to be reviewed by their peers (Nordås & Gleditsch, 2007). One may even question whether these cited works are by specialist on the issue of conflict. This study outlines possible causal chains from climate change to conflict from different articles. For Hendrix and Glaser (2007) the starting point is that climate change results in a reduction of essential resources for livelihood, such as water and food, which in turn can have consequences: people affected by scarcity will start to fight over resources, people will start to leave affected area to other areas or host communities, thereby increasing the number of refugees or Internally Displaced Persons (IDP). In addition to Hendrix and Glaser, Barnett and Adger (2007) also argue that when migrants encroach on other people's territory who are also resources constrained, the potential for conflict rises.

Some contemporary researchers such as (Bond and Bond, 2007; Hendrix and Salehyan, 2002; Raleigh and Kniveton, 2012; and Hendrix and Glaser, 2007) argue that the theoretical models of the relationship between climate change and conflict are extremely complex. There are too many variables and indirect effects in the pathways; the potential for model misspecification is therefore high. The causal chain relationship between climate change and conflict is repeating and even exacerbating errors of the past in contemporary research agenda. In support, Meierding (2013) argues that the complex causal chain has also led to the underdevelopment of theories concerning climate change and conflict linkages. It is therefore necessary according to Meierding that researchers shift from current emphasis in general, and rather focus on the variable that is most influenced by climate change. Meierding also argues that it is necessary to disaggregate the causal chain, restricting the analyses to single linkages for more detailed examination of each linkage by analyst.

One agrees with the argument that climate change-conflict theoretical models are complex; this is based on the uncertainty surrounding climate change. It is better to study a single linkage at a time for more clarity, understanding and detailed information.

Barnett and Adger (2007) like Homer-Dixon (1991) focuses on developing countries where a large majority of its population is dependent on the primary sector for employment, saying consequences in such countries will lead to wide spread poverty and rebel movements.

Hendrix and Glaser (2007); Meier, Bond and Bond (2007) confirm these effects based on reduced annual rainfall and monthly precipitation data. Raleigh and Urdal (2007) found differences suggesting that environmental and demographic variables have a moderate to low effect on risk of conflict. Reuveny (2007) like Barnett and Adger (2007) points out that migration may lead to conflict in host communities. However, it is shown by Suhrke (1997) that specific cases of migration and conflict should not be generalised.

Climate change is a highly debatable topic of concern in the world currently and it is associated with a number of issues. Shortages of water and food are predicted to trigger massive population drift leading to migration famine and conflict. Climate change is creating millions of refugees- many people are forced to migrate from their home lands due to drought, rising temperatures and extreme weather conditions such as storms and floods. Climate change also threatens global peace and security as nations and groups come into conflict over scarce natural resources (Environmental Justice Foundation, no date).

From a researcher point of view on the argument concerning what factors can trigger violent conflict, I will agree with Suhrke (1997) who argues that specific cases of conflict should not be generalised. Meierding's argument appears less complicated using a single linkage to explain the pathway for the causal mechanism. Looking at the various arguments by scholars, governments and scientist one then questions the existence of a climate change connection or at least, how important is climate change as a driver of conflict, relative to other factors?

2.2.5 Climate Change and its uncertainties

The defence community views uncertain circumstances and outcomes as risk, necessitating a risk management technique framework for addressing such risk. Despite the uncertainties of climate change, General Gordon Sullivan, former United States (U.S) Army Chief called for the address of climate change and its consequences, Sullivan observed that "you have to act with incomplete information and according to the trend line ... if you wait until you have 100 per cent certainty, something bad is going to happen on the battlefield" (CNA MAB 2007) as cited by King and Goodman (2011). This is the national approach to the uncertainty of climate change. Sullivan argues that conceptually, uncertainty is neither inherently positive nor negative, however based on national security analysis a worst case scenario of uncertainty can cause catastrophic consequences such as drought and desertification.

Reports from the department of defence demonstrate that climate change is a core element of national security planning and should be assessed with already existing frameworks used to

evaluate risk, threats and responses. It is difficult to measure the exact magnitude of the threat posed by climate change; this is because the language used by scientist in predicting uncertainty and the confidence level of climate impact is not sufficiently clear. The uncertainty of many nations over the issue of climate change makes them to argue about the security implications of climate change. These nations show stiff resistance over the debate about climate change, such as developing countries. Whereas there are some nations such as Great Britain, Australia and the United States who lobby for the idea of a climate change debate (CAN, 2007).

From one's critical point of view the level of uncertainty warrants such stiff resistance from different nation, perhaps with more empirical evidence the confidence level of climate impact will be sufficiently clearer. Making decisions on how to address these problems is the responsibility of policy makers which brings our discussion to who is responsible for tackling climate change issues? Who is responsible for creating awareness about what climate change is all about? People who are mostly affected by climate change according to Homer-Dixon (1991) are people in developing countries that depend wholly on agricultural activities. Unfortunately, their perception about climate change is limited. One may argue that the lack of understanding and knowledge about climate change can to a great extent boost conflict.

2.2.6 Vulnerability and Adaptation

Research findings by McCarthy (2001) also points toward adaptation. The finding is consistent with findings of Mathew which focuses on adaptive capacity of humans and the society. McCarthy observed impacts of climate change to be a reality on environmental and physical systems. McCarthy explains that individuals, organisations and societies in response to post climate changes have adjusted their behaviour and considered adaptation to altered climatic conditions. Based on Adger et.al, (2005) adaptation can be reactive when triggered by present or past events, and anticipatory based on futuristic conditions. To Adger (2003) adaptation can be motivated by many factors these include protection of social and economic wellbeing or for safety reasons. Kelly and Adger (2000) link vulnerability to the process of adaptation, where adaptation is facilitated by reducing vulnerability. In support of Adgers' view the Cornucopian in their critique of Homer-Dixon and other neo-Malthusian theorists, humanity has the capacity to overcome resource scarcity through technology and the application of knowledge, concluding that humans can adapt to scarcity (Gleditsch & Urdal, 2002).

The Stern report (2006) places emphasis on adaptation saying Adaptation ‘... *is crucial for dealing with the unavoidable impacts of climate change, but has been under-emphasized.*’ Ikeme (2003) also supports that climate change adaptation is well promoted and recognised as an inevitable component of climate change. Ikeme argues about adaptation unpreparedness of developing countries, especially Africa to climate change. It is evident that African countries lack the recognition of the need to adapt. There is poor incentive and lack of capacity to adapt, further exacerbating their vulnerability. Unfortunately, very few attempts and strategies have come up to understand the underlying reasons of adaptation unpreparedness in the region.

Malltezi et al (2015) recently promotes the view that countries should prepare a set of climate change adaptation actions to manage the risk and adapt to climate change, using the Tirana experience in Albania. The exercise for which Tirana used was carried out using the climate compass tool, a vulnerability assessment of all different sectors was carried out to evaluate the risk posed to vulnerable target groups. In the end feasible adaptation options were proposed in order to ensure possible sustainable development of the city. Malltezi et al also argues further that adaptation to climate change is a continuous long term process, there is no start or end date. At every stage of research there is room for improvement on the decisions and plans already in existence. I support Malltezi et al; their view is practical and gives room for further research and improvement based on a specific case.

In support to USEP (2014) on how human activities contribute to climate change, Malltezi et al talks about how human activities have contributed to exacerbate impact of climate change. It is important for government to integrate climate change adaptation actions into planning and decision making for sectors such as urban planning, transport and water infrastructure. In as much as building a city is important, sustainability should be considered priority. This is important as such documentation will not only help the adaptation process but also in mitigating activities that would rather worsen the situation of climate change.

Adger, Arnell & Tompkins (2005) argue that to successfully embark on sustainable adaptive methods elements of effectiveness, equity, efficiency and legitimacy should be considered in the development of pathways into uncertain future. They further argue that adaptation processes should be judged at different scales, it involves new and challenging institutional processes.

2.2.7 Financing climate change adaptation

Williams and McNutt (2013) raises the issue on the challenges confronting different governments in financing and coordinating adaptive responses to climate change. There is also the issue of coordination among leaders on the challenges of climate change adaptation. Many countries are faced with the lack of capacity to respond to climate change challenges. Integration of climate change into long term planning has not been realistic and is haphazard even at various government levels. The issue of funding and support poses a lot of challenges and raises complex questions in the finance sector. Williams and McNutt are of the opinion that policy making capacity of governments should be put into consideration in relation to climate change adaptation. From what one perceives the issue of finance is very crucial in the recent COP2 conference held in France. There is a huge debate about who should finance climate change adaptation and mitigation, no country is spared.

One way to see this working is by how climate change is perceived by policy makers; they can only be convinced based on their standpoint and in-depth understanding of the concept of climate change. Policy makers ought to believe that climate change impacts negatively on the environment and that poses as a risk. It is therefore important to have positive attitudes about protecting the environment and the willingness to respond to climate change.

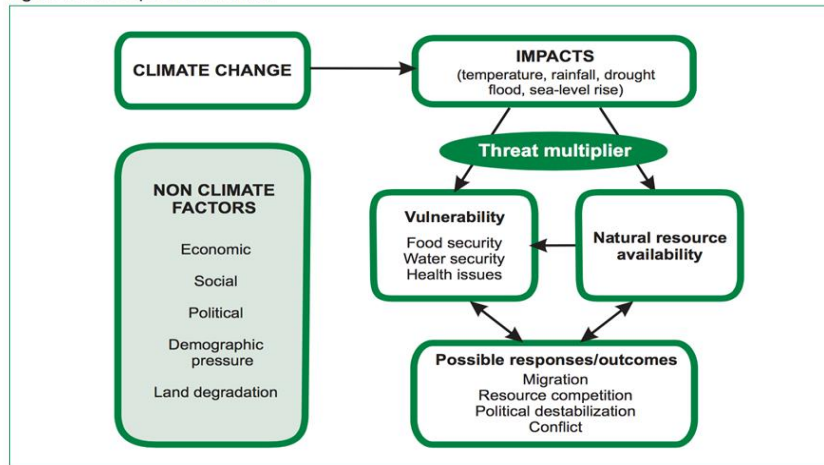
US Army (1996) have a strong opinion that the defence community has vast experience dealing with uncertainty, drawing lessons from their ‘risk management’ approach is a step that will help describe the effects of climate change and how the findings can be better communicated to policy makers and the wider audience. The IPCC sees the first two steps in each process as relevant to its reporting. To Rosenzweig & Solecki, 2000 this risk assessment and intelligence analysis can both define and assess problems but the overall decision making lies with the policy makers

While others may endorse climate change adaptation or mitigation as a stand-alone Brugger, Morton and Dessai (2015) endorse both climate change and mitigation as a hand-in-hand approach Saying ‘‘someone who is willing to reduce greenhouse emission (mitigation) is also willing to prepare for climate change impacts (adaptation)’’ and thus endorses both response strategies for the same reasons.

2.2.8 Conceptual Framework

Figure 2. Environmental change and conflict.

Figure 1. Conceptual framework



Source: UNEP, (2011)

To further explore the link between climate change and violent conflict, a conceptual framework underlying this study is shown in figure 2. The framework builds on the 2009 UN Secretary-General report on climate change, showing the possible livelihood security implications in the context of the Sahel. Based on the conceptual frame work, the steps and variables of the conceptual framework will be discussed. The framework is based on academic literature in the field of environmental change and conflict

2.2.8.1 Climate Change impacts

Recently the Intergovernmental Panel on Climate Change (IPCC), United Nations Environmental Program (UNEP) and World Meteorological Organisation have reported that the globe has become warmer over time in the last century, with average surface temperature increasing by About 0.6 +or – 0.2 degrees Celsius in the twenty first century. The Intergovernmental Panel on Climate Change addressed the risks associated with climate change in its Fourth Assessment report. The impact of climate change generally undermines the living conditions of people in the world and is specific for each region, the most vulnerable being regions highly dependent on agricultural output and ecosystems services. The report confirms predictions of extreme weather events and conditions increasing in directly impacted areas and extending to other areas and sectors through complex and extensive linkages. The earth is said to be warmer in the past 1000 years, it's based on these historical records that IPCC base its predictions of warmer years in the coming decades. In its

fourth assessment report the IPCC defines climate change as “a change in the state of the climate that can be identified (e.g. 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. It refers to any change in climate over time, whether due to natural variability or as a result of human activity” (IPCC, 2007).

In another study by Ikeme (2003) impacts of climate change of particular concern to Nigeria are related to desertification, coastal zones, and water resource and food security. These impacts entail significant economic and social cost with a ripple effect on economic development. The cost of climate change is worsened by the regions dependence on agriculture, making it susceptible to climate variability (Ikeme, 2003; IPCC, 2007). Looking at the area of study, McCarthy (2000) also reported that climate change threatens sustainable resource management in dry and arid regions of northern Nigeria. A changing climate with altered patterns in rainfall, temperature, winds and solar radiation will exacerbate desertification, having negative effect on food and water security. Variations between the climate of past decades and recent climate is shown by Hughs (2000)

Population growth and increasing desertification will have a side effect on the feeding of people and can cause conflict. According to Paehler (2007) natural resources are gradually decreasing in the Northern part of Nigeria and if care is not taking, in the long run this could lead to internal migration and conflicts over shrinking landed resources as it is already feasible in some states in the northern fringes and central area of Nigeria. Due to the dominant role of agriculture in Nigeria, minor climate deterioration can have adverse negative effect, causing devastating socio economic consequences

Based on research number of previous studies have reported the impact of climate change to be adverse on social, economic and political development of the society. This is based on some of the conclusions made by premise providers such as the IPCC. I argue against some of these predictions, because they lack the appropriate evidence to prove extreme weather conditions. It is more appropriate if such predictions are based on probability and a time line.

The conceptual framework shows five elements of climate change that risk compounding the existing vulnerabilities in the third pathway: Temperature change according to Hansen (1998) is associated with global warming; average temperature changing over a period of time is referred to as ‘global warming’. Hansen also relates sea level rise over many centuries to

global warming, but ask the questions ‘how sure are we about global warming? What can be done about global warming?’

2.2.8.2 Climate Change as a ‘threat multiplier’

Climate change is seen as a ‘threat multiplier’ by security organisations, analysts and academics. In 2003 the pentagon commissioned a scenario analyst to consider the implication of climate change on international security, it was from this consideration that climate change was labelled ‘mother of all security problems’, since then the international community have since paid increasing attention to the security implications of climate change (Brown, Hammill, & McLeman, 2007).

The potential scope of the consequences of climate change raises concern about its security implications. Indeed, this has a link to the published TAR, even though a peripheral issue in the IPCC reports the issue has accelerated. Apart from been a political issue on global agenda climate change was debated upon on 17 April 2007 in the Security Council and was established as a security issue. Despite the concern over security implications in public debates, statements about security implications remain speculative with questionable sources. Nordås & Gleditsch (2007) argue that the IPCC for one has little empirical backing on the implications of climate change for conflict, they also rely on second or third hand information (Nordås & Gleditsch, 2007).

Given the securitised context of climate change, it might be expected that the harmful impact of climate change in the northeast region would fuel up or even intensify and multiply the enmity that sustains the on-gong conflict between pastoralist and farmers. Climate change is thus presented as a ‘threat multiplier’ for the north-central in relation to climate change predictions of drought, desertification and low water supply. Many actors have now constructed climate change as a potential threat to the population. Other drivers of conflict are also compounded, although many states have acknowledged that global warming is a serious threat to the population. The issue of climate change is not treated as a challenge for environmental policy making; rather it’s seen as a justification for security related responses.

David king a renowned scientist suggests that climate change is by far a greater threat to the world’s stability than even terrorism. Eleven retired US generals and admirals added some military authority to the issue of climate change arguing that climate change has the capacity of acting as a threat multiplier for instability in volatile regions, and to existing concerns such as water and food security, this poses as a national security challenge (CAN, 2007).

African leaders also have this to say about climate change; Yoweri Museveni, the president of Uganda spoke at the African Union Summit in 2002 saying climate change is an 'act of aggression' by developed nations against developing nations, demanding for compensation for damage that would be caused by global warming from GHG emission by developed nations (Brown, Hammill, & McLeman, 2007).

Climate change at the UNSC was highly lobbied by the UK from its platform as rotating president of the council. Most European nations welcomed the idea of a climate change debate, though it encountered stiff resistance from other countries like South Africa, Egypt and China. Their argument was based on inappropriateness of the choice of venue for such a systematic debate on a technical issue such as Green House Gas GHG. The Chinese representative argued that the Security Council lacks professional competence in handling climate change. In the end over 50 countries participated in the debate and it was agreed upon that UNSC was an appropriate forum, albeit not the only forum to discuss such an issue (Brown, Hammill, & McLeman, 2007).

Looking at the conceptual framework climate change as a threat multiplier has various consequences resulting from it. These social consequences are inter-related and one outcome can lead to the occurrence of another or outcomes may be linked in one way or the other simultaneously or at different situations. I argue that though the multiplier effect is possible it should be considered that environmental conditions in a country may differ as do the internal conflict the occurrence of a flood in one part of the country may not necessarily be the cause of conflict in another part of the country.

2.2.8.3 Vulnerability

The level of vulnerability of an affected area determines the extent to which climate change is constituted as a threat. Vulnerability, defined by IPCC is 'the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change (IPCC, 2007). Climate change impacts shown in the first pathway; prolonged drought, floods, sea level rise, increasing rainfall variability, and temperature rise compound the existing vulnerabilities in the third pathway, leading water and food insecurity and health issues.

Security analyst and academics warn that climate change threatens water and food security, and population in disaster prone areas. According to the Fourth Assessment Report adapted from Brown, Hammill, & McLeman (2007) these threats can lead to forced migration, raise tensions, and trigger conflicts and vector borne diseases. Devereux & Edwards (2004) argue

that production self-sufficiency is not a prerequisite to food security at the household and national level. Most individuals and countries buy or import their foods; they are right in their assertion. But if households and countries who depend on agriculture and have fewest alternatives and sources of income stand to lose food due to climate change, certainly the fall in harvest will undermine national and household security.

Also changes in climate can lead to changes in resource availability and in turn result to competition of resources and local level conflict, migration and political destabilization. Adger & Kelly (1999) are of the opinion that "the vulnerability or security of any group is determined by the availability of resources and, crucially, by the entitlement of individuals and groups to call on these resources". When the availability of resources is threatened it puts the social and economic well-being of society at the centre of the analysis.

2.2.8.4 Responses/outcomes

The impact of these variables could lead to possible responses and outcomes. The conceptual framework shows not only violent conflict as a possible outcome but competition for resources, migration and political destabilization.

Changes in natural resource availability from the conceptual framework could involve the scarcity of natural resources. Scarcity of resources is a consequence of climate change and can occur in two ways. First, is a decrease of supply or decrease in resource base, and second is an increase in population which can lead to an increase in demand or consumption. This will in turn trigger competition for resources. The IPCC predicts the non-beneficial impact of climate change to the globe, according to IPCC changes in increased temperature, precipitation patterns; rising sea levels and reduction in annual rain fall can lead to scarcity of resources and competition of scarce resources (IPPC, 2007)

In the conceptual framework migration as an outcome of the threat of climate change is a social effect. According to Reuveny (2007) migration is in different types, it can be gradual or rapid, and migration can be temporary or permanent, it all depends on threat situation. For example, sudden or seasonal alterations can most likely cause temporary displacement. Migrants also can be divided into those who travel far and attempt to settle in safe havens and those who move on as far as necessary to avoid the sudden threat. Climate change related migration is argued by Reuveny (2007) to result to violent conflict in receiving areas, according to Reuveny there are three possible complementary processes through which this can occur. First, the arrival of a different ethnic group than the local population may give rise

to ethnic tension. Second, a burst of mistrust between the migrants and local population may arise. Third, the arrival of migrants can lead to competition over scarce resources. Reuveny further argues that people can predict the effect of climate change on migration by exploring environmental problems on migration. His suggestion unlike that of McLeman & Smith (2006) suggesting migration as the only adaptive mean is that; people can adapt to these problems remaining in place and doing nothing, staying in place and mitigating the problem or as McLeman & Smith put it leave affected area.

Political instability in the conceptual frame work is an outcome and is argued by Hegre & Sambanis (2006) through substantial empirical evidence in the connection between political instability and violent conflict. This argument was proved using a quantitative method for analysis, to show statistically the link between the two variables as consequences of climate change.

Blench (2004) looks at two types of conflicts to be of particular concern in the development of Africa as a whole; socio-political conflict and natural resource conflict. West Africa in general and in particular Nigeria has experienced a considerable increase in natural resource conflicts in the twentieth century. According to Blench there are various political parties to natural resource conflict; farmers, pastoralist, fishermen and hunters. Blench argues that conflicts between farmers and pastoralist groups have received the most attention, they are both food producers and compete for similar resources, wetland areas and arable land as they contain some of the potentially and most productive areas for food. To Hendrix and Glaser (2007) they base their study on state-based internal armed conflicts at national level. Unlike Reuveny (2007) who refers to one-side violence (Genocide) non-state (violence between groups but not state). Raleigh and Urdal (2007) on the other hand focus on climate related violence over scarcity of resources in conflict zones supporting the view of Homer-Dixon. With most internal conflicts affecting a limited part of the country; amongst recent cases of climate related violence is the case of Darfur.

Scarcity conflicts analysed by Theisen and Brandsegs (2007) argue that such conflict is affected by resource scarcity, paving a way for future study on conflict implications of climate change. Meier et al (2007) supports Theisen and Brandsegs in non-state conflicts, that clearly these conflicts are not monitored. Nordas & Gleditsch suggest a more extended network of conflict monitoring at the state and local level as that would be extremely helpful toward empirical studies of climate related conflict (Nordas and Gleditsch, 2007).

2.2.9 Context of Nigeria

2.2.9.1 Geographical location

Nigeria is a large country with great diversity (Blench, 2004). In relation to climate changes observed by IPPC (2007) a general over view of the climate change impacts in Nigeria over a 105 years' period by Odjugo (2010) show a 1.1 Degree Celsius rise in temperature, a decrease in rainfall by 81mm, drying up of surface waters, desert encroachment and shift in cultivated crops. According to Federal surveys (1978) and Barbour et al. (1982) Nigeria is a country with marked climatic contrast and ecological diversity and occupies 923,768 km². Soils are of the ferruginous tropical type along the Niger and Benue. Other major topographical features are the highlands of the Mambila and Jos plateau, though they occupy a small area, are of considerable significance to the livestock population. Seasonal movements of the Inter-Tropical Convergence Zone determine to a large extent Nigeria's climate, leading to contrasting wet and dry seasons. The north receives substantially less rainfall and a short wet season: the annual wet season is just about two months a year, mean annual rainfall is less than 500 mm in north eastern Nigeria. Whereas in the south east rainfall exceed 4000 mm annually. Due to proximity of the Atlantic in the south, rainfall variations are less significant compared to the north, which suffers periodic droughts increasing the arid nature of the Sahel (Blench, 2004).

The study shows that there are a number of effects emanating from climate change, some of the effects of climate change relevant to the issues examined in this study are that climate change is most likely to cause forced displacement and conflict over landed resources; Onset disasters such as storms, floods and droughts causing severe water shortages; to economic and social impact in North-eastern Nigeria and other parts of Nigeria where people end up as Internally Displaced Persons. What has been the impact of climate change over the years? What are the significant changes that have occurred and have gradually triggered internally induced migration and intrastate violent conflict?

Shifts in climate change in the northern region of Nigeria is characterized by a drop in rainfall, increased heat and dryness, making the environment grow arid, with depleted quantity of water, fauna and flora resources. This causes a migration of the Fulani herders to wander from the northeast region of Nigeria to other parts of the country where water, flora and fauna resource are available for pastoral and arable farming needs of the people (Roma, 2008). The North east zone of Nigeria is situated within 9 ° -14 ° N and 8 ° – 15 ° E and sits on one fourth land mass of Nigeria. Its political zones comprise of six states, Yobe,

Adamawa, Gombe, Taraba, Bauchi and Borno. Most of the state share international boundaries with Cameroun and Chad Republics. Due to acute dryness of soil, luxuriant growth of grass and flora is not supported. However, there is luxuriant growth of trees by highlands, mountains and riverbeds that support arable and animal husbandry. There are over 200 ethnic groups in the region the most popular been the Tiv, Bachama, Fulani, Jukun and Kutep (TEE.REX, 2003). Whereas, the north central states in Nigeria include Niger, Kwara, Kogi, Plateau, Nassarawa, Abuja Federal Capital Territory and Benue. These states are situated geographically in the middle belt region of the country and are rich in natural land features.

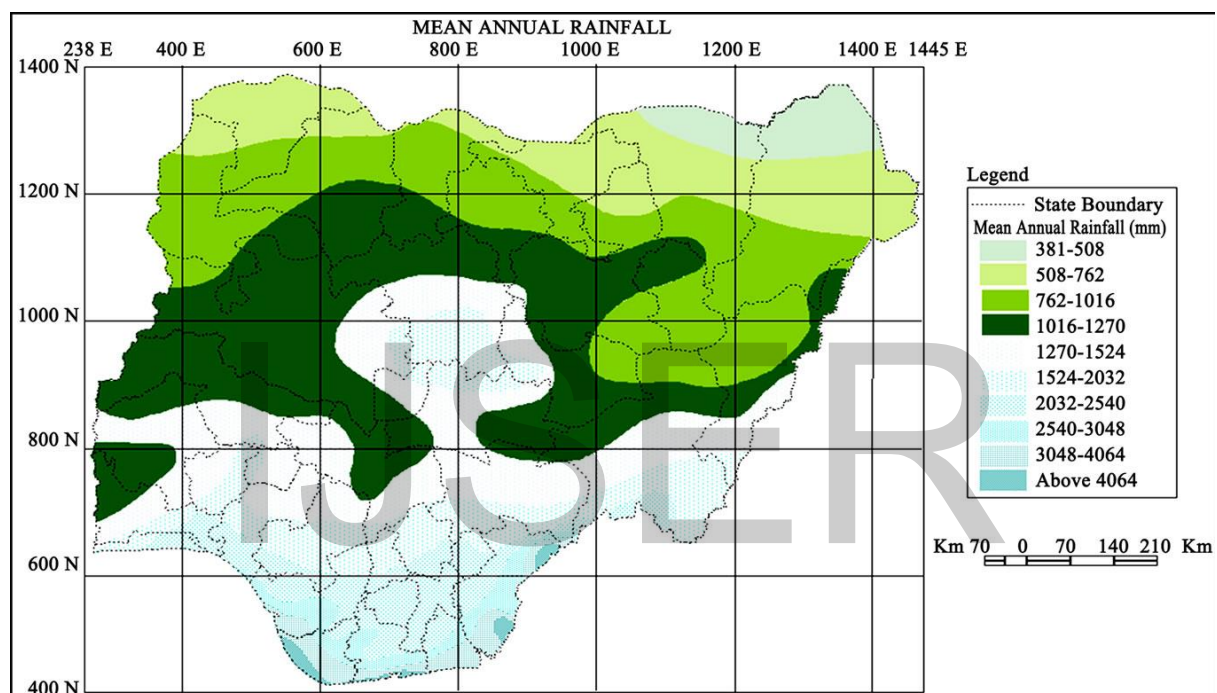
Climate change effects can be observed moving towards the northern border of Nigeria. According to Okpi (2010) about 200 villages in Yobe state have been incorporated within the Sahara Desert. Olori (2002) also contributed to desert encroachment in northeast of Nigeria, in Yobe and Gombe States alone losing over 60,000 ha of farm lands to desertification, and removing grazing lands from herdsmen yearly. The 50 to 75% land mass in northern Nigeria alone accounts for about 43% of Nigeria's landmass, which is affected by desertification and which is particularly vulnerable to soil degradation. Increasing desertification has implications on migration patterns between the north and the south. The movement of people southwards has resulted in violent conflicts

Despite climate change implications, water for sanitation, agricultural purposes, drinking and other activities is needed. A lack of water will undermine the very base of all aspects of development in many parts, especially those exposed to climatic. As climate change affects the north-eastern region of Nigeria pastoralist according to Blench move closer to the south in search of arable lands, thus sowing the seed of conflict. These long-distance migrants are well armed and are willing to use violence to assure their grazing (Blench, 2004). The risk of conflict in these areas is high if existing political institutions fail to address conflicting interest over access to scarce resources.

Map 1 show the decrease of rainfall with increasing distance from the coastal areas to the north semi-arid areas, Adefolula (1986) and Olarinan (1990) argue that with increasing distance from the coastal area, less rainfall is bound to be experienced. But from another examination of rainfall patterns and its variability in north eastern Nigeria Majid and Ishaku (2010) conducted a study on rainfall pattern and variability and argue that mean annual rainfall is not dependent on distance but other climatic factors such as temperature, solar

radiation, winds and soil nature can determine mean annual rainfall. Arguing that Taraba and Borno states located in the southern most end of their study receives a higher amount of rainfall than Gombe which is located between the two. They base their argument on data collected from Nigeria Meteorological Agency Nigeria (NIMET) in Abuja. Does this explain that climatic changes affect the amount of annual mean rainfall in an area not necessarily depending on its proximity to the coast?

Figure 3. Map of Nigeria showing mean annual rainfall patterns



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2.2.9.2 Climate change and conflict in Nigeria

Fasona and Omojola (2005) have captured climate change induced conflict in Nigeria in the last few years. In their study, various conflicts over land cut across struggle for dominance and control of land resources amongst communities. The Guinea Savannah farmer close to cultivation will naturally resist any slight invasion of his farm land by nomads' herdsmen who are in constant search of greener pastures. Fasona and Omojola identified different conflict types that could arise at intra-ethnic, inter-ethnic or personal level, actors in the conflict can vary from original owners being the indigenes and settlers, conflict can also be between people with same resident status or those sharing contradicting rights. The major stake or issue to contend with is fresh grazing land or arable land for herdsmen to take their

cattle for grazing. The objective on the other hand could be for distributive justice as some communities feel cheated over the expanse of land due to them; this is related to towards political emancipation and control of the community or area. Another objective for communities could be to reinforce their identity to be able to capture the economic base of the community which is land.

Climate change induced conflicts have been inevitable and it is necessary to address these problems to ensure sustainable development for the affected areas in question and other future generations. Based on the problem of conflict arising due to induced climate change, it is therefore important to understand the relationship between climate and conflict in northeast and north-central region of Nigeria.

2.2.9.3 Source of Conflict between Pastoralist and farmers in Northern Nigeria

The Fulani Pastoralists' militancy for the survival of their herd of cattle makes violent conflict with farmers inevitable. Though a well acceptable traditional practice, the close integration between raising livestock and enhanced farming have posed a serious threat on the relationship between pastoralist and farmers in Northern Nigeria. Northern Nigeria is a plural society and has the potential for economic conflict; the largest migrant pastoralist in Nigeria is the Fulbe or Fulani, who have integrated amongst the Hausa farmers from the Senegambia valley centuries ago. According to Blench (1994); Tolnab (2001) and Fabusoro (2006) a combination of factors can increase the potential for conflict in northern Nigeria.

Rise in temperature and variability in rainfall, as well as drought is experienced by two thirds of Bauchi, Borno, Gombe, Jigawa, Knao, Kaduna, Kastina, Kebbi, Sokoto, Yobe and Zamfara states. These experiences have implications for climate conflict via land scarcity and water shortage and scarcity. From government geological data the Sahel creeps southwards by 1,400 square miles every year, the predominant Fulani herdsmen of the lower Sahel and Sudan savannah ecologies is now moving south to northern states (Kwara, Abuja, Benue, Kogi, Nasarawa and Plateau) for greener pasture outside their normal grazing routes. At the same time due to weather –related factors farmers also explore new lands for cultivation, leaving wanderers fewer places to water and graze their flocks. The climatic migration is not acceptable by root and tuber farmers of the Guinea Savannah and forest belt of the South, for fear that Fulani herds will destroy their farmlands, and the natural result is clash over right to lands.

Below are photos showing how pastoralists invade farm lands to the detriment of farmers.

Figure 4. Fulani herder and cattle invading on farmlands



Source: Naija247 news, 2016.

From study the major sources of conflict between the Fulani pastoralist and farmers can be traced to land related issues, especially over grazing fields which accounts for the highest percentage of conflict. Both users struggle over the control of economically viable land and this causes tension and violent conflict. Conflicts between farmers and pastoralist have increased or decreased overtime depending on economic, environmental and other factors. For example, increase in herd size, due to improved health conditions of the cattle, forced pastoralist to seek for more grazing lands beyond their limited area. Climate change has also constituted a threat by putting pressure on the land and causing changes in the availability of scarce resources. However, improvements in human health and population have enhanced a much greater pressure on the land (Blench, 2004; Abbas, 2012).

2.2.9.4 Theoretical and empirical examination of climate change and conflict between Fulani herdsmen and farmers in Northern Nigeria

According to Odoh and Chilaka there are causes to every conflict; people do not automatically start to fight just because weather changes and rise in temperature has occurred. They believe that drawing lines of causation between climate changes requires caution and

attention into research. For instance, in Nigeria, a basic causal mechanism links climate change with violence, growing shifts in climatic challenges, left unaddressed can stress resources such as water and land to shorter supply and have secondary effects such as poor economic growth, hunger, livelihood, sickness and open the door to violent conflict (Odoh & Chilaka, 2012).

A theoretical and empirical examination of the worsening incident of violent conflict between Fulani herdsmen and farmers in Nigeria was conducted by (Odoh & Chilaka, 2012; Udu, 2013; Audu, 2013) using a purposeful sampling technique. In support of Homer-Dixon's theory, Audu argues that local scarcity of resources can lead to conflict between farmers and pastoralist, Audu also believes that scarcity of resources has increased the prevalent rate of violent conflict in certain parts of Nigeria. Farmers and pastoralist are amongst those whose source of livelihood is threatened, therefore competition for access to scarce resources often pitch both groups against each other. Odoh and Chilaka also base their argument in support of Audu, saying that the immediate cause of conflict between Fulani herdsmen and farmers is scarce resources, while the remote cause is climate change, which through desertification and drought has led to the scarcity of natural resources, intensifying the conflict between the two groups. I relate with this argument because, it looks at a single linkage between climate change and conflict, which is scarce resources and it focuses on agricultural natural resources, a sector that is influenced by climate change. This argument is in line with Meierding's argument that advocates for a higher coupling between theory and analyses to be able to provide more compelling evidence that a relationship between climate change and conflict does not exist or be able to demonstrate clearly the connection between climate change and conflict.

Though the cause and origin of civil conflict are largely unknown at least at the national level, Blench argues that conflict between farmers and pastoralist is associated to two major causes; (1) increase in human population due to improved human health (2) and increase in herd size due to cheap trypanocide and veterinary drugs. The former has driven a much greater use of wet lands by farmers for food production and the later has driven a much greater use of arable lands for greener pastures. Herders are compelled to seek pasture, away from their traditional ecological range and increased population puts pressure on arable lands and direct access to wetland areas which can result to violent conflict between users (Blench, 2004).

2.2.9.5 Empirical review of the socio-economic effects of conflict amongst Fulani herdsmen and farmers

As earlier stated in the problem statement, the conflict between Fulani herdsmen and farmers in north –central Nigeria is taking a great toll on the economic and social development of the people and their community. Apart from researching on the root cause of the problem it is also necessary to analyse the effect of the problem. Ijirshar et, al. (2015) agrees with Tonah (2006) that conflicts between farmers and herdsmen have become a common feature of economic livelihood in West Africa. It is no doubt that the present clashes between herdsmen and farmers in predominantly farming areas of the central region has resulted in the destruction of farmlands, loss of lives and has become a major threat to food production. The loss of lives has gradually affected farming activities and other related business activities and socio economic activities. Farmers are afraid to go to their farms to farm, most of the farms have been abandoned for fear of been attacked by Fulani herders. The farm output has decreased drastically, farmers that could export to other state can no longer do that, this has a ripple effect on the country as a whole causing hike in food prices. The gains recorded by agricultural sector in the area of food production have reduced.

Musa & Shehu (2014) assessed that the conflict between Fulani herdsmen and farmers is caused by destruction of crops and farmlands, the role of traditional rulers, contamination of water and harassment of herdsmen. The assessment found that loss of lives and property, displacement of both farmers and herdsmen and a decrease in output emerged as effects of this conflict. The study argues that government provision of grazing lands and the introduction of modern methods against traditional husbandry will help tackle the issue.

Alawode (2013) with a different view argues that the frequency and levels of conflict between herders and farmers is attributed to the emergence of democratic governance that encourages farmers to freely express their grievances over the intrusion of grazers. To Adisa (2013) the conflict between herders and farmers is inevitable his major concern then is the perception of conflict and coping strategies amongst farmers and herders, suggesting a role in the periodic extension and management of conflict between farmers and herders via a farmer-herders' association. Akpaeti & Umoh (2013) after an examination of conflict between the two groups shares the view of Musa & Shehu over the effects of conflict, how conflict is a determinant of farm output, the negative impact on farm output influences agricultural output in any conflict affected community.

To a great extent I share the views of Musa & Shehu on the causes of conflict, but the question that needs to be addressed is how came about the invasion on farmlands by herders, it is important to know why herders are matching through and grazing on farmlands. If the issue is just about grazing lands, then it is right to say the government should make provision for grazing lands. But will provision of grazing lands actually stop herders from moving further on farmlands, will herders be content to embark on the modern methods suggested by Musa & Shehu. This is where I agree with Adisa over the setup of a farmers-herders' association to manage the conflict between the two groups. Am not of the opinion that democratic governance encourages conflict, it is possible that people can use herders-farmers conflict for their personal agenda, but not the democratic institution as suggested by Alawode.

Below are photos depicting the displacement of farmers, the destruction of property and possibly lives and the clashes that in some cases were so severe that military interventions were necessary.

Figure 5. Persons displaced from Agatu Local Government in Benue State, Nigeria



(Source: Vanguard 2016).

Figure 6. Loss of lives and property in Okada, Nigeria



(Source: Google images, 2014).

Figure 7. Showing clashes with military personnel on ground in Nasarawa state, Nigeria.



(Source: Channels, 2014).

2.2.9.6 Conclusion

This chapter considered the issues surrounding the research problem from the theoretical perspective of other findings, looking at the different methodologies and strategies used to proffer solutions. Very key to this chapter is the conceptual framework that shows the causal mechanism of climate change and conflict. Further in this chapter the contextual analysis of the target area in the north central region of Nigeria was considered to show conflict in the area. Also the purposeful method of research used by other researchers was analysed.

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CHAPTER THREE: METHODOLOGY

3.0 Introduction

Methodology to Wisker (2001) is a philosophical approach governing research practices. The effects of this methodology will determine method used for research design validity, data collection and analysis. The methodology of this study is under pinned by theories informed by the works of various literatures, based on the stand point that climate change is considered to have a link to conflict. This research design is based on how the study is structured and the researcher's epistemological views of this study.

The chapter explains the choice of methods that were used to collect data, present findings, analysis and interpretation of findings, how the research was designed, conducted and the various strategies used in obtaining the findings are also discussed. The choice of research methods used according to Wisker (2001) depends upon the methodology and the research questions the researcher is asking. For Wisker It is both robust and helpful to combine across the qualitative and quantitative research method, this is built in stages beginning with a quantitative approach then developing into a qualitative approach.

Following the conclusions made by Homer- Dixon (1995) and Meierding (2013), a quantitative methodology will not be entirely suitable due to limitations in data availability; rather both quantitative and qualitative methods are used for analyses of this study. The researcher supports the new methodological innovation- the geographically disaggregated research design recommended by Jensen (2009). Other authors like Wisker see the disaggregated strategy of collecting data as not appropriate for analysing all causal patterns or variables for environmental change and conflict; it rather reduces the scale of analyses and offers a more accurate assessment of causal mechanism. In the case of this study, the data collection will emphasize local resource scarcity between herdsman and farmers that affects their livelihood. Hendrix & Sahehyan share the same view with Jensen, that geographical disaggregated research design gives analyst the opportunity to carry out quantitative test that are a close match with theorized climate change-conflict linkages (Hendrix & Sahehyan, 2012).

This research may not be able to gain final answers but with the data collected it will be interpreted based on the choice of a case study. The findings are relative and will contribute to knowledge, addressing the identified gaps. The study uses two approaches; a theoretical

exploration and empirical research design, it argues and expands on the different ideological constructions and theoretical perspectives underlying the perception of this study

3.1 Research Design

The design of the research based on the views of Burns and Groves is the entire process involved in a series of decisions conducted by the researcher for achieving a credible end result. The study adopted a survey research design, which provides a general framework for the collection of appropriate data that explores the relationship between climate change and conflict, how climate change engenders conflict between farmers and pastoralist. Gray, 2004; Kaplan and Duchon 1998 call for a combination of research methods that would have great impact on the quality of research work. Wisker (2001) argues that “some research projects are built in stages...they begin deductively, then develop inductively...” as a social scientist one should probably believe that facts are proved through trial and error, measurement, experimentation and that a repetition of studies ensures reliability.

The use of or reliance on many different methods or sources of data can be described as triangulation (Bryman 2004). Many authors have argued over the need to use multiple sources for data collection. It is important because the use of multiple methods help to balance out potential weaknesses inherent in each method of data collection. Where numbers are inherent the quantitative method is used, in the case of drawing maximum information to gain in-depth insight of the issue the qualitative method is inevitable (Easterby-Smith et al, 2002). The study uses an eclectic approach of both qualitative and quantitative means of data gathering and information on knowledge about the cause of conflict and perception of climate change. It is not sufficient to base investigation solely on qualitative reasoning but to also consider quantitative analyses. This research will use both approaches separately, looking at the possibility of both tools complementing each other in the course of the investigation. Statistics produced from the quantitative method alone may not provide all the results or findings needed for the final outcome. Quantitatively this research will use interviewer – administered questionnaire for data elicitation. The researcher in this case is inductive and seeks fuller, more varied responses from respondents.

Climate change and conflict relationship in terms of who is affected is based on numbers; therefore, eliminating the quantitative method in this research will lessen the quality of work and take away its core essential.

A multistage sampling technique is used for selecting participants for administering questionnaires. All together the selection process is in four stages, the first 3 stages involve a purposeful sampling strategy, whilst the fourth stage is a random sample selection of participants for the questionnaires. The first stage targeted a purposeful selection of three conflict affected states. The second stage involved a purposeful selection of two Local Government Areas from each state. The third stage involved a selection of affected communities from the affected LGA for sampling. The final stage was a random sample selection of 25 people from each community for administering the valid questionnaire. In total the researcher targeted 150 participants as respondents.

To follow up the questionnaire an in-depth interview is conducted. The outcomes sought for this research are better served accessing the sample directly for in-depth comments. Apart from the detailed information, the researcher set out to collect fascinating contextual and interesting new insights. To avoid time and money consumption not too many interviews are conducted. This approach will provide rich information based on insider experience and privilege insights. In as much as clear responses from a structured interview make analysis simpler, the researcher will avoid been guided and limited and rather structure the interview in a semi-structured, open-ended manner. Qualitatively a one to one in-depth interview will be carried out, this will give in-depth discovery of the people's attitude, perception, and view of the problem and this will give the researcher room and an opportunity to observe respondents during interviews.

A research assistant is recruited for data collection purposes (administering the questionnaires and carrying out interviews). The entry point is through the community leaders as they play a major leadership role in the community, they will serve as contact persons for ease of data collection. The researcher's choice of a purposive sampling technique targeting traditional village heads, farmer, herders and local government officials is based on their position, knowledge and role of the subject matter.

3.1.1The pilot process

To attain perfection with the questionnaires' the researcher will take advice, to pilot the questionnaire with a sample selection. This is to ensure that factors that could interfere with the smooth administration of questionnaires and the validity of research are eliminated. This also is used to avoid changing responses over time and have just one attempt with genuine responses (Wisker, 2001). The questionnaires will be used to produce broader information

from respondents about their perception of the relationship between climate change and conflict. A pilot test was carried out and the questionnaire was assessed by the researcher's assistant among the Gbagi community in Karimu, Federal Capital Territory (FCT) Nigeria. Ambiguous items on the questionnaire were removed and the wordings restructured for more clarity and reliability of the questionnaire. This process ascertained the internal consistency for reliability.

The pilot process gave the researcher the confidence and credibility for full scale implementation. The process has determined some adjustments to the implementation plans. The pilot used a similar demographic group to the actual target population, the process revealed unforeseen challenges especially in how the questions were worded. It also helped in gauging the target population reaction to the process, the feedback and necessary alterations on the questionnaire has given the researcher an opportunity to make better decisions about how to allocate time and resources for a successful study.

Overall the questionnaire was complex in wordings and flow arrangement according to respondents during the focus group discussion, that brought together some of the participants from the pilot test. Some participants suggested alternative questions and answers wordings which have been applied to the questionnaire. More simplistic word is now applied for a better understanding by respondents. Some questions were too long and were shortened as well as deleted as the need arise, especially the questions that appeared to be repetitive with no rationale.

The questionnaire has not only been tested but the field worker too has been tested from this process for data collection. From the debrief meeting over the phone am confident that the data collector has the capacity to collect data for analyses.

3.2 Source of data

The researches choice of a primary data collection is because the data information collected relates directly to the study. The two challenges encountered with this approach is the cost of collecting data and the time constraint involved. Primary data was used to generate data; this provided vast information to address the objective of the research. Sources of primary data included farmers, pastoralist, local government officials, community leaders, representatives of farmers and herders' association and non-governmental. These sources provided information on the reality of the conflict between pastoralist and farmers. Secondary data was collected from past research works, publications like journals and books for reference.

3.3 Study area and Population of Study

Abbass (2011) had earlier on described the study area as vast, arid and less densely populated compared to the southern part of Nigeria. Out of the 36 states 18 states make up northern Nigeria. Very peculiar to this region is the plurality of cultures, according to Abbass this creates potential areas of conflict; every group struggles to project its interest in the allocation, access, management and control of resources. The north has a prolonged dry season and 3-5 month of rainfall. Agriculture which is the major source of the northern economy is majorly rain-fed, not until recently with the introduction of the fadama irrigation schemes. Still it does not address the issue of less rainfall in the region.

3.4 Sample and Sampling Procedure

Ideally, a whole population should be studied to give more confidence in the findings than the findings from a study of the fraction. To generalise findings to the wider population and to say that findings are valid and applicable to more people is the objective of every researcher. However, it is expensive, time consuming, tedious and impracticable to study an entire population. Due to this limitation a fraction of the population is selected and the proportion of the population sample represents the entire population in order to make inferences possible (Olurode and Soyombo, 2001).

For data collection, the north-central geo-political zone of Nigeria was purposively selected. Within this zone three affected states namely Benue, Nassarawa and Plateau were also purposively selected. The north-central zone happens to fall victim to several of the pastoralist and farmers conflict. The north-central zone is a major transhumance route for nomadic Fulani herders and their cattle for convergence during the dry season and this has led to clashes between the two groups. Two local government's areas, from each state were purposively selected for the study. This is as a result of the prevalence of conflicts and rate of casualties in their localities. They include; Guma and Gwer East LGA of Benue state, Nasarawa-Eggon and Doma LGA of Nasarawa state, Riyom and Barkin Ladi LGA of Plateau state.

Purposive sampling is a valuable sampling technique that many researchers employ in the course of their study. Odoh and Chilaka observe that the use of a purposive sampling technique gives the researcher the opportunity to use research participants with specific qualities relevant to the study. Also Purposive sampling guides the researcher on the selection of samples for the study (Koerber and McMichael, 2008). For these reasons the research

focuses on six affected LGA in three affected states. The sample population from the three selected states consisted of 36 pastoralists, 90 farmers, and 24 members of the public.

3.5 Research Instrument

The Two instruments developed for data collection included; a semi-structured 21 item questionnaire for farmers, pastoralist and members of the public. The questionnaire was titled “ Questionnaire on climate change and conflict patterns among Pastoralist –Farmers in north-central Nigeria.” A section of the questionnaire has a rating point ranging from Strongly Agree, Agree, Disagree and Strongly Disagree, the remaining section is semi-structured and allows a two-way communication process. The questionnaire was complemented by a semi-structured interview schedule with open ended questions for community leaders and local government officials on the causes of violent conflict between pastoralist and farmers, how the conflict affects the economy of the north-central, and policies that can address the conflict between farmers and pastoralist.

The instruments used in this study were considered very important tools for conceptualising variables. The theories provided the basis for understanding the dynamics of the theme of study. Data collection is through the administration of questionnaires and interviews. One hundred and fifty copies of the questionnaire are administered to herders, farmers and the public, this process was complimented by an interview of community leaders and local government authorities. These key informants provided information and their opinion on why there is existing conflict between the farmers and the herders; talking about the causes and the factors responsible for the problem and the possible solutions to such a problem. Out of the one hundred and fifty (150) questionnaires administered one hundred and thirty-five were retrieved for analysis.

The researcher had the following in mind while developing the questions; does the number support who is affected and the question about their perception of climate? Looking at the responses what are the numbers suggesting about the relationship between climate change and conflict? Do the numbers suggest that respondents have knowledge of the relationship climate change has with the conflict between Fulani herders and farmers? In this case the questionnaires will not be used for data analysis but for in-depth discovery of perceptions about climate change and knowledge about the on-going conflict in the affected area, the factors responsible for conflict from the attitudes, behaviours, activities, responses, events and facts. The quantitative approach will focus on this. The qualitative approach however

will be used in analysing the possibility of other factors been responsible for conflict in the area of study

3.6 Ethics and confidentiality

We are in the twenty-first century and it is expected ethically that researchers undertaking research on human subjects to seek formal ethical approval for the research (Oliver, 2003). The aim of this is to ensure that the human rights and confidential nature of the participant's involvement is not revealed, ethics was taking into account. Also on the other hand it is also ethical to have the consent of the participant (Horn, 1996). In the end it is expected that the research is conducted in an ethical manner, no harm is caused and confidentiality of participants is maintained. Attached to the questionnaire is an ethics form to ensure that all subjects are aware of their rights and what it means to give their consent.

For accessibility into the community a letter explaining the research aims and process, and the final use of the findings was delivered to all community leaders. A copy of the consent form for participants to sign that they give consent for data to be gathered and used was also presented to the community leader. Full assurance on data collected to be kept confidential was given; data will not be released after research and will not be used without approval from participants.

3.7 Limitations

Time and resources were a major limitation in this study. With enough time and resources the researcher would have selected a wider sample population and perhaps with more resources the researcher would have employed more than one data collector for data collection. This would have saved time and enabled the researcher to cover a wider population sample size for validity sake.

3.8 Conclusion

This chapter looked at the different methodologies and strategies necessary for carrying out the research. The objective of this chapter is to provide reasons as to the choice of methodology and why this particular method was chosen. The researcher methodology was outlined in detail, explaining the research design process of data collection, area of study and the limitations.

CHAPTER FOUR: ANALYSIS

4.0 Introduction

As emphasised by Wisker (2001) findings for this research were derived from analysed data collected via questionnaires and transcribed interviews. This chapter will relate my research findings to my original research question, objectives and review from various literatures. According to Bell (2005) as one starts to analyse data and start to produce findings that could be shared with others, it is important to apply the different parts of the findings and conclusion. This chapter will also seek to analyse the data obtained and give meaning to it, and this, Bell says can be done in various forms depending on how the researcher wants to present it and on what the research findings suggest. Any conclusion which can justifiably be drawn from findings should be made (Bell, 2005).

The study employed two methodologies: the quantitative methodology using questionnaires as the instrument for data collection among a cross section of 150 participants and qualitative methodology via in-depth interviews and observations among 12 interviewees in three states. As both quantitative and qualitative a study, data collected were subjected to content analysis, whereas the themes and information were discussed and analysed using simple percentages and tables. The research adopted a mixed methodology with data analysis presented in both contextual and numeric formats. To understand this study, the data analysis will help to evaluate the various pieces of information gathered, descriptive statistics, tables and percentages are used to analyse the data.

4.1 Results of findings and discussions

The research sample comprised of 150 participants of whom all 150 responses were retrieved: (123) 82% males and (25) 16% females, were drawn from a survey of 6 Local Government Areas in three selected north-central states; Plateau, Benue and Nasarawa. The age bracket shows that the majority of respondents fall within the age bracket of 25-34 years (56%) and also within 35-44 years (24%). Educational qualification in the states show that a majority of the sample population had more of Tertiary education (42%) and Secondary education (38%). 35% of the respondents were farmers, 17% per cent were pastoralist, 28% per cent were civil servants and 20% per cent were traders.

Table 1. Showing the socio- Demographic characteristics of participants

Gender	Frequency	Percentage
Female	25	16%
Male	123	82%
Age		
25-34	85	56%
35-44	36	24%
45-54	15	10%
55-64	9	6%
65-74	5	3%
Educational Qualification		
Tertiary	51	62%
Secondary	48	57%
Primary	41	27%
None	10	15%
Occupation		
Farmer (FM)	52	35%
Pastoralist (PST)	25	17%
Civil servant (CS)	42	28%
Trader (TD)	30	20%

Field survey 2016

4.1.1 To observe the perception of respondents in north-central Nigeria, on climate change and its effects on communities.

Table 2. Participants' perception of climate change and its effect on communities

Description	Benue	Nasarawa	Plateau
Change in extreme weather pattern	52%	40%	48%
Less rain/water shortage	40%	50%	50%
Desertification	6%	10%	2%
Low yield of crops	40%	50%	50%
Communal conflicts from shortage of grazing land	5%	5%	35%
Health issues	8%	9%	10%
Increase in crime	4%	2%	3%

Field survey 2016

Table 2. Above shows the percentage distribution of respondents' perception and observation of climate change and its effects on communities. From the data shown above change in extreme weather pattern at (93%), low yield of crops at (93%), less rain and water shortage at (93%) were noted by majority of the respondents as a major problem from climate change. A majority did not note desertification as a problem from climate change. Communal conflicts from shortage of grazing land, health issues and increase in crime has the least effect on all three states except Plateau (35%) this is due to many years of conflict that has led to segregation and an increase of population, in various areas populated by people from similar or different groups and ethnicity. A farmer from Guma Local Government Area in Benue state and a trader from Nasarawa had this to say:

“More heat and less rain is creating drought conditions in northern parts of Nigeria. Many households have to harvest rain for water consumption, lands in the north lack water for vegetation, as such Fulani herders move down south to land that have green vegetation. Even towards the south there is acute water shortage in areas such as Guma” (FMmale/44 years/Guma/Benue).

“Nasarawa is so hot nowadays. It was not like this while growing up, hamatan these days is very harsh unlike before it used to be pleasant. Even the dry season is longer now”. TDFemale/40 years/Nasarawa.

There is no gain saying, the inhabitants of these states feel the brunt of changes in weather pattern and shortages of water. People are complaining about hunger and poverty and striving for other means of survival apart from agriculture. Categorically participants mentioned that the current trend of diminished agricultural produce has made a lot of households to encourage their wards to take to western education. Table 1 shows a high number of participants that have tertiary education. With a formal education they are looking at eligibility for government jobs and political ambitions. A farmer from Gwer Local government in Benue said:

‘‘It is better for our children to go to school and be educated, so that they can get jobs in government parastatals and ministries. Agriculture will not give them much to live on; things have changed compared to when our fathers depended on farming. We are now finding it difficult to depend solely on just farming, we combine it with trading’’. (FMmale/52 years/Gwer/Benue).

4.1.2 Relationship between climate change and conflict between Fulani herdsmen and farmers in north central Nigeria.

Table 3. Factors responsible for conflict between Fulani herdsmen and farmers

Description	Benue	Plateau	Nasarawa	percentage
Climate change	47	43	10	66%
The role of traditional rulers	40	45	2	58%
Destruction of crops/farmlands	3	3	40	30%
Contamination of water	1	45	40	57%
Harassment of herdsmen by host community	4	45	40	59%
Religion	40	2	8	33%
Ethnicity	40	45	40	83%
Insecurity	2	45	40	31%

Field survey 2016

Table 3 above shows the statistics, depicting the factors responsible for the increasing conflict between Fulani herders and farmers. In all three states conflict is attributed mostly to ethnicity at (83%) and climate change at (66%), except for Nasarawa state which does not greatly attribute conflict to climate change. Other factors such as harassment of herdsmen by host community, the role of traditional rulers and contamination of water are also seen as

factors responsible for conflict between the two groups. The (33%) that responded saying climate change is not responsible for the conflict between the two groups attributed the conflict to nomadic culture and criminality of the Fulanis and the natural tendency they possess to harass. Others attributed to over population saying:

“In the past, Fulanis had a mutual relationship with residents but since the population in cities have increased, perhaps the host community does not want to share the scarce resources” (FMmale/35 years/Plateau).

(Yahaya, 2000) notes that there is an increase in the cases of conflict among farmers and Fulani herdsmen in recent times. On the average he noted that cases of conflict relating to agricultural activities and destruction of crops by cattle have taken over any other type of conflict in recent times in the north central region of Nigeria.

“To avoid continuous conflicts some victims have moved from affected lands in search of other lands. Some people have nowhere to go and are harboured in Internally Displaced camps” (FMmale/42 years/Nasarawa).

A man from Nasarawa state spoke extensively about the misconception people have about the clash between the Fulani herdsmen and farmers. He said:

“People misinterpret the clash between Fulani herders and farmer to be ethnic and religious. These clashes are actually a struggle over the control or possession of land or other resources or both. Fulanis and their herds are intruding on farms and destroying yields, this is because they seek for greener pasture for their herds. This is not acceptable by farmers in Nasarawa or anywhere else, the fear farmers have is that herds will destroy farmlands and crop production. It is from these farm yields that when we sell we are able to put food on the table, pay school fees for our children to have access to an education and also clothe them” (FmMale/51 years/Doma/Nasarawa).

From observation a number of the participants were not so certain about what is causing the Fulanis to migrate from other parts of the country in the north to intrude on their farms. A (66%) of respondents who have a perception of climate change understand that climatic shifts in the north and middle belt region is transiting from Sudan Savannah to pure Sahel due to the influence from the Sahara is gradually increasing southwards. Automatically, the transition affects the Guinea Savannah which is giving way to the Sudan Savannah. This explains why the Fulanis in the lower Sahel and Sudan Savannah are moving south to northern states (Benue, Plateau, Nasarawa, Abuja, Kwara and Kogi). These states are close to the forest belt and guinea Savannah of the south for greener pastures for their herds. The natural result is clash over right to the lands, a pattern seen across the Sahel that experiences drought, feed and water shortages caused partly by desertification and drought which have sent nomadic pastoralists, most of them ethnic Fulanis, wandering south to some northern states close to the Guinea Savannah, outside their normal grazing routes. At the same time, a mix of weather-related factors has pushed farmers to cultivate more land each year, leaving wanderers fewer places to water and graze their stock.

4.1.3 Economic impact of climate change-conflict

Apart from the effects shown in table 2 (1) loss of lives (2) displacement of farmers (3) insecurity (4) decrease in food production (5) poverty and increase in criminal activities, were identified by respondents to be effects of climate change conflict. This has affected the availability of some staple foods and has caused a hike in the cost of staple food. Some of the respondents attributed the scarcity of some crops and the hike in food prices to climate change conflict.

‘‘It is only of recent that we started to hear about climate change through radio jingles. Government has also promised to help improve our crop yields, but up till now nothing tangible to show government efforts has taken place. But the worse of it all is this fight between the Fulanis and farmers. Our leaders have failed us, these are our farms and they should make the Fulanis to stop coming to fight us’’ (FM and TDFemale/42 years/Plateau).

The poverty level is gradually rising as many cannot afford three square meals talk less of nutritious food. Akoroda (2010) argues that the poverty level in the north cannot be compared to the poverty level of the south as the effect of climate change in the north is so alarming on

the vegetation. But as observed the effect of climate change in the north is gradually making waves down south. It is therefore very important to put in place measures that will tackle the effect. For those that understand the remote cause of the conflict between the farmers and Fulani herdsmen, they are asking and seeking for government intervention to tackle climate change.

There has been an increase in the number of households who cannot afford food. A survey of the 36 states in Nigeria show a food security issue, the number of Nigerians who cannot afford food from January to December 2005 was on the increase. A survey by FAO (2005) shows the fraction of Nigerians from this states that are unable to afford food. The table depicts the situation in the three states of study.

Table 4. Extract of the FAO Survey of food Affordability in Nigeria

States	Households	2005
Benue	300	27%
Nasarawa	300	43%
Plateau	300	34%

FAO, Survey 2005

“Our lives and properties used to be safe; we could sleep outside especially during the heat period and even leave our doors unlocked. It’s sad to say that the situation has changed; a lot of people have lost their lives and property to rampaging hoodlums and criminals that have taken advantage of the conflict between farmers and Fulani herders. Unfortunately the government is not paying serious attention to us peasants; we call on the government for security of the people” (CSMale/ 55 Years/Ikpayongo/Benue).

Among most of the respondents, the most common outcry was for the Federal and State government to come to their aid and support. A woman from Plateau narrated how she lost her family to the on-going conflict. She said:

“With the death of my entire family; my husband and two sons, am calling on all the levels of government to please come and solve the problem in our communities. The death of my loved ones is sad, I don’t know if I can get over it” (TDFemale/47 years/Plateau).

Unfortunately, as earlier stated government intervention in addressing the problems associated with climate change in Nigeria has never been taken seriously, this acclaimed by over 50% of respondents from the three states.

4.1.4 Appropriate measure and strategies to tackle climate change and conflict between Fulani herders and farmers

A 96% majority of respondents believe that climate change can be tackled, 90% of respondents said the federal government should be responsible for addressing climate change problems. Even though many respondents suggested most of the options the most recommended ways suggested by a majority of respondents was planting of trees and irrigation. The role of individuals was recognised as an important point to note. One of the respondents from Nasarawa responded saying:

“It is not good to leave everything in the hands of the government, individuals also have a role to play, especially in campaigning against the cutting down of trees for fire wood, if we are saying government should plant trees, we should also endeavour to plant these trees and stop the cutting down of trees for firewood as human activities have a significant impact on climate change” (FMMale/45 years/Nasarawa).

Also as individuals, (7%) of respondents in Nasarawa agreed they can contribute to reduce climate change, some suggested the digging of boreholes, stop the burning of bushes and have cisterns for water storage. Some of these suggestions look and sound very technical to be individual responsibilities, but with the right strategies and technical support from government they believe it is achievable. Respondents agreed that it is important to know about climate change, many people are not well informed about climate change but are willing to know. Respondents further suggested awareness creation by both individuals and government for people to look after the environment, saying it is not too late to reverse whatever changes that have occurred due to climate change. Some of the respondents

complained that government is not doing so much in tackling climate change, also that there is conflicting evidence about climate change; these are issues that need to be addressed during intervention.

An official from the Local Government council stated as follows:

“Before now migration of Fulanis and their cattle use to be in the middle of the dry season and after harvest period. But nowadays to our shock we see them throughout the year, you are driving they are on the road, you are in your farm they are destroying your crops, worse of all you are sleeping and they are burning your house. What exactly do they want? This has caused a huge loss to us; I cannot begin to tell you how this has affected us and how it will affect the country. Most of the foods in this country come from this region; if we do not farm it means the country will not eat. Government should do something quickly” (CSMale/55 years/Gwer/Benue).

In the area of addressing conflict 76% of respondents suggested dialogue between the two groups and provision of grazing lands for pastoralist. A pastoralist said:

“We have been running away from desertification and drought like many other Fulani nomads in the far north where there is little food for our cattle. We cannot live to see our cattle without food. We move to lands where our cattle can feed, most times we have to fight for our cattle to eat. My suggestion is that government should provide land for our cattle to feed” (PSTMale/41 years/Nasarawa).

Kabiru Yammama, a climatic and environmental consultant is of the view that the effects of climate change are partly responsible for the disputes between Fulani herders and farmers. As grazing lands in the north turn into desert the nomadic community is gradually and increasingly moving towards the south. He links the shortages of water and cultivable lands in the north- now turned desert lands, to climate changes. This he says is explained in the 2008 National Meteorological Agency study, rainy season in north Nigeria has dropped from 150 days 30 years ago to 120 days, cutting crop yields by 20% (Odoh, 2012).

4.2 Reflection of Analysis

The single most striking observation to emerge from the demographic data comparison was the high number of educated people in tertiary institution. Least expected, these rural communities had a high number of participants in tertiary and secondary level of education, though still engaged in farming and trading activities. This showed another dimension of communities affected by climate change conflict to be able to cope with the emerging challenges. The adaptation unpreparedness discussed in the previous study is evidenced in this instance. It is difficult for some farmers to cope with the challenges; instead of adapting the people are rather seeking other survival options. The effect of this change of livelihood can affect food production in the long run, as many are rather seeking white collar jobs against farming and producing low yields. So apart from dealing with climate change conflict affecting food production and causing food insecurity in the country, there is the high rate of farmers who have chosen other livelihood means aside farming.

The perception from respondents about the effects of climate change via extreme weather patterns, low crop yield, less rainfall and water shortages correlates with the findings of the previous findings. The findings of the result show that respondents are aware of the effects that climate change has on the environment, and how climate change can affect agricultural yields and natural resources. With these shortages in place the state feels the brunt of changes; Hunger, poverty and striving as other means of survival can set in. The discussions of the results continue with factors that are responsible for the conflict between the two groups. The most striking result to emerge from the data is that conflict in the three states is attributed to mostly ethnicity, though climate change is also seen as a factor, there is a 23% difference in opinion. The finding is conflicting in comparison to the previous study under review.

Furthermore, from observation it was noted that the perception of climate change in the three states is narrowed to weather patterns and changes in rainfall and water. Participants lacked information and knowledge to connect climate change to the on-going conflict between Fulani herdsmen and farmers; this therefore explains ignorance and lack of information about the nexus between climate and conflict. Ironically a higher percentage of participants from the result show that participant's perception of the effects of climate change on their livelihood is high, but on the other hand a lesser percentage of participants can relate climate change as a remote cause to the conflict between Fulani herdsmen and farmers. This result finding shows that the right information is not disseminated in the affected areas.

Nigeria is a country with so much diversity; both in language and culture my perception about the finding in this present study is related to how Nigeria as a country is comprised of different languages and tribes, thereby the serious outbreaks of conflict over time is bound to occur. It is possible that any conflict emerging between different tribes or groups can be seen as either ethnic or even religious. The possibility of respondents perceiving the conflict between Fulani herdsmen and farmers as due to ethnicity is not farfetched.

The result of the present study also suggests the economic impact of climate change conflict to be in the area of loss of lives and property, decrease in food production, displacement of farmers, poverty and increase in criminal activities. Interestingly this correlation relates to the findings in the literature review, the impact of climate change is felt in the multiplier effect as shown in the conceptual framework. Government is not only faced with tackling climate change but conflict and the economic impact.

The most surprising correlation is that; respondents believe that climate change can be tackled not only by government alone but individuals also have a role to play. Three issues emanated from our findings; the issue of food insecurity, lack of knowledge and ignorance about how climate change relates to conflict and the adaptation unpreparedness of the country. These three issues supposedly should be addressed concurrently if possible.

The finding specifically suggest ethnicity to be the main cause of conflict between Fulani herdsmen and farmers, even though climate change is also seen as a factor responsible for conflict between the two groups, ethnicity has the highest percentage of respondents. From observation a conclusion can be drawn from the present study that; it is possible that many people have heard of climate change, but unfortunately they do not have an understanding or the in-depth knowledge to relate climate change as a remote cause to the conflict between the Fulani herders and farmers. It was also shown that their understanding revolves around the information that has been disseminated in school, radio, newspaper and television about climate change in terms of just weather patterns. Information and evidence about how climate change is a remote cause of conflict, should be put together by a central government body so as to avoid conflicting information and evidence about climate. Dissemination about climate change however is the responsibility of all the different bodies mentioned in our data collection; schools, all levels of government and all mediums of media for the information to reach the different target groups.

One of the most significant finding to emerge from this study is that climate change has and is still affecting pastoralist, farmers, civil servants, traders and students in northern Nigeria as shown in table 2 and explained further on in the impacts of climate change conflict, socially economically and otherwise. Due to the incessant agitation over scarce resources and the effects of displacement, many of the populace have designed other survival strategies, it is therefore important for government at all levels to have in place more machinery to tackle climate change. In the long run government will be combating and reducing inherent conflicts.

4.2.1 Reflection of analysis and previous findings

This study set out to determine the nexus between climate change and conflict. The present study was designed to determine this relationship from the findings of the results and analyses. The finding is in the lines of the finding of the earlier literature, that found out that climate change effects can lead to scarcity of resources, and as a result the likelihood of conflict. The present finding supports the study of Bachler and Spillman (1996); Popovski (2009); Gleditsch (2007) and Sachs (2005) which concluded that not everyone agrees that there is a direct link between climate change and conflict, also that climate change is not the only responsible factor for conflict. The finding of this present study identifies ethnicity as a major factor for the conflict between Fulani herdsmen and farmers. It also relates the conflict to changes in climate in the northern part of Nigeria, which therefore triggers the wandering movement of pastoralist to the southern region. This movement of pastoralist and their cattle rampaging on farms has therefore caused the increased conflict between the two groups.

The finding is also consistent with the findings of past studies. According to Hendrix and Glaser (2007); Homer Dixon (2001); Smith (2006); Westing (2002) and Cooper (1999) that climate change can cause a reduction of essential resources for livelihood, the consequence could lead to conflict and in the long run poverty sets in. Also very consistent is the perception of climate change in the area of its effects; WBGU (2007) ascertained that climate change has the capacity to overstretch adaptive capacities. The UNSC (2007) stated that climate change can affect peace and security. Homer Dixon (2001) argues that climate change can lead to competition over scarce resources and result to peoples' livelihood been affected and the likelihood of conflict. Respondents attributed the scarcity of crops, hike in food prices and displacement of farmers to climate change and conflict. Effects of climate change are increasing and this may affect both rural and urban settlements. People displaced

from rural areas may eventually settle in urban areas and as a result the population growth will lead to competition over scarce resources and as a result the likelihood of conflict.

From the preceding analysis and findings, we validate our theoretical and empirical assumption that climate change though a significant factor responsible for conflict between Fulani herdsman and farmers in north central Nigeria, it is not the only factor that causes conflict. The hypotheses made by the authors in the previous study show that climate change has a relationship with conflict. With the finding of this analysis, it agrees with the previous authors in the literature review that climate change has a relationship with conflict. Though it is not the only factor responsible for conflict, it acts as the remote cause to conflict.

4.3 Limitations

The limitations of this present study include the following; (1) the ignorance and lack of information about climate change amongst participants made it more difficult for the research assistant to gather data. The understanding of the people in the area of climate change was limited to weather patterns and its effects on crops, relating climate change with conflict appeared very strange to most respondents (2) Most of the respondents were poorly educated and could not understand most of the terminologies. In such a case the research assistant had to explain and elaborate using simple terms for a better understanding. This contributed to taking so much of the limited time available (3) also the inability for the researcher to personally collect data on the field, the researcher had to use an assistant to collect data, this was due to the inability to travel the distance. Not being able to collect data personally, limited some observations that could have arisen and probably increased the validity of the present finding. Lastly, time was a limitation, research time and resources as stated in the methodology also played a role. Probably with enough time and resources a larger population size would have been administered and my research assistant would have had more time to visit other rural communities in other local government areas for a more population sampling size, probably that would have also affected the findings.

4.4 Conclusion

This chapter analysed the results from the data collected, relating the research findings to the original research question and objectives of this study. The reflection of the analyses was also carried out to give meaning to the result finding. The themes and information were discussed and analysed in a contextual and numeric format using tables and percentages.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATION

5.0 Conclusion

The following conclusions can be drawn from the present study. My central thesis in this study is that, as much as the findings suggest that the immediate cause of Fulani herdsmen and farmer conflict is ethnicity, the remote cause is climate change, which has through less rainfall, drought and desertification led to the immediate cause and has therefore intensified the conflict between the two groups. Implications of the results and future research directions are presented and areas for future research are recommended. In my conclusion scarcity of resources constitutes the immediate cause of farmers and Fulani herdsmen conflict. While climate is the remote cause, ethnicity is identified as the most responsible factor for the conflict. This is due to the level of understanding about climate change by different respondents.

Recurring scramble for scarce ecosystem resources has resulted into violent conflicts between Fulani pastoralists and farmers. The intensity, widespread and destructive nature of these conflicts has a negative effect on the development of all affected communities and Nigeria as a whole. This is because water and feed shortages caused by drought and desertification triggers scarcity of these resources and sends pastoralist to wander outside their normal grazing routes. Apart from these, farmers are also pushed to cultivate more lands each passing year, that leaves pastoralist with fewer routes to water and graze their stock. The contest between these two groups has resulted in the deaths of several hundred Nigerians and still counting. From my findings many do not have the understanding nor knowledge of the remote cause of this conflict, this arises as a great issue and challenge in tackling the issue of this particular conflict.

The use of the military by government to resolve conflicts between pastoralist and farmers has been ineffective, rather it has led to the deaths of many armed forces, introduced modern weapons in the conflict, escalated the frequency of the clashes and exacerbated insecurity amongst conflicting parties making them take responsibility of their own security, this is threatening to the sustainability of the federation. These issues among others have made it difficult for government to prevent the escalation of conflicts between Fulani pastoralist and farmers in north central Nigeria.

5.1 Recommendation for policy and practice

This research has thrown up many questions in need of further investigation; further work needs to be done to establish whether ethnicity or climate change is the actual cause of conflict between Fulani herdsmen and farmers. It is recommended that government should deliberately design activities that will mobilize and enlighten the two parties involved in conflict, it is important for both parties to understand not only the ecology and the resources available but also the climatological changes in their localities. This also calls for harmonious coexistence and security between the two parties. Government policies should ensure that the Fulani pastoralist secure rights to grazing lands to reduce insecurity and conflict. Since the Fulani pastoralists do not possess the rights to land, they wander and feed their cattle on open land culminating the frequency of conflict and pressure on land. Is it possible for cattle to access grazing routes without pouncing on farmers' crops? With stern government policies, strict compliance from both parties, effective regulation of activities, conduct, behaviour, and most importantly dialogue, the conflict between the two groups can have a head start for tackling the issue.

This calls for urgent attention from government at all levels, to put in place the right machinery that will create awareness and educate particularly people in the northern part of Nigeria about climate change. Over 70% of Nigeria's food crop comes from this region and therefore the need for climate change adaptation and mitigation. But even as a country Nigeria should invest more in tackling climate change; more research in agricultural technology and climatologic research, to combat drought and desertification, and in the end reduce conflict.

Farmers and pastoralist must work towards a respectful and understanding relationship, respecting the rights of each other in their interactions. Pastoralist must stop the wandering of their herds on farm lands and destroying crops, while farmers should avoid encroaching on routes mapped out for grazing lands. Both groups need to acknowledge the needs of the other and the circumstances influencing them. This should be supported by government in constructively resolving conflicts between the two parties to ensure inter dependence and coexistence, also by mapping out more grazing areas for pastoralist.

Also state governments in the far north, on the fringes of the Sahara should embark on mitigating climate change by intensifying afforestation programs so as to check desert encroachment. The need to address this issue is key, conflicts between farmers and pastoralist

has direct impact on food security in the country as a whole. Poor responses to climatic shifts in a region can trigger resource shortages and poor response to resource shortages can heighten conflict risk. The climatic shifts in Nigeria if left unaddressed will continue to throw stressed resources such as land into shorter supply. As a multiplier effect secondary effects such as hunger, diseases, unemployment, food insecurity, and poor economic growth can set in, resulting to violent conflict. As can be seen from the study this is playing out already in a few conflict prone states in arid north. The results presented here may facilitate improvements in the nearest future.

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Appendix 1: Summary of data collected

Description	Benue (Frequency)	Nasarawa (Frequency)	Plateau (frequency)	percentage	Observation
Heard of climate change	44	42	46	88%	<p>Students, Civil Servants, traders, retired personnel's and farmers are mainly the ones that have heard of climate change.</p> <p>It was also observed that each group of persons relied and trusted on different medium for information about climate change. Students heard from school, civil servants and traders heard from the media, government and friends. Retired persons heard via television, newspaper and radio.</p>
Not heard of climate change	6	8	4	12%	<p>People without a formal education in the rural community are mostly the ones that have not heard of</p>

					climate change. People that have never heard about climate change were eager to know about it.
Climate change is not responsible for conflict between Fulani herdsmen and farmer	3	40	7	33%	
Climate change is responsible for the conflict between Fulani herdsmen and farmers	47	10	43	66%	
Climate change can be tackled	50	44	50	96%	

Appendix 2: Questionnaire on climate change and conflict patterns among Pastoralist –Farmers in north-central Nigeria

Objectives of the survey

- ✚ To observe the perception of respondents in north-central Nigeria on climate change and its effect.
- ✚ To determine the relationship between climate change and conflict between Fulani herdsmen and farmers in north central Nigeria.
- ✚ To explain the socio economic effects of conflict on the development of a country
- ✚ To suggest appropriate measures and strategies that can be used by pastoralist, farmers, community leaders and government in reducing the problems associated with climate change in northern Nigeria.

Community:

Local Government Area:

State:

Section 1: Perception over climate change and its effect on communities

1. Have you heard of climate change?

☐

Yes (please go to 2)

☐

No (please go to 6)

2. Where have you heard about it? *Tick as appropriate*

☐

Television/Internet

☐

Newspaper

☐

Friends/Family

☐

Radio

☐

school

☐

Government

☐ Others (*please specify*)

3. By ticking one box by each row, please indicate how much you would **trust** information about climate change if you heard it from...

	A lot	a little	not very	not
at cant				
all choose				
Friends & family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Media (Newspaper, television, radio, internet)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Please tick from the options below what you think climate change is all about

<input type="checkbox"/> Change in Weather pattern	<input type="checkbox"/> Less rain	<input type="checkbox"/> Water shortage	<input type="checkbox"/> Desertification
--	------------------------------------	---	--

5. Please look at the following list of climate change effects and tick the one that has the most effect and least effect on you.

		Most effect	least effect
Less rainfall/ Drought	<input type="checkbox"/>	<input type="checkbox"/>	
Desertification	<input type="checkbox"/>	<input type="checkbox"/>	
Water shortage	<input type="checkbox"/>	<input type="checkbox"/>	
Shortage of grazing lands	<input type="checkbox"/>	<input type="checkbox"/>	
Conflict	<input type="checkbox"/>	<input type="checkbox"/>	
None	<input type="checkbox"/>		

6. Do you want to know about climate change?

☐ Yes (please go to 7)

☐ No

Section 2: Relationship between climate change and conflict amongst Fulani herdsmen and farmers (factors responsible for conflict)

7. In your view is climate change responsible for the conflict between Fulani herders and farmers?

☐ Yes (please go to 8)

☐ No (please go to 9)

☐ I don't know (please go to 9)

8. What other factors are responsible for the conflict? *Please tick as appropriate below*

The role of traditional rulers

☒

Destruction of crops/farmlands

☒

Contamination of water

☒

Harassment of herdsmen by host community

☒

Religious

☒

Ethnicity

☒

Others (please specify)

9. In your opinion what are the factors responsible for the conflict?

.....

.....

.....

.....

.....

.....

Section 3: Economic impact of climate change –conflict

10. How has this conflict affected your community?

☒

Loss of lives & property

<input type="checkbox"/>	Displacement of farmers
<input type="checkbox"/>	Insecurity
<input type="checkbox"/>	Decrease in food production
<input type="checkbox"/>	Crime
<input type="checkbox"/>	Others
.....	
.....	

Section 4 Appropriate measures and strategies to tackle climate change and conflict between Fulani herders and farmers

11. Do you think anything can be done to tackle climate change?	
<input type="checkbox"/>	Yes
<input type="checkbox"/>	No
<input type="checkbox"/>	Don't know
12. Who do you think should have the main responsibility of tackling climate change?	
Please tick one box only	
<input type="checkbox"/>	International organisation (e.g UN)
<input type="checkbox"/>	State government
<input type="checkbox"/>	Local government
<input type="checkbox"/>	NGOs
<input type="checkbox"/>	Individuals
<input type="checkbox"/>	Others (please specify).....
<input type="checkbox"/>	Federal Government

13. What do you think can be done to tackle climate change by this main body?

- ☐ Irrigation
- ☐ Tree planting
- ☐ Farm tenure system
- ☐ Water storage

14. What can you as an individual do to tackle climate change?

.....

.....

.....

.....

.....

.....

15. What do you think can be done to tackle the conflict between Fulani herders and farmers?

- ☐ Dialogue between the two groups
- ☐ Provision of grazing lands for herders
- ☐ Farmers/Pastoralist association

16. Please indicate how much you agree or disagree with the following statements about climate change by ticking one box on each row

	Disagree	Disagree	Agree strongly	Agree	Neither	agree
					Nor	disagree

strongly

a .We can all contribute our bit to reduce climate change ☐ ☐ ☐

☐ ☐

b. Government should create awareness for people ☐ ☐ ☐

☐ ☐

to look after the environment

c. It is too late to do anything about climate change ☐ ☐ ☐

☐ ☐

d. Human activities have a significant impact on climate ☐ ☐ ☐

☐ ☐

change

e. Climate change is frightening ☐ ☐ ☐

☐ ☐

f. Many people are not well informed ☐ ☐ ☐

about climate change ☐ ☐

☐ ☐

g. Evidence of climate change is unreliable ☐ ☐ ☐

☐ ☐

h. If I come across information about climate change I will ☐ ☐ ☐

☐ ☐

tend to look at it.

I There is too much conflicting evidence about climate ☐ ☐ ☐

☐ ☐ n

Change to know whether it's truly occurring

J The government is not doing much to tackle climate ☐ ☐ ☐

☐
☐

Change.

K Recent droughts in the north are due to climate change. ☐ ☐ ☐ ☐

☐

L it is important to know about climate change. ☐ ☐ ☐

☐ ☐

Section 5. About you

Just so I can compare views from different participants, could you please tell me about yourself?

17. You are.....

☐ Male
 ☐ Female
 ☐ Prefer not to say

18. Please indicate your age bracket

☐ 16-24
 ☐ 55-64
 ☐ 25-34
 ☐ 65-74
 ☐ 35-44
 ☐ 75-84
 ☐ 45-54
 ☐ 85 over
 ☐ prefer not to say

19. What is your highest qualification?

☐ Tertiary ☐ Secondary ☐ Primary ☐

20. What is your occupation

☐ Farmer ☐ Trader ☐ Civil servant ☐ Pastoralist ☐ None ☐

21. Would you be willing to take part in a brief interview (either in person or via the phone to discuss these issues further? **The interviews will be treated with as much confidentiality as the questionnaire**

☐ Yes

☐ No

Thank you so much for your time to complete this questionnaire

IJSER

Appendix 3: Survey cover letter

October 2016

Dear Sir/ Madam,

IJSER

Survey Cover Letter

Survey of climate change -conflict

I would like to introduce myself as Barbara Jika. I am a post graduate student at London South Bank University. I am currently working on a research project about the nexus between climate change and conflict. The researcher has purposely selected the north-central region as its sample population to ensure a representation of people's views. Your assistance in completing the questionnaire will be invaluable. Whatever information you provide will be kept anonymous and confidential.

The questionnaire seeks information on environmental issues, your opinion about the conflict between Fulani herders and farmers and questions about yourself. In as much as we would appreciate you answering all the questions, if you don't feel like answering any you don't have to – please just do what you can. It won't take long to complete it and I do hope you enjoy it.

Key findings from this survey will provide insight on the question of whether climate change is a major factor to conflict and how this issue can be addressed by the governing body.

If you have any concerns about the survey, please do not hesitate to contact the research assistance on the field.

Thank you very much for your assistance.

Yours faithfully

Barbara Jika

Appendix 4: Collected data and observations

Questionnaire on climate change and conflict patterns among Pastoralist –Farmers in north-central Nigeria

Objectives of the survey

- ✚ To observe the perception of respondents in north-central Nigeria on climate change and its effect.
- ✚ To determine the relationship between climate change and conflict between Fulani herdsmen and farmers in north central Nigeria.
- ✚ To explain the socio economic effects of conflict on the development of a country
- ✚ To suggest appropriate measures and strategies that can be used by pastoralist, farmers, community leaders and government in reducing the problems associated with climate change in northern Nigeria.

Community:

Local Government Area:

State:

Section 1: Perception over climate change and its effect on communities

22. Have you heard of climate change?

☐

Yes (please go to 2)

☐

No (please go to 6)

NASSARAWA- 8- No, 42- Yes

JOS- 4- No, 46- yes

MAKURDI- 6- No, 44- Yes

Observation- Students, Civil servant, traders, retired persons and few farmers are mainly the ones that have heard of climate change. People without a formal education in rural areas have never heard the word climate.

23. Where have you heard about it? *Tick as appropriate*

☐

Television/Internet

☐

Newspaper

☐

Friends/Family

☐

Radio

☐

school

☐

Government

☐

Others (please specify)

Observation- - In all the States, most of the students have been taught in school about climate change. Civil servant and traders through the Media, Government and family/ friends. Retired persons have heard mainly through the Television, Newspaper and Radio

24. By **ticking one box by each row**, please indicate how much you would **trust** information about climate change if you heard it from....

		A lot	a little	not very	not
at	cant				
					Much

all choose

Friends & family

☐
☐
☐
☐
☐

Media (Newspaper, television, radio, internet)

☐
☐
☐
☐
☐

Government

☐
☐
☐
☐
☐

School

☐
☐
☐
☐
☐

Observation- In all the States, students trust the information they are given in school. Civil servant and traders trust the government, retired persons trust the Media.

25. Please tick from the options below what you think climate change is all about

☐

Change in Weather pattern

☐

Less rain

☐

Water shortage

☐

Desertification

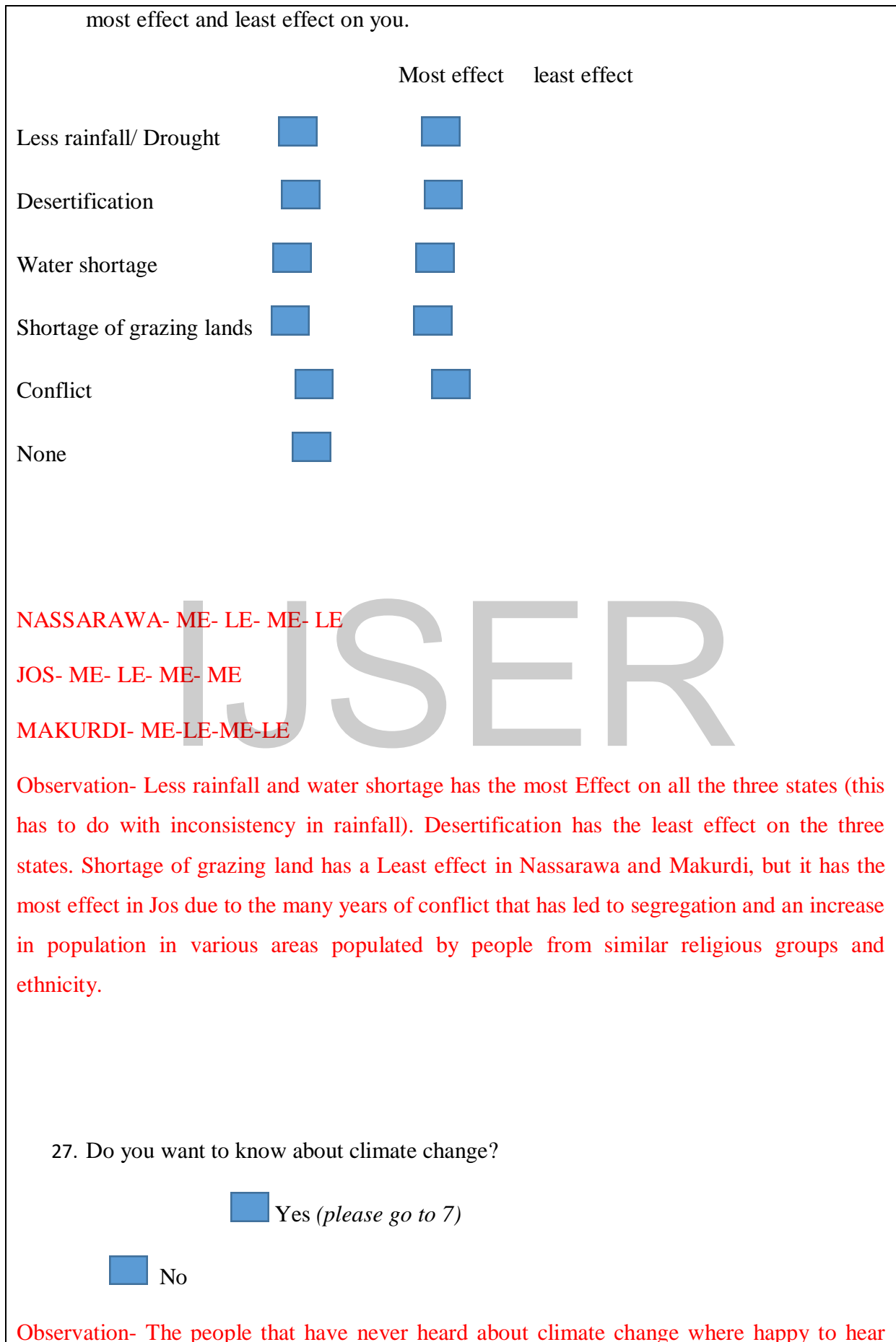
☐

NASSARAWA- All- 25, Weather patterns- 20 Desertification- 5

JOS- All- 25, Weather patterns- 24 Desertification- 1

BENUE- All- 20, Weather patterns- 27 Desertification- 3

26. Please look at the following list of climate change effects and tick the one that has the



about it.

Section 2: Relationship between climate change and conflict amongst Fulani herdsmen and farmers (factors responsible for conflict)

28. In your view is climate change responsible for the conflict between Fulani herders and farmers?

☒ Yes (please go to 8)

☐ No (please go to 9)

☐ I don't know (please go to 9)

NASSARAWA- No 40, Yes- 10

JOS- ME- No-7, Yes- 43

BENUE- No-3, Yes-47

IJSER

29. What other factors are responsible for the conflict? *Please tick as appropriate below*

The role of traditional rulers

☒

Destruction of crops/farmlands

☒

Contamination of water

☒

Harassment of herdsmen by host community

☒

Religious

☒

Ethnicity

☒

Others (please specify)

NASSARAWA- All-40, Religion-8, Traditional Rulers-2

JOS- All-45, Religion-2, Destruction of Farmlands-3

MAKURDI- All-40, Insecurity-2, Harassment of herdsmen-4, Destruction of farmlands-3,
Water contamination-1

30. In your opinion what are the factors responsible for the conflict?

.....

.....

.....

.....

.....

.....

NASARAWA- Nomadic Culture and criminality of the Fulanis and harassment of herdsmen

JOS- Over population. In the past, the Fulani had a mutual relationship with residents but since the population in cities have increased perhaps they residents are not willing to share their limited resources

BENUE- Religion

Section 3: Economic impact of climate change –conflict

31. How has this conflict affected your community?

- ☐ Loss of lives & property
- ☐ Displacement of farmers
- ☐ Insecurity
- ☐ Decrease in food production
- ☐ Crime
- ☐

Others

.....
.....
Observation- In all the states they said all of the above

Section 4 Appropriate measures and strategies to tackle climate change and conflict between Fulani herders and farmers

32. Do you think anything can be done to tackle climate change?

☐ Yes

☐ No

☐ Don't know

NASSARAWA- 44- Yes, 5-No, I don't know-1

JOS- All-Yes

BENUE- All- Yes

IJSER

33. Who do you think should have the main responsibility of tackling climate change?

Please tick one box only

☐ International organisation (e.g UN) ☐ State government

☐ Local government

☐ NGOs

☐ Individuals

☐ Others (please

specify).....

☐ Federal Government

NASSARAWA- 2-UN, 2-Local Government, 46-FG

JOS- ME- 2-ALL, 4-UN, 1- I Don't know, 43-FG, 1-Individual

BENUE- 2-UN, 2-Individual, 46-FG

34. What do you think can be done to tackle climate change by this main body?

- ☐ Irrigation
- ☐ Tree planting
- ☐ Farm tenure system
- ☐ Water storage

NASSARAWA- All-21, trees-24, Irrigation-4, Farm tenure-1

JOS- ME- All-18, trees-24, Irrigation-4, Water storage- 4

BENUE- All-25, trees-20, Irrigation-5

35. What can you as an individual do to tackle climate change?

.....

.....

.....

.....

.....

.....

NASSARAWA- trees-25, Bore hole-15, Stop burning grasses- 2, Tell others-8

JOS- ME- trees-35, Bore hole-10, water storage- 5, Tell others-5

BENUE- trees-30, Bore hole-13, Stop burning grasses- 2, Tell others-5

36. What do you think can be done to tackle the conflict between Fulani herders and farmers?

- ☐ Dialogue between the two groups

<input type="checkbox"/>	Provision of grazing lands for herders
<input type="checkbox"/>	Farmers/Pastoralist association
NASSARAWA- Dialogue- 45, grazing land-3, All-2	
JOS- ME- Dialogue- 30, grazing land-8, All-12	
BENUE- Dialogue- 40, grazing land-4, All-6	

37. Please indicate how much you agree or disagree with the following statements about climate change by ticking one box on each row

	Disagree strongly	Disagree	Agree strongly	Agree	Neither agree nor disagree
a .We can all contribute our bit to reduce climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Government should create awareness for people to look after the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. It is too late to do anything about climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Human activities have a significant impact on climate change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Climate change is frightening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

f. Many people are not well informed

about climate change



g. Evidence of climate change is unreliable



h. If I come across information about climate change I will



tend to look at it.

I There is too much conflicting evidence about climate



Change to know whether it's truly occurring

J The government is not doing much to tackle climate



Change.

K Recent droughts in the north are due to climate change.



L it is important to know about climate change.



For all states- a. AS b. AS c. DS d. AS e. AS f. AS g. DS h. AS i. DS j. AS k. AS l. AS

Section 5. About you

Just so I can compare views from different participants, could you please tell me about yourself?

38. You are.....



Male

<p>Female</p> <p>Prefer not to say</p> <p>NASSARAWA- Female-25, Male-25</p> <p>JOS- ME- Female-25, Male-25</p> <p>BENUE- Female-25, Male-25</p>	
<p>39. Please indicate your age bracket</p> <p>16-24 25-34 35-44 45-54 55-64 65-74 75-84 85 over</p> <p>prefer not to say</p> <p>NASSARAWA- (16-25)- 19, (25-34)- 16, (35-44)- 15</p> <p>JOS- 16-25)- 20, (25-34)- 14, (45-54)- 2 (35-44)- 11, (55-64)- 3</p> <p>BENUE- 16-25)- 16, (25-34)- 18, (45-54)- 5 (35-44)- 10, (65-74)- 1</p>	<p>40. What is your highest qualification</p> <p>Tertiary Secondary Primary</p> <p>NASSARAWA- Tertiary-15, Secondary- 35</p> <p>JOS- Tertiary-30, Secondary- 20</p> <p>BENUE- Tertiary-34, Secondary- 16</p>

41. What is your occupation

☐ Farmer ☐ Trader ☐ Civil servant ☐ Pastoralist ☐ None ☐

NASSARAWA- Farmer- 10, Trader- 20, Civil servant-15, Students-5

JOS- Farmer- 5, Trader- 10, Civil servant-15, Students- 20

BENUE- Farmer- 10, Trader- 5, Civil servant-20, Students- 15

42. Would you be willing to take part in a brief interview (either in person or via the phone to discuss these issues further? **The interviews will be treated with as much confidentiality as the questionnaire**

☐ Yes

☐ No

In all states they said yes

Thank you so much for your time to complete this questionnaire