

UNIVERSITY OF NAIROBI



DEPARTMENT OF DIPLOMACY AND INTERNATIONAL STUDIES

ENVIRONMENTAL STRESS AND CONFLICTS IN THE SAHEL REGION: A CASE STUDY
OF MALI

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SUPERVISOR

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2023

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DECLARATION

I, Njoki Fridah Wanjiru, assert that this thesis is my original effort and to the best of my knowledge has not been submitted to any university for the award of an MA degree in diplomacy.

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DEDICATION

I dedicate this study to my family especially my husband, Peter, and our sons Jaheim and Milan for their continued love and moral support. To my mum Martha Njoki who always knew I would make it to university. To my sister Irene Wangui for her courage to pursue her dreams against all odds. To my niece Angela Njoki, and nephews Dan, and Antony, may you be inspired to follow your dreams because it is never too late.

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ABBREVIATIONS

AFISMA:	ECOWAS International Support Mission in Mali
AQIM:	Ansar Dine and Al-Qaeda in the Islamic Maghreb
AU:	African Union
COP:	Conference of the Parties
ECOWAS:	Economic Community of West African State
EU-EUCAP:	European Union Sahel-Mali Capacity Building Mission
EUTM:	European Union Training Mission in Mali
IMF:	International Monetary Fund
IPCC:	Intergovernmental Panel on Climate Change
MDGs	Millennium Development Goals
MINUSMA:	UN Multidimensional Integrated Stabilization Mission in Mali
MNCS:	Multinational Companies
OECD:	Organization of Economic Cooperation and Development
OPEC:	Organization of Petroleum Exporting Countries
UNDP:	United Nations Development Programme
UNEP:	United Nations Environment Programme
UNSC:	United Nations Security Council
SDGs:	Sustainable Development Goals

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ABSTRACT

Environmental stress and armed conflict in the Sahel region and in particular Mali have been major causes of international concern. They have destabilizing effects on the political, economic, and social aspects of human life. The kind of environment that the present generation hands future generations is contingent on today's global protection and conservation measures. This study set out to examine the drivers of environmental stress in the Sahel region; analyze how environmental stress contributes to conflicts in the Sahel region; and finally critique the effectiveness of the mechanisms used to manage environmental stress and armed conflict in the Sahel region. To achieve these objectives, the study used the environmental scarcity theory by Thomas Homer-Dixon; the theory states that there is a connection between violence and environmental scarcity. It focuses on three issues, the origin of scarcity, the consequences of scarcity, and the various types of conflicts that result. It identifies structural-induced, supply-induced, and demand-induced environmental circumstances that act as drivers of conflict. In its methodology, the study employed a mixed research design to reveal the behavior and perception of the target audience. Primary data was collected through the issuing of questionnaires while document analysis was used as a secondary method of data collection. In addition, a mixed method of data analysis was used to analyze the social circumstances in which environmental stress and armed conflicts occur. The findings of the study are that drivers of environmental stress vary from region to region but the effects are experienced by all. The Sahel is experiencing rising temperatures, droughts, famine, sand storms, floods, pollution, climate change, deforestation, over-exploitation of resources, habitat destruction, and other weather occurrences impacting the economic, political, social, and food security of Sahelian states. The impact will depend on the resilience measures in place. Secondly, Africa and Sahel in particular have experienced ongoing armed conflicts that hinder good governance which is essential in formulating environmental protection policies and their implementation. National power, ethnicity, ideology, and resources are the top causes of armed conflicts in Africa and finally, the management of environmental stress may currently be overshadowed by the immediate security concerns in the Sahel region. It may not be the priority due to scarcity of resources and other competing factors but it can be considered. Therefore, the study recommends Mali should overhaul the colonial governance organizations and effect democracy that responds to citizens' needs effectively, Address the political crisis by returning to civilian rule through free, fair, and transparent elections, Ensure fair distribution of resources and infrastructure, Create economic opportunities for the youths to reduce the likelihood of them getting recruited into insurgent groups and institutions of justice and mediation should be strengthened and respected to mitigate eruption of armed conflict.

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CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Background to the study

Environmental stress refers to any environmental factor that causes pressure, trauma, or strain on an organism or ecosystem.¹ It can be caused by a multiplicity of factors including pollution, climate change, habitat destruction, natural disasters, and human activities. Environmental stress can have significant negative impacts on both the physical and biological components of an ecosystem. For instance, industrial waste can affect agricultural production (contaminating soil and water) and the health of the consumers. Climate change can lead to life-threatening meteorological conditions like deluges, famines, and heat waves, which can damage the ecosystems and harm organisms living within them.

Human activities such as overfishing, poaching, and unsustainable agricultural practices also contribute to environmental stress. These activities can lead to the exhaustion of mineral deposits, damage biodiversity, and habitat destruction. Additionally, the usage of exhaustible resources such as fossil energy adds to climate change and air pollution, which further exacerbates environmental stress. The various environmental stresses include climate change, pollution, loss of ecological diversity and habitat, change in land use, and overexploitation of resources in a manner not sustainable.²

The Sahel region has a semi-desert climate, stretching across Africa, from the Red Sea to the Atlantic Ocean covering, Eritrea, Djibouti Ethiopia, Sudan, Chad, Mali, Niger, Nigeria, Burkina

¹Schulte P.M, 2014 “What is environmental stress? Insights from fish living in a variable environment” *The Journal of Experimental Biology* 217, 23-34

² ibid

Faso, Senegal, and Mauritania. It is a region that is highly vulnerable to environmental stress, with recurrent droughts, desertification, and soil degradation being some of the most pressing challenges.³ One of the main roots of ecological stress in the Sahel is climate change. The area has witnessed a substantial decrease in precipitation over the past couple of years, which has led to prolonged droughts and the drying up of rivers and lakes. This has had a devastating impact on agriculture and livestock production, which are the core bases of livelihood for many in the region. The Sahel is a critical region for biodiversity and provides important ecosystem services, including carbon sequestration.⁴ The degradation of the Sahel's environment is likely to exacerbate climate modification and threaten global food safety.

According to the 2020 ND-GAIN Index, Sahel states apart from Mauritania are in the upper 15% of states most susceptible to weather change. This vulnerability report by Notre Dame University looks at six key vulnerability areas namely; food security, availability and access to water, access and affordability of healthcare, ecosystem services, human habitat, and infrastructure.⁵ Mali despite being Africa's third largest gold producer, is one of the poorest in the continent. Mali has an active conflict with coups and counter-coups becoming a common feature while still handling the Tuareg rebellion.

The armed struggle in Mali has its roots in several historical, political, and economic factors. In 2012, a Tuareg rebellion in northern Mali triggered a political crisis that led to a military coup and the takeover of northern Mali by various Islamist rebels, such as Ansar Dine and Al-Qaeda in the

³ Heinrigs, P., 2010 "security implications of climate change in the Sahel Region: policy consideration" Sahel and West Africa Club Secretariat and OECD

⁴ Locatelli B., 2016, "Ecosystem Services and Climate Change" Routledge Handbook of Ecosystem Services, Routledge, London and New York, ISBN 978-1-138-02508-0, pp. 481-490.

⁵ The university of Notre Dame, 2022 "Notre Dame Global Adaptation Initiative 2020 Ranking" <https://gain.nd.edu/our-work/country-index/> accessed 27th March 2023

Islamic Maghreb (AQIM). The conflict involves various parties, including the Malian government, armed groups in the north, foreign forces, and international organizations.⁶ The Malian government is supported by France, which has a significant military presence in the country, as well as other global establishments such as the United Nations and the African Union. The conflict in Mali is also driven by various socio-economic factors, including poverty, inequality, and the existence of valuable natural resources such as gold and uranium. The control over these resources has been a key factor in the conflict, with armed groups in the north seeking to control and exploit them for their benefit.⁷

Armed conflict impacts the environment in various ways. Other than deaths resulting from armed conflict, it also affects the development goals of the society through mass displacement of people, refugee crisis, illegal migration, capital flight, destroying the social fabric, destruction of infrastructure, and increased disease burden due to lack of proper sanitation facilities in refugee camps among others. Armed conflict therefore affects all spheres of human life, that is, political, economic, and social. Generally, countries that have been engaged in armed conflicts have less development than those that have been peaceful. Research done to track the success of the UN Millennium Development Goals (MDGs) established that armed conflict sets back development by great margins, for instance in Burundi, the war set the country back by 30 years.⁸ According to FAO, Mali faces three types of conflicts: “over natural resources; Conflicts over state control and governance; and conflicts arising from the prevailing situation of insecurity in the country.”⁹

⁶ Ananyev M and Poyker M., 2023 “identity and conflict: evidence from Tuaregs rebellion in Mali” World Development Volume 161

⁷FAO, 2021. “Mali – Analysis of conflicts over natural resources” A Summary. Rome, Italy

⁸ Gates S., et al., 2012 “development consequences of armed conflict” World Development Vol.40, No.9 pp.1713-1722 <https://dx.doi.org/101016>

⁹ Ibid p.3

1.2 Statement of the Research Problem

The Sahel region has been unstable and in armed conflict for a while now, the armed conflict is primarily rooted in weak economic, political, and governance structures. Environmental fragility adds to the risks faced by the Sahel region including reduced climate change resilience, food insecurity, economic stagnation, and conflict. The region has a rapid urban population that is largely unregulated thereby putting pressures on available resources, food insecurity due to desertification and natural resources mining, and its own attending problems including environmental damage, rent and revenue collection and distribution, and potential funding source for rebel groups.

As with many conflicts, efforts to resolve them do not include environmental protection since environmental stress is not included as the cause of the conflict or a contributor to the conflict. Efforts are being made to address environmental stress in the Sahel, including reforestation programs, promoting sustainable agriculture and livestock production practices, developing alternative livelihoods, climate change resilience, transparency in handling rates and revenues from extractive industries, and democratization among others.¹⁰ These efforts are separate from political efforts to end armed conflict in the region. However, the challenges are enormous, and there is a need for sustained efforts and international cooperation to address the primary origins of environmental stress in the Sahel. Past efforts including discrediting Islam and radicalization have proved ineffective in curbing the violence. However, policy responses remain fragmented and fail to capture the link between environmental stress and other types of risks. Despite concerted efforts to manage environmental stress and armed conflict in the Sahel, the successes have been few and

¹⁰ The World Bank, 2011, 'Sahel and West Africa program in support of the Great Green Wall Initiative'

far between, this background informs the researcher's decision to study the management of environmental stress and conflicts in the Sahel region with a case study of Mali.

1.3 Study Questions

1. What are the key drivers of environmental stress in the Sahel Region?
2. How is environmental stress contributing to conflicts in Mali?
3. Are the mechanisms used to manage environmental stress and conflicts in Mali effective?

1.4 Study Objectives

The overall aim of this study is to examine environmental stress and conflicts in the Sahel region: a case study of Mali.

The precise aims are:

1. To examine the drivers of environmental stress in the Sahel region.
2. To analyze how environmental stress is contributing to conflicts in Mali
3. To critique the effectiveness of the mechanisms used to manage environmental stress and conflict in Mali.

1.5 Literature Review

A literature review is an inspection of the academic basis of a particular subject. It offers a summary of the available information. It helps the researcher to find applicable concepts,

approaches, and gaps in the present research thereby generating new knowledge.¹¹ This study will employ both theoretical and empirical literature evaluations.

1.5.1 Theoretical literature review

In an endeavor to get the best theory to link environmental stress and armed conflict, the study looked at various environmental and armed conflict theories.

1.5.1.1 Economic Theory of Conflict

This theory indicates armed conflicts are a result of a threat of scarcity and explains the economic undercurrents resulting in armed conflict in the world. The theory was originally advocated for by Karl Marx, and Claude Ake and recently by Anke H and Paul Collier¹² Communities usually fight over natural resources, farmlands, grazing fields, and water resources among others, and political power and scarcity cannot be delinked from each other. Scarcity or dread of lack is frequently a powerful force for political rule and the desire to control resources. The threat of famine and mismanagement of scarce resources can push conflict over resource management as well, something that seems to affect the world. Both the scarcity and abundance of resources cause conflict. Using this theory, economic justice and safeguarding of human privileges would be some of the ways one can mitigate armed conflicts.

Collier argues that the presence of natural resources, and how they are (mis)managed can serve as potent drivers of (under)development. He further argues that natural resources influence both the political and economic systems which are interlinked. When handled well, rents and revenues from

¹¹ McCombes S., 2019 “What Is a Literature Review | Step-by-Step Guide & Examples”
<https://www.scribbr.com/literature-review/dissertation/>

¹²Charles, A. Osah, G. ©2018 “ECONOMIC THEORY OF CONFLICT” *International journal of Advanced Research (IJAR)* DOI:10.21474/IJAR01/8036 Accessed 10th April 2023

resources will help governments perform their core duty of providing public good, thereby bringing development. The same revenue and rents can be used by the elite to keep a regime in power and consequently be used to fuel rebellions against the government. Countries that have managed to be accountable in the handling of rents and revenues have developed and the resources have been a blessing while where accountability is lacking, conflict occurs.¹³

1.5.1.2 The Honey Pot Theory

Soysa explains that eco-violence is a survival war against resource scarcity which strains the socioeconomic aspects of life. Resource abundance becomes the ‘honey pot’ fought for. In abundance, the resources are used to fund the armed conflict. This war economy becomes a major hindrance to peace efforts amplifying greed and grievances in society.¹⁴ Kahl argues that rebel groups are encouraged to form and fight over abundant extractive resources such as oil, gold, and diamond. In doing so, the motive is greed, not grievances. The rebel groups want to control rich-resources areas for their benefit and profit.¹⁵ Nevertheless, Kahl argues that this hypothesis ignores key issues such as fight can only occur for non-renewable resources and that not all rich-resource countries witness armed conflict rather it is only weak governments that cannot be able to deal with rebellion. This is illustrated by the happenings in African countries where armed conflict and the presence of abundant natural resources go hand in hand while in strong democracies such as Norway, the presence of oil did not lead to war instead the country has mechanisms to develop

¹³ Collier, P. (2010), “the political economy of natural resources” *Social Research: An International Quarterly* 77(2):1105-1132

¹⁴ Soysa, I., 2002, “ecoviolence: shrinking pie or honeypot?” *Global Environmental Politics* uploaded in the *MIT Press Journals*

¹⁵ Kahl, C.H., 2014, “plight or plunder/ natural resources and civil war” University of Minnesota, Ridgway Working Group pp1-22

sustainably, has an open accountable system in handling the rates and revenues, and invests surplus through the Oil Fund.¹⁶

1.5.1.3 Resource Curse (paradox of plenty) Theory

The term ‘resource curse’ was first used in 1993 by Richard Auty, to describe a situation where people fight over resources especially the non-renewable ones like oil, gas, and minerals, and are unable to use the resources to change their fortunes.¹⁷ It signifies the political, social economic challenges that resource-rich countries experience precisely because there will be competition over the control of the said resources. This normally occurs due to vested interests of leaders and multinational corporations (MNCs). The presence of these resources affects the character of a state’s leadership, upholding democracy and provision of services to the citizenry. Over-dependence on natural resources also affects the production of other goods and services especially agriculture which highly depends on a good environment.¹⁸

Kahl argues that dependence on natural resources makes countries susceptible to price unpredictability and produces crowd-out effects that hurt lasting financial growth. The resource curse hypothesis further argues that the existence of abundant natural assets funds the creation of dictatorial governments and exploitation. Such governments are major targets for violent uprisings and to stem this, they use the same resources to buy political support, especially amongst their ethnic groups¹⁹ Resource curse hypothesis is now used to study why some resource-rich countries succeed while others fail.

¹⁶Torres, C.S.R, 2015, “Norway oil and gas sector: how did the country avoid the resource curse? *Revista tempo do mundo* vol.1, No.1 pp 93-106

¹⁷ *ibid*

¹⁸ *Ibid* p.7

¹⁹ *Ibid* p.7

1.5.2 Empirical Literature Review

An empirical literature review examines past empirical studies of a research question. For this research, the researcher will review recently available information concerning environmental stress and armed conflict and historical background from the global, regional, and national levels as well as strategies used to address environmental stress and armed conflict.

1.5.2.1 Key drivers of environmental stress.

The environment is the foundation of the existence and survival of every living being. Environmental protection has become a developmental strategy for most countries today. Global environmental issues have become the center stage of political debate since global warming (greenhouse gas,) affects all.²⁰ In Africa, people particularly depend on land for survival, land scarcity is a major trigger of armed conflict. This is worsened when natural resources such as oil and gold are discovered, and communities, governments, and multinational companies seek to control resource extraction leading to violent conflict associated with resource competition.

Maurya et al. argues that environmental stress is triggered by both human and natural activities. Natural activities such as rising temperatures, droughts, and flooding are common in the Sahel region. Wildfires, earthquakes, storms, and global warming can permanently destroy the ecology of an area. Human activities including deforestation, water, air, and soil pollution, rural-urban migration, industrialization, and population growth are key drivers of environmental stress.²¹ Choudhary et al., say that human disturbance is the primary cause of environmental stress particularly in industrial activities. Industrialization brings with it economic wealth for states and

²⁰ Shahzad, U., 2015, "Global warming: causes, effects and solutions" *Durreesamin Journal* (ISSN: 2204-9827) August, Vol 1 issue 4,

²¹ Maurya et al., 2020, "an introduction to environmental degradation: causes. Consequences and mitigation" pp 1-20, DOI:10.26832/aesa-2020-edcrs-01

their people, but it also requires more energy consumption, brings pollution, and congestion, encourages urbanization, clearing of forests for settlement and food production.²²

Nelson classifies drivers of environmental stress into two categories; indirect and direct. Indirect drives include demographic, socio-economic, political, cultural, religious, and technological changes while direct drivers are pollution, change in land use, climate change, overexploitation of natural resources, and invasive species and diseases.²³ The direct and indirect drivers interact and interlink. According to Tian et al., biodiversity loss, pollution, global warming, desertification, and extinction of species drive environmental stress. They particularly point out land degradation as a key factor.²⁴ Africa in its quest to feed its growing population has embraced chemical fertilizers and deforestation for food production and settlement. Water sources are drying up at alarming speed, for instance, Lake Chad which has reduced in size by 90%. Experts blame the shrinking on climate change, population growth, and the volatility in the region.²⁵

Burke et al. argue that rising temperatures are impacting the likelihood of armed conflicts.²⁶ Africa's economy is largely dependent on rain-fed agriculture. Agricultural products take the bulk of Africa's exports and therefore decreased rainfall will affect yields which will affect revenue. Burke argued that conflicts are likely to increase during the drier season as people migrate to look for food, water, and pastures. Environmental refugees are becoming a key security threat internally and externally. The reduced revenue also affects the government's ability to sustain people's needs.

²²Choudhary et al., 2015, "environmental degradation: causes, impacts and mitigation" Conference Paper, Rajasthan Technical University

²³ Nelson G.C. "ecosystems and human well-being: current states and trends" MA Scenarios Volume 1

²⁴ Tian et al., 2004, "research progress in Butachlor degradation in the environment" *Pesticides-Shenyang*, 43(5):205-209

²⁵Pham-Duc et al., 2020, "the lake Chad hydrology under current climate change", *Scientific Reports* 10:5498, https://doi.org/10.1038/s41598-020-62417_W

²⁶ Burke et al., 2009, "warming increases the risk of civil war in Africa" *PNAS* vol.106/No.49

This economic hardship may become a catalyst for the escalation of rebellion, a rebel soldiers' recruitment tool, and at times regime change.

Kahl contends that environmental stress becomes a factor in armed conflicts when combined with political exclusion, ethnic divisions, and marginalization. Due to this exclusion, such groups lack peaceful settlement of disputes thereby triggering armed violence, for instance, the Tuaregs in Mali. Environmental stress further weakens marginalized groups leading them to rebellion.²⁷ In his "plight or plunder" paper, Kahl using the honey pot and resource curse hypotheses argues that rebel groups will form where there is an abundance of resources and weak governments. He further argues that abundance in one resource will lead to overdependence on that resource, consequently, neglect of other areas of the economy occurs. When that resource becomes scarce or prices go down, governments will be unable to provide services to the people who are likely to revolt.²⁸

The Tuareg and Arab communities in Northern Mali have rebelled against the central government four times, in 1963, 1990-1996, and 2006, and the ongoing conflict started in 2012. In all of those times, political and economic marginalization have been the key issues. The government is accused of paying more attention to Southern Mali where there is gold and cotton while neglecting the agricultural north. In the ongoing conflict, the Tuareg are demanding for full autonomy of their state, Azawad.²⁹ The government response has always been military pushing more people to join the rebel groups.

Ishiyama and Pechenina studied the likelihood of environmental degradation causing genocide in Rwanda and Darfur, they found out that population growth, land pressures, and water scarcity do

²⁷ Kahl, C. "states, scarcity and civil strife in the developing world"

²⁸ Ibid p. 7

²⁹ Davis, R.,2018," addressing conflicts in Mali: political, humanitarian and security problems" *SIR Journal*

contribute to conflict but they have to be accompanied by other political and socio-economic factors. For environmental degradation to cause conflict, two conditions must be met, one is group identity where one group feels unfairly treated and two, there is no mechanism to air grievances.³⁰

Hussona argues that climate change is a contributing factor to armed conflict in Africa; it is a threat multiplier.³¹ Across the Sahel region from Senegal to Sudan, prolonged drought, desertification, and soil erosion have resulted in decreased productivity of the land, as well as changes in grazing patterns. In Sudan, this has contributed to a civil war lasting for over three decades. In northern Nigeria, aridity has eradicated many livelihoods that depend on farming and livestock production. This makes young men and women vulnerable to recruitment by terrorist groups like Boko Haram. The political upheaval in the region has rendered the governance structure weak or non-existent. Poor governance limits environmental protection efforts.³²

1.5.2.2 The Nexus between environmental stress and conflicts

The environment, access, and distribution of mineral deposits have contributed to the start and escalation of many wars. Environmental clashes manifest as ideological, political, socio-economic, ethnic, religious, or territorial conflicts.³³ Economic issues arise mostly in the distribution of rents and revenue of the natural resources among the government, the local community, and the multinational companies extracting the resource, where the government and MNCs benefit at the expense of locals.

³⁰ Ishiyama, J. and Pechenina, A. 2012, "environmental degradation and genocide, 1958-2007. *Ethnopolitics*, 11: 2,141-158, DOI:10.1080/17449057.2012.656836

³¹ Hussona J.,2021 "How is climate change driving conflict in Africa?" ReliefWeb accessed 7th January 2022 <https://aoav.org.uk/2021/how-is-climate-change-driving-conflict-in-africa/>

³² Mbay,A.A and Signe, 2022, "climate change, development and conflict-fragility nexus in the Sahel" Brookings Global working papers

³³ Libiswewski S., 1992 "What Is Environmental Conflict? A paper presented at the first coordination meeting of the Environment and Conflict Project (ENCOP)in BerneKurich April 30- May1, 1992

Ole Theisen and others in their ‘Climate wars?’ paper conclude that after examining different locations, the amount of rain they receive, drought mitigation measures, political relations, and ethnic composition, there is little evidence of environmental stress (in this instance, drought) and the start of armed conflicts. They caution over emphasizing environmental security as a security issue and that it has little bearing on policymaking. They argue environmental stress on its own does not cause armed conflict, it has to be accompanied by political exclusion, weak governance structures, historical experiences, cultural discrimination, ethnic division, general feeling of marginalization, and lack of access to peaceful means of settling disputes.³⁴ They further argue that environmental stress can trigger latent conflict to become active if the government is unable to provide public goods and resilient measures due to economic shocks occasioned by decreased yield in rain-fed agriculture which in turn affects government revenue. Another possibility would be tensions between host and home countries of environmental refugees and individuals whose income has been negatively affected by the drought would be more incentivized to become rebel soldiers.

Collier, in his book *The Bottom Billion*, contends that four kinds of traps hinder developing countries from efficiently and effectively using their resources to develop namely, the conflict trap, the natural resource bottleneck, being non-coastal with unscrupulous neighbors, and bad authority in power and poor economic policies in a small country.³⁵ Natural resources have been used to fund both government and rebel groups in different armed conflicts. The parties in an armed conflict will fight over access and control of abundant natural resources, which provides incentives to start and sustain an armed struggle. In dealing with such conflicts, the economic status of the

³⁴ Ole Magnus Theisen et al, 2011 “climate wars? Assessing the claim that drought breeds conflict” *International Security*. Vol 36, No 3 (winter 2011/12), pp 79-106

³⁵ Collier P., 2008 “the bottom Billion: why the poorest countries are failing and what can be done about it”, Oxford University Press; 1st Edition

warring groups becomes a key part of the peace deals. This is informed by the idea that the armed struggle might be more economic than political. Accessibility of natural resources can also extend armed struggle as they afford rebel groups and warlords a reliable source of funds with which they can withstand combat rendezvous for long. Where parties entangled in a skirmish have a common interest and are obsessed with the utilization of such resources, a jointly advantageous stalemate arises. In such a status quo the war parties are not particularly interested in the notion of reconciliation since economic gain and profiteering are guaranteed with continued chaos.

Buhaug's paper "Climate Not to Blame for African Civil Wars" agrees with Ole Thesian that the civil wars can be explained by ethnic discrimination, political marginalization, and poor economic structures and adds the end of the Cold War which in essence ended state-- state wars and focused attention on internal strife.³⁶ In his criticism of Burke et al., whose work linked civil wars and rising temperature in Africa, Buhang dismisses the methodology used to attain the said data and the location covered which excluded the Sahel region which is normally used as a scarcity-induced conflict example. Buhaug redefines civil war to include those wars with less than 1000 deaths, examines the climate conditions before war erupts, and how these conditions change annually.

Afyare and Abdullahi while writing on the Somali conflict illustrated how in Somalia the struggle over assets (such as land, water, and natural gas) and power has seen the country be at war since the early 90s.³⁷ This resource scarcity and subsequent conflict make it difficult to have peace deals, instead, the conflict becomes protracted. The presence of natural resources can bring friends and foes together and can also keep them apart. The actors can be labeled criminals or innocent

³⁶ Buhaug H., 2010, "climate not to blame for African civil wars" Centre for the Study of Civil Wars, Peace research Institute Oslo (PRIO), 0134, Oslo Norway

³⁷ Afyare A. E. & Dr Abdullahi B. © 2006 "The Somali Conflict: Root causes, obstacles, and peace-building strategies" *African Security Review*, Vol 15:1, PP. 32-54, DOI:1080/10246029.2006.9627386

depending on which side they fall in and whose interests they are protecting. In Sierra Leone, government soldiers become rebels during the night.³⁸ Thus, undermining the country's security and development.

1.5.2.3 Mechanisms used to manage environmental stress and conflicts.

As with any other conflict situation, there are several management efforts to the environmental stress and conflict in the Sahel region. These efforts are political and economic but to have an all-around conflict transformation, environmental protection must be factored in.

Cooper did a summary of the various natural resources management efforts in the Sahel. Top on the list is transparency in handling revenue accrued from extractive resources such as gold, oil, and uranium. In 2018, a global standard to promote accountable and open management of non-renewable resources -the Extractive Industries Transparency Initiative (EITI)- was started. The program monitors Multinational Corporation activities in the host country, its participation in community development, the government revenue, and how rents are distributed with the community. Other efforts are geared towards renewable resources such as agricultural land and water through rehabilitation of weak soils, reforestation, land use to accommodate farmers and pastoralists, and training locals on climate change resilience.³⁹

Doso Jr. suggests the application of sustainable agriculture to curb environmental stress in the Sahel region. This is done through agroforestry where crops and trees are grown together to rehabilitate forests, while at the same time increasing production of food crops. He also advocates for the use of technology such as nitrogen fixing trees to help with soil nutrient content and

³⁸National Advocacy Coalition on Extractives (NACE) ©2009 "Sierra Leone at the Crossroads: Seizing the chance to benefit from mining" www.christianaid.org.uk/sierra-leoneat-the-crossroads.pdf accessed 24th March 2023

³⁹ Cooper R, 2018, "Natural resources management strategies in the Sahel"

integrated farming, that is, crop farming and livestock keeping to help improve the livelihoods of the people.⁴⁰

The Sahel region is battling violent extremism, coups, and counter coups and insurgencies. The epicenters of these conflicts are the border of Mali, Burkina Faso, and Niger (Liptako-Gourma region) and the borders of Chad, Niger, Cameroon, and Nigeria (Lake Chad region) and spreading to West Africa. Several groups are operating in the same region which is a security nightmare for the region, Africa, and the world. There are efforts to de-escalate insurgencies in the region. Imran suggests the use of a multifaceted approach to peacebuilding, this approach would include development, access to services, protection of human rights, the democratization of the region, security sector reforms, building trust amongst citizens, rebel groups, and the government, and removing benefits accrued from war economies.⁴¹

1.5.3 Gaps in the Literature

Environmental stress became an issue in the international arena after the UNDP Human Development Report 1994 that linked environment, development, and peace. Environmental stress is directly linked to development and peace. In peacetime, environmental stress and human security as a whole is prioritized both in funding, policy formulation, and implementation but in conflict situation, not so. Since then there has been a concerted effort to protect the environment but the link between environmental stress and conflict remains a grey area. In most occasions, political solutions to conflict do not factor in environmental degradation as a contributor to conflict. In the reviewed literature, the two phenomena are discussed separately and when studied

⁴⁰ Doso Jnr, S., 2014, "land degradation and agriculture in the Sahel of Africa: causes, impacts and recommendations" *Journal of Agricultural Science and Application* DOI:10.14511/jasa.2014.030303

⁴¹Inman K., February 23, 2023 "Africa's Sahel Needs a Coordinated Plan on Extremist Violence: As the Sahel region's turmoil spreads, curbing it requires responding to many overlapping crises." <https://www.usip.org/publications/2023/02/africas-sahel-needs-coordinated-plan-extremist-violence>

together, there is no definitive link and this study wants to link them and establish the causal relationship between the two. Most of the interventions on environmental stress are geared towards reforestation. Research shows that there are other ways to conserve the environment such as proper city planning, population growth control, and improved governance. This study will go ahead to examine these interventions and their effectiveness in managing environmental stress and conflict in the Sahel region.

1.6 Justification of Study

Environmental stress and conflicts are intertwined in the study of international relations. The literature available on the relationship between environmental stress as a contributor to conflict especially military conflict is not a lot. Oftentimes, the two phenomena are studied separately. This study will add to the available literature to find lasting solutions, research into the causes is imperative. The study will examine the history and actors of conflicts in the Sahel region and how the increased environmental stress is aiding the conflict. The research will also help students wishing to pursue this line of thought by making their research a bit easier. It will build the academic world.

The study will help policymakers appreciate the bearing of environmental stress, on armed conflicts and how to mitigate it. It will help come up with policies that help environmental protection thereby maximizing the benefits and reducing the negatives that arise. This study will therefore be critical in formulating policy papers that would be used by practitioners in both the private sector and government departments. Practitioners in the area of managing conflicts and environmental degradation will significantly benefit from this study.

Civic education is a crucial part of transforming armed conflicts. This study will provide the public with information on the part of the environment as a source of conflicts, the escalation of armed conflicts, and how to include environmental protection clauses in any peace deals. The public needs to understand how they contribute to environmental stress and how they can be involved in its conservation.

1.7 Theoretical Framework

The study will use the environmental scarcity theory by Thomas Homer-Dixon; the theory states that there is a connection between violence and environmental scarcity.⁴² It focuses on three issues, the origin of scarcity, the consequences of scarcity, and the various types of conflicts that result. It identifies structural-induced, supply-induced, and demand-induced environmental circumstances that act as drivers of conflict. A lot of environmental issues trigger and/or exacerbate conflicts in the Sahel region. This ranges from a struggle by insurgent groups to control resources and political power, local squabbles between farmers and pastoralists to climate change.

The Homer-Dixon theory emphasizes local events as underlying powers, particularly changes in the environment and increased demographics.⁴³ As such, environmental scarcity ends up decreasing or allowing for unequal distribution and access to renewable resources, such as water bodies, foraging areas, woodlands, aquatic assets, agronomic acreage, and wildlife. In regions where the population keeps growing, available resources must be shared in any form among those who live there, parties who actually may have diverse interests, such as farmers, pastoralists, and even metropolitan dwellers.

⁴² Glaser, S. M.et, al ©2019 “Armed conflict and fisheries in the Lake Victoria basin” *Ecology and Society*, Vol 24(1):25, accessed 2nd February 2022 doi.org/10.5751/es-10787-240125

⁴³Homer-Dixon, T. © 1991 “On the Threshold: Environmental Changes as Causes of Acute Conflict.” *International Security Journal* Vol. 16, no. pp. 76–116. doi.org/10.2307/2539061.

In the environmental-conflict framework, unfulfilled needs for such resources as pasture or water fire up conflict among the locals. In Homer-Dixon's environmental scarcity paradigm,⁴⁴ different groups of livelihoods may begin to come up with a resource capture where everyone seeks to access and even control, where possible, the main natural resources locally found and actively exclude others in the process. The Sahel region communities started insurgencies when they realized they were not benefitting from the natural resources and that its exploration was interfering with other important resources such as land and water. Increased scarcity of these key renewable resources results in livelihood insecurity, poverty escalation leading to economic deterioration, migration, and at times civil strife compounded by the fact that all these pressures blend with other different pressure crescendos leading to violence in the Sahel region and globally.

Supply-induced scarcity occurs when there is environmental degradation, a breakdown in the delivery of infrastructure, or a reduction in the supply of resources. In the case of the Sahel region, reduced supply leaves the affected communities battling for the few scarce resources. Demand-induced scarcity happens when the supply of the resource cannot meet demand. Structural-induced scarcity happens when there is unequal access to resources. This inequality can be a result of government policies, social-cultural issues, and economic barriers like inadequate infrastructure. Homer-Dixon notes that the demand, supply, and structural scarcities have to be accompanied by political, economic, and cultural aspects for them to cause conflicts.

The theory also emphasizes resource capture and ecological marginalization. Resource capture, on the one hand, is when powerful groups can possess resources and control their distribution to their advantage leaving the poor majority in society to experience the harshness of environmental

⁴⁴ Homer-Dixon T., 1994 "Environmental Scarcities and Violent Conflict: Evidence from Cases" *International Security Journal* Vol 19, No. 1: 5-40

scarcity. On the other hand, ecological marginalization occurs when population increase and limited pastures and water force people to migrate to easily ruined highlands; the destruction and deforestation add to financial sufferings that encourage uprising and revolt.⁴⁵ This is illustrated by the dying of Lake Faguibine which the Tuareg had moved to after drought in their region. For settlement, deforestation occurred and now the lake is no more, the residents are now either migrating or fighting the ever-increasing sand dunes. Homes and schools have been buried.⁴⁶

This theory will help the research to assess the environmental stress of scarcity and conflict in the Sahel region as it advances the causes of conflicts and suggests how to manage environment-based conflicts. To be effective, all three scarcities must be dealt with simultaneously. Conflict has both internal and external contributors. For pastoralists and farmers, dependence on similar resources of water and pastures/agricultural lands for economic well-being will resort to conflict when there is scarcity and degradation. Ecological marginalization occurs when pastoralists have to migrate in search of pastures and water. This migration puts pressure on host communities who may be farmers who depend on the same resources to grow crops. The Sahel region also has an unbalanced demand and supply of natural resources and experiences structural violence due to the government's indifference to their suffering. The Sahel region insurgencies are fueled by dissatisfaction with the unequal distribution of natural resources and government responses to rising jihadism in the region. For instance, the Dogon in Eastern Mali are protecting themselves from jihadists who have made pastoralism impossible through Islam tax and pillaging.⁴⁷ This

⁴⁵Martin A., et.al, 2006 "Is environmental scarcity cause of civil wars?" 3:1, pp 1-4,
Doi:10.1080/1569340600593981

⁴⁶ Nicolas Haque (2021) "Climate change dries Mali's Lake Faguibine, displaces population" Al Jazeera English

⁴⁷Javo Discover Documentary (2023) Terrorism in the Sahel: The Jihadists of Northern Africa/ Investigative Documentary, YouTube

theory will help the researcher assess the environmental stress and conflict in the Sahel region since it looks at the environment and other factors as contributors to conflicts

1.8 Hypotheses

1. There is a relationship between environmental stress and conflict in the Sahel region.
2. The environmental stress witnessed in the Sahel region is a contributor to conflicts in the region
3. The mechanisms used to manage the conflict in the Sahel region have not taken into account the environmental stress as a source of conflict in the region

1.9 Research Methodology

This segment highlights the procedure utilized in this research. The study used primary and secondary data to enrich the findings. The methodology further underscores the research design that applied in this study, methods of data collection, and analysis.

1.9.1 Research Design

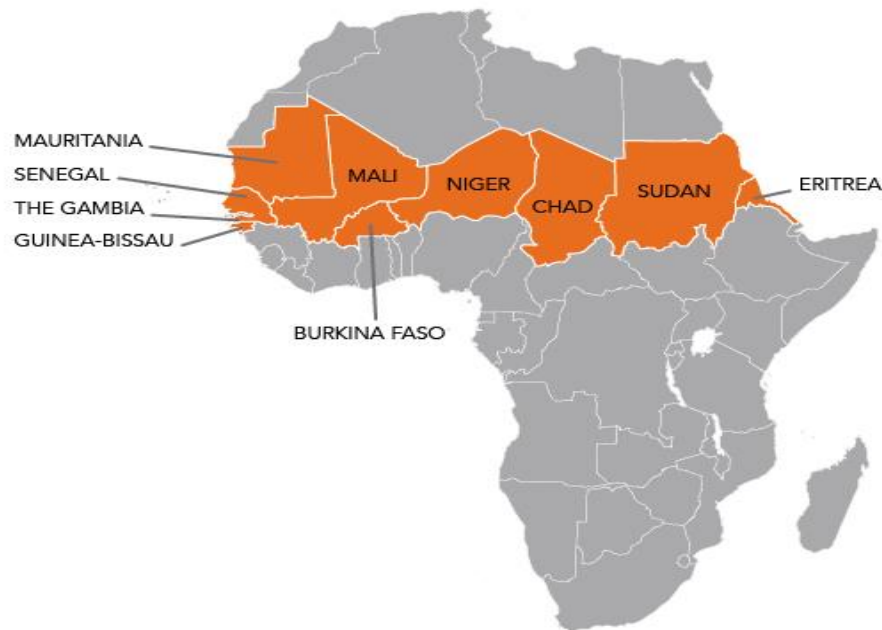
Research design is the whole plan that a researcher selects to assimilate the various components of the study in a comprehensible and consistent manner. It helps the researcher address the research problem successfully. Its purpose is to make sure that the evidence obtained is relevant and topical.⁴⁸ This research used mixed design (non-purist approach). This combines both qualitative and quantitative designs in equal measure to yield a more balanced. The research is aimed at examining environmental stress and conflicts in the Sahel region: a case study of Mali.

⁴⁸ De Vaus, D., 2001 “Research Design in Social Research” SAGE Publications London, UK pp 17-32

1.9.2 Research Area

The research covered the Sahel region as illustrated in the map below

THE SAHEL REGION INCLUDES 10 COUNTRIES THAT VARY DEMOGRAPHICALLY.



Source: <https://www.prb.org/resources/demographics-challenges-of-the-sahel/>

1.9.3 Target Population

The target people for this study was 5 Malian Honorary consulate bureaucrats, 20 African Union and 20 ECOWAS officials. The researcher also reached out to 10 diplomatic missions of the Sahel region countries based in Nairobi and 10 academicians. The total number was to be 65 people. At the end of the study, the researcher was able to reach out to the 65 persons but only 27 responded.

1.9.4 Sample Size

The sample size is a fraction derived from the target population mainly due to limited time and resources. The study will use the basic random sample method and purposive sampling which is used for the documentation and collection of appropriate information and cases connected to the topic of interest.⁴⁹

The study used Yamane's formula, which is calculated as follows; $n = \frac{N}{(1+Ne^2)}$

Whereby, n=corrected sample size, N= environmental stakeholders, and e=Margin of Error (MoE), e=0.05 based on the study condition.

Therefore; $n = \frac{65}{(1+65(0.05^2))}$

$$n = \frac{65}{1.1625}$$

$$n = 55.9139 = 56$$

Purposive sampling is the intentional selection of information based on its ability to demonstrate a specific theme or concept. The researcher issued questionnaires to the 64 people based in Mali and Sahel countries to get primary data and conducted one interview with a UNEP official. To better understand the situation on the ground, the research used news stories and documentaries from credible media houses.

⁴⁹ Robinson R.S. 2014 "Purposive Sampling. In: Michalos A.C. (Ed.) Encyclopedia of Quality Life and Well-Being Research. Springer, Dordrecht pp1

1.9.5 Data Collection

Data collection is the meticulous tactic of amassing and assessing evidence from numerous sources, to get an all-inclusive and clear-cut depiction of an area of importance.⁵⁰ The primary method of data collection for this study was issuing organized and non-structured questionnaires through Google Forms and Kobo Toolbox to the staff at the Honorary Consulate of Mali based at Hurlingham Nairobi, Kenya, UNEP, and AU officials and scholars of international relations. Interviews available in the media (television, social media, and newspapers) were also used. This research also collected data from secondary sources using the document analysis method. It involves examining existing data, databases, and organization reports to get the information needed. They include books, peer-reviewed journals, newspaper articles, online sources archives, videos, news clips, censuses, and organizational records. The materials were analyzed from historical, current, and future points of view about environmental stress as a contributor to conflict in the Sahel region. The advantages of the document analysis method and issuing questionnaires include saving time and reducing movement.

1.9.6 Data Analysis

Data analysis is the procedure of developing solutions to problems through the inspection and understanding of available data. It's about scrutinizing, cleansing, converting, and displaying data to discover valuable data, updates, and support policymaking.⁵¹ It is in line with the objectives of the study. The main themes were identified, coded, and classified according to academic standards and evaluated via the Statistical Package for Social Science (SPSS). Qualitative and quantitative

⁵⁰ McLaughlin Emily "data collection" accessed 28th March 2023 <https://searchcio.techtarget.com/definition/data-collection>

⁵¹ Corporate Finance Institute "Data Analysis" accessed 28th March 2023 corporatefinanceinstitute.com/resources/knowledge/data-analysis

data analysis was used to analyze the social circumstances in which environmental stress and armed conflicts take place. Qualitative and quantitative data analysis are best for this study since it is interested in the social behaviors of the actors in conflict situations.

1.9.7 Ethical Concern

Bryman and Bell insist that research should not cause harm to the participants; it should respect their dignity and privacy, obtain consent, and maintain confidentiality, and bias during data collection, analysis, and presentation should be avoided. This study upheld these ethics, by valuing the confidentiality and dignity of the contributors, and ensuring the data collected is presented without bias and prejudice. The research is only for academic purposes. The study will have a combination of online sources and visits to the library for materials.

1.9.8 Study Limitations

The researcher research out to the 65 people but only 27 responded, the Mali consulate did not respond to the queries. This challenge was overcome by reaching out to Malian people via LinkedIn and African Union Youth Facebook group thereby getting the much needed information.

1.10 Chapter Outline

The research thesis is made up of five chapters as outlined below:

Chapter One: Introduction. The section introduces the study by contextualizing the research problem. It further highlights the background of the study, the study objectives, and the research questions. The chapter also reviews the relevant literature and justifies the study and methodology to be used.

Chapter Two: The chapter examines the concept of environmental stress and various factors that lead to environmental stress. It further investigates the environmental stress in Mali and the global and regional responses.

Chapter Three: This chapter examines the armed conflict in the Sahel region, the concept of environmental security, and the nexus between the conflict in the region and the environmental stress witnessed there.

Chapter Four: This chapter provides an overview of intervention measures to manage the environmental stress and conflict in the Sahel region, it examines if the interventions include environmental protection and how effective they have been.

Chapter Five: Summary, conclusion, and recommendation. This chapter gives the summary and conclusions of each research question and the objective of the study. It also gives recommendations on effective mechanisms to end the conflict in the Sahel region while at the same time protecting the environment.

CHAPTER TWO

DRIVERS OF ENVIRONMENTAL STRESS

2.1 Introduction

Environmental stress issues are increasingly finding themselves at the center of global discussions on development, security, and peace. How states choose to respond to environmental issues will determine the kind of world future generations will inherit. With this in mind, this chapter will examine the concept of environmental stress, its details, and the different stressors to the environment and their impacts. It will further investigate the environmental stress in the Sahel region and global and regional responses.

2.2 What is environmental stress?

The world is increasingly becoming aware of environmental issues and their impacts on the daily lives of individuals and state security. Even though environmental degradation is not new, rapid industrialization and urbanization have complicated matters affecting developed and developing countries. According to numerous environmental experts, the rapid population growth, resource depletion, and global environmental changes demand changes in how governments view security.¹ Environmental stress is one of the elements influencing conflicts, and human and state security. The expenses of environmental stress include scarcity, nutrition insecurity, poor health circumstances, displacements, and interferences of the political and social structures.²

The term ‘environmental stress’ is used in the biological (physical and mental health of human beings and animals) field but when referring to physical environmental changes and responses, it

¹Environmental Change and Security Project Report (ECSPR), (2006) Woodrow Wilson International Centre for Scholars, Washington DC, PP 77-85

²ibid

becomes ambiguous. Stress and stressors are terms used interchangeably. stress is defined broadly as “any situation in which the environmental demands on individuals exceed their ability to respond” while stressors are environmental factors that cause stress for instance rising temperatures, food availability, presence of predators, infections, and others. Schulte suggests that environmental stress refers to stressors as environmental fluctuations that cause a reduction in the fitness and performance of a phenomenon.³ Even though the environment can cope with stress, that ability can be depleted and the environment gets harmed.

Environmental stress refers to elements within the environment that negatively affect efficiency, reproduction, and improvement of the environment. The stressors can be air pollution, forest fires, water contamination, global warming, and overcrowding among others.⁴ According to the World Economic Forum 2018 Report and subsequent reports, the earth is on a downhill trajectory to environmental destruction. The report identified environmental challenges as a top threat to international stability and security. Environmental stressors include life-threatening weather occasions and temperatures, quickening biodiversity loss, pollution of air, soil, and water, and most critical disappointments of climate change alleviation and adaptation.⁵ This has also been reported by UNEP which classifies pollution, climate change, land degradation, and loss of natural and cultural resources as major environmental issues.⁶ The existing interconnectedness makes the environmental risks a non-stop debate in international relations since crises such as water cause involuntary migration while weather impacts like drought cause disruption of life and

³Schulte P.M. (2014) “what is environmental stress?” Insights from fish living in a variable environment” *The Journal of Experimental Biology* 217,23-34, doi:10.1242/jeb.089722

⁴ Environmental Science Open Library, “Chapter 15 ~ Environmental Stressors”

<https://ecampusontario.pressbooks.pub/environmentalscience/chapter/chapter-15-environmental-stressors/>

⁵ World Economic Forum (2018) The Global Risk Report, “fractures, risks and failures” page 8-17

⁶ Van Haaften E.H., Van de Vijver F.J (1999) “dealing with extreme environmental degradation: stress and marginalization of Sahel dwellers” *Soc Psychiatry, Epidemiol*, 34(7):37682. doi:10.1007/s001270050158. PMID:10477958

infrastructure. Environmental stressors can often lead to increased levels of distress, uneasiness, and hostility.

The UN Conference on Human Environment (1972) in Stockholm pushed the idea that environmental issues were international issues that threatened development, peace, and security. The environmental movement caught on leading to the push for sustainable development which argues that development is at par with environmental protection. The environment provides humans with assets essential for life (air, water, food, shelter, and natural resources). This supply of renewable and non-renewable resources sustains life. Consequently, the environment consumes waste produced by humans through absorption and/or recycling and provides habitat for humans and other species. Overcrowding these habitats leads to degradation.⁷ Environmental stress occurs when humans overuse or misuse the environment as it fulfills the three functions. Pollution, scarcities of non-renewable resources, improper waste disposal, overpopulation, and others affect all three functions that interlink.⁸

2.3 Environmental Stress in Africa: Key Drivers

The realities and dangers of environmental stress have been documented over the years by the Intergovernmental Panel on Climate Change (IPCC) and other organizations. IPCC Fourth Assessment Report 2007, showed how Africa was vulnerable to climate changes, worsened by multiple stresses and low resilience capacity,⁹ while the Sahel is an environmentally fragile region and this fragility is worsened by armed conflict, food insecurity, reduced resilience, and

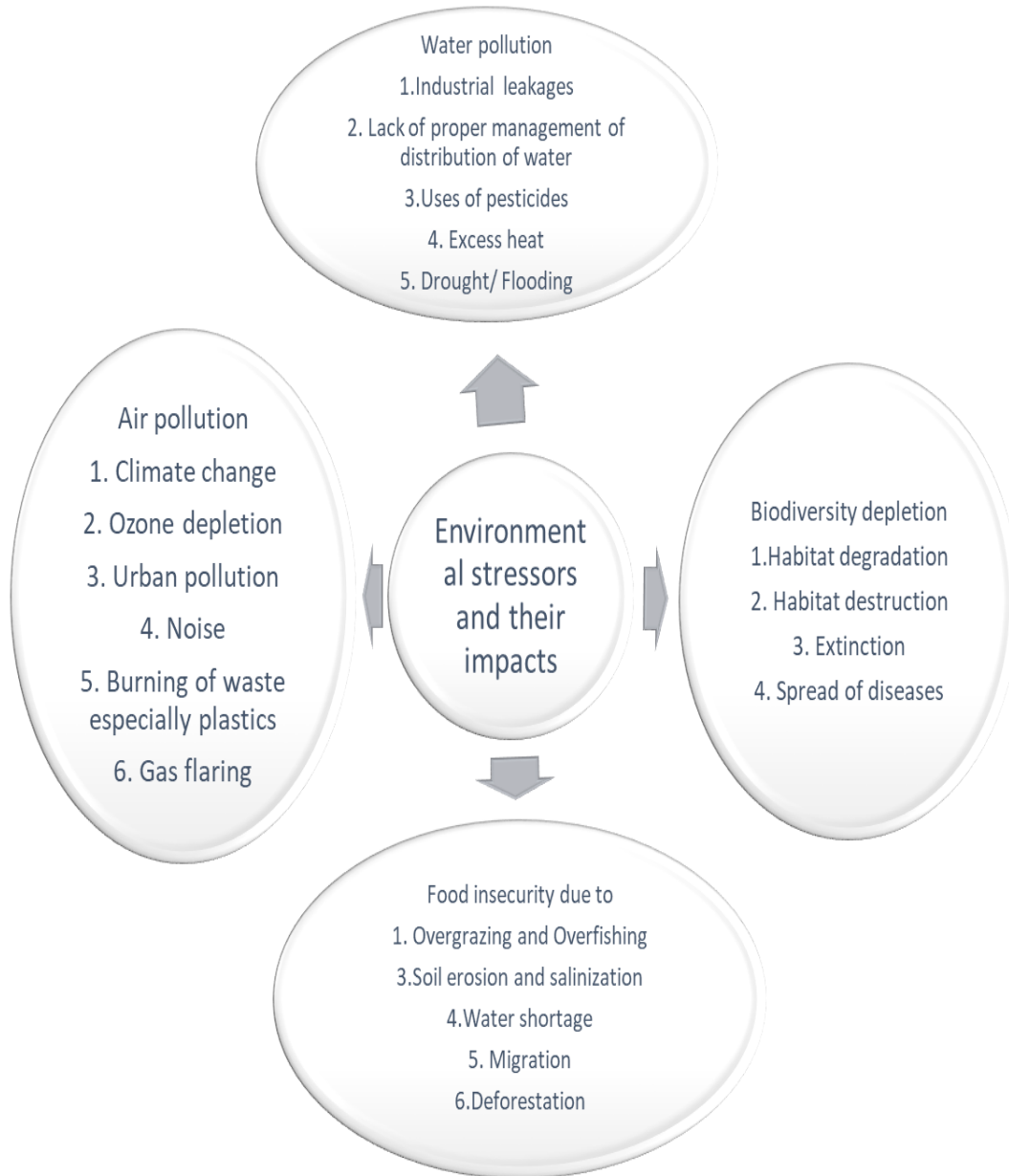
⁷ Riley, D. and Jorgenson, A. (2012) “environmental problems” The Wiley-Blackwell Encyclopedia of Globalization. 10.1002/97804706.wbeogl174.

⁸ *ibid*

⁹ IPCC (2007): Climate Change 2007: synthesis report. Contribution of working groups 1,2 and 3 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change {core writing team, Pachauri, R.K, and Reisinger, A. (eds.)} IPCC. Geneva Switzerland, 104 pp.

development capacity. These studies have identified droughts, famine, floods, rising temperatures, and erratic rainfall as the main issues afflicting Africa.

¹⁰Figure 1 **Environmental Stressors and Impacts**



¹⁰ Source: Author

2.3.1 Population Growth

The world population has increased over the years. UN Population Division argues that falling mortality rate, under-utilized family planning, and lack of education for girls contribute to population progression. Each human being is entitled to the earth's resources and therefore a growing population will affect the ecological system. The earth is unable to replenish the resources used due to degradation.¹¹ Population growth automatically translates to the need for more land to settle and produce food. This leads to deforestation, decreased biodiversity, and pollution which contributes to climate change and eventually conflicts. Conflicts over water, land, and energy resources are visible in various parts of the world including Africa and the Middle East. As the population grows, human and wildlife conflicts occur. This proximity between animals and human beings also leads to the spread of diseases such as Covid-19, Zika virus, Ebola, and others.

The need for energy also goes up and the population does. Africa has a high population rate that requires settlement and energy. The extraction of resources to provide energy causes pollution, overfishing, overhunting, extinction of some species, and transmission of diseases. The rural-urban migration that is common in African countries puts pressure on available resources such as drainage systems, sewer lines, and the emergence of slums. Many scientists are certain that the added stress on the world will lead to environmental disturbance and breakdown so severe it threatens the viability of life on Earth as we know it.¹²

¹¹Bish J.J (2020) "Overpopulation: Cause and Effect" Population Media Centre
<https://www.populationmedia.org/the-latest/overpopulation-cause-and-effect>

¹²Scientific American (2019) "Does Population Growth Impact Climate Change? Does Population Growth Impact Climate Change?" Earth Talk Magazine

2.3.2 Food Production Patterns and Methods

According to UNEP, the way humanity grows, transports, distributes, and consumes food is damaging the natural world. Research shows that there is sufficient food in the world for all but the distribution is the issue. Despite this nearly 11 percent of the world's population is undernourished, and diet-related ailments push 20 percent of untimely death, related both to malnutrition and to obesity.¹³

The changing climatic conditions are damaging crops and disrupting food supply chains. Communities are unable to access fresh water for drinking and irrigation as the rising temperatures contribute to the drying of water bodies while the soil degradation due to over-use of land, use of harsh chemical fertilizers, and soil erosion which reduces soil health equals less yield. Climate change also alters the distribution and behaviors of pests and diseases which affect crop production and animal husbandry.

Africa's economy is agricultural-driven. Many dwellers are subsistent farmers and pastoralists. Unsustainable land management practices, such as overgrazing, unsuitable irrigation, soil erosion, and sub-division of land into smaller pieces for inheritance purposes, contribute to land degradation in Africa. Degraded lands result in reduced agricultural productivity, loss of biodiversity, and increased vulnerability to climate change. Degradation of land also occurs in oil-rich countries such as Nigeria where oil spills and gas flaring are common. Closely related to land degradation is deforestation.

Water is an important component of human life and human activities are closely connected to availability and quality of water. Water access is normally associated with scarcity with over 2.1

¹³Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (2019) The Global Assessment Report on Biodiversity and Ecosystem Services
ipbes.net/sites/default/files/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf

billion persons lacking access to clean and safe water at home globally. Some of the causes of water shortages include famine, natural calamities, conflict, occupation, economic blockades, geopolitical struggle, and greenhouse gasses.¹⁴ Many African countries face water scarcity due to factors such as population growth, inadequate infrastructure, pollution, and climate change. This scarcity affects access to clean drinking water, sanitation, and agricultural productivity, leading to health issues, conflicts, and migration.¹⁵ In mining areas, water contamination occurs in various ways. The mud as residue from drilling can contaminate the water bodies. There is also a risk of producing water mixed with crude oil and gas, especially in onshore drilling. Another danger is oil spills from leaky pipelines during transportation or storage. The contamination of the water affects human activities like fishing and farming, marine and plant life, and worsens water scarcity.

2.3.3 Industrialization and Pollution

The Industrial Revolution brought great progress into human life, nevertheless, industrialization has its negative effects on the environment such as pollution, discharging heavy metal into the soil and water bodies, greenhouse gases, expansion requiring land clearing, waste generation, and urbanization.

Africa grapples with various forms of pollution, including air pollution from industrial activities and household cooking methods, water pollution from inadequate sanitation systems and industrial waste, and soil contamination from mining and improper waste disposal. These pollutants pose significant health risks to communities and degrade ecosystems.¹⁶ With high poverty levels, coping

¹⁴ Kralow, C. A. (2019) “the international law and politics of water access: experiences of displacement, statelessness, and armed conflict” London School of Economics and Political Science; London WC2A 2AE, UK; pp1-28

¹⁵ UNICEF Advocacy Brief (2022) “Investing in water security for children in the Horn of Africa” Water-Crisis-Horn-Africa pdf. Pp1-8

¹⁶ Abioye O.F, Mabel, O.I, Tait, C. (2016) “environmental Pollution in Africa” Springer Publication ISSN 1387-585X Environment Development Sustainability, DOI10.1007/s10668-016-9894-4

mechanisms are also limited. For instance, the use of firewood to cook is a basic need in Africa, this dependence on firewood not only pollutes the air affecting the Ozone Layer and human health, but it also contributes to deforestation, reduced rainfall once water catchment areas are destroyed, and worsens climate change.

Industrial pollution is a huge concern in Africa. Air, soil, and water pollution occurs in mining grounds, manufacturing plants, and other industrial activities whose chemical wastes are not properly disposed of. Locals are normally adversely affected by these pollutions. A case in point is the Owino Uhuru area of Mombasa, Kenya where locals are suffering different ailments due to lead poisoning from a lead smelter that recycled lead-acid batteries. Human Rights Watch conducted similar studies in Nigeria, China, Kosovo, and others.¹⁷ Today, air pollution is a leading cause of death in the world, WHO puts the number of deaths at 7 million every year. People experience increased cases of respiratory diseases, decreased food production due to water and soil contamination, and the migration of people to other areas. Increased cases of miscarriages, premature birth, low birth weight, and birth deformities among other health issues are witnessed.¹⁸

2.3.4 Urbanization

To provide the industries with labor, the emergence of towns occurs. The increase of population concentration in cities destroys habitats to make way for settlement and infrastructure. Rapid unplanned urbanization has led to the loss of biodiversity and degrading ecosystem health. It exposes cities to floods, landslides, and urban heat pockets, especially in slum areas. Urbanization affects the environment through the expanded use and consumption of natural resources, clearing land for buildings, and waste generation and disposal. Air, water, and soil pollution is rampant in

¹⁷ Horne, F. (2023) “Landmark decision in Kenya Lead pollution case” Human Rights Watch

¹⁸ Madhrika, S. “determine environmental impacts of upstream process of oil and gas industries” ICENIS

cities, especially mining towns.¹⁹ Africa is home to assorted ecosystems and distinctive wildlife, but it faces substantial biodiversity loss due to habitat ruin, illegal wildlife trade, pollution, and climate change. This loss has deep ecological, economic, and cultural implications, impacting tourism, traditional knowledge systems, and overall ecosystem health.²⁰

2.3.5 Deforestation

Rampant deforestation, primarily driven by agriculture, logging, and urbanization, has depleted Africa's forests. This loss of forest cover contributes to soil erosion, biodiversity loss, and decreased carbon sequestration, exacerbating climate change and impacting local communities' livelihoods.²¹ Degradation of land and deforestation creates another bigger problem of desertification. Desertification is a process where “fertile land turns into desert due to drought, deforestation, and inappropriate land use practices”. Desertification leads to the displacement of communities, food shortages, and resource conflicts.²²

The environmental issues that contribute to conflict include access to natural resources and livelihoods where farmers and herders compete for land, water, and biomass at the local level while regionally and internationally tensions arise due to management of transboundary resources especially water.²³ The clearing of forests for agriculture, urbanization, and logging contributes to habitat loss, soil erosion, and carbon emissions. Deforestation disrupts ecosystems, threatens biodiversity, and reduces the Earth's ability to absorb greenhouse gases.²⁴ The destruction and

¹⁹ Ibid p.29

²⁰ African Centre for Strategic Studies (2022) “African biodiversity loss raises risks to human security” <https://africacenter.org/spotlight/african-biodiversity-loss-risk-human-security/>

²¹ FAO (2022) “Forests and trees provide vital goods and ecosystem services but are undervalued in economic systems” The State of World Forests 2022 Report

²² Intergovernmental Panel on Climate Change “Desertification” Special Report on Land and Climate Change

²³ The World Bank Annual Report (2021) “from crisis to green, resilient, and inclusive recovery” Washington, DC, World Bank Group <https://documents.worldbank.org/curated/en/120541633011500775/The-World-Bank-Annual-Report-2021-from-crisis-to-green-resilient-and-inclusive-recovery>

²⁴ Nunez, C. (2022) “climate 101- Deforestation” National Geographic <https://www.nationalgeographic.com/environment/article/deforestation>

fragmentation of natural habitats, such as wetlands, forests, and coral reefs, disrupt ecosystems and threaten the survival of many plant and animal species. These stressors are often driven by land development, infrastructure projects, and unsustainable resource extraction.

The Sahel is an important region due to energy, security, and geopolitical interests. According to the Organization of Economic Cooperation and Development (OECD), the climate in the Sahel is very seasonal and it is prone to long-term drought, affecting food security and the economic prospects of the Sahelian population.²⁵ Environmental experts are concerned with rising temperatures, increasing sea levels, and recurrent and extreme climate events such as desertification and reducing water resources.

OECD identifies key environmental stressors in the Sahel as unregulated urban expansions, unregulated mining, and food insecurity as areas of concern regarding environmental damage, elite capture, and illicit financing of armed groups.²⁶ High population, urban and agricultural expansion, and mining are stressing the environment yet few adaptation mechanisms have been implemented. Even though many studies have failed to establish the link between environmental stress and armed conflicts unless accompanied by other factors, the environmental fragility in the Sahel does contribute to armed conflict as a trigger and a worsening variable.

On food security, Sahel is dependent on rain-fed farming, which makes them susceptible to changing climatic conditions. Droughts and flood in the region lead to immediate loss of livelihoods, and food insecurity and increases the likelihood of conflicts between farmers and herders. Migration patterns of pastoralists cause agro-pastoral conflicts in search of water and

²⁵Heinrigs, P. (2010) “security implication of climate change in the Sahel region: policy consideration” OECD Publication

²⁶ OECD (2022) “environmental fragility in the Sahel” OECD Publishing, Paris

pastures, land rights, and socio-economic factors. The dependence on agriculture means they don't have alternative sources of income.²⁷ The prolonged droughts of 1963 to 1993 were part of the triggers for the Tuareg armed rebellion in the 1990s. The Tuareg felt aggrieved by the government's indifference to their suffering.²⁸

While addressing the United Nations Security Council (UNSC) in 2020, Peter Maurer of the International Committee of the Red Cross said that the Sahel people are “walking a tightrope of survival” due to conflict, climate change, and environmental degradation pressures.²⁹ Experts predict that the Sahel region will experience an increase in temperatures ranging between 2 to 4 degrees Celsius by 2080.³⁰ The area will also suffer erratic rainfall patterns thereby increasing the likelihood of droughts and flooding. Flooding does not only occur due to increased rainfall but also due to plastic pollution. The careless disposal of plastics interferes with drainage infrastructures.³¹

2.4 Key Impacts of Environmental Stress

Analysts have for a long time predicted the impacts of abrupt environmental stress on international security, and states have endeavored to put several measures in place to mitigate the impacts by securitizing environmental stress. Since it's a global common problem, several multilateral organizations have taken measures to give periodic reports on environmental stress impacts which widely cover the economy, social, and political spheres of life.³²

²⁷ Ibid p.29

²⁸ Ibid p.3

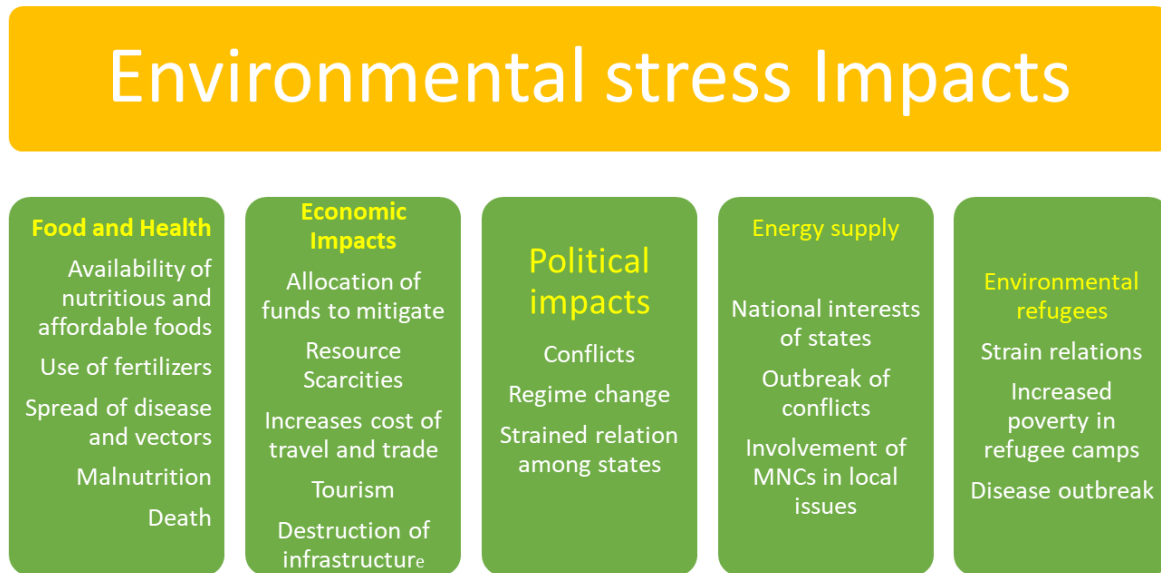
²⁹ United Nations Security Council Press Release (2020) SC/14307

³⁰ Ibid p.35

³¹ Climate, Peace and Security Fact Sheets (April 2021) Sahel Region

³² Lee, G., Thwaites, J., Conca, K., 2017, “climate change and global security: what is the role of the United Nations Security Council?”

Fig. 2 Environmental stress impacts



2.4.1 Economic impacts

Since the outbreak of COVID-19 in 2020, the global economy has taken a hit especially when international trade and travel were brought to a halt. The world economy has withered other economic meltdowns in the past, and environmental stress has featured prominently in affecting it. The disruption of the earth's environment commands attention and resources due to its impact on the global economy. Environmental problems can lead to economic losses. International Monetary Fund estimated the cost of environmental stress to be 5% of the global GDP each year yet despite the cost of environmental protection being 1% of the global GDP, states still do not implement protection and resilience measures.³³

Environmental stress directly affects the economy by increasing water, land, and resources scarcities. Scarcity affects the availability and affordability of goods. As illustrated in the

³³Zamid, A., Matthieu, B., Massetti, E., (2022) "Macro- fiscal implications of Adaptation to climate Change" International Monetary Fund

environmental- scarcity theory by Homer-Dixon, demand, supply, and structural scarcities affect the locals directly and indirectly. In agro-pastoral communities, pastures and water scarcity fire up tensions. Scarcities reduce access and affordability of goods and services.³⁴ Flooding, soil erosion, and deforestation will degrade the arable land and fish stocks will decrease. This forces people to move from one area to another in search of scarce resources creating problems such as conflict with host communities, and depletion of available resources due to the high population affecting the human security of all involved.³⁵ This increases the cost of living pushing many to live below the poverty line due to an increase in food prices.³⁶

Indirectly, it affects international trade and travel, the provision of insurance services, and financial systems while affecting the state's ability to create resilience measures. Increased disaster risks lead to increased instability in the financial markets while the profits are eroded in the investment in fossil fuel drilling equipment which get damages locals who may feel aggrieved by the presence of multinational companies in their region. For instance, in the Niger Delta, the locals would siphon off crude oil. Crude oil is a prime target for terrorism, piracy, insurgency, civil unrest, and industrial espionage, the infrastructure in the energy sector is also expensive to put up and its flammability requires extra security.

Extreme weather events and disasters also destroy infrastructures, homes, medical facilities, and schools and affect the government's and other humanitarian organizations' ability to provide

³⁴ Ibid pp 16

³⁵Clingendael Institute (2016) The economics of planetary security Report
https://www.clingendael.org/pub/2016/economics_of_planetary_security/2_the_economics_of_climate_change_as_a_conflict_factor/

³⁶ Woodrow Wilson International Centre for Scholars, 1996, "environmental change and security project report (ECSPR)

essential services. Drought, famine, and flooding have destroyed many lives in Africa. The Sahel region has experienced extreme drought since the 1960's.³⁷

Environmental stress affects poor and rich states differently. Rich states can build resilience but they are also the biggest contributors to environmental degradation. Scarcity is a dominant driver of environmental stress vulnerabilities. Poor countries especially in Africa and Asia have few means at their disposal to evade, decrease, or modify to risks to livelihoods occasioned by environmental stress. Environmental degradation and poverty combined cause deaths, malnutrition, and inadequate access to clean water and health facilities.³⁸

Culture is important in any society. Environmental stress affects culture negatively, drought, heat waves, flooding, and earthquakes can seriously harm or even destroy shrines, ancient and archaeological sites, and ethnic landscapes. These sites attract millions of tourists who are also at risk of death or injury.³⁹ When they are closed due to natural and man-made disasters, the socioeconomic status of the locals will be altered. The rich history is also lost especially when students and scholars cannot access it.

Nevertheless, environmental stress can enhance economic development in the long run if sound policies are implemented. The rents and rates from natural resource extraction and production can improve a state's economic status, develop infrastructure, and provide social services.⁴⁰

³⁷ Mayans, J (2022) "the Sahel at the heart of climate change issues" Solidarites International

³⁸ Barnett, J. (2010) "Environmental Security" The Routledge Handbook of New Security Studies, 123-131.

³⁹ Council of Europe "European and Mediterranean major hazards agreement"
www.coe.int/en/web/euoparisks/cultural-heritage

⁴⁰ Weidan, O.D., Elbargathi, K. (2021) "does environmental stress affect economic growth: evidence from the Gulf Cooperation Council Countries" Clean Tech Environ Policy 23, 2561-2574, <https://doi.org.10.1007/s10098-021-02169>

2.4.2 Energy resources

Energy occupies a vital position in humanity and its cost has a substantial influence on social and economic activities. The performance of the energy sector is a great element of the government's development plans.⁴¹ The world is a huge consumer of energy and it's a key feature in governments' policies. Energy shapes national interests and international relations. Energy can be a tool and driver of global diplomacy and warfare. It can be the means for states to pursue particular foreign policies. It influences political, military, diplomatic, and economic strategies created by leaders to seek to secure energy resources. The availability of dependable, cheap energy is vital to economic strength at home, which in turn gives a country bigger leverage in the international arena.⁴² Environmental degradation and negligence contribute to the scarcity of natural resources that further trigger an outbreak of conflict in a society. For instance, oil exploration and coal mining activities lead to air pollution, water pollution, land degradation, and the destruction of the ecosystem.⁴³ The livelihood of communities surrounding the areas gets affected and at times leads to human displacement. This, therefore, leads to conflict among different communities and companies doing explorations.

In the quest to be energy secure, environmental degradation especially from the upstream activities is a huge concern for man and the environment. In the face of climate change and its effects, state relations are getting jeopardized. For instance, South Korea accused China of blowing fumes directly at Seoul.⁴⁴ How states react to environmental damage will also be influenced by non-state

⁴¹ Kenya Ministry of Energy, 2004, "Kenya's sessional paper number 4 on Energy" Kenya National Energy Policy

⁴² Bahgat, G. (2006) "Europe's energy security: challenges and opportunities" International Affairs Vol.82, No.5 pp 961-195

⁴³ Bingham, K., Jr. (2001) "Environmental scarcity and the outbreak of war"
<https://www.prb.org/resources/environmental-scarcity-and-the-outbreak-of-conflict/>

⁴⁴ Mubassira, M. T. (2020) "Transboundary Pollution from China and Its Impact on South Korea: A Road to Health and Environmental Degradation" <https://internationalaffairsbd.com/transboundary-pollution-china-impact-south-korea-road-health-environmental-degradation/>

actors such as multinational companies (MNCs). In the USA, the MNCs forced the government to withdraw from the Paris Agreement even though this decision has since been revised, while in Ecuador's Amazon region, the US oil giant Texaco seriously degraded the ecosystem. In Nigeria's Niger Delta region, oil pollution of the marine environment has depleted fish and water resources that people have normally depended on for their livelihood. Oil spills and gas flaring have led to massive degradation of the land and marine environment.⁴⁵ Multinational companies are to blame for the environmental pollution and attending damages as the government refuses to hold them to account. The locals feel that they deserve compensation for their suffering.

2.4.3 Food and Health

The relationship between food, health, and the environment is complex. Food production and human health depend greatly on the state of the environment. A clean and sustainable environment is a must for the production of food which itself is important for human health and man's very own survival. Of all human needs, food is at the top. The notion of the Right to Food was accepted officially in the Universal Declaration on Human Rights (UDHR) in 1948 and accepted by all UN member states.⁴⁶ Food security is the availability and accessibility of food in the right qualities and it must meet the dietary needs of the people.⁴⁷ According to the European Union and World Bank, food security is about ensuring that everybody can access sufficient, affordable, and nutritious food.⁴⁸ Environmental stress affects the entire food value chain from production, quality, quantity, availability, storage, transportation, utilization, and much more. The level of food production in a

⁴⁵ Osuagwu E.S., and Olaifa E. (2018) Effects of oil spills on fish production in the Niger Delta. PLoS ONE 13(10): e0205114. <https://doi.org/10.1371/journal.pone.0205114>

⁴⁶ Food and Agricultural Organization (FAO), 2016, Climate Change and Food Security: Risk and Responses

⁴⁷ Ibid

⁴⁸The World Bank (1996) "what is food security?" Definition based on the 1996 World Food Summit <https://www.worldbank.org/en/topic/agriculture/brief/food-security-update/what-is-food-security#:~:text=Based%20on%20the%201996%20World,an%20active%20and%20healthy%20life.>

country determines its food and health security status. Environmental stress has, more often than not, contributed to food insecurity. The Paris Agreement (2015) recognizes that safeguarding food security and ending hunger is a priority. It also admits that food vulnerabilities are mainly due to climate change.

Excessive use of chemical fertilizers, pesticides, and insecticides has also added to environmental pollution. Rachel Carson's (1962) book "The Silent Spring", drew attention to the unintended effects of the chemical industry, especially the use of pesticides, on ecosystems and bird populations and brought intense pressure to create regulation of chemical pollution and the need for environmental assessment reports before any project was implemented.⁴⁹ Human health will be highly affected by the depletion of the ozone layer leading to an increase in cancer cases due to exposure to ultraviolet radiation.

Global warming creates conducive conditions for the spread of infectious diseases through the spreading of vectors for diseases that multiply and migrate, spreading tropical diseases like malaria and dengue fever.⁵⁰ The increasing temperatures, extreme weather, and unreliable rainfall that makeup climate change contributes to environmental stress and scarcity. Rising sea levels increase the risks of flooding followed by prolonged drought thereby affecting food production. State, continental, and international stability is affected by the increased competition over dwindling reserves of air, arable land, fisheries, and other food sources and water. Environmental stress threatens to alter the distribution and availability of key resources throwing the livelihoods of many, especially from fragile states in danger.⁵¹

⁴⁹ Carson R (1962) "The silent spring"

⁵⁰ Pirage, D., 1995, "Micro Security: Diseases Organisms and Human Well-Being" The Washington Quarterly

⁵¹UN Interagency Framework Team for Preventative Action, ,2012, Toolkit and Guidance for Preventing and Managing Land and Natural Resources and Conflict

2.4.4 Environmental refugees

Environmental refugees are a new phenomenon in international studies. Ordinarily, refugees and internally displaced persons (IDPs) were a result of armed conflicts, political, race, tribe, and religious persecution,⁵² but with environmental refugees, it is the harsh climatic conditions and environmental scarcities that push them to look for shelter outside their states and homes. Their movement within and outside their countries is triggered by environmental factors like severe droughts, flooding, poor harvests due to poor weather, and bad harvests induced by pestilences such as locusts and armyworms.

Unlike with traditional refugees, there is no international legal framework to address environmental refugees thereby creating problems for both the receiving and sending states. Calls have been made by the UN to create legal frameworks to address issues concerning environmental refugees. According to former UN Secretary-General Ban Ki-moon, environmental refugees are remaking the human geography of the planet, this trend will increase as deserts advance, forests are felled and sea levels rise.⁵³ More resource scarcity, intensified in the frequency, and intensity of extreme weather events force resource-dependent persons to migrate. It has been argued that environmental factors are in fact, the root cause of most migrations across the world. Migration worsens competition over the remaining resources, destabilizes neighboring communities, and increases the risk of conflict in transit and destination regions. Displacement is not only a humanitarian and security challenge but also a developmental one.

⁵²Convention Relating to the Status of Refugees 1951

⁵³United Nations Environment Programme (2014) UNEP Year Book 2014: “emerging issues in our global environment” <https://wedocs.unep.org/20.500.11822/9240>.

The unregulated movement of millions of people can lead to tensions and is a threat to global peace as these people are certain to cross international borders. The influx of refugees and internally displaced persons from one state/region to another is a security threat. Displacement is a complex challenge in the world and it's an hindrance to decreasing poverty and realizing sustainable development with peace and security. Africa has complex cultural, social, and politically induced conflicts made worse by demographic changes due to the increase in population and movement of people who fight over scarce natural resources, faced with harsh climatic conditions like droughts, floods, and the growing threat of diseases.⁵⁴ Environmental displacement is caused by natural happenings compelling disaster assistance such as earthquakes, volcanic eruptions, floods, and human-made causes such as exhaustion of water, soil, and other resources, illegal dam construction, and industrial accidents. Other causes include population pressure, diseases, and poverty.⁵⁵ The conflict in Mali has displaced over 4 million people.

2.5 Global and Regional Response

Due to its multiplicity of abilities, environmental stress requires a multi-sectoral approach to policymaking and effective implementation. The push for sustainable development through the Sustainable Development Goals (SDGs) particularly addresses environmental protection as the key to attaining the goals. Earth Summits have been held every 10 years since the Nairobi Earth Summit (1982). Besides UNEP and other international environmental organizations, there are other multilateral environmental agreements. These instruments were enacted to help in the protection and conservation of the environment at regional and international levels. They include the Barcelona Convention for Protection against Pollution of the Mediterranean Sea (1976), the

⁵⁴The UNHCR and the World Bank Group, (2015) "Forced Displacement and mixed migration in the Horn of Africa

⁵⁵ Ferris, E. (2018) "displacement, natural disaster and human rights" Brookings Education <https://www.brookings.edu/on-the-record/displacement-natural-disasters-and-human-rights/>

Montreal Protocol on the Substances that Deplete the Ozone Layer (1987), and the Convention on Biological Diversity (1992) among others.

Environmental issues are transboundary and their management is also transboundary. Environmental management regimes evolved due to increased awareness of the damage to the environment and the centrality of the environment in the sustenance of life. Regimes have been established to deal with various environmental issues of international concern, including global warming, endangered species, hazardous waste, food security, water, desertification, forests, swamplands, and others.⁵⁶ The UN is leading this management system using its organs and affiliate organizations. Global management often involves the development and implementation of international agreements and treaties intended to address specific environmental issues. Examples include the Convention on Biological Diversity (1973), the Basel Convention on Toxic Transportation and Disposal (1993) the United Nations Framework Convention on Climate Change (1992), the Kyoto Protocol (1997), and the Paris Agreement on Climate Change (2015) and others. These agreements provide a framework for countries to cooperate, set targets, and take collective action.

The Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs) have pushed for sustainable development that protects the environment while eradicating poverty, gender inequality, pollution, and diseases. The goals integrate environmental sustainability with social and economic development, emphasizing the need for an integrated approach. SDG Goal 17 addresses the importance of international cooperation.⁵⁷

⁵⁶ Colby M. E (1989) “the evolution of paradigms of environmental management in development” World Bank Strategic Planning and Review Paper Discussion Paper 1 multi-page pdf

⁵⁷ United Nations “Sustainable Development Goals (SDGs) retrieved March 24th 2023
<https://unodsd.un.org/content/sustainable-development-goals-sdgs>

Water management needs comprehensive laws to guide the usage, management, and distribution. In the absence of transboundary water treaties, customary international law guarantees states' right to the equitable and reasonable use of transboundary waters tempered with the obligation not to cause significant damage. Some of the international water laws include; the General Treaty of Vienna (1815); Convention and Statutes on the regime of navigable waterways of international concerns in Barcelona (1921); convention relating to the development of hydraulic power affecting more than one state and protocol of signature (Geneva) 1923; the convention to combat desertification Paris (1994); convention on the protection and the use of trans-boundary watercourses and international lakes (UNECE Water Convention) and the most recent one 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention/ UNWC). The world through the UN has also made water a priority, especially with its inclusion in Sustainable Development Goals, Goal Number 6, “ensure access to water and sanitation for all” In 2010 the UN General Assembly issued resolution 64/292: the human right to water and sanitation.⁵⁸ To address global water challenges, the UN declared 2005-2015 the “international decade for action, “water for life”

Individually, states have their responses to environmental stress. This can include setting emission standards, promoting renewable energy, enforcing wildlife protection laws, implementing waste management practices, and establishing protected areas. States have established mechanisms for protecting and restoring ecosystems. Conservation efforts focus on preserving biodiversity, protecting endangered species, and maintaining essential habitats. Restoration involves initiatives such as reforestation, habitat rehabilitation, and ecosystem regeneration to reverse the effects of

⁵⁸ McCaffrey S. C. (2015) “international water laws for the 21st century: the contribution of the UN Convention” University of the Pacific, 6053679.pdf pp 11-19

environmental degradation. For instance, the AU is leading efforts to implement the Great Green Wall of Africa by the African Union (AU), rehabilitation of Lake Chad, and other such projects requiring states to cooperate.

The application of technology is also being used to counter environmental stress. Clean energy technologies, such as solar and wind power, can help reduce greenhouse gas emissions. Additionally, innovations in waste management, water treatment, and sustainable agriculture can contribute to mitigating environmental stress.⁵⁹ Farmers are also advised to plant drought-resistant crops, embrace irrigation, do soil studies, and diversify the sources of food. Genetically modified crops are also gaining traction even as they attract embrace and ridicule in equal measure.

The Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI) is an aspiring project to restore “100 million hectares of degraded land, sequester 250 million metric tons of carbon to combat climate change, and create 10 million jobs by 2030”.⁶⁰ The wall will prevent further desertification of the region, reclaim some desert lands, help eliminate poverty, and protect the environment. Unfortunately, these ideal goals are yet to be achieved. By 2023, only 18 million hectares of the ruined lands have been reclaimed. The 33 billion US dollars needed to complete the project is hard to come by with its partners missing to honor their promises. Some fear creating the barrier will not necessarily address the climate change in the region since desert boundaries are self-motivated and dependent on rainfall disparities. Nevertheless, the project has its benefits as the communities put it into use by embracing beekeeping, agroforestry, and pastoralism.⁶¹

⁵⁹ Krishna, K. J et.al (2022) “renewable and sustainable clean energy development and impact on social, economic and environmental health” *Energy Nexus*, Vol.7 100118, ISSN 2772-4271, <https://doi.org/10.1016/j.nexus.2022.100118>

⁶⁰Hance, J. and Raman, S. (2023) “progress is slow on the green great wall, but some bright spots bloom” *Mongabay Series*

⁶¹ *ibid*

Managing environmental stress and reserving the damage done requires financial muscle. As earlier stated, the IMF puts the cost of environmental protection at 1% of the global GDP.⁶² During the COP Conferences, there have been suggestions that the rich nations should pay for their environmental damage which affects the poor countries who incidentally are the least polluters. This suggestion has not been fully implemented. COP 27 called for the establishment of a fund to help those affected by environmental disasters such as flooding and droughts.⁶³ The Paris Agreement has become a political debate with countries opting in and out at will. States are also encouraged to invest in renewable energy, green infrastructure, and sustainable businesses that can drive the transition to a more environmentally friendly economy.

Global and regional responses to environmental stress are slowed down by how long it takes for member states to agree on how to collectively deal with them. This is, mainly because solutions touch on the interests of different states in different dimensions and therefore, they are careful when appending their signatures. Secondly, matters of environment and climate change are not yet fully understood, there are different schools of thought on environmental importance, its influence, and how to handle its protection.

2.6 Chapter Conclusion

The chapter examined the various drivers of environmental stressors globally and in the Sahel region. The environment is the most international issue and its security is a significant element of peace, national security, stability, and human rights. Environmental stress is a threat multiplier because of its potential to exacerbate many of the current challenges and threats in the international

⁶² Ibid pp. 35

⁶³ https://unfccc.int/process-and-meetings/conferences/sharm-el-sheikh-climate-change-conference-november-2022/five-key-takeaways-from-cop27?gclid=CjwKCAjw2K6lBhBXEiwA5RjtCeXbY_PlX0O_4WQ48c8cIZ-TTs0yJvQx4qGQCHJNU7uTot0REeXzEhoCbDwQAvD_BwE

system. It affects security both state security and human security, affects the diplomatic relations of states, increases conflicts over scarce resources, and peace elusive. Its impact on international relations can't be ignored. There is a need for states to ratify protocols like the Kyoto Protocol the Paris Agreement, and Cancun Agreements to protect the environment and in the long run, ensure conflict management.

CHAPTER THREE

NEXUS BETWEEN ENVIRONMENTAL STRESS AND ARMED CONFLICTS: AN ANALYSIS

3.0 Introduction

In chapter two, the study examined the concept of environmental stress, the key drivers of environmental stress in Africa, and its impacts. Drought, flooding, and climate change are stressors to the environment and they have devastating impacts on economies, socio-political spheres, state security, and human security and limit the earth's ability to provide its services to humanity. Africa is a poor continent with vast natural resources yet most affected by the effects of environmental stress. Africa is employing several mechanisms to manage environmental stress including policy changes, adapting technology, and ratifying international norms meant to protect the environment. Poor governance, lack of institutional capacity, and goodwill of the ruling elite weaken Africa's capacity to build resilience against environmental stress and its impact.

This chapter examines the connection between environmental stress and armed conflicts. Conflicts are normal in life due to human hostility, conflicting goals, scarce resources, misunderstanding, and greed, at the state and international levels. Escalation of disputes often leads to war, war devastates economies, sweeps out millions of people, and increases the likelihood of protracted conflicts. History is painted with armed conflicts amongst nations, intrastate and individual conflicts. In the international relations dialogues, interstate wars took a back seat after the Cold War though it has reemerged recently with USA invasions in Afghanistan and Iraq and the Russia-Ukraine war. After the Cold War, numerous conflicts emerged, including political wars in Africa and the Middle East which are mostly intrastate. Security experts continue to document the shocking impact of war on societies and the continuous efforts to find peaceful resolutions to

global disputes. In the study of causes of armed conflicts, the question that most scholars are asking is, what is the relationship between environmental stress and armed conflicts, and how to manage them.

3.1 Armed Conflicts in Africa

Since the end of the Cold War, inter-state wars have become less common while intrastate wars have increased. These new armed wars are more intense and protracted. Mary Kaldor says that these new wars “involve networks of state and non-state actors and most violence is directed against civilians.”¹ The actors in armed conflicts are a mix of government soldiers, guerrilla leaders, jihadists, organized criminal mobs, reservists, mercenaries, and private contractors.² Armed conflicts are based on group identity such as ethnic, religious, and tribal therefore mobilization happens along the politics of identity forming an “us” against “them” concept where there are insiders and outsiders respectively. Financing armed conflicts is done through the illegal economy like looting and pillaging, kidnapping, and smuggling of valuable natural resources among others. Due to the political and economic interests of the parties, the armed conflicts tend to prolong.

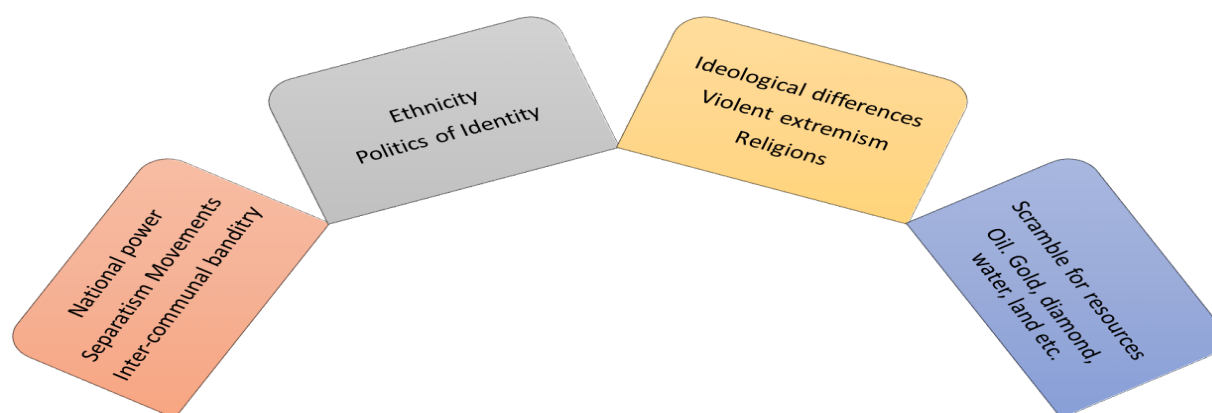
The continent of Africa has a long and disastrous account of armed conflict that happened before imperialism and continued even after decolonization. There is no one cause of conflict, but having analyzed different conflicts in the region, the APSA Impact Report 2017 report identifies national power at 25.2%, sub-national predominance (ethnic-based) at 21.3%, ideologies at 18.72% and resources at 17.4% as the main causes of conflicts in Africa. The conflicts can be in the form of

¹ Kaldor M, (2013), “in Defence of new wars” *Stability: International Journal of Security and Development*, 2(1), P.Art.4. DOI: <https://doi.org/10.5334/Sta.At>

²

disputes, non-violent disasters, violent calamities, limited combat, and war. The different conflicts find convergence in the actors involved, the conflict dynamics and drivers of conflict at play, and how these conflicts are addressed by AU/RECs. There was a slight decline in the number of conflicts in Africa from 110 in 2016 to 107 in 2017.³

Fig.3 Causes of armed conflicts



3.1.1 National Power

Armed conflicts take different shapes. It can be a secessionist movement that desires autonomy, for instance, South Sudan declaring independence from Sudan and Eritrea from Ethiopia. It can also happen through coups, this is most common in West Africa and the Sahel region, recently Mali, Niger, and Burkina Faso experienced coups back to back and they are yet to stabilize. A coup aims to seize power and remain within the country.⁴

³ Institute for Peace and Security Studies (2017) APSA Impact Report 2017 Addis Ababa Ethiopia

⁴ UN Chapter xv “Armed conflict and their consequences”

<https://www.un.org/esa/socdev/rwss/docs/2001/15%20Armed%20Conflict.pdf>

Nationalism sentiments have grown in the recent past. Many aggrieved groups are calling for their separation from states due to economic, political, social, ideological, and religious grievances. Separatist movements desire to have self-rule. When people are frustrated and unable to fight against the mighty powers, they react violently against the state. Groups desire to separate from a larger group due to ethnic, religious, economic, and even political reasons. The separating group may feel that it has been marginalized, cannot access resources and services like others, has no representation in government, and has other structural issues. This is manifested in insurgency, revolutionary and sub-revolutionary terrorism, and international terrorism activities. Nationalism is grounded on the idea that a person's allegiance and commitment to the nation-state exceed other individual or group interests. It is the belief that each nationality should form a state. It's a structure generated by people who consider their nation as greater to all others. This sense of supremacy is rooted in shared origin, linguistic, religious conviction, ethos, or a set of values. Others include shared music, literature, and sports.⁵

Post-colonial Africa has witnessed armed conflicts especially coups in the Sahel region. The independence dreams of freedom, eradication of poverty, and unity have failed leaving in its wake a disillusioned people. To explain post-colonial separatism activities, Obi asserts that "the high expectations of the people that democracy would reverse decades of poverty, corruption, and underdevelopment have hardly been met by the new democrats".⁶ This eventually produced feelings of dispossession and the impulse to form a dissident group and embark on irrational terror assaults on both innocent residents and the government. In West Africa where coups are common, the common grievance is the involvement of former colonial power France in the internal affairs

⁵ Amadeo Kimberly ©2020 "defining nationalism and patriotism" The Balance www.thebalance.com/nationalism-definition-examples-pros-cons-414952#nationalism-since-the-great-depression

⁶ Obi CI (2008). "No Choice, But Democracy: Prising the People Out of Politics in Africa?" Uppsala. In Claude Ake Memorial Papers p.2.

of these countries. The coup leaders are getting support from the locals who feel France continues to benefit from their resources at their expense.

Sahel region has been increasingly volatile. Three (Mali, Burkina Faso, and Niger) of the G5 Sahel (Mali, Niger, Burkina Faso, Mauritania, and Chad) countries that form the core of the region have suffered repeated coups since 2020. Politically, the Sahel also includes Sudan, South Sudan, Eritrea, Senegal and Nigeria. The region has dissident groups and civil wars usually linked to independence and political struggle. Eritrea has had territorial and border disputes with Ethiopia, South Sudan seceded from Sudan which has also been in turmoil since the toppling of strongman Omar Al Bashir in a 2019 coup.⁷ South Sudan has its fair share of intrastate conflict that is ethnic-based. The President, Silva Kiir, and one of his Vice Presidents Riek Machar have been involved in various clashes through their ethnic tribes of Dinka and Nuer respectively, and aimed at controlling state power and resources. Nigeria struggles with conflicts in the Niger Delta and insurgency by the Boko Haram group. Inter-tribal conflicts (involving violence between tribal and in-group groups, for example among rural inhabitants) are also common due to the different needs for water, pastures, and farming.⁸

3.1.2 Ethnic Division

Many states in Africa are multi-ethnic in composition. Ethnic identity connotes safety and any threats to that sense of safety will elicit defensive responses. This desire to protect a group's identity and way of life breeds conflict when the various needs are not met either through

⁷ Verhoeven, H. (2023). "Surviving revolution and democratization: The Sudan armed forces, state fragility and security competition." *The Journal of Modern African Studies*, 1-25.

⁸ Beyene, F. (2017), "Natural Resource Conflict Analysis Among Pastoralists in Southern Ethiopia". *Journal of Peacebuilding & Development*, 12(1), 19–33. www.jstor.org/stable/48602933

systematic or institutionalized discrimination. Multiethnic conflicts threaten global security and state security.

The idea of ethnicity is embedded in identity. Who people identify with creates an inner group and an outer group. This sense of identity oftentimes brings people together to protect their rights, opportunities for development, and most importantly power in state governance.⁹ Ethnic conflicts have been part of the African continent for a long time. From the genocide in Rwanda to the secession movements in various countries to the post-election violence in Kenya and other countries and the conflicts over scarce resources, ethnicity has taken a new devastating direction. Just like the rest of the continent, the Sahel region has dealt with ethnic conflicts. Political elites often use ethnic identity to manipulate the citizens to further divisive politics for their gain.

Scholars such as Edward Azar and Ted Gurr contend that ethnic conflicts are deep-rooted, complex, and protracted making them difficult to resolve.¹⁰ Ethnic conflicts in Africa have been fueled by numerous interconnected contributory reasons such as poverty, human rights abuses, bad governance and bribery, ethnic sidelining, and rise of small arms use.¹¹ Also, competition over scarce resources, fear due to transitions, or past trauma as well as social-economic conditions that influence political life add to the causes of ethnic conflict in Africa.

These ethnic conflicts in Africa are compounded by the colonial legacy of divide and rule, poverty, underdevelopment, and political patronage. Across Africa, the colonial administrations divided geographical areas based on ethnicity. The divisions along ethnic lines are most pronounced during

⁹ Rupesinghe, K. "Governance and conflict resolution in multi-ethnic societies"
<https://archive.unu.edu/unupress/unupbooks/uu12ee/uu12ee04.htm>

¹⁰ Irobi E.G, (2005) "Ethnic Conflict Management in Africa: A Comparative Case Study of Nigeria and South Africa" Beyond Intractability Knowledge Base <https://www.beyondintractability.org/casestudy/irobi-ethnic>

¹¹ Igwe, P. & Lock D. & Ochinawata, C. & Nwakpu, E. & Nwedu, C. (2020) "The Global Order, Regional Integration and Multiculturally Diverse Stakeholders: The Case of ECOWAS". *International Journal of Organizational Analysis*. 10.1108/IJOA-10-2019-1896

the electioneering period. The need to acquire power which translates to economic control makes elections high-stakes endeavors. Ethnic conflicts also gain international attention when a minority group in one state is a majority group in another state, or the commonality cuts across borders thus involving more than one state.¹²

3.1.3 Ideological Differences

Initial African armed insurgent movements were mainly based on their anti-colonialism and later those movements promoted ideological loyalty to the outside patrons throughout the Cold War and by the start of the twenty-first century few armed rebellions had an evident ideological standing. Ideology is defined “as a set of beliefs or philosophies” in which “practical elements are as prominent”.¹³ Currently, ideological framework particularly global Islam, is a significant feature of many armed conflicts. For instance, the Boko Haram in Nigeria to the Al-Shabaab in the Horn of Africa.¹⁴

Ideological-based conflicts have been witnessed in Mozambique, Somalia, and Nigeria, just to name a few. Ideological conflicts are often mixed up with a scramble for resources. In Mozambique, the insurgency in Cabo Delgado is a continuing violent conflict between the Islamic militants and the Mozambican security forces. It has claimed so many civilians’ lives since the civilians are the targets of attacks. According to Abhishek Mishra,¹⁵ the discovery of natural gas resource that was to bring hope to people, instead brought forced displacement and homelessness,

¹² Behr, A. W. Border, ©2017 “Identity and (In) Security: The Kenya-Somalia Border 1963-2016” <https://erepo.usiu.ac.ke/bitstream/handle/11732/4574/AGNES%20WANJIRU%20BEHR%20PhD%20IR%202019.pdf?sequence=1&isAllowed=y>

¹³ Cranston, M. (2020) "Ideology." Encyclopedia Britannica, <https://www.britannica.com/topic/ideology-society> accessed June 30th 2023

¹⁴ African Union Report ©2014 accessed June 10th 2021 <https://www.peaceau.org/en/article/report-of-the-chairperson-of-the-commission-on-terrorism-and-violent-extremism-in-africa-1>

¹⁵ Abhishek Mishra, (2020) “Understanding Mozambique’s Islamic Insurgency” Observer Research Foundation <https://www.orfonline.org/expert-speak/understanding-mozambiques-islamist-insurgency-65993/> accessed May 1st 2023

loss of means to earn an income, inadequate reparation, and increasing violence from local armed insurgents caused by foreign energy companies poaching for lucrative deals in this province. The rise of terrorist groups Al Qaeda, Boko Haram, Al Shabab, ISIL, and others has exacerbated the security threat occasioned by violent extremism. Violent extremism can be based on spiritual, tribal, or political grounds. It elevates the power of a specific group and rejects a more open-minded and all-encompassing society.¹⁶

Nigeria has been prone to different kinds of conflicts. They range from religious, inter-communal, banditry, and resource-based conflicts that threaten national and regional stability. These conflicts are worsened by political, economic, and identity-based issues.¹⁷ The Niger Delta has a “long-running discontent and militancy’ while the North East is facing Boko Haram insurgency, the Middle Belt faces banditry and conflicts between farmers and herdsmen, and the southeast is dealing with the separatist Biafra agitation. These conflicts have killed many, displaced millions, and ravaged the economy of the whole country. Internal conflict usually spreads to the neighboring countries thus becoming inter-state in nature. The conflict between nomadic herdsmen and indigenous farmers is complicated.

Mali has experienced an ongoing conflict involving jihadist insurgencies and ethnic tensions, leading to instability in the country and the wider Sahel region. Mali has been struggling with an armed conflict since 2012. The conflict began when Tuareg rebels, who are a minority ethnic group in Mali, took up arms against the government. The conflict has since spread to other parts of the

¹⁶ UNDP (2016) “Preventing Violent Extremism, Through Promoting Inclusive Development, Tolerance and Respect for Diversity. A Development Response to Addressing Radicalization and Violent Extremism”

¹⁷ US Institute of Peace -Africa Center ©2021 accessed 3rd March 2022 [https://www.usip.org/events/religion-identity-and-conflict-northern-nigeria#:~:text=Conflict%20in%20northern%20Nigeria%20is,on%20local%20markets%20and%20livelihoods.\(video\)](https://www.usip.org/events/religion-identity-and-conflict-northern-nigeria#:~:text=Conflict%20in%20northern%20Nigeria%20is,on%20local%20markets%20and%20livelihoods.(video))

country and has involved several other armed groups, including al-Qaeda in the Islamic Maghreb (AQIM).¹⁸

3.1.4 Scramble for resources

The OPEC oil wars of the 1970s fueled the debate over the ecological capacity of the earth and the political ramifications of disputes over natural resources. Environmental degradation and the exploitation of natural resources are part of the driving force of violence between states and intrastates. The violence is fueled by the small arms and light weapons (SALW) proliferation, the rampant drought, the movement of people for greener pastures, and global warming.¹⁹ Resource scarcity or abundance can lead to an unstable international system. Both environmental scarcity and abundance cause security concerns. Scarcity is determined by environmental modifications, population increase, and imbalanced distribution or access to resources. The scarcity of basic renewable resources like fish, water, forests, and cropland can damage financial productivity and state stability to deliver for the citizens. This causes conflict and violence between states and intrastate.²⁰

When resources are abundant, greed becomes the cause of conflict especially in areas where there is oil, diamond, and gold among other precious minerals. According to Collier, armed conflict destroys economies. This happens through the destruction of resources, destruction of the social order, diversion of public expenditure, “dis-saving” of government and private equity, and the

¹⁸ The Atlantic (2013) “Mali conflict enters a new phrase” <https://www.theatlantic.com/photo/2013/02/mali-conflict-enters-new-phase/100463/>

¹⁹ Gitari, B.N, (2015) “environmental conflict and national security in Kenya: Case study of Turkana”, University of Nairobi,

²⁰ Meyers Norman, © 2004 environmental security: what’s new and different? https://www.researchgate.net/publication/237228259_ENVIRONMENTAL_SECURITY_WHAT'S_NEW_AND_DIFFERENT

shifting of assets out of the country to safer countries. The scholar concludes by terming war as “development in reverse.”²¹

Non-military threats also exist in Africa. From environmental degradation to health issues especially emerging diseases like COVID-19 and Cancer. This affects the socio-economic status of the region. COVID-19 has particularly been destructive to the economy due to the closure of borders and international travel affecting the movement of labor, goods, and services. The loss of life and destruction of the family unit have been equally tasking. The repetitive conflict has had principally negative concerns for the position of women and children, leading to displacement, disempowerment, and increase of sexual and gender-based violence (SGBV).

3.2 Nexus between environmental stress and armed conflicts in Africa

Past study on the origins of armed conflicts, peace, and security has concentrated on the greed for power, ethnicity, ideology, and natural resources of the communities without considering the environmental changes as a contributing factor. The environment has become a security issue in the increasingly globalized world, due to the availability of more information and data on the effects of mismanaging our surroundings. Environmental security is essential to state security since it comprises the aspects and interrelatedness among natural resources, the economy of the state, and regional stability. The environment plays a key role in peace, conflict, and destabilization of people and governments. The UNDP Report on Human Development (1994) identifies environmental security as one of the seven pillars of human security. Others are personal,

²¹ Collier, P et al. (2003) “breaking the conflict trap: civil war and development policy: A world Bank Policy research report” Washington, DC: World Bank and Oxford University Press.
<https://openknowledge.worldbank/handle/10986/13938> p.17

community, food, health, economic, and political securities. All of them are dependent on the environment since it affects all of them.²²

According to UNEP, environmental factors are seldom, if ever, the only reason of violent struggle. Nevertheless, the natural resources and connected environmental stresses can be associated in all exploitation stages of the conflict series, from causing to the eruption and spread of violence to damaging any chance for peace.²³ Access and movement of water, land dilapidation, deluges, and pollution, in adding to rivalry over extractive resources, can directly worsen strains and lead to the outbreak of conflicts, as is the case for resource exhaustion issues such as deforestation, soil fertility loss, and desertification.

The association concerning security and the environment offers a new clarification and examination to help decision-makers, officials, intellectuals, and the citizenry to identify the problems, set priorities, and establish responses to a range of environmental and demographic changes that increasingly demand attention. Scholars of environment and security identify three schools of thought on security and environment. They are environment and new definitions of security; environment and the traditional definition of security and how security organizations affect the environment.²⁴

Scholars like Jessica Tuchman Mathews and Norman Myers argue that definite features of the environment are linked intensely to state principles that create national security interests.²⁵ They call for an expansion of the definition of security to include resources, environment, and population

²² The UNDP (1994) Human Development Report

²³ UNEP (2023) “Curbing negative environmental impacts war and armed conflicts” <https://www.unep.org/news-and-stories/statements/curbing-negative-environmental-impacts-war-and-armed-conflict>

²⁴ Dabelko, Geoffrey D., Simmons, P.J. “Environment and Security: Core Ideas and US Government Initiatives” The SAIS Review, Vol 17, No 1,127-146 ©1997

²⁵ Levy, M. A. (1995). “Is the Environment a National Security Issue?” International Security, 20(2), 35–62. doi.org/10.2307/2539228

growth. They see issues like soil erosion, population growth, biodiversity loss, and climate change can and have affected national security, and therefore protection of the environment is a vital security issue. The relationship between security and environment is multidimensional and complex in economic, socio-cultural, political, and scientific sense. Environmental stress is one of the elements influencing security. The consequences of environmental strain include scarcity, food insecurity, illnesses, displacements, and disruptions of the political and social structures.²⁶ This school of thought argues that there need to redefine the concept of security to not only protect the state from external aggression but also protect the state from global, regional, and local environmental problems since they threaten people's health, well-being, and economic safety.

Buzan, Waiver, and De Wilde in their securitization theory argue that there are five sectors – military, economy, politics, society, and environment- that are referent objects of security. They argue that political actors can raise an issue above politics by labeling it a security threat.²⁷ In environmental discourse, the referent objects are ecosystems and endangered species. With this in mind, there have emerged political actors who agree that environmental stress is a security threat while others believe it is not. This discontent plays out when negotiating international environmental treaties and their implementation. To link environment and security, the causes of environmental stress are linked to traditional security outcomes such as migration, food insecurity, and conflicts over scarce resources.²⁸ This is exactly what Homer-Dixon does in his environmental scarcity theory underpinning this study.

²⁶ Mahutova, Katarina And Barich, John. J Relationship Of Environment and Security, US Environmental Protection Agency Region 10, 1200 6th Ave (OEA-095), Settle, WA, 98101.

²⁷ Eroukhmanoff, C. (2018) "Securitization Theory: An Introduction E-International Relations Publisher www.e-ir.info/2018/01/14/securitisation-theory-an-introduction/ accessed 21st October 2023

²⁸ Gordeeva, E. (2022) "The Securitization of Global Environmental Policy: An Argument Against. *Eur J Secur Res* 7, 5–20 (2022). <https://doi.org/10.1007/s41125-022-00083-x>

Opponents of this school of thought argue that there is no need to redefine security nor should the environment be securitized. They argue that human security threats are different from military threats. They see the current debate on security and the environment as a ploy to win sympathy from the governments and the public. They point out the many Hollywood celebrities who have been preaching the climate change gospel since the first Earth Summit in 1992. They also see the debate as increasing the South-North divisions where the North is the biggest polluter yet the South is paying highly for it. Others see the debate as a new neo-colonization where the North can impose its will on sovereign states of the South.²⁹

The second school of thought on security and environment sees population increase, wealth distribution, and universal environmental changes as contributing factors to political instability and violent conflicts. The environment can determine the economic and political success or failure of a state.³⁰ The connection between environment and security is seen in the effect of armed conflict on the environment. Violent conflicts, war, and displaced persons among others can cause environmental stress. The ecosystem provides water, food, medicine, and clean air. Not giving it the attention it deserves would lead to conflicts over these scarce things. Environmental issues are transnational.³¹ Degradation affects the developed and developing states though not equally. The proponents are concerned with the abundance and scarcity of resources and their ability to elicit greed, grievance, and discontent leading to violence.

The third school of thought talks about security institutions and the environment in two ways. First, security institutions can affect the environment in either a damaging or helpful way. The military,

²⁹Woodrow Wilson International Centre for Scholars (1996) Environmental Change and Security Project Report (ECSPR). Washington DC, PP 77-85

³⁰ Goldstein, J. A. International Relations, 6th edition. www.internationalrelations.net

³¹Bourguignon, D. (2016) "Chernobyl 30 years on: environmental and health effects" European parliament think tank www.europarl.europa.eu

intelligence, and police can help monitor and enforce the implementation of environmental agreements; they also respond to and mitigate environmental disasters, gather and disseminate scientific information on the natural environment, and implement sustainable programs among others.³² Most militaries hold vast lands and they can play a significant part in environmental conservation. Secondly, the military can also harm the environment; military activities like warfare contribute to environmental degradation. Most war fields are littered with land mines and policies like “scorched earth” have negatively affected the environment. Other military activities like the use of herbicides to create chemical weapons, the use of excess energy, and nuclear residue all lead to the dangers of sicknesses, drought, famine, and even death.

Conflict impacts human security of which environmental security is a big part, other than deaths resulting from conflict, it also affects the development goals of the society through mass displacement of people, refugee crisis, illegal migration, capital flight, destroying the social fabric, destruction of infrastructure and increased disease burden due to lack of proper sanitation facilities in refugee camps among others. Armed conflict therefore affects all spheres of human life, that is, political, economic, and social.³³ Generally, countries that have been engaged in armed conflicts have less development than those that have been peaceful. For instance, the recurrent coups in the Sahel have devastated the region economically, thus requiring economic aid.

Armed conflicts and environmental stress interlink in many ways. In natural resources mining areas, it is conflicts that occur between local communities and oil companies that operate on their land. The main areas of concern for the communities are environmental degradation, disruption of socio-economic life, violation of human rights, lack of development projects, and lack of

³² Ibidnp.55

³³Gates Scoot et al. (2012) “development consequences of armed conflict” World Development Vol. 40, No.9 pp1713-1722 <https://dx.doi.org/101016/j.worlddev.2012.04.031>

compensation for the people affected by oil spills caused by equipment failure, operational and maintenance errors, sabotage, and vandalism.³⁴ The oil companies' view is that the spillage is due to sabotage by thieves and criminal gangs rather than equipment failure. This makes oil companies reluctant their corporate responsibility to compensate communities affected by oil spills.

The second level of conflict occurs between governments and communities in resource-rich areas. The main issue here is the marginalization of communities in terms of their access to political and economic power. People in such regions are of the view that they should do better in life because of the resources available to them. This sense of marginalization is the one that has led to an upsurge in militancy activities like the kidnapping of oil workers especially expatriates and damaging resource installations.

The African continent has a multi-ethnic, multilingual, and multicultural population; there has been long-standing conflict among these many communities.³⁵ Conflict is usually over control and distribution of the resource and revenue from it, therefore the presence of natural resources in the region has caused conflict and even damaged the ecosystem due to the environmental degradation that accompanies industrialization, especially oil exploration. Oil and gas have caused the intensification of conflict and environmental problems. The politics of resource ownership is the cause of armed conflicts witnessed in such areas as the Niger Delta.

Insurgency group Sunnah Wa-Jama'a- emerged and started by carrying out attacks on police and military bases in the province of Cabo Delgado, Mozambique. They cited bad governance, unimplemented laws, and the existing corrupt system that diverts resources from the already

³⁴ Watts, M. and Zalik, A. "Consistently unreliable: Oil spill data and transparency discourse." *The extractive industries and society* vol. 7,3 (2020): 790-795. doi: 10.1016/j.exis.2020.04.009

³⁵ Obeten, U. & Ebagu, E. (2020). *Challenges of Ethnicity and social work intervention in Nigeria*. 29.

struggling economy as the reason why they had decided to take up arms.³⁶ Also, there are years of poverty, marginalization, and inequality between locals and the elite in the capital, Maputo.³⁷ Climate change also contributed to this conflict as the poor people of this province are vulnerable and dependent on mostly a subsistent economy for survival which is dependent on natural resources that aid fishing and farming. The increase in extreme weather happenings has long sparked a humanitarian crisis in this region and added tensions caused by the mass appropriation of natural resources happening in this same area of the country. Hence, the urgency to fight back and regain some sort of normalcy. Most of the land here is agricultural and communities depend on it for their survival. Environmental degradation together with the growing population and occupation of the land by mining companies leads to land scarcity and conflict.³⁸

Conflict over shared resources can threaten the stability of bordering countries and even whole regions. Natural resources are assumed to offer the drive and prospect for violent conflict. The negative socio-economic effects of natural resources-based conflicts include lack of development, gender-based violence, poor infrastructure, lack of drinking water and food, increased poverty, and poor social services like education and health, among others.³⁹ It can also exacerbate political tensions and instability within a region. For instance, in the current dispute over the Nile River Basin between Ethiopia, Egypt, and Sudan, the Nile Basin is shared by 11 countries that are mutually dependent on the river for their water resources. The construction of the Grand Ethiopian

³⁶Mathias Bak (2020) “Mozambique: Overview of corruption and anti-corruption” U4 Anti-Corruption Resource Centre, Chr. Michelsen Institute (U4 Helpdesk Answer 2020:23 <https://www.u4.no/publications/mozambique-overview-of-corruption-and-anti-corruption-2020> accessed May 1st 2023

³⁷Hall, M. (2018). The Mozambican National Resistance Movement (Renamo): A study in the destruction of an African country. *Africa*, 39-68.

³⁸Okwechime, I. (2013). Environmental Conflict and Internal Migration in the Niger Delta Region of Nigeria. (COMCAD Working Papers, 119). Bielefeld: Universität Bielefeld, Fak. für Soziologie, Centre on Migration, Citizenship and Development (COMCAD). <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-51012-0>

³⁹ Adan, M, Pkalya R and Masinde I. (2015) “an assessment of the social economic impacts of conflict on pastoral and semi pastoral economies in Kenya and Uganda”. *Practical Action, Eastern Africa*.

Renaissance Dam (GERD) dam by upstream Ethiopia is thought that it will affect the activities of the downstream countries, especially Egypt and Sudan.⁴⁰ The UN says that water conflicts result from contrasting interests of water users, private or public.

The existing interconnectedness makes environmental stress a non-stop debate in international relations since crises such as those over water cause involuntary migration while weather impacts like drought disrupt life and infrastructure. Natural disasters cause deaths, displacements, and migration, slowing the economy and breakdown down the social structure.

3.3 Global and regional Responses to armed conflicts in the Sahel region

In armed conflicts, different actors benefit differently making resolving them difficult. The government, insurgent groups, and ordinary citizens use extreme violence to control available assets, labor, and trafficking networks. Violence becomes self-financing from plundering, natural resource raiding, and the embezzlement of state assets. Some of the responses to armed conflicts evident in the Sahel include the use of sanctions, mediation, negotiations, and security sector reforms.

Niger, Mali, and Burkina Faso have suffered coups in 2023, 2021, and 2020 respectively fueled by citizens' frustrations at the failure to end long-lasting insurgencies by Jihadists linked to Islamic State groups and Al Qaeda, corruption, and economic woes. ECOWAS formed a regional security force in 2022 to respond to the frequent military and jihadist activities in the region. Military intervention has been floated by ECOWAS as a possible intervention strategy in the aftermath of the 26th July 2023 coup in Niger. The security force is yet to be deployed but plans are underway

⁴⁰Pearce F. ©2015 "On the River Nile, a Move to Avert a Conflict Over Water" Yale Environment 360 assessed 3rd November 2021 https://e360.yale.edu/features/on_the_river_nile_a_move_to_avert_a_conflict_over_water

to actualize their deployment and funding.⁴¹ This military intervention, should it be rolled out will be against the AU and some ECOWAS member states including The Gambia where ECOWAS had intervened militarily, who encourage the use of diplomacy to resolve the conflict. The military juntas in Mali and Burkina Faso have declared that any external aggression in Niger by ECOWAS will be a declaration of war.⁴² The threat of military intervention has attracted the attention of Russia's Wagner Group and other foreign mercenaries who are pledging to support the junta region. This renewed Western interest in the Sahel risks the region becoming the new battleground for global powers.⁴³

AU and ECOWAS have mediated for the release of former presidents and leaders where military coups have occurred. In Mali, ECOWAS successfully negotiated for the release of the late President Ibrahim Boubacar Keïta. Niger ousted president Mohamed Bazoum, is currently held in an undisclosed location and the military Junta led by General Abdourrahmane Tchiani of Conseil national pour la sauvegarde de la patrie (CNSP) has declared that it will kill him if ECOWAS intervenes militarily.⁴⁴ AU is in favor of diplomatic solutions to the armed conflicts in the region. The conflicts in conflict have been suspended from regional bloc memberships, their borders closed and diplomatic ties severed. When faced with this, Mali negotiated for the removal of the sanctions with the promise to hold elections by February 2024. Niger is using the former president as a bargaining chip to prevent military action by ECOWAS and its Western supporters.

The UN has in the past deployed a peacekeeping mission in Mali- the UN Multidimensional Integrated Stabilization Mission in Mali (MINUSMA), established on 25th April 2013 by United

⁴¹ Sow, D (2023) "ECOWAS must look beyond the use of force in Niger" Institute of Security Studies (ISS)

⁴² *ibid*

⁴³ UN Press Releases (2022) "Economic sanctions on Mali tightened as West African Leaders reject proposed timetable for presidential elections, Special Representative tells Security Council" SC/14762

⁴⁴ *Ibid* p.62

Nations Security Council (UNSC) resolution 2100 with the mandate to stabilize the country after Tuareg Rebellion. The mission ended on 30th June 2023.⁴⁵ Also operating in Mali as peacekeepers are the European Union Sahel-Mali Capacity Building Mission (EU-EUCAP), the European Union Training Mission in Mali (EUTM), and the ECOWAS International Support Mission in Mali (AFISMA)

In Mali, Burkina Faso, and Niger coups, the regional body ECOWAS responded by issuing economic and targeted sanctions against the top leadership, cutting off foreign aid, freezing military and rebel leaders' foreign accounts, and canceling their visas and those of their close family members and cronies.⁴⁶ Trade embargoes closing borders are also used. This is in line with its zero-tolerance policy on overthrows and undemocratic government changes. Unfortunately, sanctions can backfire if the locals support the coup leaders as is the case in the three countries. The sanctioning entities ECOWAS, France, and the USA are seen as enemies of the citizens, and ideas of neo-colonialism take effect.⁴⁷ Sanctions can also be countered when the sanctioned country retaliates. France suspending flights to Burkina Faso was met with a refusal to resume the flights by Burkina Faso. The sanctioned state can also receive help from sympathizing nations who may help them bust the sanctions.⁴⁸ The UN's response to sanction-busting is naming and shaming the culprit nations.

⁴⁵ United Peacekeeping Mission (2013) "Minusma Fact Sheet: United Nations Multidimensional Integrated Stabilization Mission in Mali"

⁴⁶ Ibid p.62

⁴⁷ Aubyn, F.K., (2022) "ECOWAS Sanctions Against Mali Necessary, but May Be Counter-Productive" IPI Global Observatory

⁴⁸ Early, B. R. (2009). "Sleeping with Your Friends' Enemies: An Explanation of Sanctions-Busting Trade". *International Studies Quarterly*, 53(1), 49–71. <http://www.jstor.org/stable/29734274>

In post-conflict situations, Security Sector Reforms (SSR) will need support and finances to vet security officers and the judiciary thus building trust in such institutions.⁴⁹ In active conflicts, this support gets withdrawn to put pressure on the warring groups to reform. Former colony France and the European Union (EU) suspended security cooperation and financial aid in all three countries. Like many countries in Africa, Sahel countries also host foreign military bases (France, the USA, Germany, and Italy) to assist in counterinsurgency, anti-terror and training activities.⁵⁰

3.4 Chapter Conclusion

The environment plays a central role in human survival. In armed conflicts, the damage to the environment either man-made or natural will impact how the warring groups respond to each other. Environmental degradation has been cited as a grievance point in mining communities, while other communities have felt marginalized when governments concentrate on resource-rich areas leading to the taking up of arms, in other areas, the presence of natural resources has largely been a curse to the inhabitants and the environment. The nexus between environmental stress and armed conflicts is only evident when other factors such as political marginalization, frail governance structures, historical understandings, cultural discrimination, ethnic separation, general feeling of marginalization, and lack of access to peaceful means of settling disputes are in play.

⁴⁹ Detzner, S. (2017) “Modern post-conflict security sector reform in Africa: patterns of success and failure”, *African Security Review*, 26:2, 116-142, DOI: 10.1080/10246029.2017.1302706

⁵⁰ Ibid p.62

CHAPTER FOUR

MANAGEMENT OF ENVIRONMENTAL STRESS AND CONFLICTS IN MALI

4.1 Introduction

This study set out to examine the management of environmental stress and armed conflicts in the Sahel region, a case study of Mali. Chapter two explains in detail what environmental stress is, its impact on society, state and international relations, and global responses to environmental stress. Chapter three dived further to explain the relationship between environmental stress and armed conflicts, the causes of armed conflicts in Africa, and how the world responds to them. This chapter will critique intervention measures to manage the environmental stress and armed conflict in the Sahel region, it will examine if the interventions include environmental protection and how effective they have been.

4.2 Brief History of Mali

Mali is a landlocked country in West Africa with half of it occupied by the Sahara Desert. Its climate is arid with Rivers Niger and Senegal providing the much-needed water for domestic and commercial use and as a means of transport. The French-speaking country is large but with a small population. It is multiethnic with Bambara (Bamana), Fulani (Fuble) Dogon, and Tuareg as the main ethnic groups, and multi-religious with Islam, Christianity, and traditional belief as the main means of worship¹

¹ Baker, K.M., Imperato, P.J and Clark, A. (2023, August 28). Mali. Encyclopedia Britannica. <https://www.britannica.com/place/Mali>.

4.2.1 Political background

Mali got its independence from France in 1960 and suffered its first coup in 1968. According to civil-military relation experts, once a country suffers a military takeover, chances of a repeat are very high and true to this, Mali has suffered five successful coups and repeated rebellions in its post-colonial history. Mali has a unicameral National Assembly, presidency term is 5 years and limited to two terms. It is divided into eight provinces administered by a governor. Military service is conscripted with two-year mandatory service.² The five coups have altered the political landscape of Mali and the insurgencies in North and Central Mali since 2012 and the jihadist insurgency in the East sides of Mali have exposed the country to insecurity internally and externally. Diplomatically, the country is isolated. On August 18, 2020, a coup occurred after citizens mobilized to reject the disputed parliamentary elections and persistent insecurity. Currently, the country has a transitional government following the 2020 coup and 2021 counter-coup led by Colonel Assimi Goita. As per the 2015 Algiers Peace Accord on Mali, the country is expected to hold elections in March 2024 to return to civilian rule.³ Coups are detrimental to a country's economic outlook.

4.2.2 Economic Situation

Mali was a commercial hub for the Sahel region but now it is one of the poorest and most heavily indebted countries in the world. According to the World Bank, its poverty levels keep increasing from 15.9% in 2021 to 19.1% in 2022.⁴ Its Gross Domestic Product (GDP) is 13.8 Billion US dollars and ranks 178 out of 188 on the Human Development Index. Its economy is agricultural and tourist-driven in the North and mining of natural resources such as gold, in the South. 57.3%

² Ibid p.71

³ UN Security Council (2022) "Progress towards Peace in Mali is Unfolding, Security Council Told, Despite Tough Security, Humanitarian and Human Rights Challenges" News and Press Release

⁴ The World Bank (2023) "The World Bank in Mali: An overview"
<https://www.worldbank.org/en/country/mali/overview>

of the population lives in rural areas while 42.7% in urban areas and like most African countries, its population is largely young. The youths are unemployed and underemployed forcing them to migrate to French and other European countries for education and job opportunities. Environmental stress such as the droughts of the 70s and 80s forced many especially the Tuareg to migrate to towns and where possible new grazing lands.⁵ This migration overstretches the urban resources and many live in poverty and those in new grazing lands conflict with their farming hosts. Half of the country is occupied by the Sahara Desert making productive agriculture a tall order. Many farmers are concentrated in the valleys of the Niger and Senegal rivers where occasional flooding brings silt to crops.

The balance of trade is against Mali as Mali imports high-value goods from the West especially France while exporting goods that are susceptible to global markets and foreign exchange instabilities. Despite having gold and other minerals (Uranium, Lithium, Iron, Bauxite, Salt, and Marble), the mining industry exports the minerals as raw materials which is cheaper than finished goods. The mining industry is also largely undeveloped and limited by a lack of infrastructure. Other exports are cotton and live animals.⁶ The decades of armed conflict, resource mismanagement, foreign debt, and dependency on foreign aid have left the economy struggling.⁷ The country is heavily reliant on foreign aid from France, the United States, the European Union, and the Organization of Petroleum Exporting Countries (OPEC) countries. The food inflation by 5.2 percent in 2021 worsens food insecurity and increases poverty in Mali. High food price rises

⁵ Ibid p.71

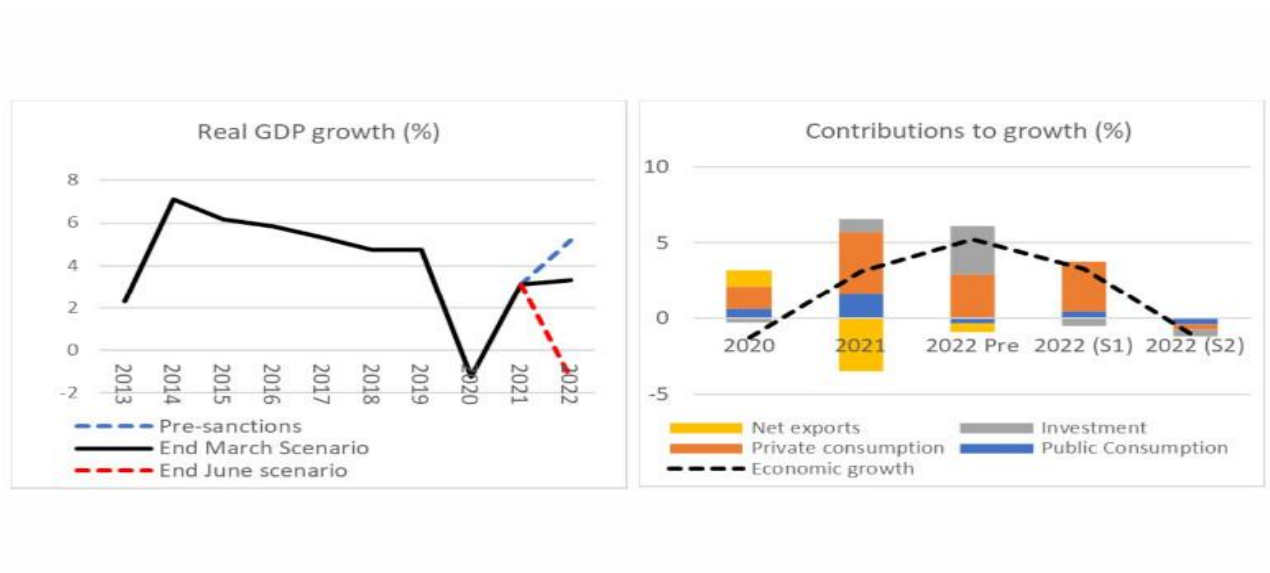
⁶ Ibid p.71

⁷ Ibid p.71

and insecurity unduly impacts underprivileged and vulnerable families, who spend 46 percent of the budget on food, compared with 31 percent for the non-poor.⁸

To boost its economy, the World Bank and International Monetary Fund (IMF) call for increased private venture and initiative, liberalization of the local market, and reduced state regulation. In 2015, the IMF canceled Mali’s debt. Mali has great economic potential if harnessed. It is home to UNESCO World Heritage Sites thus a tourist destination and its mining industry is grossly underexploited.

Fig 4. 2022 Economic outlook for Mali⁹ Source: World Bank



The above graphs indicate that Mali’s economy has been declining with 2020 as the worst year mainly due to Covid -19 outbreak and its devastating effect on trade and commerce. In 2022, before the coup, the economy was in recovery mode but took a hit after the coup. Due to the political uncertainty, investors are jittery and have adopted a wait-and-see approach. This has

⁸World Bank. 2022. Mali Economic Update - April 2022. Resilience in Uncertain Times: Renewing the Social Contract. Washington, D.C.: World Bank.

⁹World Bank Staff simulations. Note: The projections for 2022 are labeled as: Pre (before sanctions), S1 (sanctions end by early Q2) and S2 (sanctions end by Q2).

pushed many in Mali to below the poverty line. The sanctions by the international community to put pressure on the military junta have negatively affect the economy as illustrated by the first graph that show an upward trajectory before the sanctions and a downward trajectory after the sanctions.

4.2.3 Environmental Stress in Mali

4.2.3.1 Climate Change

Climate change is a global concern. The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as a “change of climatic conditions that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and in addition natural climate variability observed over comparable period.”¹⁰ Climate change reduces the availability of water and food thereby affecting food security while increasing health risks. It also affects the state's ability to provide basic services such as water, sanitation, education, health, energy, and transport.

Africa is highly vulnerable to the impacts of climate change. Climate change in the Sahelian region displays heavy rains that destroy public infrastructure, droughts, that damage livestock and crop production, and rising temperatures of up to 45° Celsius that have largely affected babies and the old. Climate change-induced shocks in Mali led to a worsening in the people's livelihoods, an upsurge in charges, and displacement.¹¹

¹⁰United Nations Framework Convention on Climate Change, 1992

¹¹ Bandsom, K. (2023) “Conflicts and climate change in Mali” Welt Hunger Life Organization welthungerhilfe.org/our-work/countries/mali/conflicts-and-climate-change-in-mali

4.2.3.2 Desertification

Half of Mali is covered by the Sahara Desert which keeps encroaching on productive lands. According to the UN Food and Agriculture Organization, 75% of the Malian residents depend on agriculture for their food and wages, and most are small-scale farmers, growing rain-fed crops on small plots of land.¹² These lands are threatened by the expanding desert at 48 km per year. The desert has encroached on lakes and other water bodies. The more the deserts spread, the more people moved to Southern parts of Mali increasing the chances of conflicts.¹³ Communities are migrating in search of pastures and water increasing the likelihood of inter-communal conflicts and vulnerability to recruitment to jihadist groups in exchange for food and security.¹⁴

Desertification is a threat to sustainable development and FAO estimates that by 2030, Africa will lose about 66% of its arable lands due to spreading deserts. From 1960 to the present, Mali has lost 82% of its forest reserves.¹⁵ To reverse this trend, FAO through Action Against Desertification is implementing the Great Green Wall of Africa in 10 countries including Mali. The program aims at restoring lands, combatting climate change, and desertification, and addressing food insecurity.¹⁶

4.2.3.3 Rising temperature

The Sahel contributes very little to CO₂ emissions but is most affected. The predicted global temperature increase from 2 degrees Celsius to 4 degrees Celsius will affect the Sahel most. The worsening climate situation is increasing the likelihood of violent conflicts between the herders

¹² UN FAO (2022) “Integrated Production and Pest Management (IPPM) Programme in Africa: Mali” [fao.org/agriculture/ippm/projects/Mali/en/](https://www.fao.org/agriculture/ippm/projects/Mali/en/)

¹³ Arsenault, C. (2017) “Drought, expanding deserts and ‘food for jihad’ drive Mali's conflict” Thomson Reuters Foundation

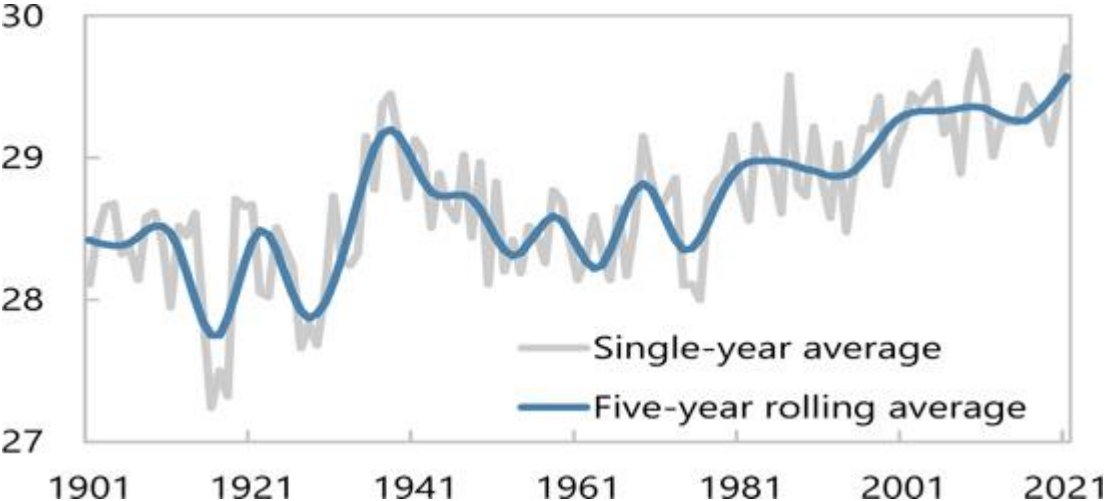
¹⁴ *ibid*

¹⁵ Africa Renewal (2021) “desertification a threat to Africa’s development” www.un.org/africarenewal/web-features/desertification-threat-to-africa-development

¹⁶ FAO Action Against Desertification Program (2022) www.fao.org/in-action-against-desertification/en/

and farmers over-grazing and farming lands and water. Mali experiences low and irregular rains, this together with the low flooding of the Niger River threatens food production. The farmers' yield reduces while the pastoralists' herds reduce in size. Despite this deep environmental impact, the Sahel countries are not resilient to climate change.¹⁷ Two-thirds of Mali's territory is covered by the Sahara desert. The temperatures keep rising.

Fig 5: Mali Rising Temperatures 1901-2021¹⁸



Mali has undergone “40 main climate blows between 1970 and 2020, with drought upsetting about 400,000 people and reducing crop returns by \$9.5 million annually, according to the World Bank.¹⁹ Food shortage can also lead to conflict or heighten prevalent ones every time herders migrate into areas such as farming grounds belonging to others. The upsurge in jihadist insurrections since 2017 has amplified ethnic pressures and violence, mainly in the central regions, and additional

¹⁷Boas, M. (2019) “the Sahel crisis and the need for international support” The Nordic Africa Institute, Policy Dialogue No.15

¹⁸ IMF Staff Country Reports 2023, 210; 10.5089/9798400246081. 002.A001, World Bank Climate Change Knowledge Portal.

¹⁹ World Bank Publication (July 2023) Mali: Strengthening Financial Resilience to Recurrent Droughts

intensified the susceptibility of the herders. The loss of industrious possessions and pillaging associated with violence and security cases have interrupted businesses and domestic incomes in the affected regions.²⁰

4.2.3.4 Land Degradation

United Nations Convention to Combat Desertification (UNCCD) defines “Land degradation as the degradation of the services provided by the land or its capacity”. The degradation is a result of both human and natural activities. Decreased rainfall, ruined vegetation, and deteriorated soil fertility lead to diminished food production.²¹ According to the Economics of Land Degradation (ELD), soil erosion in Mali is affecting its GDP. The semiarid areas of Gao and Mopti and the Northern arid region are severely degraded.²² In the cotton planting regions, studies show that degradation is affecting yield and therefore incomes. Farmers are encouraged to adopt agroforestry and reforestation to deal with the degradation.

4.2.3.5 Water Scarcity

The SDG Report 2022 estimated that about “2 billion people have no access to clean, safe drinking water” while 3.5 billion are experiencing severe water scarcity, and with climate change, these numbers will continue to increase unless urgent steps are taken to mitigate this crisis.²³ In Mali, three rivers- Niger, Senegal, and Volta provide water for the populace. Others depend on underground water through the drilling of boreholes and wells. Unfortunately, the rivers are polluted making the water unsafe for drinking. The climate in Mali is semi-arid and arid therefore, irrigation takes up much of the water use.

²⁰ Ibid p.74

²¹ Toure, I. (2020) “Land degradation along a climate gradient in Mali: Farmers perceptions of causes and impacts” Land Degradation and Development, Vol31, Issue 18 pp 204-2818 <https://doi.org/10.1002/ldr.3683>

²² www.eld-initiative.org/en/country-work/africa/Mali

²³ United Nation Climate Action www.un.org/en/climatechange/science/climate-issues/water

The effects of climate change can be felt in the quick drying off of surface water and the slow restocking of underground aquifers. Efforts to drill boreholes and wells sometimes are futile since the sub-soil is very dry.²⁴ The irregular rainfall also allows for the concentration of dangerous chemicals that render the underground water unfit for human consumption. Water scarcity is worsened by encroaching deserts and deforestation. This situation is especially dangerous for women and children who are required to trek long far in search of water exposing them to danger such as kidnapping, rape, recruitment to jihadist groups, and death.

4.2.3.6 Food Insecurity

FAO (2002) defines food insecurity as “interference of food consumption, and change in consumption patterns due to shortage of money and other resources”. SDG framework calls for safe, nutritious, and sufficient food for all and the elimination of all forms of malnutrition. There are two sides to the food insecurity debate, is insecurity a result of unequal distribution or lack of production yet research shows there is enough food in the world. Children in developed countries where food is in plenty suffer from obesity while those in developing countries that struggle with availability and accessibility of food suffer from malnutrition.

The conflict in Mali, the sanctions imposed by the international community, climate change, drought, and the war in Ukraine which is a cereals basket are affecting Mali’s ability to feed itself. Witnessed food shortages accompanied by high food prices are punishing the already overburdened populace. According to FAO (2022), 10 % of the Malian population is malnourished affecting the long-term physical and cognitive health of children.²⁵ World Food Programme says 30.4% of children under 5 have stunted growth, while 4.3 million people need humanitarian

²⁴ International Committee of the Red Cross (2022) “climate change in Mali: we drill deep but found nothing” <https://reliefweb.int/reports/Mali>

²⁵ IMF African Dept (2023) “Mali: Selected Issues” Volume 2023, Issue 210, ISBN 9798400246081

assistance in 2022.²⁶ The instability in Mali has resulted in the displacement of people, disrupted agricultural activities, and created an environment where food production and distribution are severely affected.²⁷ Water resources are an essential element in achieving food security in Mali but global warming is making it harder to produce food in Mali. As discussed previously, water scarcity is a reality in Mali.

4.2.4 Peace and Security

The Tuareg and Arab communities in Northern Mali have rebelled against the central government four times, in 1963, 1990-1996, and 2006, and the ongoing conflict started in 2012. In all of those times, political and economic marginalization have been the key issues. The government is accused of paying more attention to Southern Mali where there is gold and cotton while neglecting the agricultural north. In the ongoing conflict, the Tuareg are demanding full autonomy of their state, Azawad. The government response has always been military pushing more people to join the rebel groups.

The current regional conflict affects all Sahel countries, including Chad, Niger, Burkina Faso, Mauritania and Mali. As the individual country struggles with internal and external conflict drivers, the numerous types of violent underlying forces are progressively interweaved throughout the region – radical violence, clashes amongst different resistance groups, inter-tribal and intra-tribal conflict, lawlessness, and antagonism to govern trafficking and smuggling means. This fits

²⁶ <https://www.wfp.org/countries/Mali>

²⁷ Anzellini, V (2022) “Global Food Insecurity is on the Rise, So Is Internal Displacement. What Is the Relationship?” Internal Displacement Monitoring Centre <https://www.internal-displacement.org/expert-opinion/global-food-insecurity-is-on-the-rise-so-is-internal-displacement-what-is-the-relationship>

with a broader tendency in the Sahel region concerning the interconnection of attachments and forms of violence.²⁸

4.3 Management of Environmental stress and conflicts in Mali

According to the Nordic Africa Institute, the Sahel problems include weak states with frail capacity to govern, increased poverty, refugees, migrants, international organized crime, jihadist insurgencies, coups, and environmental fragility. To manage environmental stress and armed conflict in Sahel and Mali, the local elite, regional organizations, and international communities must find knowledge-based solutions that understand how the countries are, their history, and what would work in individual situations.²⁹ According to the Head of Environment and Climate Change at UNDP Oumar Tamboura, UNDP is supporting the restoration and protection of natural resources, consolidation of peace, and adaptation to climate change and ultimately advancing inclusive sustainable development.

4.3.1 Restoration of peace and security

80% of the respondents to the research questionnaire felt that the restoration of peace and security in Mali and the Sahel region is of utmost importance.³⁰ Peace, security, and development are the key ingredients to managing environmental stress in the Sahel. The perpetual conflicts in the region put people and governments in survival mode, leaving little time to care about other issues like the environment. The Sahelian countries lack control of their borders, transparent and accountable institutions of governance, legitimate peaceful means of power transition, means of collecting taxes and spending to provide social services, and means of settling disputes peacefully.

²⁸ Boas, M. (2019) “the Sahel crisis and the need for international support” The Nordic Africa Institute, Policy Dialogue No.15

²⁹ Ibid p.69

³⁰ Amdagh A. Respondents to the questionnaire

The large sections of Sahel that are ungovernable due to insurgencies need to be dealt with. The state should with the help of international friends regain control and exercise its sovereignty over its territories. The Sahel already has help in terms of military training, capacity building, and funding from the many military bases in the region. The problem is that these military bases are from former colonial masters and with nationalistic sentiments taking root, the help is not appreciated by the locals who also feel aggrieved that the bases are serving the sending states' interests of blundering Africa's natural resources.

The actors in the Sahel are grappling with finding a balance between state security concerns and a larger development agenda. In most cases, state security takes prominence, however, the APSA Road Map 2016-2020 says that climate change as one of the intersecting issues disturbing peace and security.³¹ 70% of the respondents claim that environmental stress escalates to armed conflict, resources get scarce, the control and demand lead to conflict. It is a survival of the fittest instinct of human beings. Environmental stress unsettles people and internally displaced people (IDPs) are a threat to the local environment since they move together with their livestock causing havoc to the new settlement.

Conflict between pastoralist and farmers is common while in other areas with mineral resources, conflict to control the resource have resulted in loss of lives.³² 20% of the respondents argued it is not environmental stress that escalates armed conflict, rather it is weak governance structures and political issues. They also pointed out that environmental stress is also experienced in the Horn of Africa, Great Lakes Region, and Sahel Conflict zones and conflicts are also common in these regions.

³¹ Davis I. (2019) "armed conflict and conflict management" SIPRI Yearbook 2019

³² Hamadi Meimo Respondents to the questionnaire

Former UN Secretary-General Kofi Annan noted that there cannot be development without security and respect for human rights and there cannot be security and development without peace.³³ To achieve the three, the Sahel needs stability, translucent, and genuine institutions that can use the taxes, rates, and rents to recover economic development and services and generate climate change resilience. The connection between environmental protection and development is clear in the global efforts to push for sustainable development.

Following the spate of coups in the Sahel region, United Nations Secretary-General Antonio Guterres thinks the epidemic coups are part of an anti-democratic trend and local solutions supported by regional and international partners are the way to go if this trend is to be slowed down. 65% of the respondents link the recurring coups in the Sahel to environmental stress as evidenced by rising military coups and civil disobedience across the majority of countries in Africa packaged as food security and a rise in cost of living.³⁴ 35% of the respondents argue refusing to tackle bad governance, for instance, will cause the locals to demonstrate against the ruling government due to the unbearable way of life hence the political affairs cannot be run smoothly.³⁵ They also pointed out that stress leads to the irrationality of the leaders, thereby having a serious impact on the political affairs of states. For instance, a study by the World Bank found that a 1% increase in temperature can lead to a 2.5% increase in the risk of civil conflict.³⁶ Environmental stress can lead to food and water shortages, which can in turn lead to social unrest and political instability.³⁷

³³Annan, K. (2006) “the address by UN Secretary-General Kofi Annan to the United Nations Association of the United Kingdom, Central Hall, Westminster, United Kingdom” <https://www.un.org/sg/en/content/sg/speeches/2006-01-31/address-un-secretary-general-kofi-annan-united-nations-association>

³⁴ Umar Jallo, climate change expert, Respondent to the questionnaire

³⁵ Muhammed Raou, Malian Farmer, Respondent to the questionnaire

³⁶ Frisker, P. (2019) Technical Paper 5. Conflict and Climate Change in the Lake Chad Region, Lake Chad Regional Economic Memorandum | Development for Peace, university of Copenhagen

³⁷ Mousa Amadou, International Relation Academician, Respondent to the questionnaire

According to Afrobarometer, 75% of Malians prefer democracy but the long-term instability, insurgencies, economic mismanagement, and corruption push them to support the military takeovers in the hope things will change.³⁸ Currently, the international efforts in Mali have been geared towards the restoration of civilian rule and counter-terrorism. According to the United States Institute of Peace (USIP) analysts, this heavy investment in the military in Mali contributed to the 2020 coup and 2021 counter-coup. The measures taken to deal with coup leaders in Mali such as sanctions and diplomatic isolations have hurt the ordinary Malian more than the elites. This entrenches the mistrust of outside help, anti-French sentiments, and increased support for the military.³⁹

4.3.2 Innovative agriculture

Mali is an agricultural-based economy. According to UNEP, agricultural activities are responsible for over 60% of biodiversity loss as increased population decade for more clearance of land for crops and pastures and it is also responsible for 33% of greenhouse gas emissions. The environment provides essential ecological services such as pest control, cross-fertilization, soil potency, and water, for food production.⁴⁰ Access to clean water and food is a basic human right for all, therefore, to increase food production and protect the ecosystems, Mali needs to promote and implement regenerative agriculture, sustainable fishing, and agroecology.⁴¹ Gardner says that changes in the food system can help alleviate hunger and malnutrition.

³⁸ Dion, F, and Sang, J. (2021) “after two coups, Mali needs regional support to bolster democracy” United States Institute of Peace (USIP) [usip.org/publication/2021/12/after-two-coups-mali-needs-regional-support-to-bolster-democracy](https://www.usip.org/publication/2021/12/after-two-coups-mali-needs-regional-support-to-bolster-democracy)

³⁹ Claes J. and Schmauder, A. (2021) “Mali: two coups and two shortcomings for a successful transition” Italian Institute for International Political Studies (ISPI) [ISPIonline.it/en/publication/mali](https://www.ispionline.it/en/publication/mali)

⁴⁰ UNEP (24th July 2023) “how this week’s UN summit could help mend world’s broken food systems” <https://www.unep.org/news-and-stories/story/how-weeks-un-summit-could-help-mend-worlds-broken-food-systems>

⁴¹ Interview with Susan Gardner, Director of the ecosystem Division at United Nations Environmental Program (UNEP)

4.3.3 Restoration of forests

About 75% of deserts and drylands are experiencing degradation. The total forest cover loss was 3.9 million hectares in the last decade. The UN Decade of Ecosystem Restoration 2021-2030 outlined strategies to recover degraded land. They include giving inducements to societies to reorient the land and improve climate funding.⁴² According to Global Forest Watch, Mali lost 3.95 hectares of forest cover between 2021-2022 due to “farming, agricultural nomadism, migration, the grazing of domestic animals, and cutting wood for the ever-increasing energy needs of the population.”⁴³

According to Issiaka Ballo, a tree planter in Mali, deforestation is a declaration of war on forests. He blames loggers for the decrease in forest cover.⁴⁴ Reforestation is one way of reclaiming degraded land and stemming the spread of the Sahara Desert. Mali together with other 19 countries in the Sahara, international partners, civil societies, grassroots organizations, and research institutes, is involved in the Great Green Wall of Africa project. Reforestation Day has been set aside to involve students in raising awareness about reforestation, bushfires, and related issues.⁴⁵

4.3.4 Proper Water Management

Restoration of degraded lands requires one key component, water. Water is an important part of peoples’ life and economic undertakings are closely associated to accessibility and quality of water. Water access is normally associated with scarcity with over 2.1 billion individuals lacking access to clean and safe water at home globally. Some of the causes of water shortages include

⁴² *ibid*

⁴³ Mr. Broulaye Diakité, Lieutenant Colonel and forestry and water resources engineer, responsible for the Yanfolila zone, Sikasso region Interview

⁴⁴ Mr. Issiaka Ballo, tree planter in Sezana Gara, Segou region Interview

⁴⁵ Mr. Issiaka Ballo, tree planter in Sezana Gara, Segou region Interview

famine, natural disasters, conflicts, economic blockades, geopolitical struggles, and contamination.⁴⁶ Water in the Sahel is a great challenge with about 40% of Africans lacking clean and safe water sources according to the Food and Agriculture Organization (FAO).⁴⁷ Amadou Gueye explains: "For decades now, rainfall has been too infrequent to refill the water table, particularly as water is overexploited in certain regions. The water quality has also worsened."⁴⁸

According to Water Aid, 1 in 5 Malians does not have access to clean water, about 4000 children die due to diarrhea each year and 11 million people out of 20.8 million do not have access to a toilet.⁴⁹ Malians depend on Niger and Senegal Rivers for domestic and commercial purposes. Its availability and distribution are not guaranteed due to stressors of water such as overfishing, climate change, and pollution. Local and regional shortage of water and fertile land, alterations in land occupation structures, environmental disturbance, and regional disasters lead to conflict over the control, sharing, and division of resources. The water demand always outweighs the supply.⁵⁰

4.3.5 Involvement of the private sector, women and youths

A key component of managing the environmental stress and armed conflicts in Mali is mainstreaming the environmental issues in decision-making and involving all parties including women and children in the fight against environmental degradation.⁵¹ Mali actively supports the

⁴⁶Kralow Carly A. (2019) "the international law and politics of water access: experiences of displacement, statelessness, and armed conflict" London School of Economics and Political Science; London WC2A 2AE, UK; pp1-28

⁴⁷ Bogmis, A.S. (2023) "water, a crucial security issues in the Sahel" <https://www.aa.com.tr/en/environment/water-a-crucial-security-issue-in-the-sahel>

⁴⁸ Papa Amadou Gueye Interview, <https://reliefweb.int/report/mali/climate-change-mali-we-drilled-deep-found-nothing>

⁴⁹ <https://www.wateraid.org/where-we-work/mali>

⁵⁰ OECD (2000) The DAC Guidelines: Helping Prevent Violent Conflicts, International Development

⁵¹UNICEF General Comment No.26 on children's rights and environment with a special focus on climate change (2023) <https://www.unicef.org/press-releases/un-committee-rights-child-calls-states-take-action-first-guidance-children-rights>

UN Women, Peace and Security (WPS) agenda having ratified the Convention on the Elimination of All Forms of Discrimination Against Women in 1979 and the Maputo Protocol in 2003.⁵² Dikiate acknowledges the importance of women's and youths' involvement in environmental stress management. He says the ‘women and youths are involved in seedling growing in nursery beds, organizing tree planting days, while involving NGOs, mining companies, schools and city leaders’.⁵³

Public-private partnerships are needed in the management of environmental stress. The private sector in Mali is investing in energy, waste management, reforestation, and agriculture. The Africa Environment Outlook (AEO) report demonstrates that sustainable business models in travel, agriculture, industries, and waste management and involving women and youths in these endeavors will help deal with the triple threat of toxic waste, biodiversity loss, and rising temperature. The report calls on international, regional, and state actors to offer practical support and mentorship to micro, small, and medium-sized enterprises (MSMEs) to help them become sustainable, resourceful, and profitable while protecting the environment.⁵⁴

4.3.6 Climate funding

In the fight against environmental stress, financing remains the biggest handle. In the just concluded Africa Climate Summit (ACS) 2023 held in Nairobi, Kenya, climate financing was a

⁵² Kiamba, A., Bokenya S.A (2023). The Un-African Union partnerships on the Women, Peace and Security Agenda: Frameworks, policies, and strategies. Vestnik RUDN. International Relations 23, (2) 307-321

⁵³ Mr. Broulaye Diakité Interview, Lieutenant Colonel and forestry and water resources engineer, responsible for the Yanfolila zone, Sikasso region.

⁵⁴ United Nations Environmental Programme (2023) “Africa Environment Outlook (AEO) for business Report: our environment, our wealth”. Nairobi, United Nations Environmental Programme. <https://wedocs.unep.org/20.500.11822/43127>

key point of discussion. To mitigate climate change, the Africa Development Bank (AFDB) estimates that Mali will use three billion US dollars between 2020 and 2030. The finances are expected to come from internal and external sources, nevertheless, its expected finances will be a challenge. To overcome this challenge, the Malian government agreed to have its local financial institutions, the National Bank for Agricultural Development, and the Development Bank of Mali accredited by the Green Climate Fund.⁵⁵ According to AFDB, this financing challenge occurs mainly due to a shortage of information regarding prospects, insufficient training in processes for accessing climate finances, little involvement in the creation of climate change policies, inadequate access to international funding, and low prioritization by the political elites.⁵⁶

When the question of prioritization was posed to the focus group, 75% felt that environmental stress issues were not a priority for the government that is battling armed conflict, and calls to prioritize the environment were made.⁵⁷ The environmental challenges in the region are likely to lead to the displacement of people. As a result, the Sahel region is likely to face significant challenges in dealing with environmental stress under these circumstances. They felt that the government could not manage environmental stress. The protracted conflict, poverty, and diseases have weakened the human capacity in the region. Without external support, the region cannot manage.⁵⁸ The capacity of the Sahel region to deal with environmental stress is currently strained by ongoing armed conflicts, government instability, and security challenges. Conflicts divert resources and attention away from environmental management efforts, making it more difficult to implement sustainable solutions.⁵⁹ 20% are positive that the Sahel region countries can come

⁵⁵ The Africa Development Bank (2023) “Africa economic outlook-supporting climate resilience and a just energy transition in Africa: Mali Economic outlook afdb.org/en/countries/West-Africa/Mali-economic-outlook

⁵⁶ *ibid*

⁵⁷ Fanta Abdoulage, Farmer, Respondent to the questionnaire

⁵⁸ Dannielle Sessay, MA Student at York State University, Respondent to the questionnaire

⁵⁹ Seydou Awana, Farmer, Respondent to the questionnaire

together and dialogue on how to cooperate in dealing with environmental stress because it is one of the causes of conflict in the region while acknowledging that it will effort and lots of resources while 5% felt that the region can build the capacity to deal with the environmental stressors.⁶⁰

Going green which is defined as having these key tenets, waste and land management, renewable energy, green buildings, and clean transportation, is an expensive affair, and many countries in Africa cannot afford it. Gardener calls on all countries to subsidize agriculture and invest in research and innovation, infrastructure, and resilience.⁶¹

4.4 Chapter Conclusion

There are efforts to manage environmental stress in the Sahel region, particularly in Mali. Respondents put restoration of peace and security and reforestation at are top of the list. The challenge is mostly funding to finance these efforts, poverty, insurgencies, and divided regional and international efforts.

⁶⁰ Ada Yahre, teacher, Respondent to the questionnaire

⁶¹ Interview with Susan Gardner, Director of the ecosystem Division at United Nations Environmental Program (UNEP)

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Introduction

The study set out to examine the management of environmental stress and armed conflict in the Sahel region, a case study of Mali. This chapter gives the summary and conclusions of each research question and the objective of the study.

5.1 Summary of the finding

This study has established that there is a relationship between environmental stress and armed conflicts. Environmental stress worsens conflicts and conflicts can be a result of environmental stress.

5.1.1 Key drivers of environmental stress in the Sahel region.

The drivers of environmental stress vary from region to region but the effects are experienced by all. Respondents identified hurricanes, rising sea levels, rising temperatures, droughts, famine, sand storms, floods, pollution, climate change, deforestation, over-exploitation of resources, and habitat destruction, and other weather occurrences as key drivers that impact the economic, political, social, and food security of both developed and developing states. The impact will depend on the resilience measures in place. Africa and Sahel in particular have experienced ongoing armed conflicts that hinder good governance which is essential in formulating environmental protection policies and their implementation. Bad governance, corruption, and greed ensure that rates and revenue from natural resources benefit just the elite while the greater part of the population suffers. This resource capture and marginalization of some groups breeds resentment and increases the likelihood of armed conflicts in the Sahel.

5.1.2 Nexus between environmental stress and armed conflicts in the Sahel region

This chapter set out to examine the nexus between environmental stress and armed conflict. It started by looking at armed conflicts in Africa and their causes. National power, ethnicity, ideology, and resources are the top causes of armed conflicts in Africa. In examining them keenly, one can see how environmental stress occurs. The different schools of thought on the importance of the environment in security discourses show clearly that some feel that environmental stress should be a concern in armed conflicts and some feel it is a non-issue. Even though on its own it does not cause armed conflict, environmental stress worsens armed conflicts and their impacts on society.

5.1.3 Management of environmental stress and armed conflict in the Sahel region.

Mali is a dry, landlocked country with immersed challenges ranging from political, to economic to environmental ones. The current political situation in Mali makes it challenging the effectiveness of management of environmental stress. The armed conflict has attracted a regional approach. The country cannot manage environmental stress mainly because of the ongoing conflict. The management of environmental stress may currently be overshadowed by the immediate security concerns in the Sahel region. It may not be the priority due to scarcity of resources and other competing factors but it can be considered. The majority of available resources are being used to manage the conflict and without international support, Mali is unable to be environmentally resilient.

5.2 Conclusions

The conclusions of this study have been drawn from the objectives, questions, and hypotheses as outlined in Chapter One. The conclusions have been drawn by testing the hypotheses.

H1 There is a relationship between environmental stress and armed conflict in the Sahel region.

Respondents have an idea of what environmental stress is, defining it as the stretching of basic resources beyond sustainable levels, human and natural pressure on the environment which impacts livelihoods, and natural or human actions that extreme conditions to the environment like earthquakes, cyclones, hurricanes, floods, rising pressure from the environment. Bad governance and bad politics lead to armed conflict and environmental stress.

Environmental stress is experienced globally through phenomena like life-threatening weather events, rising sea levels, and damage to biodiversity. In Africa, it is often exacerbated due to factors like water scarcity, desertification, deforestation, and susceptibility to climate change, leading to challenges in agriculture, food security, and water availability. These vulnerabilities worsen or escalate an armed conflict situation. Therefore, the study finds that there is a positive connection between environmental stress and conflict in the Sahel.

H2 The environmental stress witnessed in the Sahel region is a contributor to armed conflicts in the region

According to respondents, there is often a complex relationship between environmental stress and armed conflicts in Africa. Environmental stress can escalate existing tensions, contribute to resource competition, and create conditions of scarcity that fuel conflicts. Environmental stress and armed conflicts cause food insecurity, forced migration, and illegal resource extraction. However, conflicts themselves can also lead to environmental degradation due to disruption of institutions and infrastructure. Therefore, the study confirms that environmental stress is a contributor to armed conflicts in Sahel and the armed conflict also impacts the environment leading to stress.

H3 The mechanisms used to manage the conflict in the Sahel region have not taken into account the environmental stress as a source of armed conflict in the region

The mechanisms used to manage environmental stress and armed conflict in the Sahel are mutually exclusive. Political solutions to the conflict do not take into account the contributions of environmental stress to the armed conflict. The armed conflict is perceived as a state security issue while the environment does not feature in any discussions to end the conflict. Nevertheless, the region and Mali have concerted efforts to help restore the environment through reforestation, the use of agricultural technology, and involving all stakeholders. The management of environmental stress may currently be overshadowed by the immediate security concerns in the Sahel region. Therefore, the study agrees with this hypothesis that the mechanisms used to manage the conflict in the Sahel region have not taken into account the environmental stress as a source of armed conflict in the region. It may not be the priority due to scarcity of resources and other competing factors but it can be considered

5.3 Recommendations

1. Mali's former colonial master France is still heavily involved in the country's affairs. There is a need to refurbish the colonial governance organizations and effect democracy that responds to citizens' needs effectively.
2. Address the political crisis: The scheduled elections in February 2024 have to happen without further delays. The election should be free, fair, transparent, and accountable elections to entrench democracy. Once the government reverts to civilian rule, it will be able to provide basic services such as security, healthcare, food security, environmental protection, and protection of human rights, to Malians.

3. Ensure fair distribution of resources and infrastructure. In the past, the government has been accused of concentrating on the mineral-rich regions at the expense of the agricultural areas.
4. Create economic opportunities for the youths through tertiary education, employment, and a conducive environment to do business. This will reduce the likelihood of them getting recruited into insurgent groups.
5. Armed conflicts occur when there are no clear mechanisms to air grievances and mediate conflicts. Instead, governments respond with violence. Institutions of justice and mediation should be strengthened and respected

5.4 Areas for Future Studies

Environmental stress is experienced even in non-conflict situations. It would be interesting to compare how non-conflict countries are responding to environmental stress and the challenges they are facing.

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Appendix 1

Questionnaire

1. What is environmental stress?
2. How is environmental stress experienced in the world and Africa?
3. What are the key drivers of environmental stress in Africa?
4. Is there a relationship between environmental stress and armed conflicts in Africa?
5. How do the two (environmental stress and armed conflicts) affect the socio-economic prospects of Africa?
6. Does environmental stress have any bearing on the political affairs of states?
7. The Sahel region has experienced armed conflicts for a while now, do they have the capacity to deal with environmental stress under these circumstances?
8. Is the management of environmental stress a priority in the Sahel Region?
9. What are some of the environmental management being employed in the Sahel region?
10. What (if any) action(s) has the Mali government taken to manage environmental stress and armed conflict in their state?



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