

Examining the Combine Impact of Climate Change and Conflict on Food Security in Jonglei State of South Sudan

Ayite Rose Kwoji¹

¹ Master of Arts in Economic Policy

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DECLARATION

I, **Ayite Rose Kwoji**, declare to the best of my ability that this report contains no academic material that has been submitted previously, in whole or in part, for the award of any academic degree or diploma of any institution.

Signature

Date:

Ayite Rose Kwoji

DEDICATION

This report work is dedicated to my love Mr Buna Daniel, who has been a constant source of support and encouragement during the challenges of study, family, and work obligations. I am truly thankful for having him in my life. The work is also dedicated to my dad, Kwoji William, my daughter Kayla Yobu, my son Anituna and my good friend Ami Julius and Desta who have always loved me unconditionally and whose aspirations in life have always taught me to continue working harder for the things that I aspire to achieve. Great appreciation is extended to my professor **Dr. Rameez Hassan** for encouraging and guiding me throughout this period of research project.

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ABSTRACT

Achieving food security and zero hunger without destructing the environment for future generation is one of the goals to be achieved by 2030 according to UN sustainable development goals, however there are threatening challenges for attaining the goal due to combined effects of climate change and conflict on food security. The negative effect of climate change like floods, drought, high temperature and precipitations, and destruction of infrastructures leads to poor crop yields, lack of accessibility to food mobility. These coupled with effects of conflict which results into killings, displacement of the population, crop destructions, theft, and abandonment of homes to take refugee. These combined effects of climate change and conflict on food security needs to be addressed as many research papers failed to mention the two together. This research aims at examining the combined effect of climate change and conflict on food security with specific objectives of; i) to determine the effect of climate change and conflict on food security components of accessibility, availability, food stability and utilization in Jonglei state of South Sudan, ii) to examine the interrelated nature of climate change, conflict, and food security in Jonglei State of South Sudan iii) to explore the climate change adaptation methods to create food security in Jonglei State of South Sudan. The research design will be qualitative way where questionnaire will be designed to carry out focused group discussions, interviews, and observations to answer the research questions of to present the result and discussions. The scope of study will cover Jonglei state under the Upper Nile region of South Sudan as is one of the most state hit badly by negative effects of climate change and conflict with high level of food insecurity and malnutrition amongst the ten (10) other states of in the four regions of South Sudan. Qualitative research design is the method used for this research, where questionnaires are designed to collect data through focused group discussions, selected population of seventy (70) online and offline questionnaires that will be given to local leaders, government officials from ministry of agriculture and environment and some family heads as recordings are taken from respondents of Jonglei state of South Sudan. The research findings shall be collaborated by desk study of different join nutritional situation analysis from World Food Programme, FAO, and UNICEF. The research findings are discussed in detail with presentation of the respondents' views on the subject matter to answer the research questions and objectives.

CHAPTER ONE

INTRODUCTION

➤ *Background.*

South Sudan after attaining independence on 09th July 2011, it suffered two major conflict crises in 2013 and 2016 respectively. As the result of the conflicts, so many people got displaced in search for refugee and also many lost their lives, property were destroyed, and the general economy got crippled economically due to the impact of the conflict. The South Sudan transitional government continued to face macroeconomic challenges of inflation, fluctuating interest rates and exchange rates, high rates of unemployment and food insecurity leading continuous call/need for humanitarian assistance in providing food and nutritional support, health, and Wash support among others. South Sudan is a form of three geographical regions of Equatorial region, Upper Nile region and greater Bar-el ghazar region making ten (10) states. Jonglei state is under greater Bar-el ghazar region with its capital of Bor town, its major economic activities are nomadic pastoralist, crop farming and fishing. Jonglei state suffered major impacts of climate change and conflicts as its experiencing continuous flooding, interclan conflicts which greatly affected crop production and yields, this lead to continuous call for humanitarian support in provision of food assistance as the region is being classified as IPC5 and 4, (WFP South Sudan internal situation report, 2020).

Climate change is defined as a significant change in the average values of meteorological elements such as precipitations, floods, temperature, and droughts for which averages have been computed over a long period (Malhi, Kaur and Kaushik 2021). The vision for 2030 of the sustainable development goal 2.0 is to achieve zero hunger, (Cai, Y.J. and Choi, T.M., 2020) by attaining the universal food security. Zero hunger refers to a situation where all forms of hunger that lead to malnutrition are eliminated in the world, however the effect of climate change and conflict has become major challenge to the attainment of this set UN sustainable development goal. The negative effect of climate change such as flood is being experienced in South Sudan generally and worst in Jonglei state in the last two years. As a result of flood, so many agricultural activities were disrupted leading to lack of food availability, and inaccessibility of food. The excess rainy waters submerged most of the land in Jonglei state, destroyed all the plantations, and further preventing farmers from cultivating their vast virgin land as most population are either residing on small islands, or at roadsides in their small temporary huts with limitation to farming. Furthermore, the floods have led to infrastructural destruction, as no road left to access most towns, villages, payams and bomas within the state. Infrastructural inaccessibility hindered most humanitarian organizations in providing food and non-food items support. Though other measures were taken to ensure all needed humanitarian support is reached to the targeted population through dyke constructions and resort to expensive means of transportation like air became the only option to ensure lives are saved from hunger.

On the other hand, conflicts have negatively affected the lives of residents in Jonglei state of South Sudan. Even after attainment of South Sudan independence, conflict within Jonglei state continued among the communities ranging from inter-tribal conflicts, inter-clan conflicts, cattle riding to revenge killings/ conflicts. These conflicts left many of the population in bitterness and anger towards each other, which in return leads to un-peaceful co-existence that prevents a lot of economic activities to take place. Both armed and un-armed conflicts in Jonglei disrupted so many food security components of availability, accessibility, stability, and utilization, which drove the communities to malnutrition.

➤ *Problem Statement.*

Most population of South Sudan continue to depend on humanitarian aid for food especially Jonglei state as it was declared in nutrition Integrated phase classification 5 (worst/d critical stage) by United Nations World Food Programme (WFP Annual report 2022) after their situational assessment with findings that majority of the population in the state faces malnutrition that called for immediate need for food assistance of over 190,000mt and cash assistance of 39.6 million dollars of cash-based transfers thus rendering support to 5.6 million people in South Sudan (WFP Annual report 2022). These came as a result of flood that hit the state since 2020 till date; The negative effect of climate change such as flood is being experienced in South Sudan generally and worst in the upper Nile region of South Sudan particular Jonglei state in the last two years. Due to flood, many agricultural activities were disrupted leading to lack of food availability, lack of accessibility to food as major routes that connects the state to other states became submerged with water. The excess rainy waters led to increased water levels at the Nile which results to overflow of waters from riverbank that submerged most of the vast land in Jonglei state. Consequently, all plantations were destroyed, further preventing farmers from cultivating as most population are either residing on small islands, or at roadsides in their small temporary huts on dykes that were built for them by United Nations World Food Programme in South Sudan. This limits the population from farming. Furthermore, floods led to infrastructural destruction, as no road left to access most towns, villages, payams and bomas within the state. This lack of inaccessibility hindered most humanitarian organizations in providing food support though other measures were taken through projects like dyke constructions and resort to expensive means of food and non-food items transportation through air transportation to ensure food assistance is achieved to save lives from hunger.

South Sudan in general has been hit by two major conflicts in different times, 2013 and 2016 respectively. These conflicts successfully crippled the economy of South Sudan in all aspects putting all the economic activities to deteriorate; many people were killed, displaced, and forced to live in a refugee camp, these alone led to disruption in agricultural production.

It's against this ground that called for need to examine the combined effect of climate change and conflict on food security in Jonglei State of South Sudan. The study outcome will be used to inform the policy makers, government, and humanitarian stakeholders on the need to adapt climatic change methodology and work towards embracing long lasting peace in South Sudan.

➤ *Objectives*

• *General Objective.*

The study purpose is to examine the combine effect of climate change and conflict on food security in Jonglei state of South Sudan.

• *Specific Objectives:*

- ✓ Determine the effect of climate change and conflict on food security components of accessibility, availability, food stability and utilization in Jonglei state of South Sudan.
- ✓ Examining the interrelated nature of climate change, conflict, and food security in Jonglei State of South Sudan.
- ✓ Exploring the climate change adaptation methods to create food security in Jonglei State of South Sudan.

• *Research questions*

- ✓ What are the effects of climate change and conflict on food security components of accessibility, availability, food stability and utilization in Jonglei state of South Sudan.
- ✓ How is climate change, conflict and food security interrelated in nature in Jonglei state of South Sudan.
- ✓ What are the climate change adaptations in Jonglei state of South Sudan that will help create food security.

➤ *Significance of the study*

Studying and discussing the combine effect of climate change and conflict on food security will help inform different actors on the need to address the existing issue of food security components of accessibility, availability, food stability and utilization in Jonglei state of South Sudan and finding climatic adaptation methods and mitigation for creating accessibility to food, availability of food, food stability and utilization. The identified climate adaptation methods will help the government and humanitarian bodies to helps predict how much rain the next winter might bring, or how far sea levels will rise due to warmer sea temperatures and design appropriate measures and emergence response plans ahead of time.

➤ *Scope of the Study.*

The study is geographically limited to the territory of Republic of South Sudan, which is comprised of ten (10) States and three (3) administrative areas running under decentralized system of governance, with case study of Jonglei state under Upper Nile region in South Sudan.

According to United nations World Food Programme South Sudan, more than 5.6million inclusive of returnees and refugees from Sudan (July 2023) are in desperate need for food assistance.

The content of the study examining the combine effect of climate change and conflict on food security in Jonglei state of South Sudan is conducted through use of both qualitative and quantitative methods to determine the effect of climate change on food security components of accessibility, availability, food stability and utilization, examining the interrelated nature of climate change, conflict, and food security and exploring the climate change adaptation methods to create food security in Jonglei State of South Sudan. Data collection will be through a selected population of seventy (70) online and offline questionnaires that will be given to local leaders, government officials from ministry of agriculture and environment and some family heads from Jonglei state of South Sudan. The research findings shall be collaborated by desk study of different join nutritional situation analysis from World Food Programme, FAO, and World Bank.

CHAPTER TWO

LITERATURE REVIEW

➤ *Introduction*

The combined effects of Climate change and conflict on food security have become inevitable to the disruption of food/crop production in Jonglei State of South Sudan. The effect of climate change such as flood is being experienced in South Sudan generally and worst in Jonglei state in the last two years. As a result of flood, so many agricultural activities were disrupted leading to lack of food availability, and inaccessibility of food. The excess rainy waters submerged most of the land in Jonglei state, destroyed all the plantations, and further preventing farmers from cultivating their vast virgin land as most population are either residing on small islands, or at roadsides in their small temporary huts with limitation to farming. Furthermore, the floods have led to infrastructural destruction, as no road left to access most towns, villages, payams and bomas within the state. Infrastructural inaccessibility hindered most humanitarian organizations in providing food and non-food items support. Though other measures were taken to ensure all needed humanitarian support is reached to the targeted population through dyke constructions and resort to expensive means of transportation like air became the only option to ensure lives are saved from hunger.

➤ *Variables.*

Climate change is a variation in weather conditions. Climate change affects food security in different ways like through agricultural production that leads to poor yields due to changes in precipitations and temperature that results into unexpected heavy rain pours at time of crop plantation and germination and no/low rains in between or the reverse to aid the crop yields. The heavy rain pours leads to floodings as a result of raised sea water levels. The floods in return leads to poor crop yield generally. Climate change has already threatened crop productivity especially in the major food crops (wheat, maize, rice) which are staple food crops across many countries (Lobell et al., 2011; Syed et al., 2022). Climate variables like low and high temperature stresses, change in precipitation frequency and intensity, and other climate change induced disasters such as drought, salinity and erupting sea levels are changing slowly, but definitely will negatively impact the crop production in the coming decades (Raza et al., 2021; Ullah et al., 2021). These variables are currently faced greatly in different countries of the world especially within Jonglei State of South Sudan. The poor yield in crop production leads to food insecurity which impacts the health of the people badly resulting into malnutrition. Most areas of Jonglei state have been classified as integrated Phase classification (IPC) 5 and 4 by humanitarian food security and Nutrition cluster in South Sudan. This classification implies the criticality and urgent call for food assistant by the UNWFP and other UN agencies for the population.

Further, floods result into lack of food availability, and food inaccessibility. These comes due to destructions of infrastructures especially roads and bridges that leads and connect so many into activity of market. As reported by UNWFP, June 2023 major roads that connect the different Counties, payams, bomas and villages within South Sudan and Jonglei state in particular has been disconnected as it becomes nearly impossible to deliver both food and non- food items to the suffering population. This forces the need to lobby for donations to fix a solution to ensure food assistance is provided to the population. Many dykes were built by major UN agencies like UNMISS, UNWFP and IOM, food being delivered through the most expensive delivery modality (Air transport) by airlifting and airdrops. Therefore, Transportation infrastructure is necessary as well, both in 365 areas that currently lack reliable transit and in new areas, as crop production areas shift due to 366 temperature changes, (Fanzo, et al., 2018).

The United Nations reported that upto 783 million people around the world are living hunger, (Uganda Daily Monitor., August 23, 2023). These numbers signifies some of the factors being climate change that leads to change in rain patterns, as rain season delays and when it comes, it over pours. Poor and low crop yields are being achieved among farmers due to the changes in rain pattern; in that crop plantation seasons are being disrupted as rain comes and goes at crop germination stage that needs more/less rain pours. This results to food insecurity. Climate patterns within east African region and africa as a whole totally changed as a result of global warming, (Godde et al., 2021). Climate change has negatively led to global warming, increase in green house gas emission, droughts and cyclones. As powerful cyclones to hit the coast of Africa devastated the city of Beira, Mozambique, in March 2019, (World Bank 2023). Cyclone Idai brought damaging winds, torrential rain, and claimed hundreds of lives that negatively leads to destructions of property, which includes food and lives. This impacts on food production systems thus affecting food security.

• *Conflict*

Conflict is a most sensitive variable in the study. South Sudan since after its independence on 09th July 2011 has undergone series of both national and subnational conflicts. Many subnational conflicts within Jonglei State of South Sudan that ranges from inter-tribal conflicts, inter-clan conflicts, among others caused destruction of socio-economic activities, (UNDP., 2022). The major conflicts experienced within jonglei state are inter tribe, Nuer and dingers, dingers and Murle, Nuer and Murle among others. This conflicts led to destructions of proprty, looting and killings amongst the population, which results into less involment into agricultural activities like crop production. Conflictd within Jonglei state of South Sudan results into insecurities that led to inaccessibility of the location by both humaniterian actors and private sectors for trade and supplies, as inaccessibility led to lack of food security. Many African countries like South Sudan facs food insecurity as a result of conflicts especailly the west African Countries that suffers from conflicts which is similar to the Nigerian civil war and other secessionist movements across West Africa especially Upper East Ghana crisis is concentrated in the Bolgatanga and Bawku areas (Ujunwa et al ., 2019). The Ukraine- Russian conflict also affected food secuirty severely as the effect is being felt worldwide due to reduction in production wheat, cereals among

others (Rabbi et al., 2023). Many countries in the world were dependent on Ukraine for food supplies, however due to the conflict/war, shortage of food popped in, increasing the already existing food insecurity in the world.

Food security, the Food and Agriculture Organization (FAO) defines food security as a “situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life (Schilling et al., 2020). This definition shows that food security is comprised of four components of availability, accessibility, utilization and stability. This means food security can not be overlooked only to the word. Candel (2018) identified the causes of food insecurity to include “changing diets, yield gaps, effects of climate change, poor governance, social inequality, the functioning of the global trade system, biofuels production, and financial speculation.” Prosekov and Ivanova (2018) also attribute the predictors of increasing food insecurity to “natural cataclysms, conflicts, population growth, and poverty.” Implying that food security is easily affected by numerous factors. Therefore, climate mitigation and adaptation approaches must be adopted before major crisis happens. Certainly, there are many research limitations concerning research conduction and research implementation regarding climate change and impacts on food production and food security (Knight et al., 2008; Firdaus et al., 2019). Many researchers tried to determine and examine the food security in various ways but none of them tried to examine the combined effect of climate change and conflict on food security, which called for need to bridge the gap possessed through the other literatures.

CHAPTER THREE METHODOLOGY

➤ *Research Design*

The research design for this paper is descriptive in nature utilizing the qualitative research approach in attempt to examine the combined effect of climate change and conflict on food security in Jonglei State of South Sudan. The study personifies local community leaders, heads of family government officials from ministry of environment and agriculture, employees from UNFAO, UNWFP and World Bank respectively, based on years of experience, professional experience, and level of responsibility. The desk study is verified from current reports on the subject topic represented by UNFAO, UNWFP and World and counties that made up Jonglei state of Nyirol, Urur, greater Pibor Administrative area, Akobo, Fangak and Ayod to examine the combined effect of climate change and conflict on food security in Jonglei State of South Sudan to collaborate the questionnaire findings.

➤ *The Study Population and Sample Size.*

Kyando, R. (2013) defines population as the entire mass of observations, which is the parent group from which a sample is to be formed. In addition, Kothari (2004), affirms that population is a group of individuals, objects, or items from which the sample is taken for measurement, and it refers to an entire group of person or elements, which have one thing in common. For this study, population covers local community leaders, heads of family government officials from ministry of environment and agriculture, employees from UNFAO, UNWFP and World Bank respectively. The sample size included seventy (70) of those aforementioned professionals in line with Roscoe (1975) rule of thumb, which stated that sample size larger than 30 are appropriate for most research.

➤ *Data Collection Instruments.*

- The questionnaire consisting of two parts (A and B) was developed. In part (A): personal information of the respondent e.g., work experience, level of education. Part (B) asked the respondents semi structured open-ended questions on possible effects of climate change and conflict on food security components of accessibility, availability, food stability and utilization, how climate change, conflict and food security are interrelated in nature, and what climate change adaptations they recommend in Jonglei state of South Sudan that will help create food security.
- The sampled size comprises of seventy (70) respondents from local community leaders, heads of family government officials from ministry of environment and agriculture, employees from UNFAO, UNWFP and World Bank, respectively.
- The questionnaire is presented to respondents through focused group discussions, interviews, and observations.

➤ *Questionnaire Design*

The questionnaire was designed to gather data from professional and experienced respondents with full knowledge on combined effect of climate change and conflict on food security. The respondents were asked on what they think could be the combined effect of climate change and conflict on food security components of availability, accessibility, stability, and utilization, they were further asked to explain in their opinion how climate change, conflict and food security are interrelated in nature, and finally to determine on what possible climate change adaptations they recommend in Jonglei state of South Sudan that will help create food security.

➤ *Data Analysis Techniques.*

The raw data was processed through thorough cleaning, organizing, checking for data accuracy and completeness through reports from World Bank, UNWFP, UNICEF and UNFAO, removing any irrelevant information, and making corrections as needed to uncover the insight of respondents. Deeper descriptions of data from different respondents gotten through focused group discussions, interviews that were recorded to answer all the study desk objectives.

CHAPTER FOUR

RESULTS AND DISCUSSION

➤ Introduction.

This section presents the information collected from personifies local community leaders, heads of family government officials from ministry of environment and agriculture, employees from UNFAO, UNWFP and World Bank on the combined effect of climate change and conflict on food security components of availability, accessibility, stability and utilization, their opinions how climate change, conflict and food security are interrelated in nature, and finally the recommended possible climate change adaptations in Jonglei state of South Sudan that will help create food security as was presented to the professionals to gauged their ideas and opinions. This section looks at the professional's demographics such as educational levels, work experience, age, and area of work. The targeted research samples were seventy (70) professionals with good knowledge on climate change, conflict, and food security. Feedback from seventy (70) respondents were obtained.

➤ Respondents Demography

The study explored and characterized the participants by gender, age group, education level, Household composition and place of employment.

• Gender

The results show that the participation by male was 64% and female 36% as illustrated in chart (1). Generally, the share of male population was more than the female population, and this could likely indicate gender disparity in public and private sector profession dealing in agriculture and environment within the country.

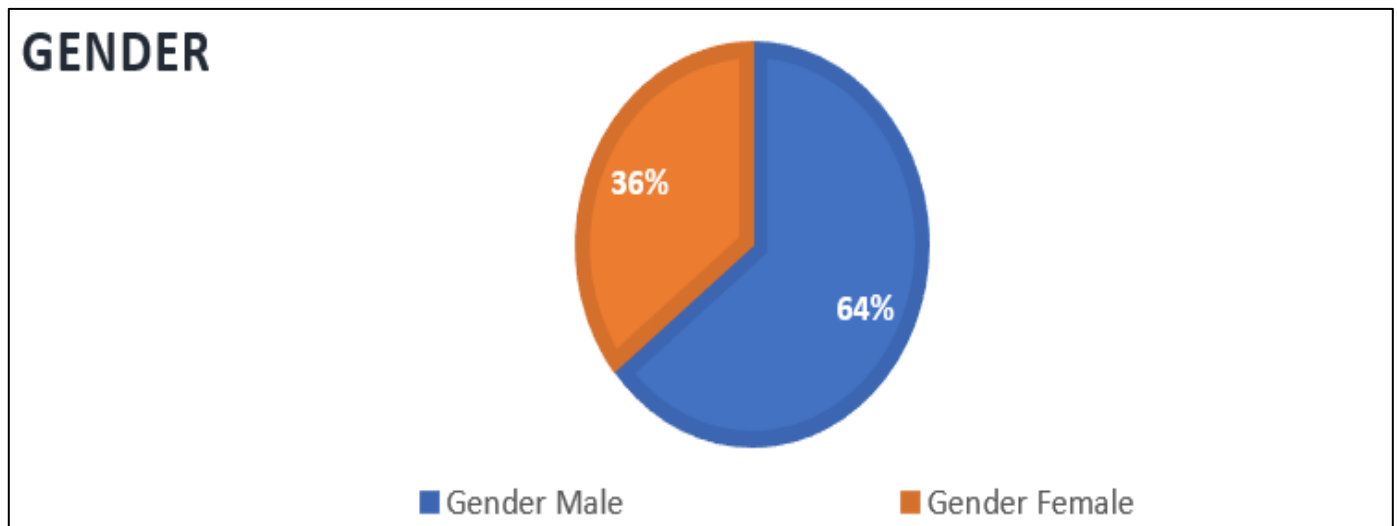


Fig 1 Gender Distribution of Respondents
Source: Primary Source

The results highlight apparent differences between male and female with respect to participation in employment sector and leadership role in the country. There are knowledge gaps in understanding how gender is addressed in public and private employment sector (i.e., ministries; institutions; and partners) can encourage gender mainstreaming (Tanzarn *et al.*, 2013).

- *Age Composition*

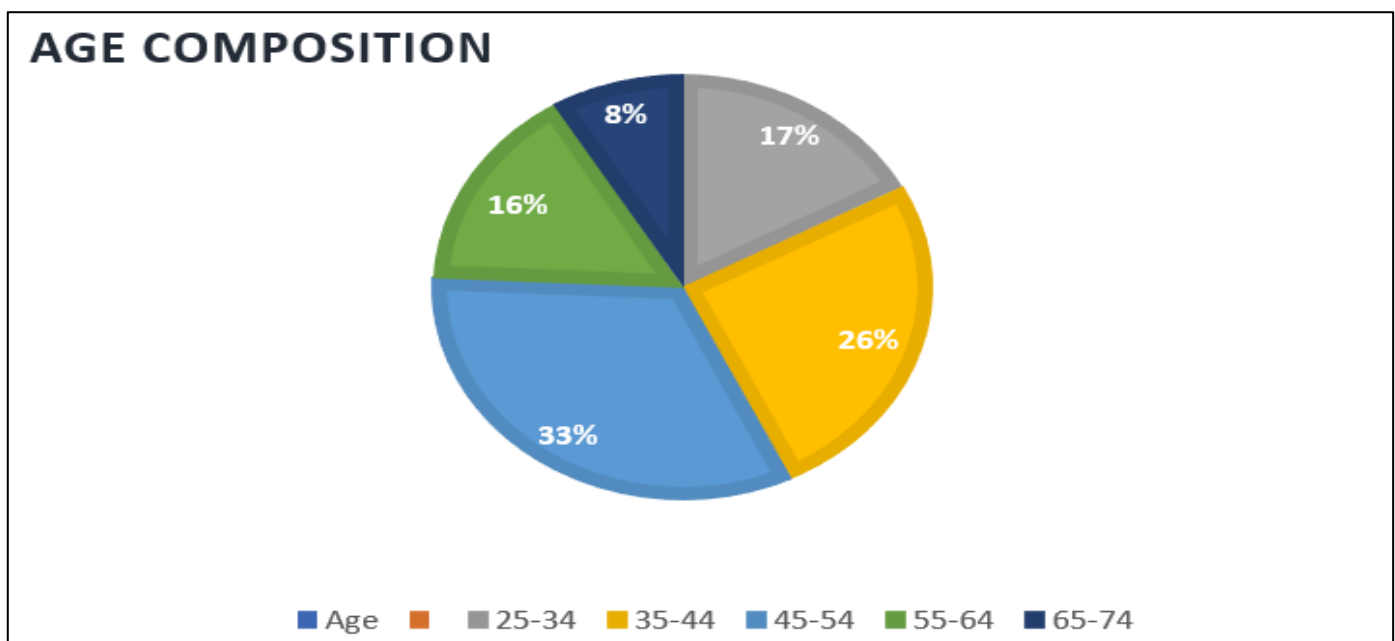


Fig 2 Age Composition of the Respondents

Source: Primary Source

The participation in the study was highest by individuals in the age range of 45-54 years age group bringing up to 33%, followed with 35-44 years age with percentage of 26%, 25-34 years age (17%), 55-64 years age (16%) and lowest of 65-74 comprising of 8% as indicated in the chart above. This finding shows that most of the respondents are mid-level professionals.

➤ *Household Composition of the Respondents*

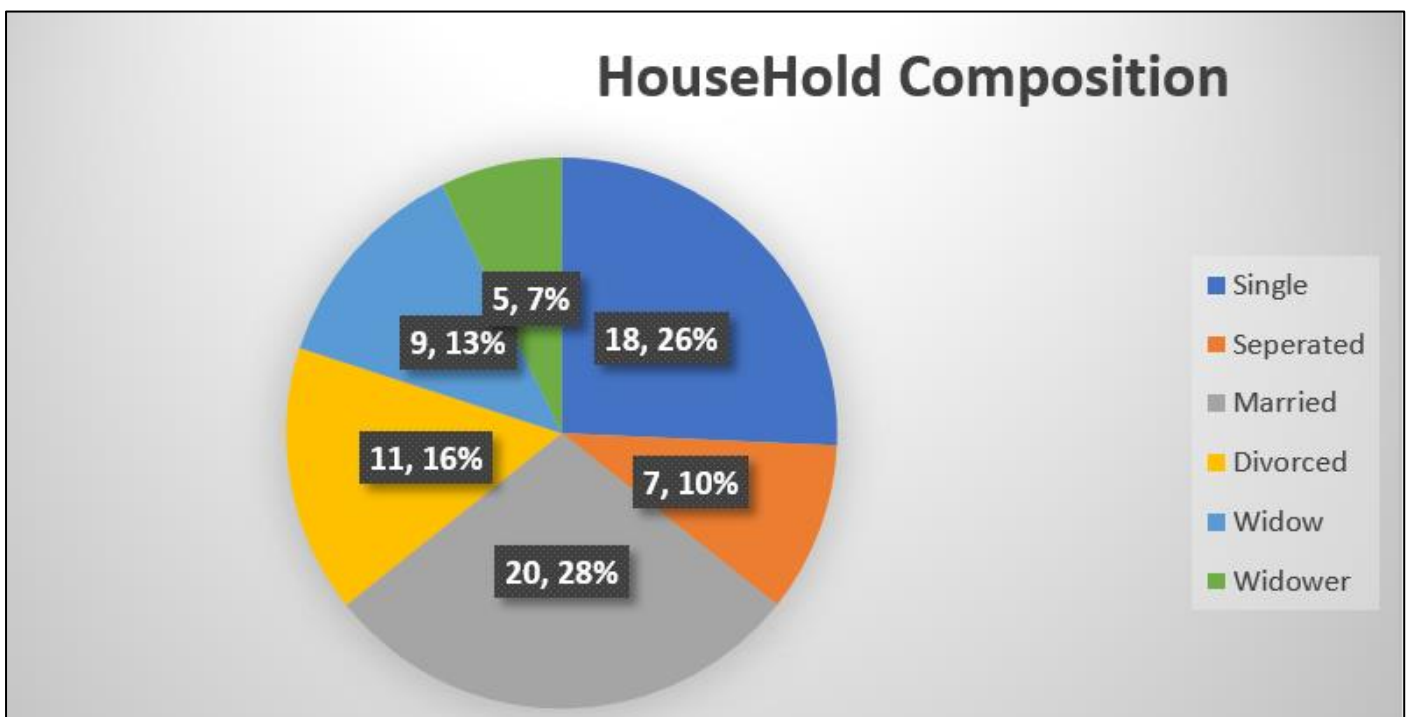


Fig 3 Household Composition of the Respondents

Source: Primary Source

The household composition of the respondent was dominated by married participants comprising of 20.28%, immediately followed by singles of 18.26%, divorced 11.16%, Widow 9.13%, Separated 7.10% and lastly widower 5.7% respectively. This means that most respondents were married head of family then employed singles responded to the questionnaire.

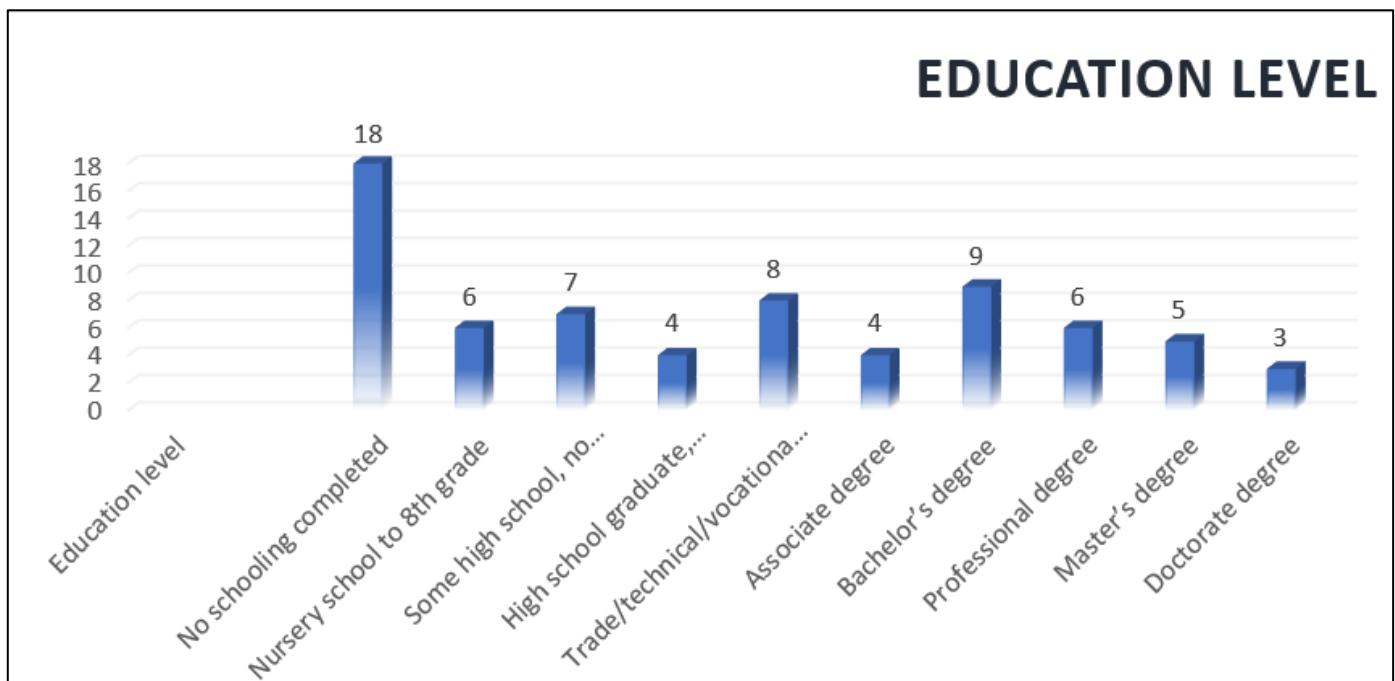
➤ *Education Level of the Respondents*

Fig 4 Education Level of the Respondents

Source: Primary Source

Most respondents for this study have not completed schooling making up to 18.26%, followed by the bachelor's degree with 9.13%, trade/technical/ vocational training with 8.11%, Masters degree 7.10% from nursery to school grade 8th 6.9%, professional degree 6.8% and the lowest with doctorate degree comprising of 2.4%. this statistic shows that the respondents were knowledgeable in their different field of studies.

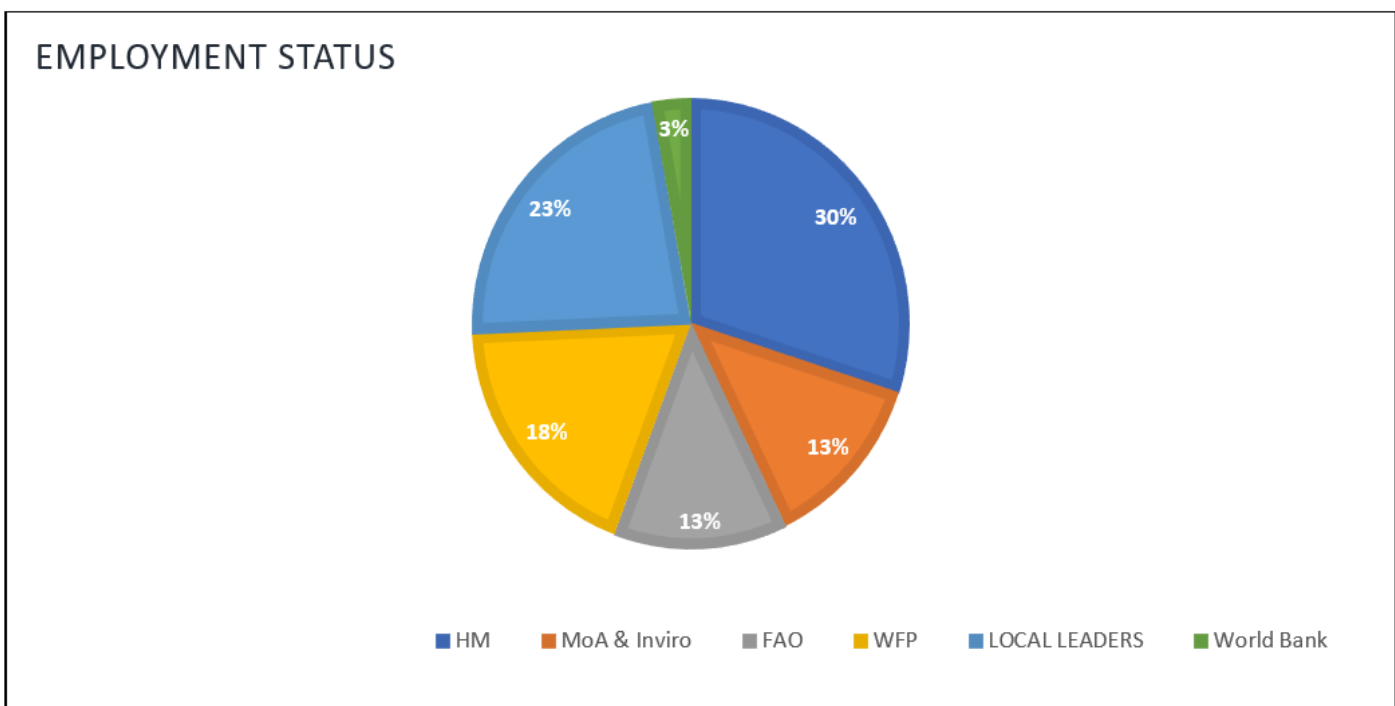
➤ *Employment Status of the Respondents*

Fig 5 Employment Status of the Respondents

Source: Primary Source

Figure 5 above shows the employment status of the respondents within the major selected sectors. Majority of the participants are employed within home management (Heads of Family) presented by 30%, then local leaders presented by 23% participants, respondents employed with UNWFP took 18%, 13% presented the participants employed with Ministry of Agriculture and environment and UNFOA, and lastly with world bank as presented by 3% respectively. This implies that most of the participants are employed locally within their home/ residential settings.

➤ *Effect of Climate Change and Conflict on Food Security.*

The study questionnaire was presented to the respondents who gave in their responses based on their experiences. Most participants asserted that climate change has a great negative effect on food security components of availability, accessibility, stability, and utilization. According to the one of the head of family, he attested that due to climate change, they have been internally displaced, and had to live on a dyke because everywhere was flooded, no where to find market to buy food, thus had to feed on water lilies for survival, as quoted “ My family was submerged with flood water, everywhere was water, as the head of family I had to take my family on top of a dyke built by UN and make a temporary accommodation for my family. I could not even afford two meals a day not to talk of three meals, the only food my family is feeding on are water lilies. He continued; life is hard, even small money was with me but nothing to buy as our market was all under waters as we used to get our food from Juba city but due to floods, all roads were blocked, which makes to have nothing to buy from the market” end of quote. This response was an evident that precipitations cause uncontrollable pours of rain waters which leads to raising of sea water levels. The raised sea water levels caused floods which results into lack of food accessibility and availability.

➤ *Interrelated Nature of Climate Change, Conflict, and Food Security.*

The interrelated nature of climate change, conflict and food security is being presented as climate change possess the effects that causes flooding, droughts, greenhouse gas emission which negatively affects food security. In presence of hunger, the population tends to grab each other's land and food which results into conflict in an attempt in finding solution to the existing problem of hunger. This was proved by a respondent from ministry of Agriculture and environment and local leaders who asserted that “the fighting communities are not to blame, sometimes to fight due to frustrations impacted in them because of natural disaster”. This statement showed how the three variables of climate change, conflict and food security are interrelated.

➤ *Climate Adaptations.*

As means to achieve food security, research respondents argued that there is need for environmental conversation means that need to be put in place like afforestation and digging of dams to observe the excess waters from flooding the environment. They further asserted that, there should be all season crops that are able to survive in all seasons. The World Bank is also helping countries adapt and increase their capacity to weather climate shocks, with projects supporting early warning systems, disaster response, civic awareness, strengthening buildings, and post-disaster recovery.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

➤ *Summary of findings*

- *Effect of Climate Change and Conflict on Food Security.*

The study through the selected sampled population of 70 identified the effect of climate change and conflict on food security as major cause for food insecurity with resulted acute malnutrition, destruction, loss of lives. Climate change leads to dependency syndromes by the population on humanitarian aid, limits accessibility to food, leads to in availability of food, food instability and lack of food utilization.

- *Interrelated Nature of Climate Change, Conflict, and Food Security.*

The responses from participants for the study indicates that climate change, conflict and food security are interrelated in nature, the actions of one lead to the emergence of the others. Due to climate change, there merge food insecurity which leads to conflict.

- *Climate Adaptions.*

Research respondents argued that there is need for environmental conversation means that need to be put in place like afforestation and digging of dams to observe the excess waters from flooding the environment. They further asserted that, there should be all season crops that are able to survive in all seasons. The World Bank is also helping countries adapt and increase their capacity to weather climate shocks, with projects supporting early warning systems, disaster response, civic awareness, strengthening buildings, and post-disaster recovery.

➤ *Conclusion*

Climate change and conflict have negative effects on food security. Food insecurity, destructions, economic under development, conflicts. There is need to factor and implement good environmental adaptations and ways to get long lasting peace by the policy makers to achieve economic growth and peaceful coexistence, country free food insecurity as means to achieve the sustainable development goal.

➤ *Recommendation*

The government, humanitarian and private sector should work hard toward the achievement of the sustainable development goals through implementation of good and sustainable peace keeping body and develop realistic policies for environmental conservations and friendly climate adaptations.

There is need to conduct research on the climate variability, as there is a gap.

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APPENDIX 1**RESEARCH QUESTIONNAIRE USED****Dear Respondent,**

I am Ayite a student at Copper Belt University pursuing a master's degree in Economic Policy. I am carrying out a research study on examining the combined effect of climate change and conflict on food security in Jonglei State of South Sudan.

You are kindly requested to take part in this study by providing information, which will be treated with utmost confidentiality and anonymity. The provided information shall not be used for any other purpose other than for this study. Kindly provide accurate information and return your completed questionnaire to the researcher.

1) BIO DATA

a) Gender of Respondent:	Male <input type="checkbox"/>	Female <input type="checkbox"/>	
b) Age of respondent:	25-34 yrs <input type="checkbox"/>	35-44 yrs <input type="checkbox"/>	45-54 yrs <input type="checkbox"/>
	55-64 yrs <input type="checkbox"/>	65-74 yrs <input type="checkbox"/>	

Employment Status	Household Composition	Education level
<div> <div>HM</div> <div>MoA & Inviro</div> <div>FAO</div> <div>WFP</div> <div>LOCAL LEADERS</div> <div>World Bank</div> </div>	<div> <div>Single</div> <div>Married</div> <div>Separated</div> <div>Divorced</div> <div>Widow</div> <div>Widower</div> </div>	<div> <div>No schooling completed</div> <div>Nursery school to 8th grade</div> <div>Some high school, no diploma</div> <div>High school graduate, diploma or equivalent</div> <div>Trade/technical/vocational training</div> <div>Associate degree</div> <div>Bachelor's degree</div> <div>Professional degree</div> <div>Master's degree</div> <div>Doctorate degree</div> </div>

2) What could be the effect of climate change and conflict on food security components of accessibility, availability, food stability and utilization in Jonglei state of South Sudan.

3) How is climate change, conflict and food security interrelated in nature in Jonglei state of South Sudan.

4) What are the climate change adaptations in Jonglei state of South Sudan that will help create food security.