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African Indigenous Environmental Conservation Strategies and Climate Change Mitigation

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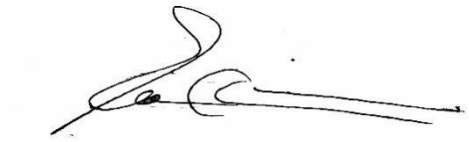
ATTESTATION

I do hereby attest that I am the sole author of this Dissertation and that its contents are only the result of the readings and research that I have done.



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ABSTRACT

Background and Aim: A cursory glance reveals that for thousands of years, the African people have developed and used knowledge of their local environments not only as part of their cultural identity but also to ensure the protection of their environment. With the recent development in indigenous studies, this knowledge has been recognized by the scientific community as a valuable source of environmental information. It has been described variously by different scholars. For some as "traditional ecological knowledge", for others as "indigenous environmental knowledge", for some others as "indigenous knowledge", "customary law", "indigenous skills", "traditional knowledge" or "ethno-science". It is so described because it constitutes a body of knowledge built through generations of living in close contact with nature for the governance of the use of natural resources. This work focuses on this indigenous knowledge system for the management of the environment. The aim of this research is to raise questions regarding the capacity of African Indigenous strategies of environmental conservation towards the mitigation of climate change in Africa and beyond. The specific objectives include to investigate: how climate change has affected Africa; if the dominant western approach towards environmental preservation has been effective in Africa; the need for an African indigenous approach towards environmental preservation; and to identify those African indigenous strategies of environmental conservation that can help in the mitigation of climate change.

Methodology: The research adopted both qualitative and quantitative methods due the dynamic nature of the issues addressed. The reasons for using qualitative research method is for providing rich descriptions of complex phenomena regarding the impact of climate change; tracking unique or unexpected events beyond what is established in the literature; illuminating the experience and interpretation of events by individuals and communities that have been adversely affected by climate change with widely differing stakes and roles in mitigating it. More so, giving voice to those whose views are rarely heard in the discourse of climate change and environmental strategies to mitigate it. Quantitative research method was used to produce objective data that can be clearly communicated through statistics and numbers. The study is a descriptive study as such the use of both qualitative and quantitative methods in a complementary way provided more richness to the research. The Igwebuike Conservation Theory, Environmental Kuznets Curve (EKC) Theory, Political Ecology Theory and Environmental Justice Theory were the theories around which this research was weaved.

Conclusion: During the past decades, the dominant approach towards environmental conservation has played a key role in the efforts towards the sustainability of the environment. However, the ecological crisis facing humanity has not been abated. This research, therefore, submits that there is the need for alternative approaches towards the preservation of the environment. It is within this context that the African indigenous alternative is proposed in addition to the dominant or western approach.

Keywords: Africa, Environmentalism, Climate Change, Environmental Sustainability, Ecological crises, Indigenous Knowledge

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Abbreviations

AfDB: African Development Bank

UNESCO: United Nations Educational, Scientific and Cultural Organization

AU: African Union

CBD: Convention on Biological Diversity

FAO: Food and Agriculture Organization of the United Nations

IPCC: Intergovernmental Panel on Climate Change.

NEMA: National Environment Management Authority

UN: United Nations

UNDP: United Nations Development Programme

UNDRR: United Nations Office for Disaster Risk Reduction

UNEP: United Nations Environment Programme

UNFCCC: United Nations Framework Convention on Climate Change

WHO: World Health Organization

SSA: Sub-Saharan Africa

CAR: Central African Republic

CBD: Convention on Biological Diversity

UNFCCC: United Nations Framework Convention on Climate Change

AREI: African Renewable Energy Initiative

GGW: Great Green Wall

AFLRI: African Forest Landscape Restoration Initiative

GHG: Green House Gas

IRENA: International Renewable Energy Agency

EKC: Environmental Kuznets Curve

NCA: Ngorongoro Conservation Area

NGO: Non-Governmental Organizations

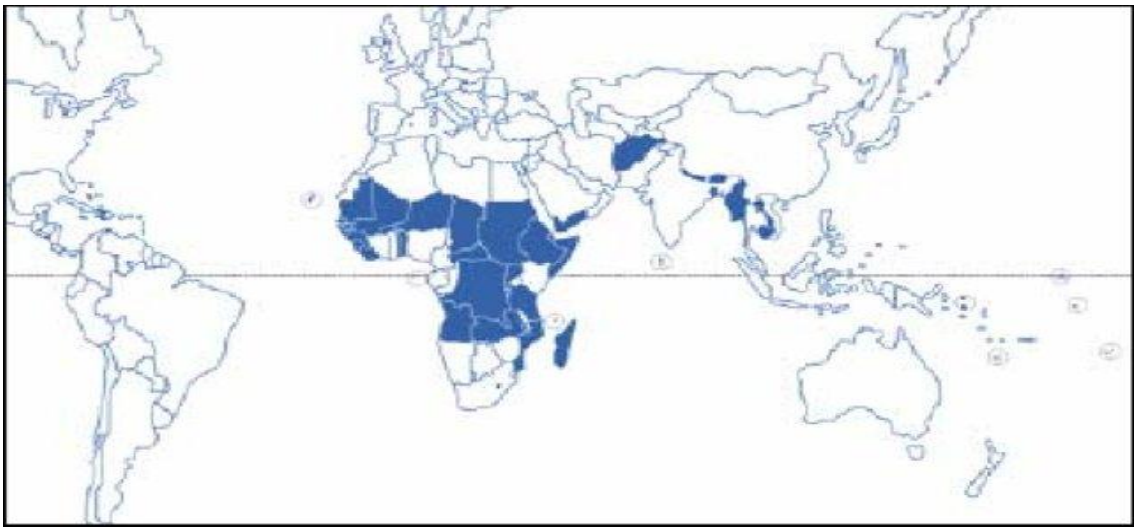
SPSS: Statistical Package for the Social Sciences

CHAPTER ONE

GENERAL INTRODUCTION

1.1 BACKGROUND TO THE STUDY

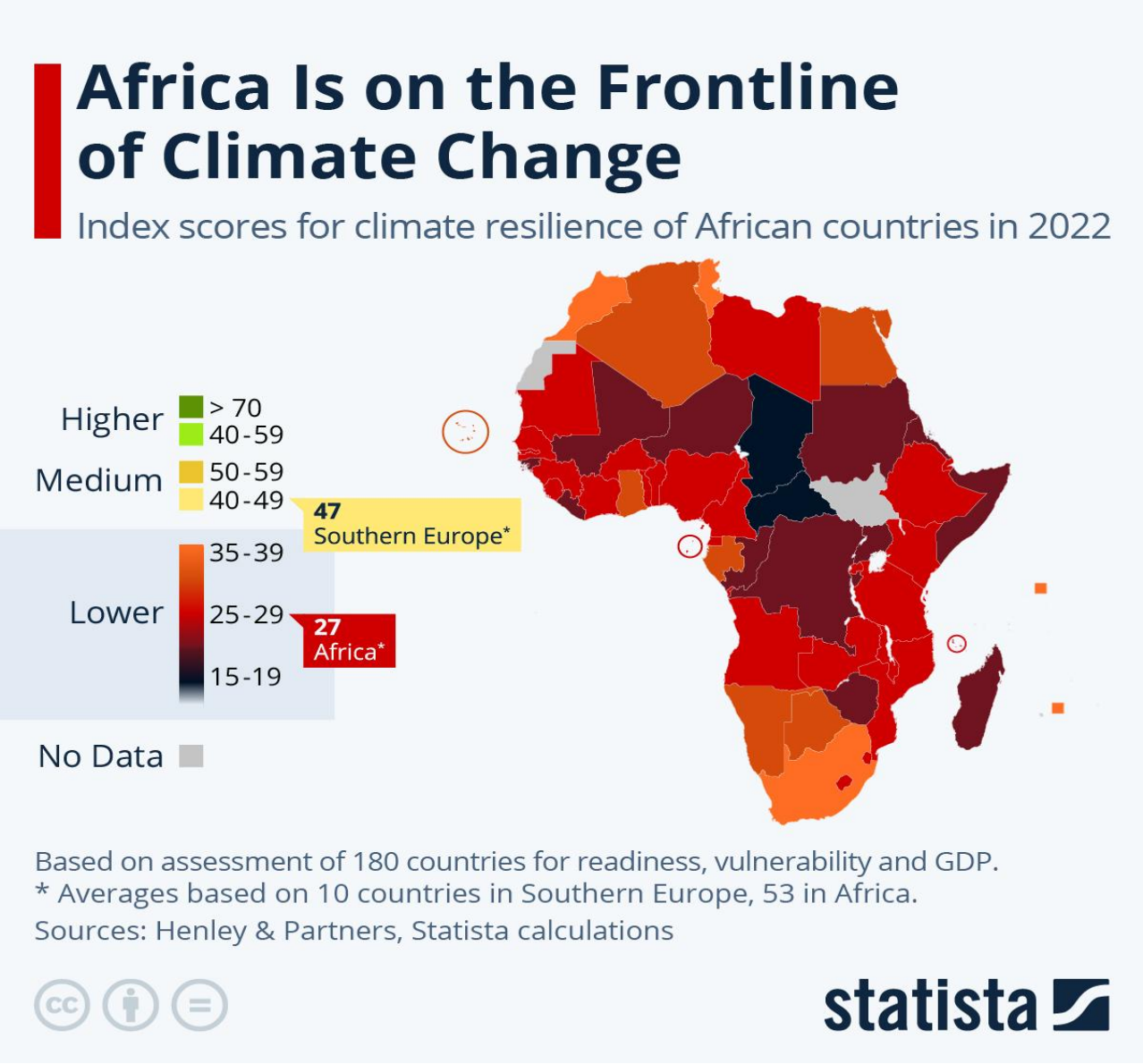
Climate change has severely compromised the livelihoods of people who are overwhelmingly dependent on the natural environment. This is evident in the experiences of African countries and other developing nations, as they are typically the least equipped to cope with the risks associated with the consequences of climate change (Pant 2012; Evans et al. 2014; Intergovernmental Panel on Climate Change 2014; Poudel et al. 2017). The region most vulnerable to climate change is Sub-Saharan Africa (SSA) because warming is projected to be greater than the global average. Additionally, agriculture, which is mainly rain-fed, serves as the primary source of subsistence for rural communities in the region (Di Falco 2018). The effects of climate change specifically impact the world's poorest and most marginalized countries and communities in Sub-Saharan Africa.Figure 1: Map Showing the Least Developed Countries.



Source: Anthony Nyong (2015)

The dark spots on the map indicate the concentration of impoverished countries worldwide. These dark spots specifically highlight Africa as the region with a high concentration of impoverished nations. Consequently, climate change will have a more significant impact on African communities, particularly those in the Sub-Saharan region, compared to other parts of the world. The figure below visually represents this situation, emphasizing that Africa is at the forefront of climate change.

Figure 2: Showing Index Scores of Climate resilience of African Countries



Source: Martin Amstrong (2022)

The effects of climate change are predominantly felt in water resources, primarily through extreme weather events such as droughts, floods, and violent storms (Nguimalet 2018). For instance, in the Central African Republic (CAR), hydro-climatic extremes like droughts and floods have historically disrupted the livelihoods of communities living in watersheds (Nguimalet 2018). Moreover, these effects have contributed to intensified conflicts between farmers and herders in Nigeria, Cameroon, and other parts of West Africa. Although climate change is a global issue, its impacts are particularly pronounced in Africa. Consequently, it is crucial to develop indigenous strategies within Africa to address climate change and its effects on the lives and livelihoods of its people.

Most of the consequences of climate change can be attributed to human actions and inaction concerning the environment. The environment, which encompasses the natural world, serves as the foundation for sustaining human life. Human activities responsible for these consequences include carbon dioxide (CO2) emissions, water pollution, land pollution, air pollution from fossil fuel combustion, deforestation for urban development, natural resource exploration and exploitation, and biodiversity destruction, among others. Since these activities are a result of human misuse of nature's resources within our natural environment, it requires human solutions through the adoption of sustainable strategies that protect, conserve, and preserve the environment for the benefit of both present and future generations. One effective approach to mitigating climate change is through the adoption of sustainable environmental conservation strategies (Olalekan et al., 2019).

There is a global outcry for the conservation of natural resources, which are being exploited due to industrialization and urbanization. Human activities driven by the desire to exploit natural

resources for industrial purposes and the destruction of biodiversity to make room for urban settlements are major contributors to the environmental challenges faced by the global community today (Olalekan et al., 2019). However, in Africa, there exist indigenous belief systems and societal norms that were traditionally used to protect the environment and conserve natural resources for the benefit of both present and future generations. These belief systems and societal norms can be referred to as African indigenous strategies for environmental conservation. Consequently, the aim of this research is to identify those African indigenous strategies of environmental conservation that can help mitigate climate change in Africa and beyond

1.2 STATEMENT OF THE PROBLEM

The relentless plundering of natural resources by humans without considering replenishment or conservation measures poses a grave existential threat. If left unchecked, humans have the capacity to bring about their own destruction and the extinction of other forms of life on Earth. This destruction can occur suddenly through a nuclear holocaust or gradually through environmental degradation and destruction. The current degradation and destruction of the environment serve as clear indicators that the Earth is approaching its breaking point. Many species have already disappeared from the Earth due to over-exploitation or the destruction of their forest habitats (Dhameja, 2007). Forest reserves, water bodies, and mineral resources constitute the natural wealth of nations. The optimal exploitation of these resources to facilitate modernization through industrialization and urbanization is how nation-states and people of all races measure the value and contribution of their natural resources to quality of life. However, the exploitation of natural resources for the well-being and development of any nation has both positive and negative consequences. Therefore, every nation must take measures to maximize the

benefits of resource exploitation while minimizing the serious negative consequences associated with excessive resource exploitation, particularly environmental damage, pollution, and ecological degradation (Kanu & Emoit 2016, 2019; Augustine, 2014).

As human beings exploit the environment, various consequences have emerged, including air, land, and water pollution, deforestation, greenhouse warming, toxicity from industrial and urban waste, destruction of biodiversity, erratic weather conditions, water scarcity, floods, droughts, and depletion of the ozone layer. All these are major manifestations of the consequences of climate change, which in turn give rise to social, economic, and political problems. However, there is a global consensus that environmental conservation is the key to mitigating and alleviating these problems. The challenge lies in determining which strategies should be adopted to achieve long-term sustainability and ecological balance between human needs and the preservation of the environment. It is this problem of finding sustainable strategies for environmental conservation, specifically to mitigate the effects of climate change, that motivates this research. The study aims to address this problem from an African perspective.

1.3 RESEARCH QUESTIONS

The study will attempt to answer the following questions:

1. The study will aim to provide answers to the following questions:
2. How has the current ecological crisis impacted the people of Africa?
3. To what extent has the dominant Western approach to addressing ecological problems been successful in finding sustainable solutions?
4. Is there a necessity for alternative approaches to environmental preservation?

5. Do African traditional/indigenous strategies exist for the conservation of the environment?

1.4 AIM AND OBJECTIVES

The aim of this study is to identify and analyze African indigenous strategies of environmental conservation that can effectively mitigate climate change in Africa and other regions. The specific objectives of the study are as follows:

1. To investigate the impacts of climate change on Africa and assess how it has affected the continent.
2. To examine the effectiveness of the dominant Western approach to environmental preservation in Africa.
3. To explore the need for an African indigenous approach to environmental preservation, considering the unique context and challenges faced by the continent.
4. To identify and document African indigenous strategies of environmental conservation that have the potential to contribute to the mitigation of climate change.

1.5. METHOD OF THE STUDY

The research employed a combination of qualitative and quantitative research methods to address the dynamic nature of the issues being investigated. The decision to use qualitative research methods was motivated by several factors. Firstly, qualitative methods allow for in-depth exploration and understanding of complex phenomena related to the impacts of climate change. They enable researchers to capture rich descriptions, delve into unique or unexpected events that may not be well-documented in existing literature, and shed light on the experiences and

interpretations of individuals and communities who have been adversely affected by climate change. These methods are particularly valuable in uncovering diverse perspectives and experiences, amplifying the voices of those who are often marginalized or underrepresented in discussions on climate change and environmental strategies.

On the other hand, quantitative research methods were employed to generate objective data that can be effectively communicated through statistics and numerical analysis. These methods provide measurable and quantifiable information, allowing for statistical comparisons, trend analysis, and generalizability to larger populations. The combination of qualitative and quantitative approaches in a complementary manner enhances the comprehensiveness and richness of the research, providing a more holistic understanding of the topic under investigation.

Overall, the study can be classified as a descriptive study, and the utilization of both qualitative and quantitative methods contributes to a more robust analysis and interpretation of the research findings.

1.6. SIGNIFICANCE OF THE STUDY

The practical significance of this study lies in its potential to provide valuable insights into the adverse effects of climate change on the African people. By understanding these effects, policymakers, organizations, and communities can develop targeted strategies and interventions to mitigate and adapt to climate change impacts more effectively. The study also aims to shed light on the value systems and practices within African traditional societies that can contribute to environmental conservation and resilience in the face of climate change. This knowledge can inform decision-making processes and the development of sustainable practices within African societies.

Furthermore, the study's theoretical significance lies in establishing a correlation between environmental conservation strategies and the reduction of climate change impacts. By demonstrating the effectiveness of indigenous strategies and practices in mitigating climate change, the research can contribute to the broader theoretical understanding of the relationship between environmental conservation and climate change mitigation.

Additionally, this research has educational significance as it can serve as a valuable resource for students conducting research on climate change. It can provide a comprehensive understanding of the contribution of African traditional practices to environmental preservation and serve as a foundation for further research in this area. By disseminating the findings, the study can contribute to the overall body of knowledge on climate change and indigenous environmental conservation strategies, benefiting students, researchers, and practitioners in the field.

1.7. SCOPE AND LIMITATION

This study is focused on the Nigerian society, which is composed of six geopolitical zones, due to the practical challenges of conducting research across diverse communities in Africa. These zones have different climatic conditions and have experienced climate change impacts in various ways, making them representative of the broader African experience. By examining the Nigerian context, the study aims to provide insights into the relevance of environmental conservation strategies employed by Indigenous African peoples to mitigate the impacts of climate change and address the excessive exploitation of natural resources. The research presents these long-standing African value systems as an alternative approach to climate change mitigation.

However, the study faces several constraints that need to be acknowledged. Firstly, the sample population size may be limited due to practical considerations and logistical challenges.

Gathering data from inaccessible experts and communities may require more time and resources. Financial constraints may also limit the extent of data collection and analysis. Additionally, language barriers may pose challenges in communicating and accessing relevant information. Moreover, the issue of insecurity in certain regions may restrict the researchers' ability to interact with local communities and gather data effectively.

Despite these constraints, the study aims to provide valuable insights within the limitations of its scope. By focusing on the Nigerian context and considering the challenges faced, the research contributes to the understanding of African indigenous strategies for environmental conservation and their potential in mitigating the impacts of climate change.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The impacts of climate change on Africa are indeed significant, affecting various aspects of the continent's ecosystem, socio-economic development, and food security. This chapter is structured into four main parts: the conceptual framework, the theoretical framework, the empirical framework, and the gap in the literature.

The conceptual framework section will establish the foundational concepts and definitions relevant to understanding the impacts of climate change on Africa. It will provide a comprehensive overview of key terms and concepts, such as rising temperatures, changing rainfall patterns, and extreme weather events, which are central to understanding the effects of climate change on the continent.

The theoretical framework section will delve into the existing theoretical frameworks that inform this research. It will explore established theories and perspectives on climate change, such as vulnerability theory, adaptation strategies, and the socio-economic implications of climate change. This section will provide a theoretical basis for the research and guide the analysis and interpretation of findings.

The empirical framework section will review and analyze existing research studies that have been conducted in the field of climate change impacts in Africa. It will examine relevant empirical research, case studies, and data that contribute to the understanding of climate change impacts on the continent. This section will serve as a basis for contextualizing and building upon previous research findings.

Lastly, the gap in the literature section will identify the specific contribution that this research makes to existing knowledge. It will highlight the unique aspects, perspectives, or gaps that this study aims to address, filling in the existing research gaps or providing new insights into the impacts of climate change on Africa. This section will underscore the importance and relevance of the research in advancing the understanding of climate change impacts in the African context.

By structuring the chapter in this manner, the research aims to provide a comprehensive overview of the conceptual, theoretical, and empirical foundations relevant to understanding the impacts of climate change on Africa, while also emphasizing its unique contribution to the existing body of knowledge.

2.2 Conceptual Framework

2.2.1.1 Climate Change

Climate change refers to long-term shifts in temperatures and weather patterns. Such shifts can be natural, due to changes in the sun's activity or large volcanic eruptions (UN 2023). Climate change and environmental conservation are pressing issues that are affecting the world today. According to the Intergovernmental Panel on Climate Change (2018), the Earth's climate has changed significantly since the pre-industrial era due to human activities such as burning of fossil fuels and deforestation. This has led to an increase in the Earth's temperature, sea level rise, and more frequent extreme weather events such as floods, droughts, storms, etc. Africa is particularly vulnerable to the effects of climate change due to its high dependence on natural resources, limited adaptive capacity, and weak governance systems (UNEP, 2018). Furthermore,

Africa is home to some of the world's most important biodiversity hotspots, making environmental conservation critical for the continent's sustainable development (CBD, 2020).

Beyond the environment, Climate change as a global phenomenon has far-reaching impacts on human health and socio-economic development. According to the IPCC (2018), human activities, such as the burning of fossil fuels, deforestation, and industrial processes, have significantly contributed to the increase in greenhouse gas emissions, leading to an increase in the Earth's temperature. This increase in temperature has resulted in the melting of polar ice caps, rising sea levels, and changes in precipitation patterns, leading to more frequent and severe weather events such as floods, droughts, and storms.

Africa indeed faces significant vulnerability to the effects of climate change, primarily due to its reliance on natural resources and limited adaptive capacity. As highlighted by the United Nations Environment Programme (2018), the continent is witnessing severe impacts of climate change, such as water scarcity, food insecurity, and loss of biodiversity. These effects have wide-ranging implications for Africa's socio-economic development, putting millions of people at risk of displacement, hunger, and poverty.

The Convention on Biological Diversity (CBD, 2020) emphasizes the importance of Africa's rich biodiversity, which provides various benefits, including ecosystem services, food security, and cultural values. However, climate change and human activities pose threats to biodiversity, jeopardizing these valuable benefits. To address this challenge, it becomes crucial to prioritize environmental conservation and promote sustainable development practices in the region.

By acknowledging Africa's vulnerability to climate change and the importance of its biodiversity, the international community and local stakeholders can work together to develop and implement

strategies that mitigate the impacts and foster resilience. This involves adopting measures to enhance adaptive capacity, promote sustainable resource management, and protect biodiversity hotspots. Additionally, empowering local communities and incorporating indigenous knowledge and practices can contribute to effective environmental conservation efforts in Africa.

Recognizing the significance of environmental conservation and sustainable development in the face of climate change is a crucial step towards safeguarding Africa's ecosystems, ensuring food security, and preserving the cultural heritage of its diverse populations.

2.2.1.2 Droughts

Droughts have indeed become a significant and recurring challenge for many African countries, intensifying as a result of climate change. The United Nations Development Programme (UNDP) reports that over 40% of Africa's population is affected by droughts, and the frequency and severity of these events are expected to rise in the future. The consequences of droughts on agriculture and food security are particularly severe, leading to crop failures, livestock losses, and increased food prices.

One notable example of the impact of drought in Africa is the 2017 national disaster declared in Kenya due to a prolonged drought, which affected millions of people and livestock. This crisis resulted in food and water shortages, leading to malnutrition and loss of life. Similarly, Somalia experienced its worst drought in decades during the same year, triggering a humanitarian crisis with millions of people facing food shortages and the threat of famine.

The economic ramifications of droughts in Africa are also substantial. The loss of agricultural productivity and livelihoods exacerbates long-term poverty and economic instability, which can have far-reaching social and political implications for affected countries.

The increasing frequency and severity of droughts in Africa underscore the urgent need for proactive measures to mitigate the impacts of climate change and foster sustainable development. African countries must prioritize the development and implementation of effective adaptation and mitigation strategies. These strategies should encompass efforts to enhance water resource management, promote sustainable agricultural practices, diversify livelihoods, and invest in climate-resilient infrastructure.

Addressing the challenges posed by droughts and climate change requires both local and international collaboration, as well as the mobilization of resources and expertise. By building resilience and fostering sustainable practices, African countries can better cope with the impacts of droughts, protect food security, and promote economic stability in the face of a changing climate.

2.2.1.3 Floods

Floods, as defined by WHO, are indeed one of the most frequent and impactful natural disasters, and they have significant consequences for Africa. Climate change is exacerbating the occurrence and severity of floods in the continent, leading to widespread flooding and displacement of people.

According to the United Nations Office for Disaster Risk Reduction, Africa bears the highest burden of floods globally, accounting for over 50% of flood-related deaths and economic losses.

The continent's vulnerability to floods is attributed to factors such as inadequate infrastructure, informal settlements in flood-prone areas, and insufficient early warning systems and disaster preparedness.

The impacts of floods on infrastructure are profound. Roads, bridges, and buildings are often damaged or destroyed, disrupting transportation networks and hindering access to essential services. Entire communities can be swept away by floodwaters, leaving people homeless and in need of urgent assistance.

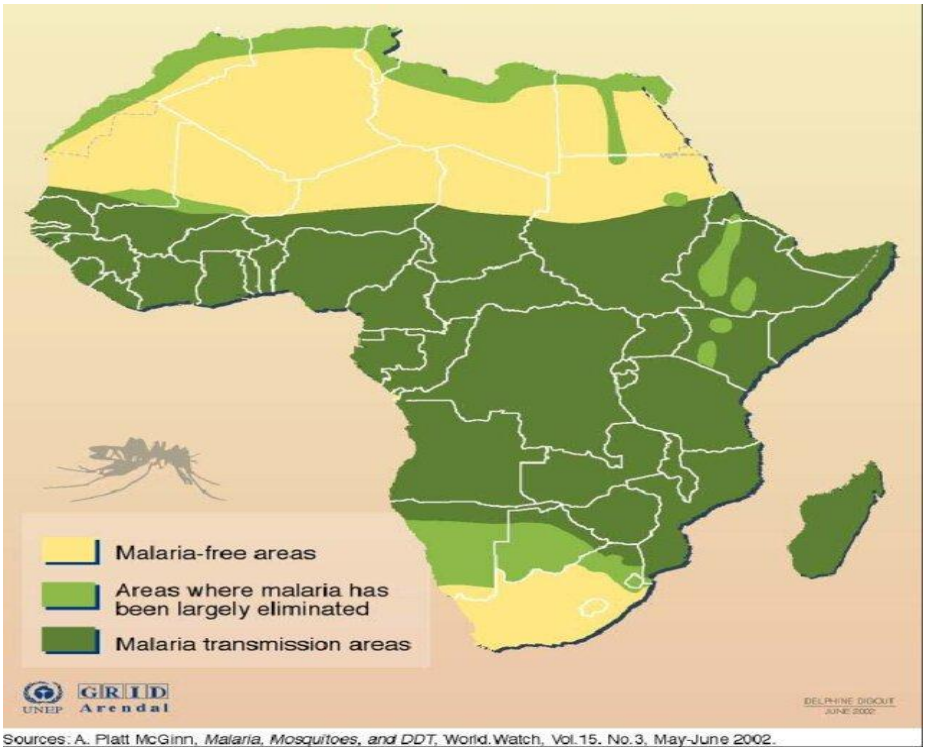
Agriculture is also heavily affected by floods. Crop losses and soil erosion resulting from inundation and waterlogging reduce food production and can lead to increased food prices. Subsistence farmers and rural communities, who heavily rely on agriculture for their livelihoods, are particularly vulnerable to these impacts.

Furthermore, floods pose significant health risks. Waterborne diseases, such as cholera and typhoid, can spread rapidly in flooded areas where sanitation systems are compromised. The stagnant water creates breeding grounds for disease-carrying mosquitoes, increasing the risk of malaria transmission.

To mitigate the impacts of floods, African countries need to prioritize investments in resilient infrastructure, early warning systems, and disaster preparedness measures. This includes adopting appropriate land-use planning strategies, improving drainage systems, and promoting sustainable agricultural practices that enhance water management and soil conservation. Enhancing community resilience through education, capacity building, and improved access to healthcare services is also crucial.

International cooperation and support are vital in assisting African countries in building resilience and adapting to the increasing challenges posed by floods. By addressing the underlying causes of vulnerability and implementing proactive measures, Africa can better manage the impacts of floods, protect lives and infrastructure, and promote sustainable development in the face of a changing climate.

Figure 3: Showing Maleria Transmission Areas



Source: Platt McGinn (2002)

In response to the increasing threat of floods, African countries are implementing various strategies and initiatives to reduce the impacts of flooding and improve resilience. These strategies include early warning systems, flood mapping, and the construction of flood-resistant infrastructure (UNDRR, 2020). However, many challenges remain in addressing the impacts of

floods in Africa, including limited financial resources, inadequate infrastructure, and poor coordination between different sectors.

2.2.1.4 Diseases

Climate change is also contributing to the spread of diseases in Africa, including vector-borne diseases such as malaria, dengue fever, and Zika virus. Rising temperatures and changing rainfall patterns are creating more favorable conditions for disease-carrying mosquitoes and other vectors to breed and spread (World Health Organization, 2019). According to the World Health Organization (WHO), malaria alone is responsible for over 400,000 deaths annually in Africa (WHO, 2020).

Climate change is contributing to the spread of diseases in Africa by altering the distribution and abundance of disease vectors such as mosquitoes. The incidence of malaria in Africa is strongly influenced by climatic factors, particularly temperature and rainfall, which affect mosquito populations and their ability to transmit the disease (Liu-Helmersson et al., 2020).

According to the World Health Organization (WHO), malaria is responsible for over 400,000 deaths annually in Africa, with young children and pregnant women being the most vulnerable (WHO, 2020). The burden of malaria in Africa is expected to increase due to the impact of climate change on the distribution and abundance of the Anopheles mosquito. In addition to malaria, other vector-borne diseases such as dengue fever and Zika virus are also expected to increase in prevalence due to climate change.

Efforts to address the impact of climate change on vector-borne diseases in Africa include the development and implementation of climate-sensitive surveillance systems, vector control

measures, and disease prevention and management strategies. For instance, the WHO recommends the use of long-lasting insecticide-treated nets, indoor residual spraying, and prompt diagnosis and treatment of malaria to reduce the transmission and burden of the disease (WHO, 2019). In addition, community-based interventions such as environmental management and health education can also play a role in reducing the spread of vector-borne diseases in Africa. However, even with all these measures, there remains so much to be achieved.

2. 2. 2.1 Environmental Conservation

Environmental conservation, on the other hand, refers to the protection and sustainable use of natural resources such as forests, water, and wildlife for the benefit of present and future generations (CBD, 2020). Climate change is caused primarily by human activities such as burning of fossil fuels, deforestation, and agricultural practices. These activities release greenhouse gases such as carbon dioxide, methane, and nitrous oxide into the atmosphere, which trap heat and contribute to global warming (IPCC, 2018).

The Intergovernmental Panel on Climate Change (2018) has reported that the Earth's temperature has increased by 1.1 degrees Celsius since the pre-industrial era, and is projected to continue rising by 1.5 degrees Celsius or more by the end of the 21st century. This increase in temperature has resulted in sea level rise, melting of glaciers and ice caps, and changes in precipitation patterns, leading to more frequent and intense weather events.

Environmental conservation is essential to address climate change and ensure the sustainable use of natural resources. This includes protecting and restoring forests, wetlands, and other ecosystems, reducing pollution and waste, and promoting sustainable agriculture and fishing

practices. Environmental conservation also involves promoting renewable energy sources such as wind and solar power, and improving energy efficiency to reduce greenhouse gas emissions (CBD, 2020). Conserving natural resources has several benefits, including preserving biodiversity, maintaining ecosystem services such as water purification and carbon storage, and supporting livelihoods and economic development. Environmental conservation also plays a vital role in mitigating the impacts of climate change, such as reducing greenhouse gas emissions by preserving forests and promoting sustainable land use practices (CBD, 2020).

Climate change and environmental conservation are closely linked, and addressing these issues require a comprehensive approach that includes both mitigation and adaptation strategies. It is crucial to reduce greenhouse gas emissions and promote sustainable development practices to mitigate the impacts of climate change, while also conserving natural resources for the benefit of present and future generations.

2.2.2.1.1 The Dominant Approach Towards Environmental Conservation

The dominant approach is basically what is referred to as the western approach towards environmental preservation. It is referred to as a dominant approach because of the central place it occupies in the global discourse on environmental preservation. This approach has been described as materilaistic, legalistic, consumeristic, profit oriented, etc. The dominant approach has been identified with most multilateral agreements like the following below:

i. Ramsar Convention on Wetlands of International Importance Especially of Water Fowl Habitats 1971;

ii. Convention Concerning the Protection of the World Cultural and Natural Heritage 1972;

iii. Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973;

iv. International Convention for the Prevention of Pollution from Ships 1973-1978;

v. United Nations Convention on the Law of the Sea 1982;

vi. Vienna Convention for the Protection of the Ozone Layer 1985;

vii. Montreal Protocol on Substances that Deplete the Ozone Layer 1987;

viii. Basel Convention on the Control of Trans-boundary movements of Hazardous Wastes and their Disposal 1989;

ix. Convention on Biological Diversity 1992;

x. United Nations Framework Convention on Climate Change 1992;

xi. United Nations Convention to Combat Desertification in those Countries Experiencing Serious Draught, Particularly in Africa 1994;

xii. Convention on the Law of the Non-navigational uses of International Watercourses 1997;

xiii. Kyoto Protocol 1997;

xiv. Cartagena Protocol on Biodiversity 2000;

xv. Stockholm Convention on Present Organic Pollutants 2001;

xvi. Minamata Convention on Mercury 2013; Paris Agreement 2015;

xvii. Rotterdam Convention on Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade 1998.

2.2.2.3 The Role of Human Activities

Human activities such as burning of fossil fuels, deforestation, and agriculture have significantly contributed to climate change. The burning of fossil fuels releases large amounts of greenhouse gases (GHGs) such as carbon dioxide (CO2) into the atmosphere, which trap heat and warm the surface of the earth (IPCC, 2018). Deforestation, which involves the clearing of forests for agriculture and other uses, also contributes to climate change by reducing the amount of carbon stored in trees and increasing greenhouse gases emissions through activities such as burning and decay (FAO, 2016). Agriculture, particularly livestock production, also contributes to greenhouse gases emissions through enteric fermentation, manure management, and the use of fertilizers and machinery (IPCC, 2019).

The Intergovernmental Panel on Climate Change (2018) has reported that human activities, particularly the burning of fossil fuels, have led to a significant increase in greenhouse gases emissions, resulting in global warming. The use of fossil fuels such as coal, oil, and gas for energy and transportation releases large amounts of carbon dioxide (CO2) into the atmosphere, which traps heat and contributes to the warming of the surface of the earth.

Deforestation is another significant human activity that contributes to climate change. The Food and Agriculture Organization (2016) estimates that deforestation accounts for around 10% of global greenhouse gases emissions. Trees absorb carbon dioxide from the atmosphere and store it in their biomass, so when forests are cleared for agriculture or other uses, the carbon stored in the trees is released into the atmosphere. In addition, deforestation can lead to increased greenhouse gases emissions through activities such as burning and decay of wood and vegetation.

The IPCC estimates that agriculture accounts for around 25% of global greenhouse gases emissions (IPCC, 2019). Livestock production is a significant source of methane (CH4), a potent greenhouse gases that is produced through enteric fermentation (digestion by livestock) and manure management. In addition, the use of fertilizers and machinery in agriculture contributes to emissions of nitrous oxide (N2O), another potent greenhouse gases.

Overall, human activities such as burning of fossil fuels, deforestation, and agriculture have significantly contributed to climate change by increasing greenhouse gases emissions. It is crucial to reduce these emissions and transition to more sustainable practices to mitigate the impacts of climate change.

2.2.2.4 The Effects of Climate Change on the Ecosystems of Africa

Climate change has significant impacts on African ecosystems, biodiversity, and resources. It has led to changes in rainfall patterns, affecting agriculture and food security (IPCC, 2018; Kanu & Emoit 2019). It can also cause sea level rise, affecting coastal communities and infrastructure (IPCC, 2019). Climate change can also lead to the spread of diseases and pests, affecting human health and wildlife (WHO, 2018). Furthermore, climate change can exacerbate conflicts over natural resources such as water and land, leading to social and political instability (UNEP, 2018).

Climate change has a direct impact on the African ecosystems, which are already vulnerable due to factors such as population growth, urbanization, and deforestation. It has been observed that the African savanna is experiencing changes in its vegetation cover, with climate change contributing to the encroachment of woody vegetation into grasslands (D'Odorico et al., 2018). This can have negative impacts on grazing lands, wildlife, and biodiversity.

The African forests are also experiencing the impacts of climate change, with rising temperatures and changing rainfall patterns affecting their distribution and health. According to the Intergovernmental Panel on Climate Change (2018), the Congo Basin Forest, which is one of the world's most extensive tropical forests, is at risk of degradation and deforestation due to climate change and other human activities.

In addition to the impacts on ecosystems, climate change also affects African resources such as water and energy. It has been observed that droughts and changing rainfall patterns are affecting water availability in many parts of Africa, leading to water scarcity and conflicts over water resources (IPCC, 2019; Kanu 2019; Kanu, Omojola, Bazza 2020). Energy production in Africa is also affected by climate change, with hydropower production being affected by changes in river flows and other weather-related factors (Adejuwon, 2019).

The impacts of climate change on Africa's ecosystems, resources, and biodiversity are significant and pose challenges to the continent's sustainable development. It is crucial to develop and implement effective strategies that can mitigate the impacts of climate change and promote the conservation of African ecosystems and resources.

2.2.2.5 Environmental Conservation in Africa

Environmental conservation is crucial for the sustainable development of Africa, as it supports the continent's economic, social, and environmental well-being. One of the most significant reasons for environmental conservation in Africa is the continents' biodiversity hotspots. According to the Convention on Biological Diversity (2020), Africa has some of the world's most important biodiversity hotspots, including the Congo Basin, the Eastern Afromontane, and

the Guinean Forests of West Africa. These hotspots are home to numerous species of plants and animals, many of which are endemic to Africa, and provide critical ecosystem services such as water purification, climate regulation, and carbon sequestration (CBD, 2020).

Environmental conservation is critical for Africa's sustainable development and the well-being of its people. Africa is home to some of the world's most important biodiversity hotspots, which provide vital ecosystem services such as water purification, climate regulation, and carbon sequestration (CBD, 2020). Furthermore, natural resources such as forests, water, and wildlife support livelihoods, food security, and cultural heritage in many African communities. However, these resources are under threat from human activities such as deforestation, overfishing and pollution, which can lead to biodiversity loss, soil erosion and water scarcity (UNEP, 2016).

Natural resources are under threat from human activities such as deforestation, overfishing, and pollution, which can lead to biodiversity loss, soil erosion, and water scarcity (UNEP, 2016). Deforestation, for example, is a significant problem in Africa, with the continent losing an estimated 3.4 million hectares of forest annually (FAO, 2020). Overfishing is also a problem, with marine fish stocks in Africa declining by 50% since the 1970s (FAO, 2020). Pollution, particularly of water resources, is also a significant concern, with many African countries lacking adequate waste management infrastructure (UNEP, 2016).

Environmental conservation is critical for Africa’s sustainable development and the well-being of its people. The continent's biodiversity hotspots and natural resources support critical ecosystem services, livelihoods, and cultural heritage, but these resources are under threat from human activities. It is, therefore, essential to develop and implement effective strategies and initiatives for environmental conservation in Africa to ensure the sustainable use of natural resources for future generations.

2.2.2.6 Traditional African Societies and Environmental Conservation

African societies have a long history of managing their environments sustainably. For example, many African societies had complex systems of land and water management, such as irrigation, terracing, and agroforestry, that helped them adapt to climate variability and maintain soil fertility (Mortimore and Harris, 1998). Traditional African religions and beliefs also emphasized the importance of respecting and protecting the natural world (Adepetun, 2019).

Climate change and environmental conservation have been important issues in African societies for centuries. Many ancient African societies had complex systems of environmental management that were aimed at conserving natural resources and maintaining ecosystem health (Kanu 2021). These systems were developed in response to the environmental challenges that these societies faced, including climate variability, desertification, and soil erosion. An example of ancient African environmental management practices is the use of terracing for soil conservation. Terracing was a common practice in many African countries, including Ethiopia, Kenya, and Rwanda, where farmers constructed terraces on steep slopes to prevent soil erosion and retain soil moisture (Mortimore and Harris, 1998). The use of agroforestry, where trees are grown alongside crops, was also a common practice in many African countries (Kanu 2021). Agroforestry helped to conserve soil fertility and maintain ecosystem health by reducing soil erosion, increasing soil organic matter, and improving soil structure (Mortimore and Harris, 1998).

In addition to these land management practices, many African societies also had systems of water management that were aimed at conserving water resources and ensuring water availability

during periods of drought. These systems included the construction of dams, canals, and irrigation systems, which helped to regulate water flow and ensure water availability for crops and livestock (Mortimore and Harris, 1998).

Traditional African religions and beliefs hold that nature is inhabited by spirits and deities that must be respected and honored. In some African societies, certain things like trees, animals, and areas of land and water were considered sacred and were protected from human use. There were also days that were considered sacred and thus activities like fishing, hunting, etc., were prohibited (Kanu 2021; Adepetun, 2019). These beliefs and practices helped to promote environmental conservation and sustainability in many African societies (Kanu 2021). Environmental preservation among traditional African societies were achieved through the following:

a. Sacred days: There were particular days that during which farming, fishing, hunting, and other human activities that has the capacity to affect nature negatively were prohibited (Kanu 2021).

b. Sacred animals: There were animals that were considered sacred and thus no one was allowed to kill them (Kanu 2021).

c. Sacred forests: There were forests that were not entered because they were considered to be the abode of great spirits (Kanu 2021).

d. Sacred trees: There were trees that were considered sacred as a result of their association with particular deities and thus were not cut down (Kanu 2021).

e. Land as sacred: Land was considered sacred as a result of its association with the land deity that was regarded as a mother. This afforded afforded the land respect (Kanu 2021).

f. Water bodies as sacred: They were considered sacred because they were seen as the abode of water spirits. This afforded water bodies respect (Kanu 2021).

g. Inorganic fertilization: The fertilization of the land was not done with the present fertilizer that contains chemicals that destroys the land. The wastes of animals or leaves were used (Kanu 2021).

h. Mixed cropping: This involves inter-cropping, the growing of two or more species simultaneously (Kanu 2021).

i. Tree planting by plants: Trees were planted by plants which helped in the protection of the soil from hazards (Kanu 2021).

j. Tree planting: Trees were planted at virtually every important occasion as such trees carry with them significance. During marriages, trees were planted, during sacrifices, trees were planted, when taking possession of a land, trees were planted (Kanu 2021).

The ecological value of the African conservative strategy include:

a. The African concept of the earth as mother, source of life, nourisher, supporter and teacher brings a new perspective to the understanding of nature. The land is not simply a human property.

b. Motherhood also introduces the concepts of respect, love, care, empathy, support, patience, etc., which are indispensable in environmental sustainability.

c. The concept of the land and water bodies as manifestations of great spirits, means that they are not just things but spiritual personalities worthy of respect.

d. The spiritual understanding of the land and water bodies helps the human person to tread with caution as a deity is involved.

e. This spiritual concept provides protection for nature. The crabs, crocodile, tortoise, snakes, water birds, frogs, etc., were seen as children and messengers of spirits living within them and so are not to be harmed.

f. There were no tree planting campaign announcements in traditional African societies, but some particular social and religious events and times went with the planting of trees.

g. The African perspective introduces the idea of an interrelated, interconnected and complementary universe. The destruction of the environment has consequences.

2.2.2.7 Colonialism and Environmental Exploitation in Africa

The colonial period in Africa (1880s-1960s) was marked by environmental exploitation and degradation. European powers such as Britain, France, Belgium, Germany and Portugal, extracted natural resources such as timber, minerals and wildlife for their own economic benefit, often with little regard for the local environment and communities (Okafor-Ozugha, 2017). Colonial policies also encouraged the conversion of forests and grasslands into commercial agriculture and plantations, leading to deforestation and loss of biodiversity (Okafor-Ozugha, 2017).

During the colonial period, European powers implemented policies that facilitated the exploitation of Africa's natural resources, leading to severe environmental degradation. In the Congo Free State, King Leopold II of Belgium authorized the extraction of rubber and ivory through forced labor, leading to widespread deforestation and loss of biodiversity (Kanu 2012, 2013; Klein, 2014). The British colonial administration in Kenya encouraged the conversion of forested land into commercial tea and coffee plantations, leading to significant deforestation

(Okafor-Ozugha, 2017). In addition to resource extraction and commercial agriculture, colonial powers also engaged in large-scale hunting of wildlife, contributing to the decline of many species (Okafor-Ozugha, 2017).

Colonial governments also imposed their own environmental values and practices on African communities, often disregarding the local knowledge and practices that had sustained the environment for centuries. For example, European colonialists introduced monoculture agriculture, which involved planting a single crop in large areas of land, leading to soil degradation and loss of biodiversity (Coombe, 2018). Additionally, colonial policies led to the displacement of communities from their ancestral lands, leading to environmental degradation as people were forced to migrate and settle in new areas, bringing about the overuse and degradation of natural resources in those areas (Okafor-Ozugha, 2017).

The colonial period in Africa was marked by severe environmental degradation due to the exploitation of natural resources and the imposition of European values and practices on African communities. The legacy of colonialism continues to impact Africa's environment and development, highlighting the importance of addressing historical injustices in current efforts to promote environmental conservation and sustainable development.

2.2.2.8 Environmental Conservation Efforts in Post-Colonial Africa

After independence, many African countries began to prioritize environmental conservation and sustainable development. Several African countries established national parks and protected areas to preserve their unique biodiversity and wildlife, such as Tanzania’s Serengeti National Park and Kenya’s Maasai Mara National Reserve (Makochekanwa and Phiri, 2017). Furthermore,

several international agreements and initiatives, such as the United Nations Framework Convention on Climate Change (1992) and the African Union's Agenda 2063 (2013), have recognized the importance of environmental conservation and sustainable development in Africa.

The post-colonial era saw the emergence of a new wave of environmentalism in Africa, with a growing awareness of the importance of protecting the continent's natural resources and ecosystems. This was driven in part by the recognition that environmental degradation posed a significant threat to human health, food security, and socio-economic development. In response, many African countries began to develop policies and programs aimed at promoting environmental conservation and sustainable development. One notable example of this is Tanzania's National Environmental Policy of 1997, which established a framework for the sustainable management of natural resources, including forests, water, and wildlife (Tanzania, 1997). The policy emphasized the importance of community participation and partnership in conservation efforts, as well as the need for integrated planning and decision-making across different sectors.

Similarly, Kenya's National Environmental Management Authority (NEMA) was established in 1996 to promote environmental conservation and sustainable development through regulation, coordination, and enforcement of environmental laws and policies. NEMA played a key role in regulating activities that pose a threat to the environment, such as waste disposal and air pollution, and has been involved in the development of policies and programs aimed at promoting sustainable development.

Beyond the regional level, African countries have been active participants in initiatives and agreements aimed at promoting environmental conservation and sustainable development. The United Nations Framework Convention on Climate Change (UNFCCC) has been a key platform

for international cooperation on climate change, with many African countries participating in negotiations and implementing climate change mitigation and adaptation measures (UNFCCC, 1992). The African Union's Agenda 2063, adopted in 2013, also recognizes the importance of environmental conservation and sustainable development in achieving Africa's socio-economic development goals. Despite these efforts, however, many challenges remain in promoting environmental conservation and sustainable development in Africa. These include limited financial resources, weak institutional capacity, corruption and competing priorities for development. Addressing these challenges will require sustained commitment and investment from governments, civil society, and the international community.

2.2.2.9 Challenges and Opportunities

The challenges faced by Africa in addressing climate change and environmental conservation are multi-dimensional and complex. Limited financial and technical resources are among the most significant challenges. African countries are among the poorest in the world, and many lack the necessary resources and expertise to develop and implement effective climate change and environmental conservation strategies. In addition, weak governance systems and political instability in some African countries make it difficult to address these issues effectively (UNEP, 2018).

Another challenge is conflicts over natural resources. Africa is home to many conflicts over natural resources such as land, water, and minerals, which are exacerbated by climate change impacts such as droughts and floods. These conflicts often result in environmental degradation, loss of biodiversity, and displacement of people (UNEP, 2018).

Despite these challenges, Africa also has significant opportunities to address climate change and environmental conservation. One of the most promising opportunities is Africa's abundant renewable energy potential. According to the African Development Bank (2018), Africa has the potential to generate 10 terawatts of solar power, which is enough to power the entire continent. The development of renewable energy sources such as solar, wind, and hydroelectric power can help reduce Africa's reliance on fossil fuels and mitigate greenhouse gas emissions.

In addition to renewable energy, Africa also has innovative community-based conservation practices that can help protect its natural resources. Community-based conservation practices such as community forests and conservation agriculture have been successful in reducing deforestation and improving soil fertility (UNEP, 2018).

Finally, the growing youth and civil society movements in Africa are also creating opportunities for addressing climate change and environmental conservation. Young people in Africa are increasingly becoming involved in environmental activism and advocating for sustainable development policies (AfDB, 2018). Civil society organizations are also playing a crucial role in promoting environmental conservation and holding governments accountable for their environmental commitments (UNEP, 2018). While Africa faces numerous challenges in addressing climate change and environmental conservation, it also has significant opportunities. These include abundant renewable energy potential, innovative community-based conservation practices, and growing youth and civil society movements. African governments and other stakeholders must work together to harness these opportunities and address the challenges in promoting sustainable development in the continent.

2.2.2.10 African Initiatives and Strategies

Several African initiatives and strategies have been developed to address climate change and environmental conservation, such as the African Renewable Energy Initiative, the Great Green Wall, and the African Forest Landscape Restoration Initiative (AREI 2016; GGWSSI 2017; AFR100 2017). These initiatives aim at promoting renewable energy, restore degraded land, and conserve biodiversity and natural resources. Furthermore, many African countries have developed national climate change policies and action plans, such as Nigeria's National Climate Change Policy and Response Strategy and Ethiopia's Climate Resilient Green Economy Strategy (Nigeria Ministry of Environment, 2012; Ethiopian Ministry of Environment, Forest, and Climate Change, 2016).

The African Renewable Energy Initiative was launched in 2015 during the Paris Climate Conference to increase access to renewable energy in Africa and promote sustainable development on the continent. The initiative aims at installing 10 GW of renewable energy capacity by 2020 and 300 GW by 2030, with a focus on solar, wind, and hydroelectric power (AREI 2016). The initiative is supported by African governments, international organizations, and the private sector. The Great Green Wall is another initiative aimed at addressing climate change and environmental conservation in Africa. The initiative was launched in 2007 by the African Union and aims at restoring degraded land in the Sahel region of Africa by planting trees, improving soil fertility, and promoting sustainable land management practices (GGWSSI, 2017). The initiative covers 11 countries, including Burkina Faso, Chad, Ethiopia, and Senegal, and is expected to cover 100 million hectares of degraded land by 2030.

The African Forest Landscape Restoration Initiative (AFR100) is another initiative aimed at restoring degraded land in Africa and promoting sustainable land management practices. The

initiative was launched in 2015 and aims at restoring 100 million hectares of degraded land by 2030 through partnerships with African governments, the private sector, and civil society organizations (AFR100, 2017). The initiative focuses on promoting sustainable forestry practices, improving soil fertility, and increasing the resilience of ecosystems to climate change. Many African countries have also developed national climate change policies and action plans to address the impacts of climate change and promote sustainable development. Nigeria's National Climate Change Policy and Response Strategy, for example, aims at promoting climate-resilient development and reduce greenhouse gas emissions through the implementation of various mitigation and adaptation measures (Nigeria Ministry of Environment, 2012). Ethiopia's Climate Resilient Green Economy Strategy, on the other hand, aims at promoting sustainable development through the development of renewable energy, sustainable agriculture, and improved land management practices (Ethiopian Ministry of Environment, Forest, and Climate Change, 2016).

These initiatives and strategies are crucial for addressing the impacts of climate change and promoting sustainable development in Africa. However, more needs to be done to ensure that these initiatives are effectively implemented and that their objectives are achieved. African governments need to prioritize the implementation of these initiatives and allocate sufficient resources to support their implementation. Furthermore, there is a need for increased collaboration between African countries, international organizations, and the private sector to ensure that these initiatives are implemented in a coordinated and effective manner. More so, there is need for the indigenization of these strategies for optimum outcomes.

2.2.2.11 Africa, Environmental Sustainability and the Global Community

Although Africa contributes the least to global greenhouse gas emissions, it is disproportionately affected by the impacts of climate change (AfDB, 2018). Therefore, Africa has a critical role to play in global climate change and environmental conservation efforts. African countries can leverage their collective voice to advocate for stronger global climate action, such as increased climate finance, technology transfer and capacity building (AU, 2016). Furthermore, African countries can lead the way in implementing ambitious national climate policies and programs and promoting sustainable development practices. Africa's contribution to global greenhouse gas (GHG) emissions is relatively small, accounting for only 4% of the total global emissions (AfDB, 2018). However, the continent is particularly vulnerable to the impacts of climate change, as highlighted in the previous chapter. Africa is expected to experience significant reductions in agricultural productivity, loss of biodiversity, and increased water stress due to climate change (AfDB, 2018). These impacts have severe implications for food security, public health, and economic growth in the continent.

Given these challenges, Africa has an essential role to play in global climate change and environmental conservation efforts. African countries can play a significant role in advocating for stronger global climate action by leveraging their collective voice in international climate negotiations. These include, calling for increased climate finance, technology transfer, and capacity building to support climate adaptation and mitigation efforts in the continent (AU, 2016).

Furthermore, African countries need to take part in implementing national climate policies and programs and promoting sustainable development practices. Some African countries have already set ambitious renewable energy targets, such as Ethiopia's goal of generating 100% of its

electricity from renewable sources by 2025 (IRENA, 2019). Other countries have implemented policies to promote sustainable agriculture, such as Uganda's National Climate Change Policy, which promotes climate-smart agriculture practices (FAO, 2020).

Africa has a critical role to play in global climate change and environmental conservation efforts, despite its small contribution to global GHG emissions. African countries can leverage their collective voice in advocating for stronger global climate action and implementing ambitious national climate policies and programs. These efforts can contribute significantly to mitigating the impacts of climate change in the continent and promoting sustainable development.

2.2.2.12 The Challenges of Addressing Climate Change in Africa

Addressing climate change in Africa is challenging due to various factors, including limited financial resources, limited technical resources, inadequate infrastructure, corruption, inadequate political will and political instability. African countries have limited capacity to adapt to the impacts of climate change, with many countries lacking the necessary resources and expertise to develop and implement adaptation and mitigation strategies. Political instability and conflicts in some African countries also hinder efforts to address climate change, with resources and attention diverted to other pressing issues. One of the primary challenges faced by African countries is the limited financial resources available for addressing climate change. Many African countries are among the poorest in the world, with limited access to financing and investment resources to implement climate change mitigation and adaptation measures (Scheba et al., 2020).

Another significant challenge is the inadequate infrastructure in many African countries, which makes it difficult to implement climate change mitigation and adaptation strategies effectively. The lack of reliable and modern transportation infrastructure hinders the distribution of clean energy and other environmentally friendly technologies (Nhamo et al., 2020). The inadequate water and sanitation infrastructure also increase vulnerability to droughts and water-related diseases (Mabele & Arko-Achemfuor, 2020).

Political instability and conflicts in some African countries are hindering efforts to address climate change. These issues divert attention and resources from climate change initiatives, leaving many African countries struggling to address pressing issues such as food security, healthcare and education. Additionally, weak governance structures and corruption in some African countries also hinder efforts to address climate change, with a lack of accountability and transparency, making it difficult to implement effective climate change policies and initiatives (Nhemachena & Hassan, 2019).

Addressing climate change in Africa is a significant challenge that requires a concerted effort from African governments, civil society and international organizations. Addressing the challenges faced by African countries, including limited financial resources, inadequate infrastructure and political instability, is crucial to developing and implementing effective climate change mitigation and adaptation measures.

2.3 Theoretical Framework

There are several theories around which a research on climate change and environmental conservation strategies in Africa can be weaved. They include Igwebuike Conservation Theory, Environmental Kuznets Curve (EKC), Political Ecology and Environmental Justice:

2.3.1 Igwebuike Conservation Theory

The Igwebuike conservation theory was first developed in a Paper presented titled "African indigenous ecological spirituality as a response to modern ecological crisis" by Kanu Ikechukwu Anthony at Harvard Divinity School in 2022 during their Inaugural International Conference on Alternative Spiritualities. The theory also appeared in a paper published in the Harvard Divinity Bulletin Spring/Summer 2023 with the title: "The ecological value of Igbo spirituality". The *Igwebuike* conservation theory is an indigenous holistic approach to the understanding and preservation of the environment. It is based on the basic principles of Igwebuike philosophy which holds that reality is interconnected, interrelated and complementary in character.

Igwebuike is an Igbo proverb and a typical Igbo name which means that there is strength in number. Going beyond its literal meaning, *Igwebuike* provides an ontological horizon that presents being as that which possesses a relational and complementary character of mutual relations (Kanu 2016, 2017 & 2021). As a conservation theory, it understands the exploitation and mismanagement of any dimension of the environment as having consequences for the entirety of reality, given the interconnectivity, interrelatedness and complementarity of reality. Every reality is related to other realities, and as such other realities become a part of my reality; and the future of my reality in terms of sustenance is dependent on the sustainability of other dimensions of reality. As a result of this structure of reality, every human action has a

corresponding consequence given that every part of reality is interconnected with other parts of reality. The implication of this perspective is that whatever I do to nature, in terms of preservation or exploitation, I actually do it for myself (Kanu 2022 & 2023).

2.3.2 Environmental Kuznets Curve (EKC) Theory

The Environmental Kuznets Curve's (EKC) theory was first introduced in the academic literature by economists Grossman and Krueger in their 1991 article "Environmental Impacts of a North American Free Trade Agreement". Since then, the EKC theory has been applied to various environmental issues, including climate change, deforestation and air pollution. The Environmental Kuznets Curve (EKC) theory suggests that economic growth can eventually lead to environmental improvement. This theory proposes that as a country's economy grows and becomes more developed, it becomes more environmentally conscious and develops the necessary resources and technologies to address environmental challenges. The EKC theory suggests that after a certain level of economic growth is reached, environmental degradation will begin to decline.

In the African context, the EKC theory could be relevant to the project topic of climate change and environmental conservation strategies. African countries are seeking to promote economic growth while addressing the challenges of climate change and environmental conservation. The EKC theory suggests that as African countries become more developed, they will become more environmentally conscious and develop the necessary resources and technologies to address environmental challenges.

However, the EKC theory has been criticized for oversimplifying the relationship between economic growth and environmental degradation. Some scholars argue that the EKC theory

ignores the potential negative impacts of economic growth on the environment, such as increased pollution and greenhouse gas emissions. Additionally, the EKC theory assumes that all countries will follow the same pattern of environmental improvement as they become more developed, which may not be the case in practice.

Therefore, while the EKC theory provides a useful framework for understanding the relationship between economic growth and environmental degradation, it should be applied with caution in the African context. African countries should prioritize sustainable and environmentally conscious economic growth to ensure that economic development does not come at the expense of the environment.

This theory proposes that environmental degradation initially increases with economic development, but eventually declines after a certain level of economic growth is reached. The EKC theory suggests that as economies grow, they become more environmentally conscious, and they develop the necessary resources and technologies to address environmental challenges.

2.3.3 Political Ecology Theory

Political ecology theory emerged in the 1980s and 1990s as a critique of mainstream environmentalism that focused on technical solutions to environmental problems without considering the social and political context in which those problems exist. Political ecology theory emphasizes the importance of understanding the social and political factors that influence environmental degradation and conservation (Baer 1996; Biersack 1999, 2006; Bryant 1998).

In the African context, political ecology theory is particularly relevant because environmental degradation is often linked to power relations, economic interests, and political decision-making.

Natural resource extraction and land-use change are often driven by the interests of powerful elites, which can lead to environmental degradation and displacement of local communities.

Political instability and corruption can also hinder efforts to address climate change and promote environmental conservation in Africa. Political instability can lead to a lack of policy continuity, making it difficult to implement long-term environmental policies. Corruption can undermine efforts to regulate industries and protect natural resources by enabling illegal activities such as poaching and illegal logging.

Therefore, political ecology theory provides a useful framework for understanding the complex social and political factors that contribute to environmental degradation and hinder efforts to address climate change and promote environmental conservation in Africa. By analyzing the power relations and political decision-making that shape environmental outcomes, political ecology theory can inform strategies to promote sustainable and equitable environmental policies in Africa.

This theory emphasizes the political and social factors that influence environmental degradation and conservation. Political ecology theory suggests that environmental degradation is often linked to power relations, economic interests, and political decision-making. In the African context, political ecology theory could explain how political instability and corruption hinder efforts to address climate change and promote environmental conservation.

2.3.4 Environmental Justice Theory

Environmental Justice Theory emerged in the United States during the 1980s as a response to the unequal distribution of environmental risks and benefits among different social groups. The

concept was popularized by civil rights leaders and activists who drew attention to the disproportionate exposure of communities of color and low-income communities to environmental pollution and hazards (Agyeman et al 2003; Cole and Foster 2001; Holifield Chakraborty and Walker 2017; Holifield Porter and Walker 2010; Landrigan, Fuller, Acosta 2017; Mohai, Pellow and Roberts 2009; Szasz and Meuser 1997).

The principles of Environmental Justice Theory were later applied to a global context, including Africa, where vulnerable populations such as indigenous peoples, rural communities, and low-income households often bear the brunt of environmental degradation and climate change impacts. Environmental Justice Theory suggests that environmental policies and initiatives should promote greater equity and justice by addressing the disproportionate distribution of environmental benefits and harms among different social groups.

African countries can use the principles of Environmental Justice Theory to develop policies and strategies that promote equitable and just environmental outcomes. This could include prioritizing the involvement of vulnerable populations in decision-making processes related to environmental policies and initiatives, as well as addressing the root causes of environmental injustice, such as social and economic inequality. By adopting an Environmental Justice approach, African countries can ensure that climate change and environmental conservation strategies promote greater equity and justice for all.

This theory focuses on the disproportionate distribution of environmental benefits and harms among different social groups. Environmental justice theory suggests that vulnerable populations, such as low-income communities and indigenous peoples, are often disproportionately affected by environmental degradation and climate change impacts. In the African context, environmental justice theory could be applied to explain how climate change and environmental degradation

exacerbate existing social and economic inequalities, and how environmental policies and initiatives can promote greater equity and justice.

2.3.5 Application of the Theories

The Igwebuike Conservation Theory, Environmental Kuznets Curve (EKC) Theory, Political Ecology Theory, and Environmental Justice Theory would be of great help in shaping the present research on an African perspective of Climate Change and Environmental Conservation Strategies.

Igwebuike Conservation Theory would provide the framework for the understanding of the issues around climate change and environmental preservation from a unique African perspective which understand reality as interconnected, interrelated and complementary in character. This complementary character of mutual relations is not unconnected with the structure of the African worldview. What this indigenous theory of conserving the environment does is that it glolocalizes the conversation on climate change and strategies for the preservation of the environment, and helps the understanding of the consequences of human action in the climate change crisis.

Environmental Kuznets Curve (EKC) theory suggests that economic development can eventually lead to a decline in environmental degradation after a certain level of economic growth is reached. African countries, therefore, need to pursue economic growth while also prioritizing environmental conservation efforts. This could involve promoting sustainable development practices, investing in renewable energy technologies, and implementing policies that reduce greenhouse gas emissions while also promoting economic growth. This theory also helps the

understanding of the incapacity of the African continent to deal with climate change challenges as a result of their poor economy.

Political Ecology theory highlights the importance of considering the social and political dimensions of environmental challenges. African countries need to recognize the role of social, cultural, political and economic factors in shaping environmental outcomes and put these factors into consideration during their decision-making processes. This could involve ensuring that vulnerable populations, such as indigenous peoples and rural communities, have a say in the development and implementation of environmental policies and initiatives.

Environmental Justice theory emphasizes the need to address the unequal distribution of environmental benefits and harm among different social groups. African countries must ensure that their climate change and environmental conservation strategies prioritize the needs of vulnerable populations, such as low-income households, who are often disproportionately affected by environmental degradation and climate change impacts.

In summary, the theories of Igwebuike Conservation, Environmental Kuznets Curve (EKC), Political Ecology, and Environmental Justice can provide useful frameworks for understanding and addressing the complex environmental challenges faced by African countries. These theories provide different lenses for understanding the complex challenges and opportunities related to climate change and environmental conservation in Africa, especially as it relates to an African indigenous approach.

2.4 Empirical Framework

Abdullahi (1990) in his “Pastoral production systems in Africa: A study of nomadic household economy and livestock marketing in central Somalia” investigates and describes the pastoral

economics at household levels and marketing possibilities in different pastoral wealth groups with particular reference to the experience in Central Somalia. He presented the different management strategies and marketing behaviors that exist between different pastoral wealth groups or households. He also investigated the characteristics of pastoral systems by identifying the diversity of the pastoral resource bases. He describes the multipurpose role and functions of different livestock species in the selected production systems. He finally evaluates the development of pastoral systems with regard to institutional, cultural and environmental attitudes which direct a tendency towards land use intensification.

Ayiemba (1981) in his work on "Human ecology: A study of environmental perception and modes of survival among the Samburu in Kenya", examines how the dynamic aspects of the environmental perception of the Samburu have influenced their personal life. In particular, the article looks at the relationship between the nomads and their perceptions of the environment and how this influences their organization of space utility. The author provides an outline of the structure of environmental decision making. The author considers Samburu migration as an adjustment procedure to environmental stress. The author observes that survival of the Samburu in different ecosystems with varying degrees of ecostress was enabled by a sound knowledge of environmental phenomena. Such knowledge was acquired through territorial mobility characterized by multiple migration returns, as well as through sound environmental education through the Samburu cultural system. The supports the idea that indigenous environmental education is a means of fostering survival among indigenous people, and thus, could help in the effort towards the reduction of environmental risks caused by ignorance of indigenous strategies.

Campbell (1991) in his "The impacts of development upon strategies for coping with drought among the Maasai of Kajiado District, Kenya" examines the Maasai strategies for coping with

drought and related food deficits in three time periods: precolonial, colonial and post-independence. The author observes that responses to drought among the Maasai are integral to the structure of society-environment interaction. He blames the colonial and post-colonial development policies in Kenya failed to recognize this relationship and have altered the efficacy and variety of coping strategies, such that the Maasai are today more vulnerable to the effects of drought. To prevent the economic and social marginalization of the majority of the Maasai, the author recommends the adoption of development strategies which enhance the diversity and productivity of the Maasai economy. This article emphasizes that prior to the advent of the colonial system of governance, that the African indigenous people had their own ways of managing their environment in such a manner that was sustainable.

De Gans (1986) in his work on “Taking indigenous knowledge eriously: The case of pastoral strategies among Turkana nomads of northwestern Kenya” describes some aspects of traditional adaptive strategies among Turkana nomadic pastoralists of northwestern Kenya. Through their devices, these herders have coped with harsh and unpredictable environments and overcame the consequences of natural disasters. This indigenous strategy for survival was, however, affected by the colonial intervention. This has made the livestock owners more vulnerable to calamities like droughts. The author suggests that livestock development interventions must be based on indigenous knowledge systems and on the special skills of indigenous peoples.

Dietz (1987) in the work on “Pastoralists in dire straits: Survival strategies and external interventions in a semi-arid region at the Kenya/Uganda border, Western Pokot, 1900-1986” studies the strategies the Western Pokot developed to survive recurrent environmental crises; the impacts of external intervention on the crises and survival strategies of the Pokot. The study submits that external actors can only partially influence 'development' because they lack the

sensitivity and flexibility required to cope with these harsh and insecure environments, and that development planners should accept that local, dispersed survival strategies are often more important than planned strategies from above. This work argues for the need for the incorporation of indigenous methods or perspectives in any plan towards environmental sustainability.

Homewood and Rodgers (1991) in their work on "Maasailand ecology: Pastoralism development and wildlife conservation in Ngorongoro, Tanzania" focus on the ecology and management of Ngorongoro Conservation Area (NCA) in northern Tanzania. they explore the conservation values of NCA and those ecological issues that have given rise to conservationist concerns. They look at past management inputs affecting the Maasai and plots the course of pastoralists development in the NCA. The book seeks to establish which factors threaten the continued existence of conservation and of pastoralism in NCA, and conversely those factors that are either compatible with, or positively reinforce the aims of both. The book leads up to a synthesis of the various facets of NCA ecology range, wildlife, livestock and human- and an integrated view of land prospects in NCA. The authors marshal evidence from historical, political, anthropological, development and archaeological as well as biological studies to explore the ecology of NCA and the future of joint pastoralists/conservation land use.

Lane and Scoones (1993) in their work "Barabaig natural resource management" examine the pastoralist ecological management strategies using a case study from the Barabaig of Hanang district, Tanzania. They provide details of the Barabaig land use system, the authors argue that the way the Barabaig manage rangeland resources is a rational and sustainable form of land use. They presented a common land tenure arrangements that are sophisticated and effective for both production and conservation of land resources. They argue that such management is based on a

close understanding of the interactions between components of the landscape and the requirements of a range of resources to sustain production. The study demonstrates how an inappropriate assessment of the economic value of the pastoral production system, and the resources that it depends upon, has led to external intervention that undermines the sustainability of the existing system.

McCabe (1983) in the paper on "Land use management among the pastoral Turkana" examines the pastoral production system of the Turkana and how it relates to the exploitation of natural resources and the general pattern of land use. The pattern of land use among them involves frequent movements and exploitation of at least five habitat types based on climate, vegetation and soil. Each land owner acts as an independent decision maker adjusting his movement cycle and land management techniques in response to environmental change, social conditions, fluctuations in herd productivity, and annual and seasonal variations in numbers of both animals and humans. For the Turkana, success and survival have depended on the ability to respond quickly to changing conditions. Development schemes in such areas often attempt to impose rigidity on these indigenous systems and pastoralists have historically ignored the regulations set down by development planners and pursued management strategies that have ensured their survival in harsh and unpredictable environments.

Western (1982) in the work on "The environment and ecology of pastoralists in arid savannas" discusses the dynamic interactions of pastoralists and their environments, focusing on the East African pastoral Masai group. He observes that the extreme demands of the environment on pastoralists have led to exploitation techniques that have been successful through time and have resulted in comparatively high human density on marginal lands. Recent changes result from their adopting technologies that initially increase their efficiency of exploitation, but which will

eventually result in imbalances that exacerbate their potential for land degradation. The author submits that technology has contributed much to the problems facing pastoralists in the savannahs, not because it is inherently disruptive, but because it has been poorly applied and not balanced against prevailing social and ecological situations.

Asrat, Idris and Semegu (1996) in the work “The 'flexibility' of indigenous soil and water conservation techniques: A case study of the Harerge highlands, Ethiopia” describe traditional soil and water conservation techniques used by farmers in the Harerge highlands of Ethiopia, and explain how these techniques are uniquely adapted to the different crops, labor demand patterns and physical conditions found in the agro-ecological/altitudinal zones of the highlands. These soil and water conservation structures are constructed in response to local needs and circumstances. Introduced structures fail to do this. They, therefore, argue that by failing to address the diversity of local needs and circumstances, project interventions can undermine the flexibility of traditional approaches to soil and water conservation.

Barrow (1989) in the work on “The value of traditional knowledge in present-day soil conservation practice: The example of West Pokot and Turkana” highlights traditional values that Pokot and Turkana people of Kenya have which could be of intrinsic value to soil and water conservation if used sensibly in the dry areas. It further identifies methods of incorporating such traditional values in soil and water conservation practice for arid and semi-arid lands. The author cites the sustained management of woody species, grazing management, the cultural value and attachment placed on trees as of integral importance in sustained rangeland management, and by inference, soil and water conservation. The broader traditional range management policies help conserve the arid lands, while the attitudes to woody species (trees in particular), ensure that very few or no trees are actually cut. This acts as a conservation control along rivers and water

courses where the majority of the good trees are found. The author observes that these traditional land management systems well developed over time are in danger of breaking down, largely due to outside interference, without trying to adopt the system to new changes.

Critchley, Reij and Willcocks (1994) in “ndigenous soil and water conservation: A review of the state of knowledge and prospects for building on traditions” explores two hypotheses: first, that much can be learned from previously ignored indigenous soils and water conservation practices; and secondly, that indigenous soil and water conservation can often act as a suitable starting point for the development of technologies and programs. The authors provide examples of indigenous soils and water conservation techniques from various countries worldwide, with a specific emphasis on sub-Saharan countries. The authors indicate that indigenous soil and water conservation evolves and thrives under a suite of specific circumstances. These include where moisture limits the production of crops and fruits; where there is cultivation of hillsides; and where there is population pressure. The authors also examine circumstances under which indigenous soil and water conservation is abandoned. They find that exodus of labor from where terracing requires a high level of maintenance, and an associated breakdown of social organization for maintenance, is one important cause. Others include: decreasing rainfall; shift of technology from the hoe toward oxen or tractor ploughing and where projects have ignored the existing traditions and superimposed new structures over the old. Based on their review, the authors conclude that although there is a widespread tradition of soil and water conservation which has been consistently overlooked, the little that is known confirms there are useful lessons to be drawn from indigenous soil and water conservation.

Kruger, Fantaw, Michael and Kajela (1996) in the chapter on “Creating an inventory of indigenous soil and water conservation measures in Ethiopia” provide detailed information about

the diverse and ingenious ways in which framers have evolved to try and manage their land. The inventory demonstrates not only the strengths of these practices and the options for improvement, but also where major weaknesses exist. The research suggests that there is wider scope for integrating aspects of indigenous soil and water conservation approaches and vice versa to improve their acceptance and appropriateness.

Reij (1991) in the paper on "Indigenous soil and water conservation in Africa" addresses the current knowledge of indigenous soil and water conservation in Africa in order to identify research needs and policy requirements in the field of African indigenous soil and water conservation with reference to places like Somalia, Sudan, Cameroon, Morocco and Tunisia. He demonstrates that despite a growing awareness of the importance of indigenous knowledge in soil and water conservation, African soil and water conservation continues to be neglected. He also analyzes cases where indigenous techniques have been maintained or abandoned, as well as the effects of project interventions on the survival or abandonment of indigenous soil and water conservation techniques.

Belshaw (1979) in the article "Taking indigenous knowledge seriously: The case of inter cropping techniques in East Africa" focuses on changes in the attitudes of research workers to inter-cropping techniques in tropical Africa over the last twenty years. Inter-cropping or associated cropping is an indigenous technique practiced in small scale farming systems in the tropics. The author presents a historical outline of applied scientific and economic research on inter-cropping systems in East Africa. Possible advantages of such systems include raising farm outputs, reducing variance in output levels, reducing labor inputs per unit of product, ensuring a timely supply of a varied range of fresh foods and avoiding cash outlays on inputs such as fertilizer.

Brokensha and Riley (1991) in the chapter on “The centrality of indigenous knowledge for the agricultural development of marginal areas of Africa” indicate that many previous studies have demonstrated that local farming systems in Africa are characterized by being dynamic, diversified, appropriate, with low capital and high labor demands. They note that these systems have been distorted by the colonial experience, introduction of cash and cash crops, markets, commercialization of natural resources, migrant labor and advent of strangers, state intervention and population growth. They caution that "traditional ways" should not be romanticized, but what is required is a balance between indigenous and western knowledge, especially in development intervention. They recommend that indigenous knowledge is an essential starting point in looking at modern and past African farming systems, especially in marginal areas where such knowledge was necessary for survival. Development interventions will fail unless account is taken of indigenous knowledge.

Knight (1974) in the book on “Ecology and change: Rural modernization in an African community” present the traditional agricultural system of the Nyiha of southwestern Tanzania, and outlines the process and results of agricultural change within this society. He provides a comprehensive account of traditional agricultural practices used by the Nyiha for exploiting their environment. He discusses the Nyiha's complement of tools and crops, as well as the land management systems, focusing on the way in which agricultural practice articulates crops and environment through the seasons and the years. The author also considers contemporary agricultural patterns, analyzing farming systems distribution throughout Unyiha as a basis for evaluating agrarian change in recent decades, such as intensified food production, cash crop growing and adoption of new technologies. Sources of change are both indigenous, such as

migration and inter-cultural marriages, as well as external, such as through missionaries, through traders, and the government via agricultural extension officers.

Wiersum (1986) in the article on "The effect of intensification of shifting cultivation in Africa on stabilizing land use and forest conservation" investigates four case studies of changes in shifting cultivation systems in Tanzania, Ivory Coast, Madagascar, and Sierra Leone. The traditional land use system is described in each study with relation to natural and socio-economic environment and to cultivation and production characteristics. Changes in the land use system resulting either from indigenous strategies or outside interventions are also described. Both traditional and alternative cultivation systems are analyzed as to their ecological stability, management resilience, production sustainability and economic reliability. The effect on forest and tree resources was also taken into account. The author finds that traditional indigenous shifting cultivation systems generally provided a sustained production of agricultural products for local use. Ecological stability and production sustainability were preserved by various management practices which provided for resilience against variable and adverse weather conditions, biotic perturbations and soil degradation and erosion. The author argues that the intensification of shifting cultivation will stabilize land use and decrease pressure on forest resources only if intensification is combined with measures to control possible negative effects on the socio-economic environment.

2.5 Gap in Literature

Several gaps have emerged during the review of literature on climate change and environmental preservation in Africa. While some of the reviews examine the impact of climate change on agriculture in Africa, and also valuable insights on the impacts of climate change on various sectors in Africa, there is insufficient literature on the need for an alternative African approach to

the problem of climate change and in the effort towards the preservation of the environment. The literature studied did not provide sufficient information on African traditional/indigenous strategies for the conservation of the environment which would serve as a major contribution of Africa to the global conversation on climate change and environmental preservation.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter outlines the research methodology for this study, which is essential for ensuring a scientific procedure. The chapter covers the following aspects: the research design, the study area, sample of the study, sampling technique, method of data collection, instrument of data collection, validity and reliability of the instrument, administration of instrument, method of data analysis.

3.1 Research Design

The design for a research work is the plan for how the study will be conducted**.** It refers to the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data. The study adopts the descriptive research design which is used to describe characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred. Rather it addresses the "what" question (what are the characteristics of the population or situation being studied? The characteristics used to describe the situation or population are usually some kind of categorical scheme also known as descriptive categories. A descriptive research is concerned with either description of existing relationships, attitudes, practices, processes, and trends, amongst others or the comparison of variables. Descriptive research does not make attempts to manipulate variables.

This descriptive research design was, therefore, employed to investigate climate change and environmental conservation strategies in Africa, with particular reference to indigenous strategies. The descriptive research design allowed for the collection and analysis of data to describe and understand the current state of climate change and environmental conservation in Africa, and also the need for an indigenous approach towards the mitigation of the consequences of climate change. This design is suitable for this study because it allows the researcher to examine the current state of climate change and environmental conservation strategies in Africa, as well as the factors influencing their implementation and effectiveness.

3.2 The Study Area

The study was conducted in various locations across the different regions of Nigeria, representing different ecological experiences. These locations were selected to capture the diverse environmental conditions and climate change challenges faced by regions. Nigeria is a country in West Africa with a population of about 215 million people and a land area of about 924,000 square kilometres. Nigeria is divided into 36 states and one federal capital territory, Abuja. She has diverse climatic zones, ranging from humid tropical in the south to semi-arid in the north. Nigeria is vulnerable to the impacts of climate change, such as rising temperatures, erratic rainfall patterns, droughts, floods, sea level rise, coastal erosion and desertification.

The different geo-political zones of Nigeria, are highly relevant study areas when examining climate change and environmental conservation strategies in Africa. The regions are characterized by a complex ecosystem comprising desert areas, mangroves, swamps, and riverine forests, rivers and creeks. This is important as it captures different climatic conditions in Africa.

Nigeria is very important for this study as she has experienced extensive environmental degradation, including deforestation, drought, oil spills, gas flaring, deforestation, erosion and pollution of water bodies. These activities have led to the destruction of habitats, loss of biodiversity, coastal land loss, salinization of freshwater sources and contamination of soil, water and air. These changes have implications for agriculture, livelihoods, and the overall well-being of the communities in the region. The study would investigate the specific climate change impacts in Nigeria and their implications for local populations. The study would focus on understanding the extent and impact of these environmental crises on relation to the need for an indigenous approach.

Nigeria as a study area is also fundamental because she is home to numerous communities that are highly vulnerable to the adverse effects of environmental degradation and climate change. These communities depend on the natural resources and ecosystem services provided for their livelihoods, including fishing, farming and forestry.

3.3 Sample of the Study

This section explains the sampling technique used to select a representative sample from the study population. A sample is a subset of the population that is selected for data collection. A purposive sampling technique was employed to select the participants for the study. The selection was based on their experience and background. This sampling technique ensured that the participants had relevant knowledge and insights to contribute to the research objectives. The population of Nigeria at about 215 million is composed of a diverse and dynamic people, with varying political, economic, social, and environmental factors that affect the different regions

region. These include government agencies at federal and state levels, private sector operators, civil society organizations, development partners, academic institutions and local communities.

The Taro Yamane formula is another commonly used method for estimating sample size, especially when the population size is large and the desired level of precision is known. By increasing the level of precision, the resulting sample size will be smaller. Here's an example using a desired level of precision of 5% (e = 0.05):

$n = N / (1 + N * e^2)$

$n = 42,436,000 / (1 + 42,436,000 * 0.05^2)$

$n = 42,436,000 / (1 + 42,436,000 * 0.0025)$

$n \approx 42,436,000 / (1 + 106,090)$

$n \approx 42,436,000 / 106,091$

$n \approx 300.98$

Using a desired level of precision of 5%, the calculated sample size is approximately 399.

Table 1: Distribution of the Geopolitical Zones and sampling size by proportion size

Zone	**Sample Size**
North West	50
North Central	50
North East	50
South East	50

South South	50
South West	50
Total	**300**

In this distribution, each region is not allocated a proportionate sample size based on their population size.

3.4 Sampling Technique

The sampling technique used in this study is the stratified random sampling. Stratified random sampling involves dividing the population into distinct subgroups or strata based on certain characteristics that are relevant to the study, such as geographical location, socioeconomic factors or population density. The aim is to ensure that each stratum is represented in the sample in proportion to its size in the population.

After stratification, a random sampling method, such as simple random sampling or systematic random sampling, can be used to select the required number of participants or sampling units from each stratum. This helps ensure that the sample is representative of the entire population and allows for the analysis of specific subgroups within the population.

3.5 Method of Data Collection

The purpose of this data collection is to assess the current state of climate change and environmental conservation strategies indigenous to Africa, and to identify the main challenges and opportunities for enhancing climate resilience and sustainability from an indigenous

perspective. The data collection involved both primary and secondary sources of data. Primary data were collected through semi-structured interviews with key stakeholders from different backgrounds and experiences. Secondary data were obtained from relevant literature, reports, documents and databases on climate change and environmental conservation in Nigeria and beyond. The data collection methods included a literature review, a stakeholder mapping, and a semi-structured interview protocol. The primary method of data collection utilized in this study was a combination of surveys, interviews, and document analysis. Surveys were administered to gather quantitative data on participant' perceptions, attitudes and behaviors related to climate change and environmental conservation. Interviews were conducted to obtain qualitative data, allowing for an in-depth exploration of participants' experiences, opinions, and strategies. Additionally, relevant documents such as reports, policies, and project proposals were analyzed to supplement the primary data collection.

3.6 Instrument of Data Collection

To gather data through surveys and interviews, a structured questionnaire and interview guide were developed. These instruments consisted of a series of questions and prompts designed to elicit information on various aspects of climate change and environmental conservation strategies. The instruments were pre-tested and refined before their application to ensure clarity and relevance.

The questionnaire consists of five (5) rating scale types. The major rating scale types are: (i) A=Agree (ii) SA=Strongly Agree (iii) D=Disagree (iv) SD=Strongly Disagree (v) U=Undecided. The questionnaire is divided into two main sections- A and B. Section A contains the personal

data of the respondents such as age, gender and location and educational background. Section B consists of a 64 item questionnaire which will be used to obtain information from the respondents about the relevance of African indigenous conservation strategies. Secondary data is derived from textbooks, journal articles, monographs, research reports, magazines and newspapers and the internet sources.

3.7 Validity and Reliability of the Instrument

Asika (2001) defines validity as the degree to which a measuring instrument measures what it is designed to measure. Validity refers to the extent to which an instrument measures what it intends to measure. The instrument is given to project supervisor in Faculty of Education to ensure that it is relevant to the research topic and areas under investigation. This will also involve checking the wordings and the relevance of the items in the questionnaires after the necessary amendment as recommended by the supervisor, the researcher will produce the final version of instrument.

For the purpose of instrument validation, the approach adopted is content validity. Content validity is related to a type of validity in which different elements, skills and behaviors are adequately and effectively measured. To this end, the research instruments and the data was reviewed by the experts in the field of research. In support of this Kerlinger (1986) argued that validation of the content of the research instrument by experts, is an important and acceptable technique. Therefore, this upgraded the quality of the instrument. The other source of data from the institutions' records was assumed to serve the purpose for which it was meant and therefore adjudged valid.

The reliability of the instrument was assessed using the test-retest reliability. The same individuals were measured over a period of two weeks in the same institutions and a correlation coefficient was computed to see whether scores on the first measure were related to scores on the second measure. According to Osuala (2005), Nworgu (2006) and Oborah (2010) high test-retest reliability is indicated by a correlation coefficient which approaches +1.00.

The reliability coefficient of the relevance of African indigenous approaches to climate change and environmental sustainability instrument was established using the test-retest method. The instrument duly completed by the respondents were collected and analysed. It was done to generate data used to determine the reliability of the instrument. Crombach Alpha was used to determine the internal consistency of the instrument and reliability coefficients of 0.84, 0.87, 0.69, 0.78 and 0.74 were obtained from the five clusters respectively. The overall reliability co-efficient was 0.79.These were assumed to be valid.

3.8 Administration of Instrument(s)

The questionnaire were administered and collected personally by the researcher in the field. The researcher encouraged the respondents to complete the questionnaire without influencing them materially. The questionnaires completed by the respondents were directly collected by the researcher for analysis.

3.9 Method of Data Analysis

Primary data collected for the research were analyzed using simple percentages to answer research questions. A Statistical Package for the Social Sciences (SPSS) was used to analyse the data collected in the study. The raw scores collected from the questionnaire were entered

according to choices of the respondents and analysed using frequencies to be converted to percentages.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS OF RESULTS

The data presented was organized in such a manner that there was a focus on the socio-demographic characteristics of the respondents participating in the study, as well as their level of awareness and engagement with climate change and African indigenous strategies for environmental conservation. A total of 300 respondents were surveyed, and their responses were collected and analyzed. The socio-demographic questionnaire covered various aspects such as age, gender, geo-political zone and educational background.

The purpose of the analysis of data collected is to provide an overview of the respondent's profile and background which is fundamental to their responses. By examining the percentages of the responses of the respondents, we can gain insights into the demographic composition of the sample and the extent to which respondents are aware of climate change and their disposition towards African indigenous strategies for environmental conservation.

Understanding the socio-demographic characteristics of the respondents is crucial for interpreting their perspectives and opinions regarding climate change and environmental conservation. It allows for a comprehensive understanding of the target population and helps in assessing the representativeness of the sample.

The findings from this analysis will contribute to the overall research objective of investigating the relationship between African indigenous strategies for environmental conservation and the mitigation of the consequences of climate change. The results will also shed light on the level of

awareness and engagement among the respondents, which can inform the development and implementation of effective indigenous conservation strategies.

4.1. Presentation and Analysis of Data

Socio-Demographic Distribution of Respondents

Table 2: ***Participants' gender and location***

Characteristic	**Category**	**Number of participants (No:300)**
Gender	Male	180
	Female	120
Location of participants	South East	50
	South South	50
	South West	50
	North East	50
	North Central	50
	North West	50

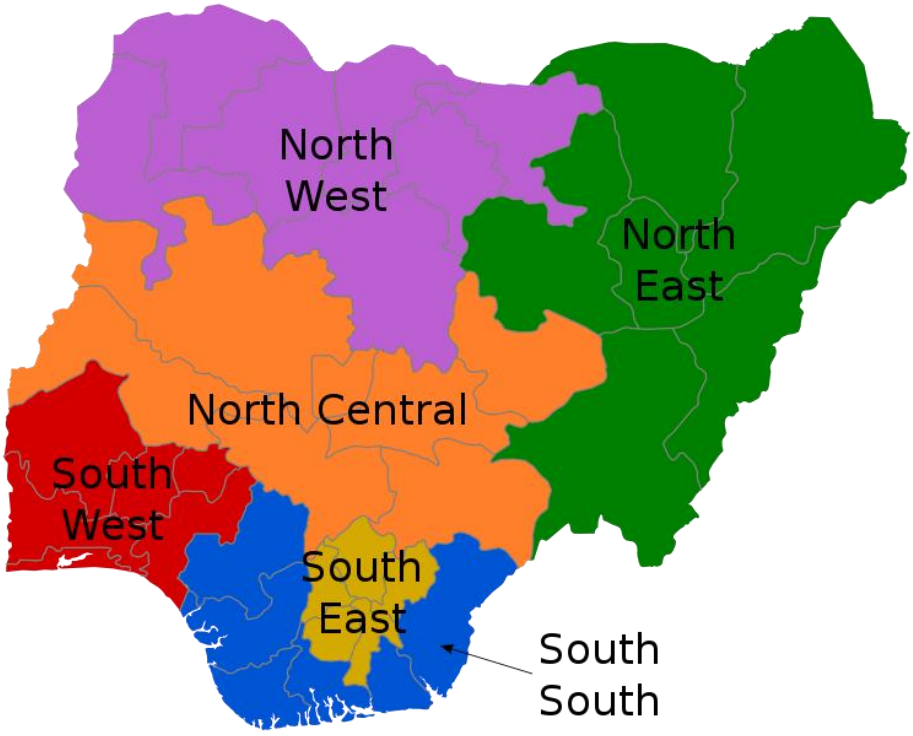
Source: Field Survey, 2023

Table 2 covers the gender and location of the respondents. It records that there are 180 male respondents and 120 female respondents. The variation in the numbers of the genders is due to the availability of respondents. Given the cultural situation in the northern part of the country, more men were available for responses, and this affected the disparity in the gender. However,

this does not change the value of the responses as their responses reflect what the geographical experience of the people are which is not a gender issue.

The respondents were taken from the different socio-political zones of Nigeria: South-east, South-south, South-west, North-east, North-central and North west.

Figure 4: Six geo-political zones of Nigeria



Source: 1999 Constitution Federal republic of Nigeria

1. **North Central:** Consisting of Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau States, as well as the Federal Capital Territory.
2. **North East:** Consisting of Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe States

3. **North West:** Consisting of Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zamfara States.
4. **South East:** Consisting of Abia, Anambra, Ebonyi, Enugu, and Imo States.
5. **South South (also known as Niger Delta region)**: Consisting of Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers States.
6. **South West:** Consisting of Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo States.

The reason for taking from the different socio-political zones is to help get a feel of the experience of climate change from the different parts of the country characterized by different weather forms. The different zones have also been affected in different ways by climate change. It is also expected that the different weather forms and climatic effects will give a picture of the varied experiences in Africa. As such, while it is about Africa, Nigeria becomes a test board for the varied climatic experiences in Africa. From the table above, the number of the representatives of the different zones who responded are as follows: South-east (50), South-south (50), South-west (50), North-east (50), North-central (50) and North west (50).

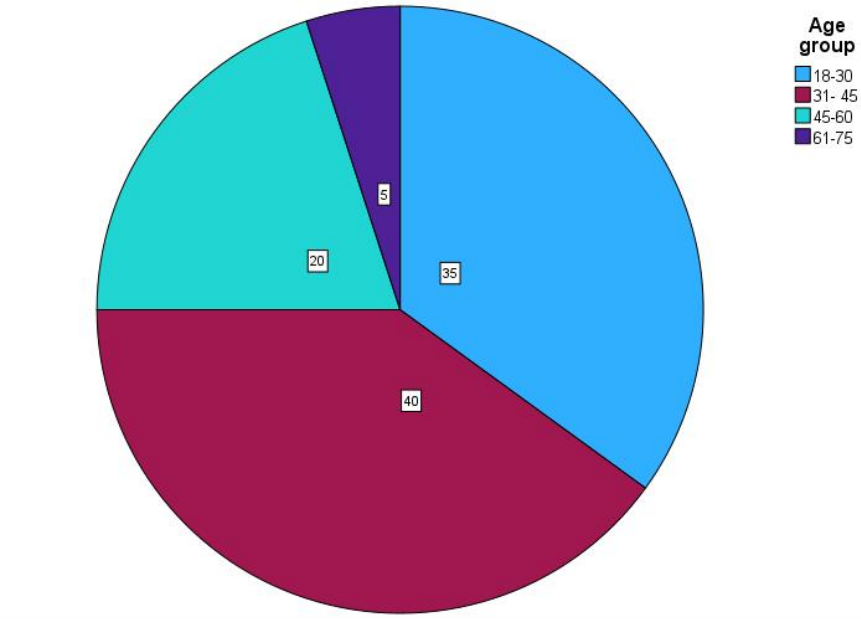
Table 3: ***Participants' age***

Age group	Frequency	Percentage
18-30	105	35
31- 45	120	40
45-60	60	20
61-75	15	5

Total	300	100%

Source: Field Survey, 2023

Figure 5: Percentage of Participant's Age on a Pie Chat



Source: Field Survey, 2023

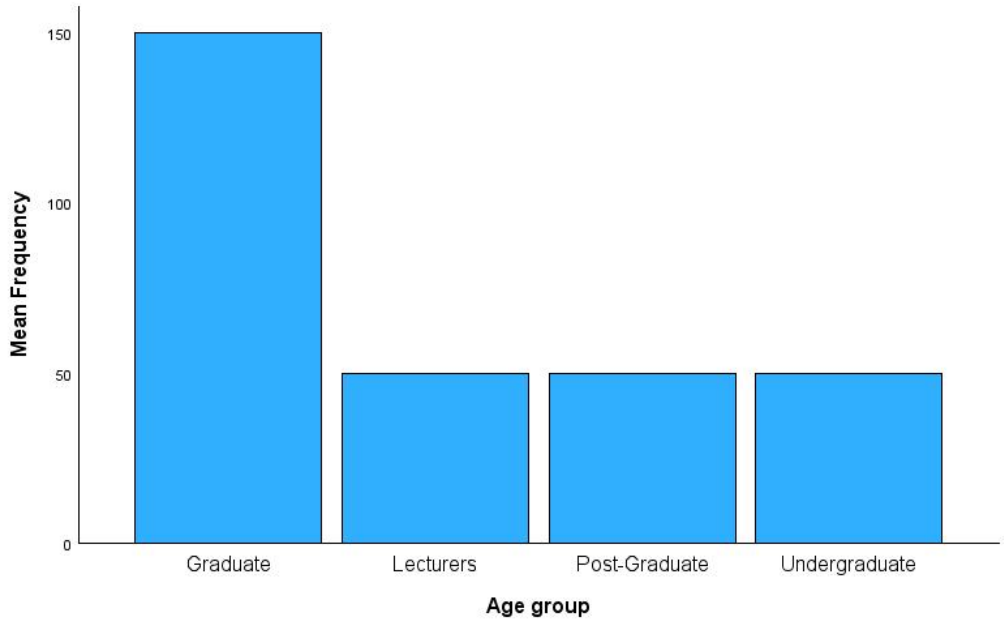
The age of the participants is from 18, which is the age of responsibility in Nigeria and same for most of Africa, to 75 years. 35% of the 300 respondents were between the ages of 18 and 30 years; 40% of the respondents were between the ages of 31-45 years. 20% of the respondents were between the ages 45-60 years, and 5% of the total number of respondents were between the ages of 61-75 years. The greater number were between the ages of 18 and 30 for the reason that they were more available to respond to the questionnaires. There was no pre-determined arrangement.

Table 4: ***Participants' Educational Background***

Age group	Frequency	Percentage
Undergraduate	50	17
Graduate	150	49
Post-Graduate	50	17
Lecturers	50	17
Total	300	100%

Source: Field Survey, 2023

Figure 6: Graph for Educational Background



Source: Field Survey, 2023

Table 4 and Figure 6 have a record of the educational backgrounds of the participants. The table shows that it was ensured that all the participants were at least university students or university graduates. 17% of the 300 respondents were undergraduates; 49% of the respondents were graduates. 17% of the respondents were post-graduates and 17% of the total number of respondents were lecturers in different universities, with a PhD in their various fields of study. The purpose of choosing this quality of respondents is to ensure that they have a good knowledge of what climate change is and it effects and thus capable of determining if there is a need for an indigenous approach.

Research Questions

CLUSTER A: The effect of the present ecological crises on the people of Africa

The present cluster referred to as 'Cluster A' focuses on six questions that attend to the different manifestations of the effects of climate change in Nigeria, and these questions border on natural disasters and other forms of ecological crisis such as flood, forced migration, pollution, deforestation and loss of biodiversity. Each table will, therefore, present the perspectives of the 300 respondents on these different issues.

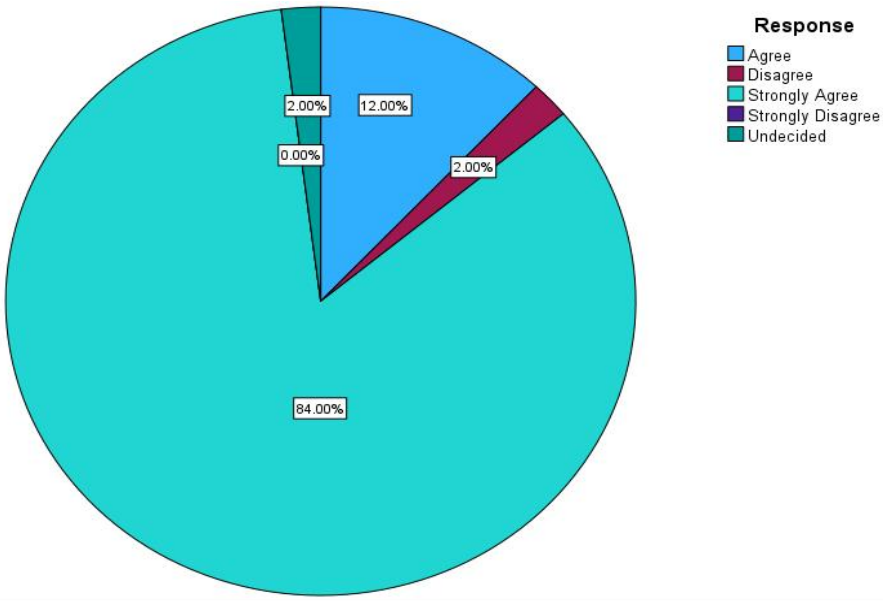
Table 5: Has the present ecological crises affected Nigeria in the form of flood?

Response	Frequency	Percentage
Strongly Agree	250	84
Agree	38	12
Undecided	6	2
Disagree	6	2

Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 7: Flood and Climate Change



Source: Field Survey, 2023

Table 5 focuses on the question of the effect of climate change in Nigeria in the form of flood. From this table 250 of the 300 respondents, making it 84% of the respondents hold strongly that climate change has affected Nigeria in the form of flood. 12% also hold the same opinion but not in the same strength. While 2% disagree, 2% were undecided about this. From the table, it is obvious that there is a good agreement that flood affecting the different parts of the country is a consequence of climate change.

Table 6: Has the present ecological crises affected Nigeria in the form of drought?

Response	Frequency	Percentage
Strongly Agree	220	73
Agree	68	23
Undecided	0	0
Disagree	12	4
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Table 6 focuses on the question of the effect of climate change in Nigeria in the form of drought. From this table 220 of the 300 respondents, making it 73% of the respondents hold strongly that climate change has affected Nigeria in the form of drought. 23% also hold the same opinion but not in the same strength. While 4% disagreed about this. From the table, it is obvious that there is a good agreement that the drought affecting the different parts of the country is a consequence of climate change.

Table 7: Has the present ecological crises affected Nigeria in the form of forced migration?

Response	Frequency	Percentage
Strongly Agree	280	93
Agree	15	5
Undecided	0	0

Disagree	6	2
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Table 7 focuses on the question of the effect of climate change in Nigeria in the form of forced migration. From this table, 280 of the 300 respondents, making it 93% of the respondents hold strongly that climate change has affected Nigeria and that forced migration which is at the heart of several conflicts in Nigeria is a consequence of this crisis. 5% also hold the same opinion but not in the same strength. While 2% disagree that forced migration is the result of climate change crisis. From the table, it is obvious that there is a good agreement that forced migration currently causing the movements of people from one part of the country to another, especially the movement of herdsmen from the northern part of the country to the different parts of the country is a consequence of climate change.

Table 8: Has the present ecological crises affected Nigeria in the form of pollution?

Response	**Frequency**	**Percentage**
Strongly Agree	240	94
Agree	12	4
Undecided	0	0
Disagree	6	2

Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

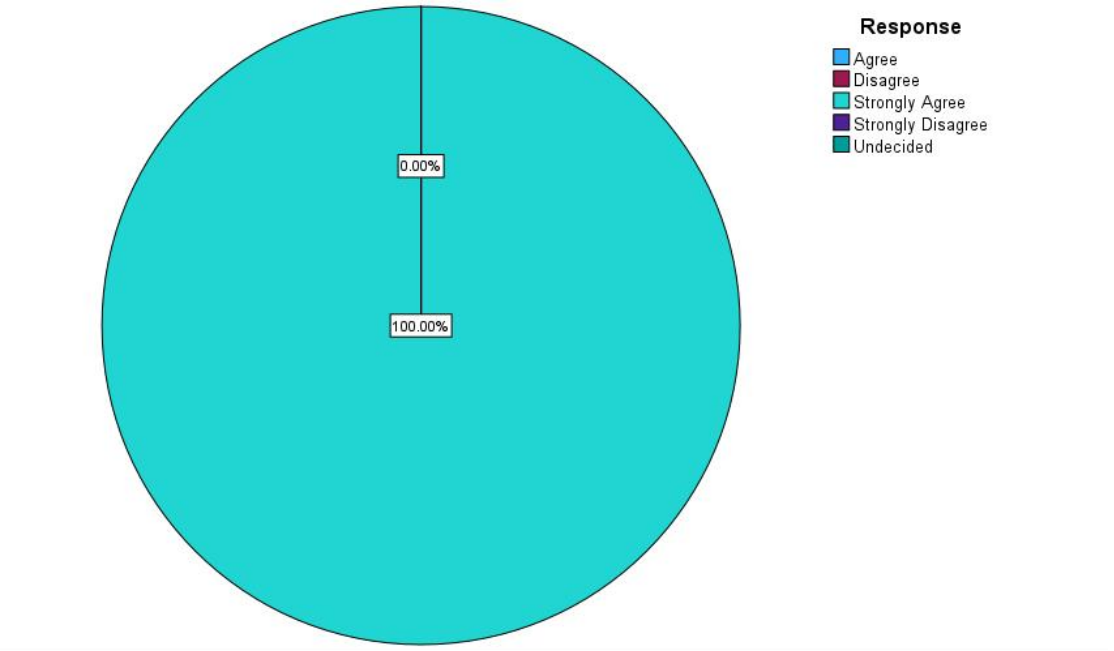
Table 8 focuses on the question of the effect of climate change in Nigeria in the form of air, water and land pollution. From this table 240 of the 300 respondents, making it 94% of the respondents hold strongly that climate change has affected Nigeria in the form of pollution. 4% also hold the same opinion but not in the same strength. While 2% disagree that the present experience of pollution is the consequence of climate change. From the table, it is obvious that there is a good agreement that air, water and land pollutions experienced in the different parts of the country are a consequence of climate change.

Table 9: Has the present ecological crises affected Nigeria in the form of deforestation?

Response	**Frequency**	**Percentage**
Strongly Agree	300	100
Agree	0	0
Undecided	0	0
Disagree	o	0
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 8: Deforestation and Climate Change



Source: Field Survey, 2023

Table 9 focuses on the question of the effect of climate change in Nigeria in the form of deforestation. From this table 300 of the 300 respondents, making it 100% of the respondents hold strongly that climate change has affected Nigeria in the form of deforestation. From the table, it is obvious that there is a general agreement that the present experience of deforestation experienced in the different parts of the country is a consequence of climate change.

Table 10: Has the present ecological crises affected Nigeria in the form of loss of biodiversity?

Response	Frequency	Percentage
Strongly Agree	220	73
Agree	70	23

Undecided	0	0
Disagree	10	4
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Table 10 focuses on the question of the effect of climate change in Nigeria in the form of loss of biodiversity. From this table, 220 of the 300 respondents, making it 73% of the respondents hold strongly that climate change has affected Nigeria in the form of loss of biodiversity. 23% also hold the same opinion but not in the same strength as the 73 persons who agree strongly that there is a relationship between the present experience of loss of biodiversity and climate change. However, 14% of the respondents disagree that there is a relationship between climate change and loss of biodiversity. From the table, it is obvious that there is a good agreement that the loss of biodiversity affecting the different parts of the country is a consequence of climate change.

CLUSTER B: The effectiveness of the dominant western approach in addressing ecological problems

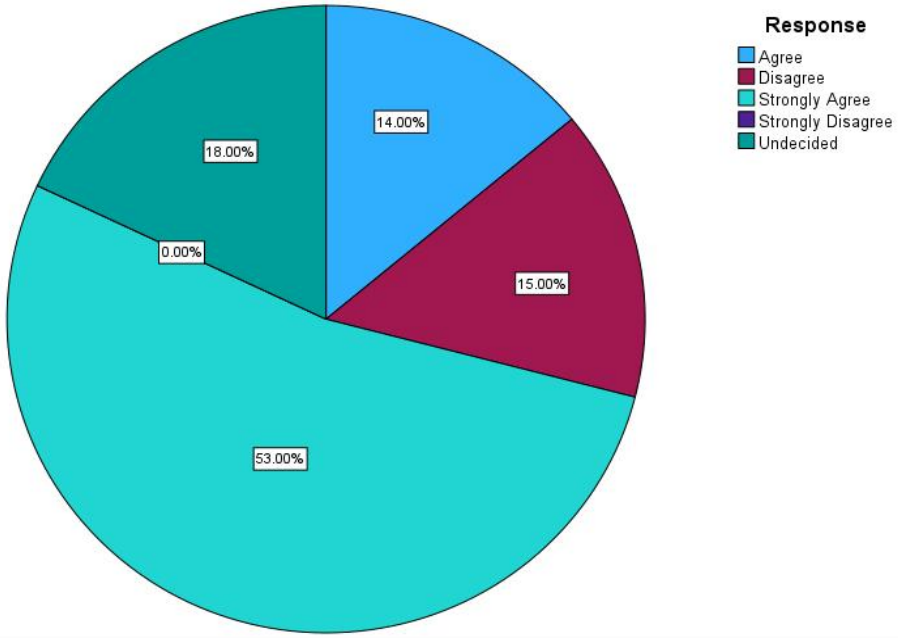
The current dominant approach has been at the centre of discussions on climate change for so many decades now. This section titled ‘Cluster B’ focuses on questioning the nature and capacity of the dominant approach which is consumeristic, materialistic, mechanistic, legalistic, secularistic and profit oriented to address the present ecological crises in the world. The responses of the different respondents are presented under every dimension of the dominant approach.

Table 11: Is the dominant approach mechanistic and materialistic?

Response	Frequency	Percentage
Strongly Agree	160	53
Agree	40	14
Undecided	53	18
Disagree	47	15
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 8: Mechanistic Character of the Dominant Approach



Source: Field Survey, 2023

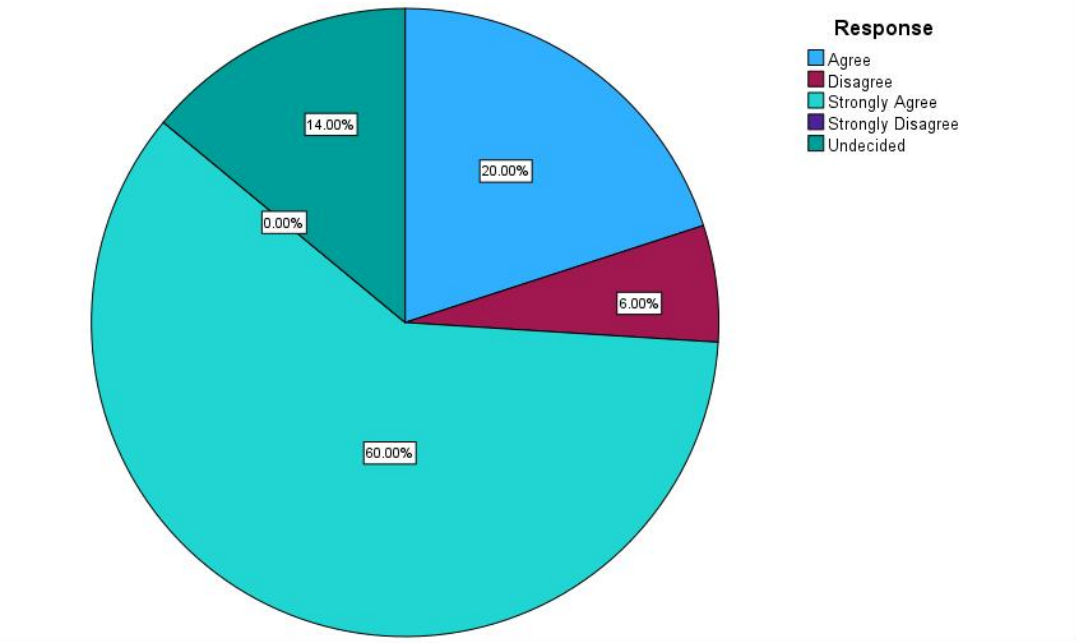
Table 11 focuses on the materialistic and mechanistic dimension of the dominant approach. From the table, 160 of the 300 respondents, making it 53% of the respondents hold strongly that the dominant approach is materialistic and mechanistic given its emphasis on material advancement. 14% also hold the same opinion but not in the same strength as the 160 persons who agree strongly that the dominant approach is materialistic and mechanistic. However, 15% of the respondents disagree, while 18% were undecided about this. From the table, it is obvious that there is more than an average agreement that the dominant approach is materialistic and mechanistic.

Table 12: Is the dominant approach legalistic?

Response	**Frequency**	**Percentage**
Strongly Agree	180	60
Agree	60	20
Undecided	40	14
Disagree	20	6
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 8: Legalistic Character of the Dominant Approach



Source: Field Survey, 2023

Table 12 focuses on the legalistic dimension of the dominant approach. From this table, 180 of the 300 respondents, making it 60% of the respondents hold strongly that the dominant approach is legalistic given its emphasis on laws and agreements. 20% also hold the same opinion but not in the same strength as the 180 persons who agree strongly that the dominant approach is legalistic. However, 6% of the respondents disagree, while 14% were undecided about this. From the table, it is obvious that there is more than an average agreement that the dominant approach is legalistic.

Table 13: Is the dominant approach profit oriented and consumeristic?

Response	Frequency	Percentage
Strongly Agree	180	60

Agree	40	14
Undecided	60	20
Disagree	20	6
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

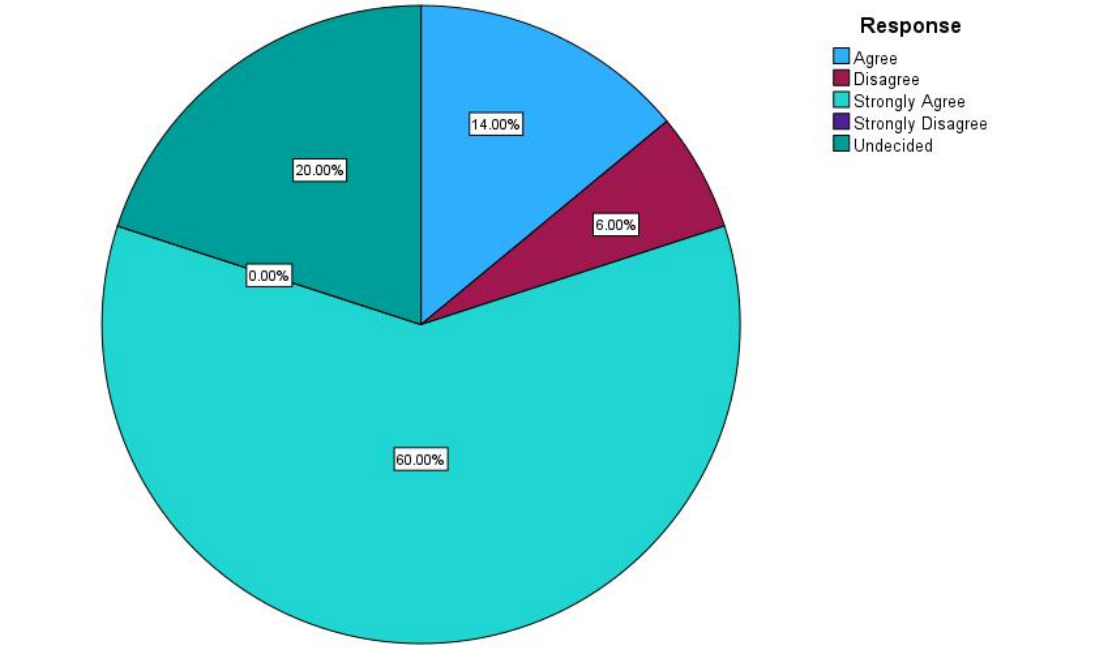


Table 13 focuses on the consumeristic dimension of the dominant approach. From this table 180 of the 300 respondents, making it 60% of the respondents hold strongly that the dominant approach is consumeristic given its emphasis on consumption. 14% also hold the same opinion but not in the same strength as the 180 persons who agree strongly that the dominant approach is

consumeristic. However, 6% of the respondents disagree. From the table, it is obvious that there is more than an average agreement that the dominant approach is consumeristic.

Table 14: Is the dominant approach secularistic?

Response	Frequency	Percentage
Strongly Agree	160	53
Agree	45	15
Undecided	55	18
Disagree	40	14
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

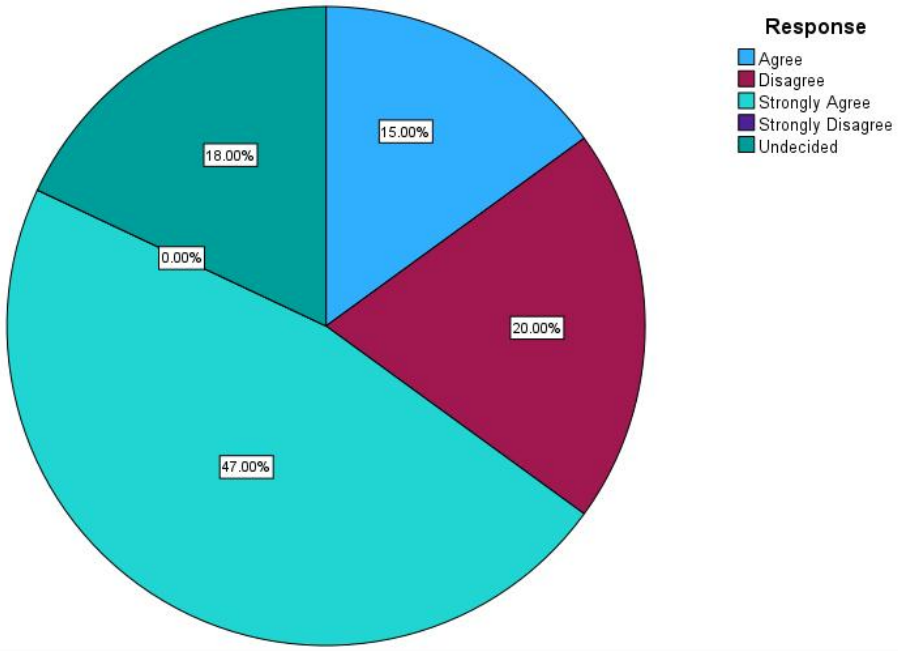
Table 14 questions if the dominant approach is secularistic. From this table, 160 of the 300 respondents, making it 53% of the respondents hold strongly that the dominant approach is secularistic given its de-emphasis on meta-empirical dimension of the environment. 15% also hold the same opinion but not in the same strength as the 180 persons who agree strongly that the dominant approach is secularistic. However, 18% are undecided while 14% of the respondents disagree. From the table, it is obvious that there is more than an average agreement that the dominant approach is secularistic.

Table 15: Does it see nature as an object for utility?

Response	Frequency	Percentage
Strongly Agree	140	47
Agree	45	15
Undecided	55	18
Disagree	60	20
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 11: The Dominant Approach and Utility



Source: Field Survey, 2023

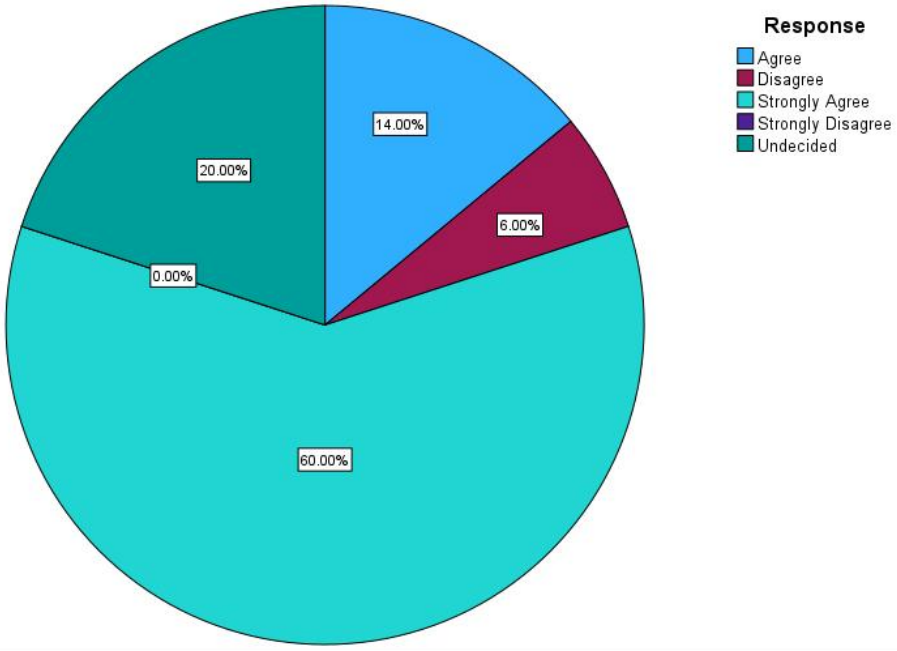
Table 15 focuses on the question regarding the dominant approach's concept of nature or the environment as an object of utility. From this table, 140 of the 300 respondents, making it 47% of the respondents hold strongly that the dominant approach sees nature as an object to be used or as a raw material waiting to be hammered into a useful object. 15% also hold the same opinion but not in the same strength as the 140 persons who agree strongly. However, 20% of the respondents disagree, while 18% were undecided about this. From the table, it is obvious that there is more than an average agreement that the dominant approach understands the environment as an object for utility.

Table 16: Does it understand the environment as an unconscious space?

Response	**Frequency**	**Percentage**
Strongly Agree	180	60
Agree	40	14
Undecided	60	20
Disagree	20	6
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 12: The Environment as an Unconscious Space



Source: Field Survey, 2023

Table 16 focuses on the dominant approach's concept of the environment as an unconscious or a void of indifference. From this table 180 of the 300 respondents, making it 60% of the respondents hold strongly that the dominant approach understands nature as an unconscious space. 14% also hold the same opinion but not in the same strength as the 180 persons who agree strongly. However, 6% of the respondents disagree, while 20% were undecided about this. From the table, it is obvious that there is more than an average agreement that the dominant approach has a concept of nature as an unconscious space.

CLUSTER C: The need for alternative approaches towards the preservation of the environment

Given the perspectives generated in Cluster B, the present cluster titled "Cluster C" focuses on questions bordering on the dominant approach's capacity of ensuring environmental sustainability. It questions if the dominant approach is at the base of the present ecological crisis and the possibility of other approaches springing from the peripheries.

Table 17: Is the dominant approach at the base of the present ecological crises?

Response	Frequency	Percentage
Strongly Agree	130	43
Agree	60	20
Undecided	70	23
Disagree	40	14
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Table 17 questions if the dominant approach is at the base of the present ecological crises. From this table, 130 of the 300 respondents, making it 43% of the respondents hold strongly that the dominant approach is at the base of the present ecological crisis. 20% also hold the same opinion but not in the same strength as the 130 persons who agree strongly. However, 14% of the respondents disagree, while 23% were undecided about this. From the table, it is obvious that

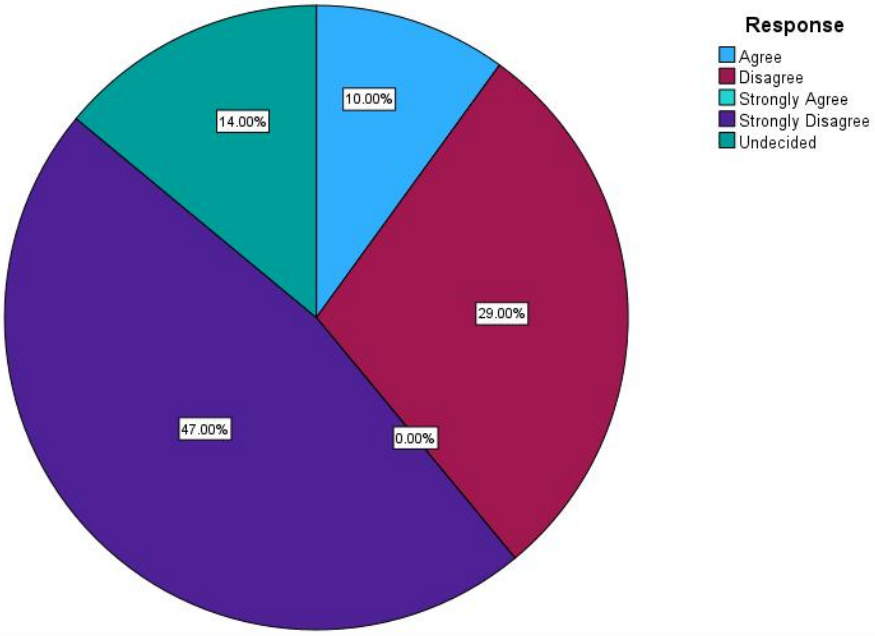
there is more than an average agreement that the dominant approach is at the base of the present ecological crisis.

Table 18: Does the dominant approach have the capacity to solve the present crises?

Response	Frequency	Percentage
Strongly Agree	0	0
Agree	30	10
Undecided	40	14
Disagree	87	29
Strongly Disagree	143	47
Total	300	100%

Source: Field Survey, 2023

Figure 13: Dominant Approach and Ecological Crises



Source: Field Survey, 2023

Table 18 questions if the dominant approach have the capacity to solve the present ecological crises. From this table 143 of the 300 respondents, making it 47% of the respondents hold strongly that the dominant approach does not have the capacity to solve the present ecological crisis. 20% also hold the same opinion but not in the same strength as the 143 persons who disagree strongly. However, 40 of the respondents were undecided, while 30 agree that the dominant approach can solve the problem. From the table, it is obvious that there is more than an average agreement that the dominant approach does not have the capacity to solve the present ecological crisis.

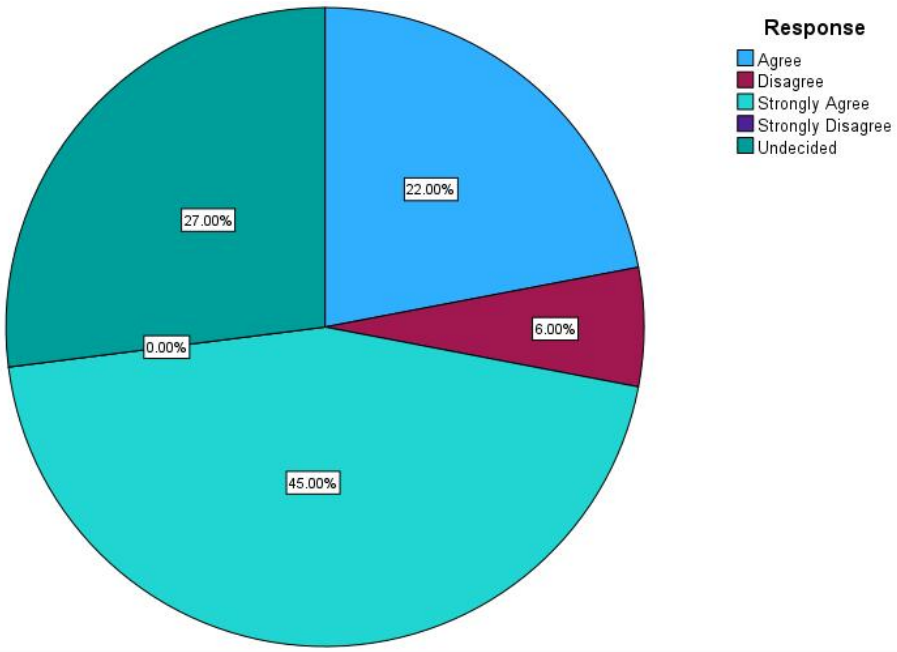
Table 19: Are there other alternative approaches?

Response	Frequency	Percentage
Strongly Agree	135	45

Agree	65	22
Undecided	80	27
Disagree	20	6
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 14: Need for Alternative Approaches



Source: Field Survey, 2023

Table 19 questions if there are other approaches outside of the dominant approach that can be of help in addressing the present ecological problems. From this table 135 of the 300 respondents, making it 45% of the respondents hold strongly that there are other approaches outside of the

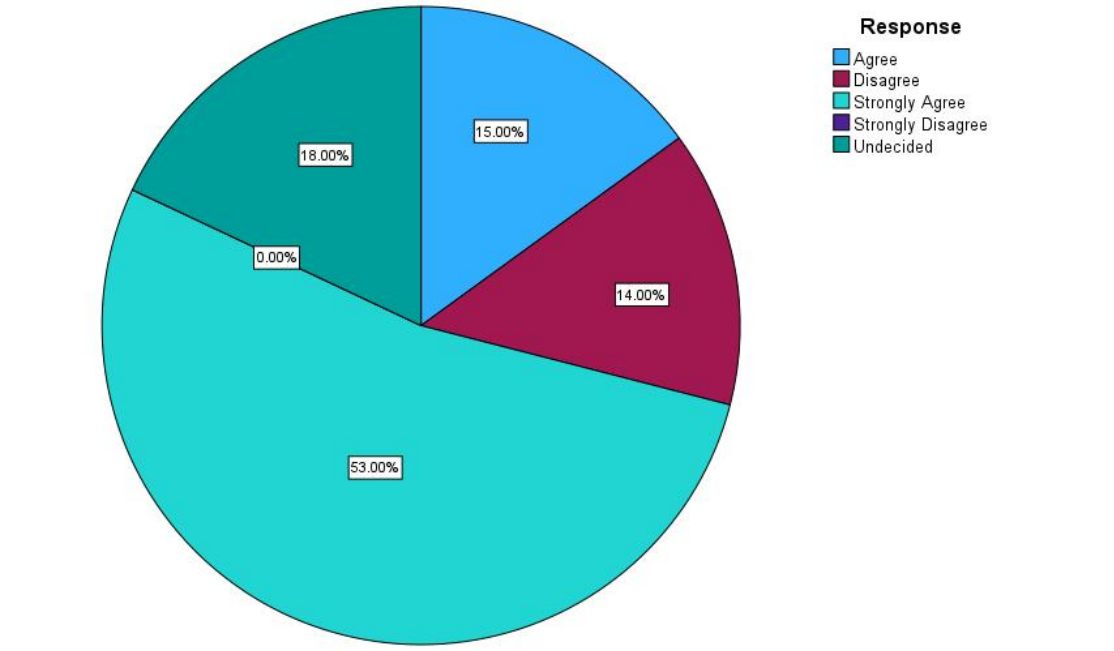
dominant approach that can help in solving the present ecological crisis. 65% also hold the same opinion but not in the same strength as the 135 persons who agree strongly. 27% of the respondents were undecided, while 6% were disagreed. However, from the table, it is obvious that there is more than an average agreement that the dominant approach is not the only approach that can be of help in solving the present ecological crisis.

Table 20: Have these alternative approaches been able to address ecological crises locally?

Response	Frequency	Percentage
Strongly Agree	160	53
Agree	45	15
Undecided	55	18
Disagree	40	14
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 15: Alternative approaches and Ecological Crises



Source: Field Survey, 2023

Table 20 questions if these alternative approaches have been able to solve ecological problems locally. From this table, 160 of the 300 respondents, making it 53% of the respondents hold strongly that alternative approaches have been able to solve ecological problems locally. 45% also hold the same opinion but not in the same strength as the 160 persons who agree strongly. However, 55% of the respondents were undecided, while 40% disagreed. However, from the table, it is obvious that there is more than an average agreement that alternative approaches have been able to solve ecological challenges locally.

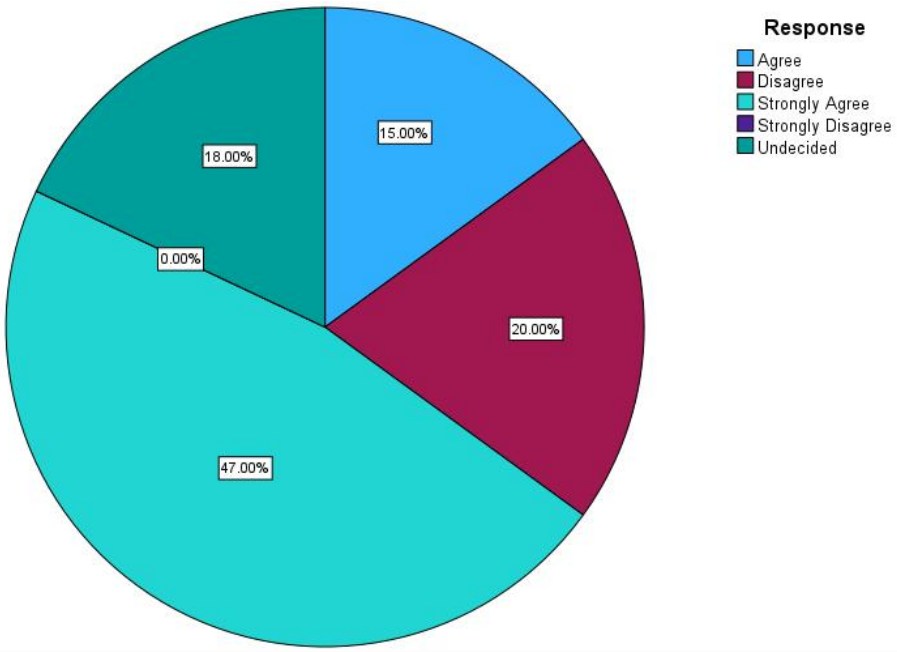
Table 21: Is there a need for alternative approaches?

Response	Frequency	Percentage
Strongly Agree	140	47

Agree	45	15
Undecided	55	18
Disagree	60	20
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 16: Effectiveness of Alternative approaches



Source: Field Survey, 2023

Table 21 questions if there is the need for alternative approaches towards solving the present ecological crises. From this table 140 of the 300 respondents, making it 47% of the respondents hold strongly that there is the need for alternative approaches outside of the dominant approach

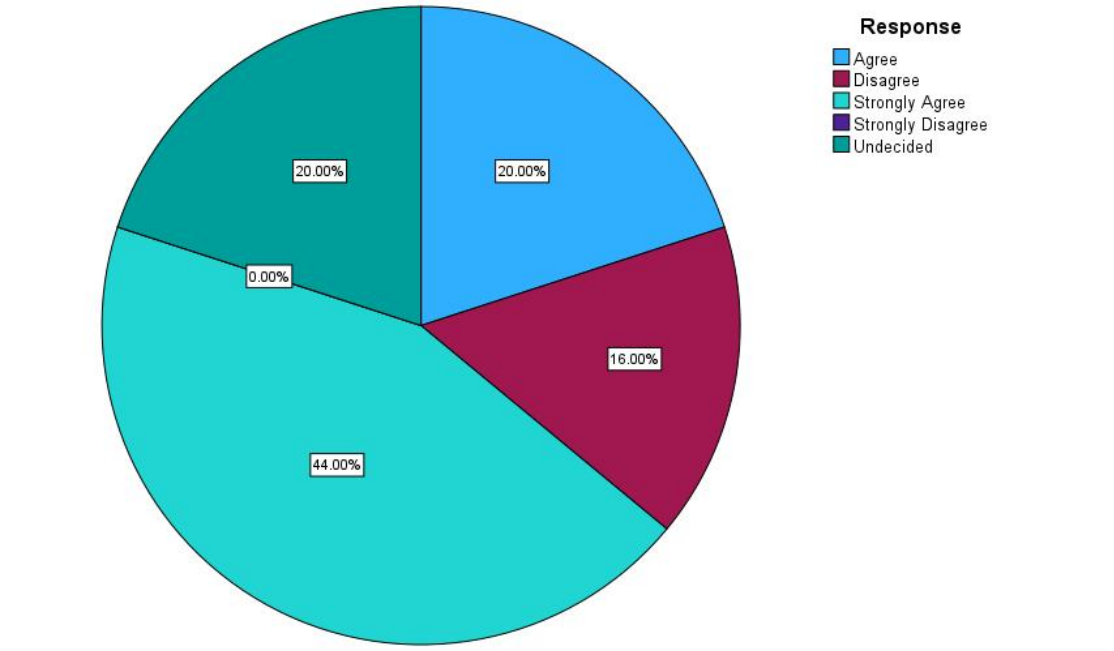
that can help in solving the present ecological crisis. 45% also hold the same opinion but not in the same strength as the 140 persons who agree strongly. However, 18% of the respondents were undecided, while 20% disagreed. However, from the table, it is obvious that there is more than an average agreement that there is the need for alternative approaches outside of the dominant approach towards solving the present ecological crisis.

Table 22: Are people more attracted to approaches that are within their categories?

Response	Frequency	Percentage
Strongly Agree	133	44
Agree	60	20
Undecided	60	20
Disagree	47	16
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 17: Openness to the Indigenous Approach



Source: Field Survey, 2023

Table 22 questions if people are more attracted to approaches that are within their own categories. From this table, 133 of the 300 respondents, making it 44% of the respondents hold strongly that people are more attracted to approaches that are clothed with their own cultural categories. 60% also hold the same opinion but not in the same strength as the 133 persons who agree strongly. 20% of the respondents were undecided, while 16% disagreed. However, from the table, it is obvious that there is more than an average agreement that people are more attracted to categories that are clothed within their cultural categories.

Cluster D: African traditional/indigenous strategies for the conservation of the environment

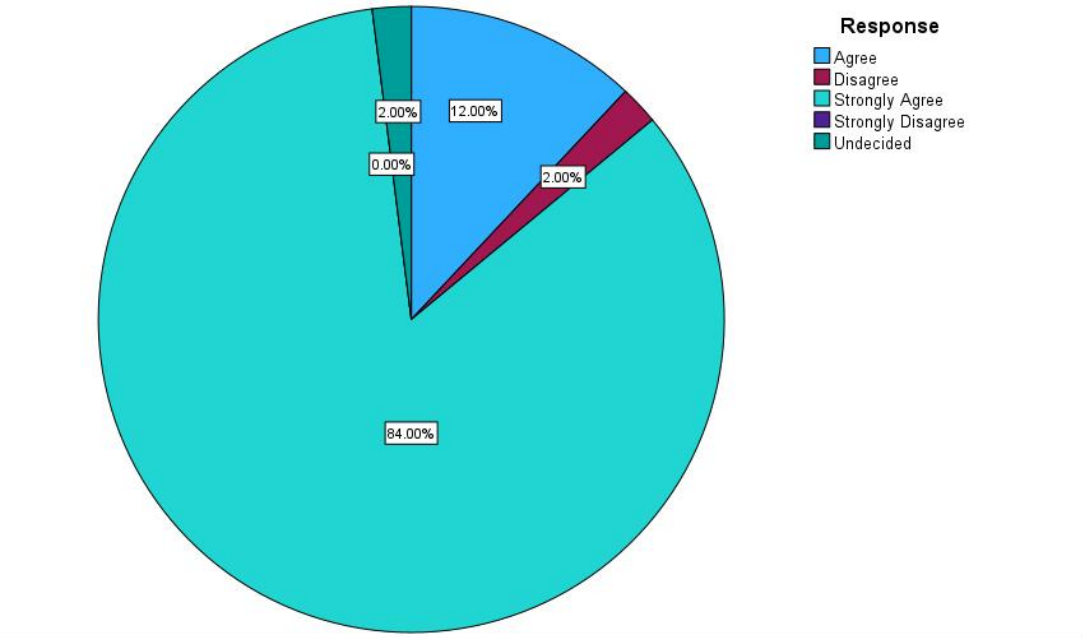
The present cluster will focus on particular indigenous strategies for the preservation of the environment and the capacity for such strategies to mitigate the effects of climate change on the environment.

Table 23: Are these strategies able to promote a better relationship with the environment?

Response	Frequency	Percentage
Strongly Agree	250	84
Agree	38	12
Undecided	6	2
Disagree	6	2
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 18: Indigenous Approach and Relationship with Environment



Source: Field Survey, 2023

Table 23 questions if indigenous approaches outside of the dominant approach are capable of promoting better relationship with the environment. From this table 250 of the 300 respondents, making it 84% of the respondents hold strongly that indigenous approaches are capable of promoting better relationship with the environment. 12% also hold the same opinion but not in the same strength as the 250 persons who agree strongly. 2% of the respondents were undecided, while 2% disagreed. However, from the table, it is obvious that there is more than an average agreement that the indigenous approaches are capable of promoting a healthy relationship with the environment.

Table 24: Are they able to promote love and respect, etc., for the environment?

Response	Frequency	Percentage
Strongly Agree	250	84

Agree	38	12
Undecided	6	2
Disagree	6	2
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Table 24 questions if indigenous approaches outside of the dominant approach are capable of promoting respect and love towards the environment. From this table 250 of the 300 respondents, making it 84% of the respondents hold strongly that indigenous approaches are capable of promoting respect and love towards the environment. 12% also hold the same opinion but not in the same strength as the 250 persons who agree strongly. However, 2% of the respondents were undecided, while 2% disagreed. From the table, it is obvious that there is more than an average agreement that the indigenous approaches are capable of promoting love and respect for the environment.

Table 25: Are they able to promote sustainability of the environment?

Response	**Frequency**	**Percentage**
Strongly Agree	250	84
Agree	38	12
Undecided	6	2
Disagree	6	2

Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Table 25 questions if indigenous approaches outside of the dominant approach are capable of promoting the sustainability of the environment. From this table 250 of the 300 respondents, making it 84% of the respondents hold strongly that indigenous approaches are capable of promoting the sustainability of the environment. 12% also hold the same opinion but not in the same strength as the 250 persons who agree strongly. 2% of the respondents were undecided, while 2% disagreed. However, from the table, it is obvious that there is more than an average agreement that the indigenous approaches are capable of promoting environmental sustainability.

Table 26: Do they emphasize the dangers of exploiting the environment?

Response	**Frequency**	**Percentage**
Strongly Agree	240	80
Agree	38	12
Undecided	0	0
Disagree	22	8
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

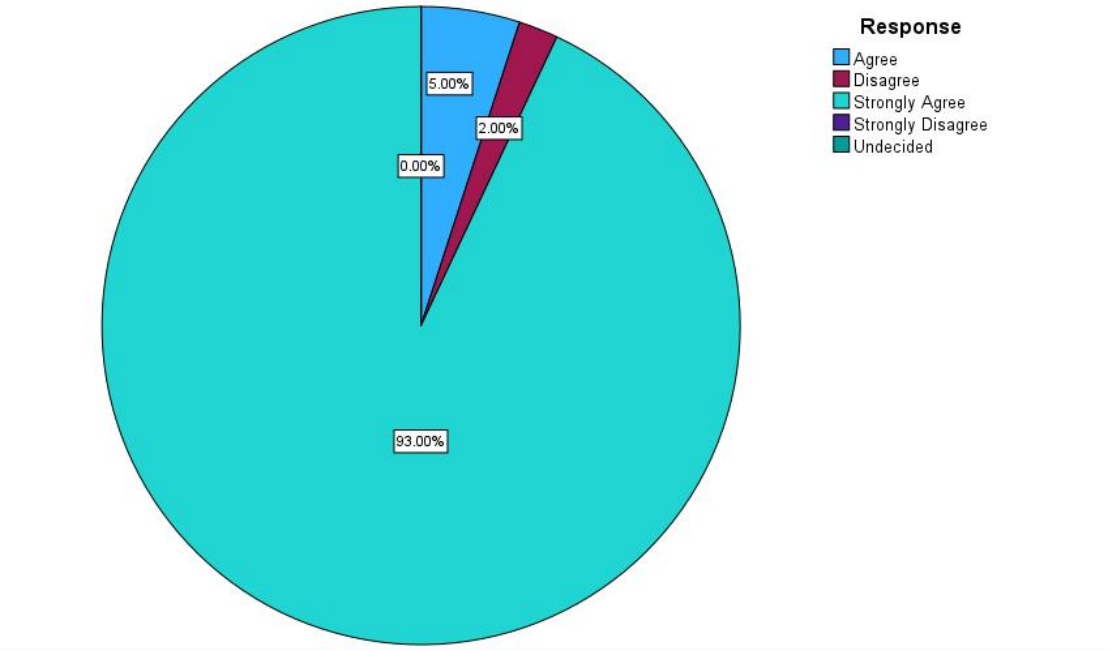
Table 26 questions if indigenous approaches outside of the dominant approach emphasize the dangers of exploiting the environment. From this table, 240 of the 300 respondents, making it 80% of the respondents hold strongly that indigenous approaches emphasize the dangers of exploiting the environment. 12% also hold the same opinion but not in the same strength as the 250 persons who agree strongly. 12% of the respondents disagreed. However, from the table, it is obvious that there is more than an average agreement that the indigenous approaches emphasize the dangers of exploiting the environmental.

Table 27: Are they able to inspire commitment of the African people towards the preservation of the environment?

Response	Frequency	Percentage
Strongly Agree	280	93
Agree	15	5
Undecided	0	0
Disagree	6	2
Strongly Disagree	0	0
Total	300	100%

Source: Field Survey, 2023

Figure 19: Inspiring Commitment towards Preserving the Environment



Source: Field Survey, 2023

Table 27 questions if indigenous approaches outside of the dominant approach are capable of inspiring the African people towards preserving the environment. From this table 280 of the 300 respondents, making it 93% of the respondents hold strongly that indigenous approaches are capable of inspiring the commitment of the African people towards the sustainability of the environment. 5% also hold the same opinion but not in the same strength as the 280 persons who agree strongly. However, 2% of the respondents disagreed. However, from the table, it is obvious that there is more than an average agreement that the indigenous approaches are capable of inspiring the African people towards environmental sustainability.

Table 28: Is a new perspective able to decolonize the discourse on environmentalism?

Response	Frequency	Percentage
Strongly Agree	220	73
Agree	70	23
Undecided	0	0
Disagree	10	4
Strongly Disagree	0	0
Total	300	100%

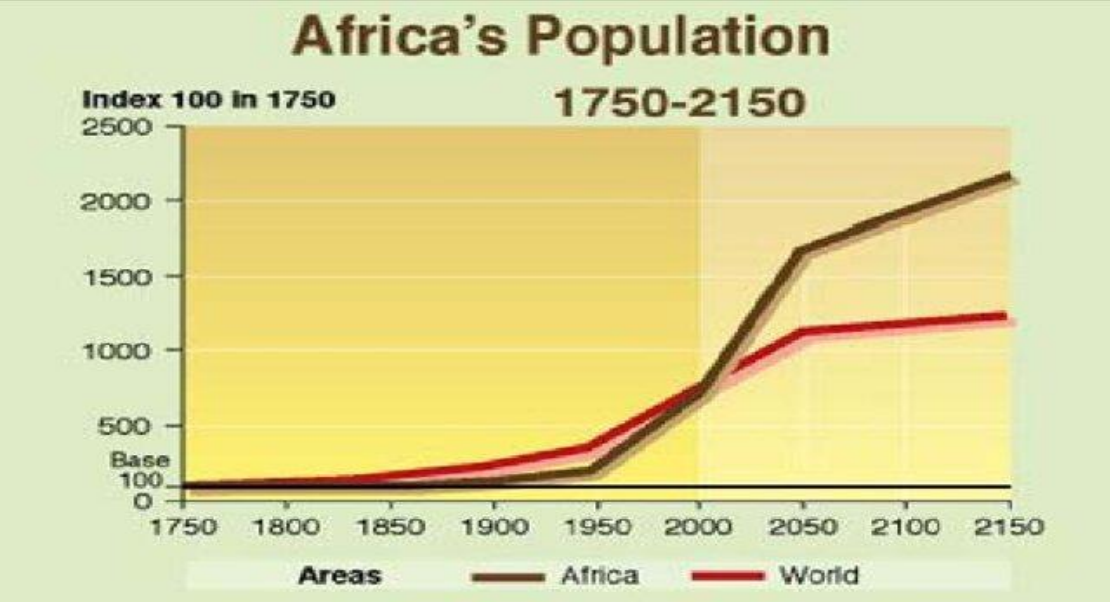
Source: Field Survey, 2023

Table 28 questions if indigenous approaches are capable of decolonizing the global conversation on environmental sustainability. From this table 220 of the 300 respondents, making it 73% of the respondents hold strongly that indigenous approaches are capable of decolonizing the conversation on the sustainability of the environment. 23% also hold the same opinion but not in the same strength as the 220 persons who agree strongly. 4% of the respondents disagreed. However, from the table, it is obvious that there is more than an average agreement that indigenous approaches are capable of decolonizing the conversation on environmental sustainability.

Africa, Climate Change and Disadvantages

This section continues the presentation of data. Data presented will be in the form of figures and they would focus on Africa's growing population which makes the issue of climate change an important issue in Africa. Added to this are figures on the problems of temperature changes and food emergency.

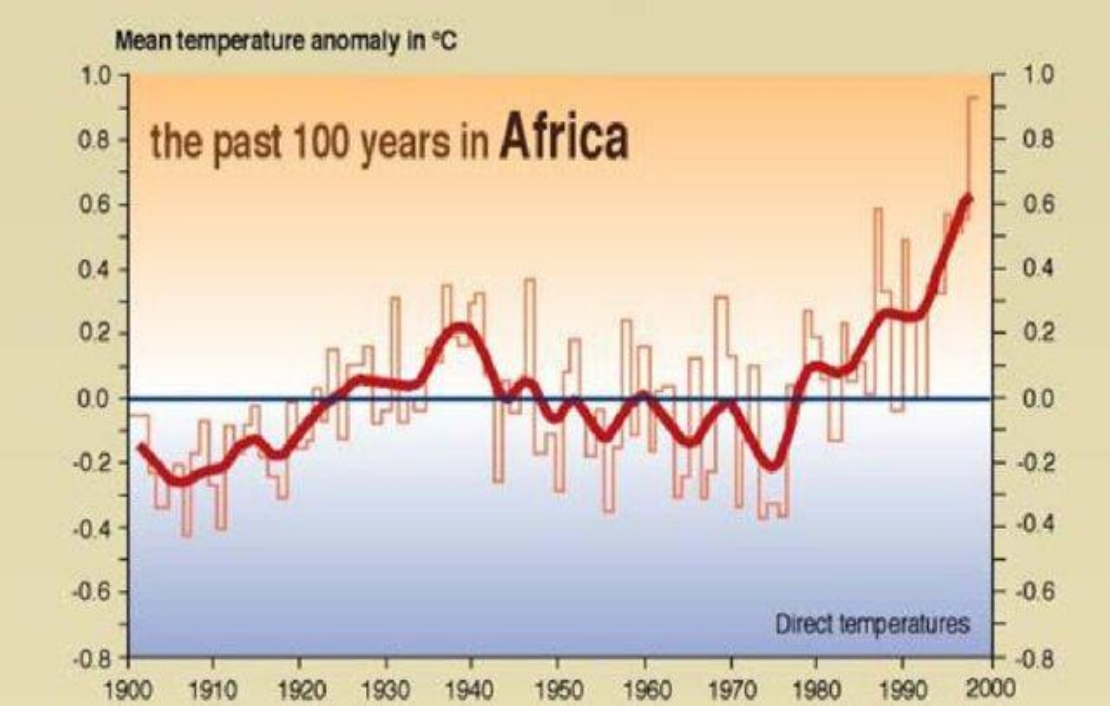
Figure 20: Africa's Population Growth



Source: Anthony Nyong 2015

Figure 20 shows that the population of Africa is on the increase and that the population will grow higher in the next decades. This is a dangerous trend given that human population growth is a major contributor to global warming. Reasons being that the greater the number of human beings the greater the use of fossil fuels to power human increasingly mechanized lifestyles. The growing population in Africa implies that there will be more demand for oil, gas, coal and other fuels mined or drilled from below the Earth. The consequence is more pollution of not only the air but the land and water bodies.

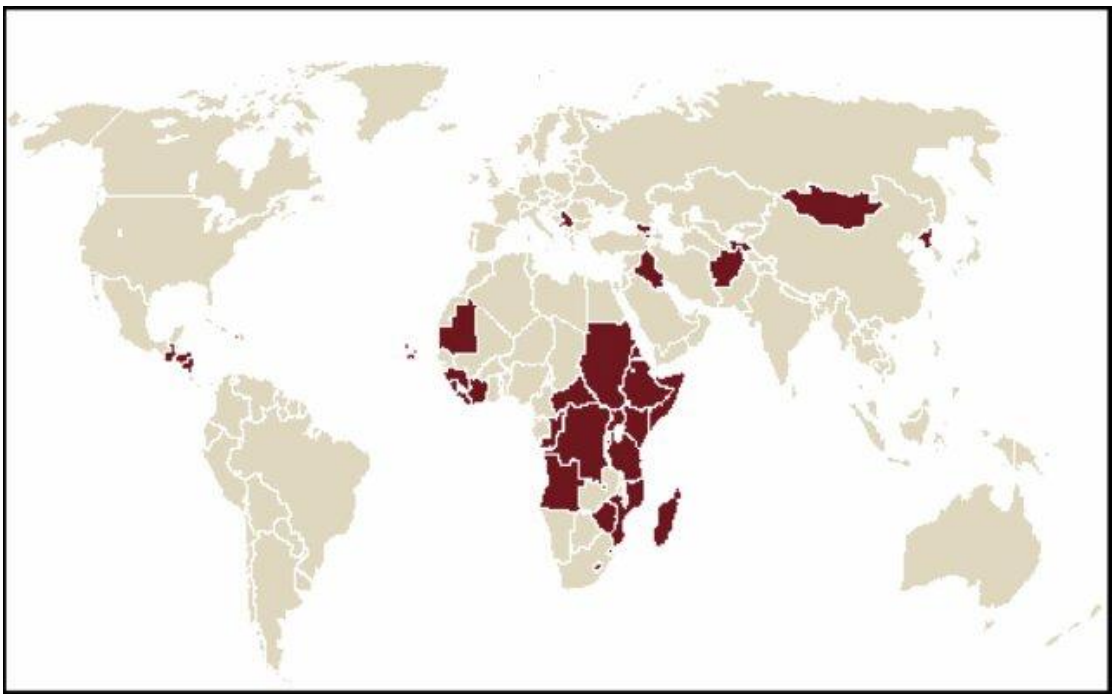
Figure 21: Temperature Changes in Africa



Source: IPCC (2001)

Figure 21 shows that during the past hundred years in Africa, that temperature has continued to rise. Although the level of heating is not the same all over the world, there is a consistent and rapid increase in global temperature. It is projected that by the end of this century, global temperature will be at least 5 degrees Fahrenheit warmer than the 1901-1960 average, and possibly as much as 10.2 degrees warmer. If annual emissions increase more slowly and begin to decline significantly by 2050, models project temperatures would still be at least 2.4 degrees warmer than the first half of the 20th century, and possibly up to 5.9 degrees warmer. This will eventually have climatic consequences for the people of Africa.

Figure 22: Countries Facing Food Emergency



Source: FAO, 2004

Figure 22 shows that Africa compared to other parts of the world faces more threat within the parameters of food insecurity. This has led to soaring food prices in many parts of Africa, given that there is more demand than supply. This has been worsened by conflict. Climate change too is plunging parts of Africa into a severe and enduring food crisis, with millions of people facing extreme hunger. With increasing population and off course poverty rate, food crisis becomes unavoidable.

The Impact of Climate Change on Africa

Under this section, data in the form of plates will be collected and presented to show how climate change has affected the environment in Africa in the forms of flooding, deforestation, etc., particularly in Nigeria.

Plate 1: Flooding in Bayelsa State, South South Nigeria

Source: Research Survey

Plate 1 presents the flood that took place in Nigeria in 2022 which happened in different parts of the country and displaced more than1.4 million Nigerians from their homes. In the above plate, people are seen leaving their homes and because of the depth, there are others who are using boats out of the flooded environment.

Plate 2: Flooding in Bayelsa State, South South Nigeria

Source: Research Survey

In Plate 2, we see the damage caused by flood not only on lives and property but only on government facilities like roads, transport systems like the rail ways, government institutions (primary, secondary and tertiary), electricity, etc. The consequence is that life is made more difficult for people as movement is affected.

Plate 3: Drought in the Northern Part of Nigeria

• Drought in the North

Source: The Sun Newspaper Wednesday, June 21, 2023

Plate 4: Drought in Ethiopia

Source: InsideBusiness Wednesday 21, June 2023

Plate 3 shows how drought is affecting the northern part of Nigeria, including, Sokoto, Katsina, etc. Ethiopia, Somalia and Kenya are experiencing the worst drought in four decades. The plate also shows the effects of drought on the soil. Plate 4 shows how the unrelenting drought has devastated the Horn of Africa and left more than 20 million people facing acute food insecurity would not have been possible without climate change. It is affecting not only human beings but also lifestock.

Plate 5: Deforestation in Nigeria

Source: Kevin Alerechi (2021)

Plate 6: Deforestation in Nigeria

Source: Joseph Obungu (2022)

Deforestation is a major problem in Africa. And this is majorly caused by agriculture, urbanization and industrialization. Plates 5 and 6 present a picture of deforestation activities taking place in Africa. The cutting down of trees is reducing the ability of forests to absorb carbon dioxide and generate rainfall, exposing territories to severe droughts and worsening the ongoing water crisis that has plagued Africa for decades.

Figure 7: Water Pollution in the Niger Delta

Source: Foundation for Investigative Journalism (2022)

Figure 8: Consequences of Water Pollution in the Niger Delta

Source: Niger Delta Region Andrew Othuke Akpeli 2019

Figures 7 and 8 present pictures of the consequences of water pollution on water bodies in the Niger Delta Region. The region is a fishing area, and oil spillage which pollutes water bodies has had catastrophic impacts not only on the biodiversity but also on the livelihood of the people. Thick black oil continue to leak into rivers and creeks, killing fish and robbing people of their livelihoods.

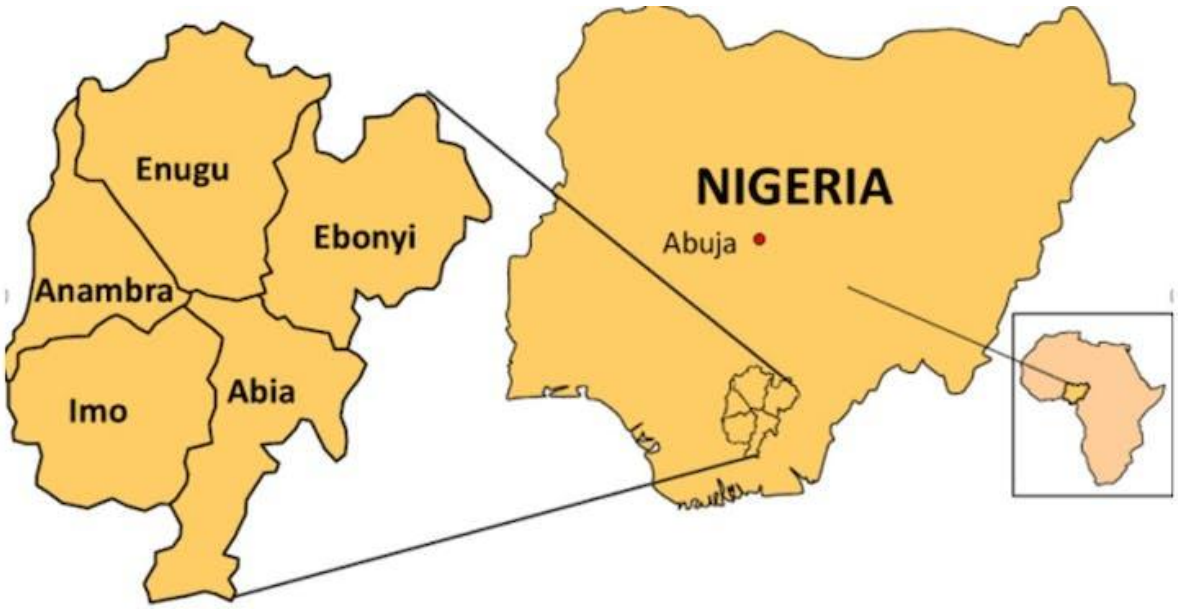
Further Survey on the Indigenous Approach

In other to determine further the need for an alternative approach, the researcher engaged in two more surveys. In the first, some enlightened persons from the five states in the South East of Nigeria were interviewed regarding the impact of international multilateral agreements and laws among indigenous people in the South East for the protection of the environment. This would help determine the level of its awareness of the indigenous approach among the local people and impact of such an approach among them.

Results

The participants (No: 30) were slightly skewed in gender towards male. However, participants represented a range of ages and distribution across the 5 states of Eastern Nigeria.

Figure 23: Eastern States in Nigeria



Source: Ojewale and Onuoha 2023

Table 23: The Major themes in participants' responses on the international multilateral agreements/laws on the protection of the environment

Theme	Sub-Theme	Theme Dimensions	#Cited
1. What are the views of the south-east on the multilateral environmental agreements/laws aimed at preventing environmental deterioration?			
Awareness of the agreements	**Complete ignorance**	• Have not heard of these multilateral environmental agreements before	25
	Partial awareness	• Know there are such documents but don't know their content	5

Involvement in environmental degradation	**Internal**	• Africans are not major players in the damaging of the environment	18
	External	• Multinationals and other corporate bodies who have come from outside of Africa are the major players in the damaging of the environment through oil drilling, falling of trees, disposal of toxic wastes, etc.	12
Indigenous Concerns	**Less Immediate**	• The issue of climate change is not the immediate concern of the greater percentage of the Igbo-African people	27
	Immediate	• It is an immediate concern that should be attended to as soon as possible	3
Commitment to the agreement	**Lack of spiritual depth**	• Agreements without a spiritual background among the Igbo-African people often attracts less commitment	15
	Lack of		

	commitment from those who should know	• The major players in falling of trees and destruction of the environment are done by those who should know	8
	Lack of awareness	• Lack of awareness affects commitment to the multilateral agreements	7
Communication	**Mode**	• The mode of communicating these multilateral agreements is not very effective	20
	Concept	• The conceptualization of the agreements is not accommodative of diversity	10
Awareness of Indigenous taboos	**Details**	• Are aware of the Igbo indigenous taboos against the mismanagement of the environment	28
	Absence of details	• Are aware of the indigenous taboos but don't have hold on details	2

Source: Field Survey, 2023

From the above table, lack of spiritual depth and awareness, and also the mode of communicating these international environmental laws suggest that there is need to begin from

what the people know (their indigenous environmental norms) and then proceed to what they do not know (International multilateral laws); thus, the need for an indigenous approach.

Survey on the need for and capacity of the Indigenous Approach

The researcher also went further to survey the perspectives of 35 scholars of Igbo-African background to know their positions on the need for an indigenous approach.

Table 30: Perspectives on the need for an indigenous alternative approach to the preservation of the environment

Theme	**Sub-Theme**	**Theme Dimensions**	**Cited**
Given the ecological crisis, what is your perspective about the need for an alternative approach to the preservation of the environment that is indigenous to the Igbo people?			
Ideologies that call for concerns	Discarding cultural practices	Completely doing away with the Igbo traditional practices in some communities	7
	Changing interests	More interest in making money than in preserving the environment	4
		Concept of the environment as property	2
Bringing back good old practices	Spiritual practices	Revive the practice of totemism	2
		Return of indigenous religious practices practises that preserve the environment	5
	Agriculture and food	Local dishes should be encouraged as they have low emission	1

		Revive traditional farming methods	3
		Use of inorganic fertilizers	1
		Sensitise and encourage people to be friendly with the natural environment	4
		Encourage tree planting	6
Alternative approaches	Religious and cultural practices	Taking only what one needs from the environment rather than an accumulative approach	2
		The need for an understanding of nature as sacred	1
		Understanding the environment within the world of symbols and customs proper to each human group	1
	Indigenous mode of communication	Using the language of the people	3
		Communicating with proverbs and African parables	1
		Going back to taboos which were understood as coming from the ancestors	6

Source: Field Survey, 2023

Table 29: How the Igbo concept of nature as interconnected and holistic reality promotes respectful relationship with the environment

Theme	Sub Theme	Theme Dimensions	Cited
How does the Igbo concept of nature as an interconnected, interrelated and holistic reality promoted a respectful relationship with the environment?			
Relationships	Order	The belief helps to enhance ecological order in the society	2
		The concept reminds the human person that though they rank high in nature, they are still part of nature.	2
	Relationships	The belief that any disruption in the interrelatedness of reality would disrupt the environment helps people respect the environment.	4
		Because realities are interconnected, there is always the need for cordial relationship in nature	6
Practices	Respect for culture	The concept promotes respect for deities, which helps people strive to meet expectations such as respecting sacred places	3
		Communal agreements/Oath-taking facilitate respect for agreements	1
		The concept helps to preserve what community considers sacred and hand them over to the next generation	4
		The concept facilitates the honouring of sacred	6

		spaces, places and animals.	
Understanding	Interconnectedness	The concept helps to create consciousness of the importance of the environment for medicine and food	1
		There is reciprocal understanding of the relevance of the human person to the environment and the environment to the human person	3
		Increases understanding that for human beings to connect to nature, they need to respect the environment	2
		The concept increases the desire to preserve the environment	1

Source: Field Survey, 2023

The responses of the respondents show a very strong interest among the Igbo-African people to return to the traditional approaches regarding the management of their environment. It also emphasizes the need for local content in tackling environmental crisis.

4.2 Findings of the Study

This research has discovered the following:

a. That the present ecological crises affected the people of Africa in several ways, which include drought, flood, desertification, forced migration, among others.

b. That the dominant Western approach to which is legalistic, consumeristic, mechanistic, profit oriented, etc, is incapable or insufficient to address the present ecological problems in Africa.

c. The present understanding of the dominant approach led to the understanding of the need for alternative approach towards the preservation of the environment, especially as it pertains to Africa.

d. That there are African traditional or indigenous strategies for the conservation of the environment, which can be explored for the preservation of the environment.

e. That the meta-empirical understanding of nature is insufficient for sustainability of the environment in Africa.

f. The African concept of nature as interrelated and interconnected gives a better concept of the relationship between the human person and the environment.

4.3 Discussion of Findings

Data collected in tables 3 to 4 reveal that the respondents have the required academic background and maturity for evaluating the consequences of climate change on the society, and also determining the need for an indigenous approach in mitigating the consequences of climate change. The respondents, from the data collected were well distributed across the 6 geo-political zones of the country which helped to capture the variety of the experiences of climate change.

Data collected in tables 5 to 10 shows that the respondents were able to make a connection between experiences such as flood, loss of biodiversity, drought, forced migration, deforestation, pollution, etc., with climate change. It reveals that there is an awareness of the consequences of

climate change among the respondents. This connection is fundamental to addressing other questions in this research. The significance of this knowledge is that it would help the respondents to make objective evaluations on the importance of an indigenous approach. The knowledge of this connection also squares with the data on the educational background of the respondents.

Going back to the questions raised at the beginning of this research, which include: Has the present ecological crises affected the people of Africa in any way? Has the dominant Western approach to addressing ecological problems been very effective in finding sustainable solutions? Is there a need for alternative approaches towards the preservation of the environment? Are there African traditional/indigenous strategies for the conservation of the environment? The data collected in tables 5 to 10 show that the African people have been affected in various ways by the present ecological crisis and that in fact, because of the economic disadvantage of Africa, she has been affected more than other parts of the world in the forms of flood, drought, pollution, deforestation, forced migration, etc.

Given the consequences of climate change on Africa, Pope Francis (2015) insists that the "warming caused by huge consumption on the part of some rich countries has repercussions on the poorest areas of the world, especially Africa, where a rise in temperature, together with drought, has proved devastating for farming" (no. 51). given the consequences of climate change in poorer countries like Africa, he describes the mismanagement of the ecosystem as a sin against humanity. In the contention of Hufnagel (2018 and 2020) and McDonagh (2004 and 2010), it is the horror of extinction; Taylor (2019) refers to it as the major human dilemma of our

time; for Tubi (2020), it is an ecocide. The descriptions of the present ecological crisis as a horror of extinction; the major human dilemma of our time and as an ecocide is very evident in the data collected in figures 3 to 8.

In response to the second question, data evidence shows that the dominant approach has not been very effective towards finding a solution to the present ecological crisis. Over the years, several human efforts by environmental experts and international organizations or conferences on environmental protection to grapple with the challenges of ecological crisis from the perspective of the dominant approach, shows that there is need for alternative perspectives or approaches (Melnick et al., 2005; Tarusariran. 2017). These measures undertaken through the dominant approach, in spite of the availability of the will to achieve them have not been able to solve the problem of ecological crisis but has only addressed the symptoms rather than the main issues, implying that there might be need for alternative measures deeper and wider in scope than some of the present measures can go (Sponsel 2014; Crockett 2014 and Bonfiglio 2012).

The lack of capacity in relation to the dominant approach raises question regarding the way forward; and since it has not been able to find a solution to the present crisis- the third question on the need for alternative approaches towards finding solution to the problem became more evident and relevant. The data evidence from this research show that given the deficiencies of the dominant approach that there is the need for alternative approaches towards environmental sustainability. Scholars have, therefore, argued that there is the need for a perspective that understands the environment as that which is not only material but non-empirical in value (Thompson 1970, Crockett 2014 and Sponsel 2014). This will involve solving ecological issues

from the particular religious, cultural and philosophical experiences of particular peoples. Pope Francis (2015) teaches that: There is a need to respect the rights of peoples and cultures… Nor can the notion of the quality of life be imposed from without, for quality of life must be understood within the world of symbols and customs proper to each human group (no. 144).

To the fourth question on African alternative perspective and its ability to address the present ecological crisis, available data show that there is an African alternative approach that is capable of mitigating the present consequences of climate change. The data collected in general is not only in favour of an alternative approach towards environmental sustainability but is also in favour of a peculiar African approach which has served African traditional societies for thousands of years before her contact with the Western world or approach.

The African people have related with their environment in a spirit of respect, solidarity and complementarity. Ogungbemi (2007) avers that:

> In our traditional relationship with nature, men and women recognize the importance of water and air management to our traditional communities. The ethics of not taking more than you need from nature is a moral code. Perhaps this explains why earth, forests, rivers, wind and other national objects are traditionally believed to be both natural and divine. (p. 36).

The African people need to relate to their environment within the categories that they understand, which are guided by earth-based spiritual traditions and practices. Scholars such as Udodora (2011), Mbiti (1976; 1975), Calder (1968) and Gbenga (2006) observe that all religious

traditions whether elementary, pre-literate or advanced, are environmental friendly. The African perspective is sacralized, which is a manifestation of the consciousness and experience of the sacred in the ecosystem which serve as a sustained source for African communities' and individuals' practical struggle for the healing of the earth's ecology and for humanity's sustainable living from the earth's resources (Taylor 2009 and S*chalkwyk* 2011). This sacred dimension centers on "having a reverential attitude toward the environment in taking care of it while dwelling within its premises" (Suganthi 2019, n.pg.). This relationship with the environment depends on a spiritual awareness and an attitude of responsibility towards the ecosystem, which include tending, dwelling, reverence, connectedness, and sentience (Suganthi, 2019; Agbo 2010; Gaudalli 2017). The African concept of the environment is based on their religious and cultural belief system about the sacredness of nature. The land is not just a land, it is an abode of a deity, and in fact a deity itself. The same with water. This affects agriculture and the relationship with the land and water. Negative attitudes against the sustainability of the environment are regarded as taboos and punishable by society. Therefore, it is this belief system that guides their protection of the environment. This is held in high regard because its passed down from one generation to the next, and people are more inclined to obey these rules because it is a religious character unlike the western approach which is purely empirical.

From the data collected during the course of this research, more than half of the respondents believe that African indigenous strategies can contribute to reducing the effect of climate change. This confidence in the African indigenous approach aligns with previous researches. Several studies have highlighted the significance of indigenous knowledge and practices in environmental conservation and resilience to climate change (Adger et al., 2013; Berkes, 2018).

This suggests that there is a growing recognition and acceptance of the value of indigenous strategies. Various studies have also emphasized the importance of raising awareness and understanding of indigenous knowledge systems and practices for sustainable environmental management (Díaz et al., 2018; Pardal et al., 2020). Studies have also recognized the efficacy of indigenous practices in maintaining ecosystem health, biodiversity conservation and adaptation to climate change (Turner et al., 2000; Mistry et al., 2016). More so, of the importance of community engagement and active involvement in conservation efforts (Leiserowitz et al., 2019; Schultz et al., 2019; Maibach et al., 2019; Milfont et al., 2019; Mistry et al., 2019).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Indigenous knowledge and practices have long played a crucial role in environmental conservation and adaptation to changing climatic conditions in Africa (Berkes 2020). The study highlights the deep understanding indigenous communities have developed over generations about their local ecosystems and how they have adapted their livelihood strategies accordingly. This work has also observed that African indigenous strategies for environmental conservation are closely intertwined with sustainable resource management and climate change mitigation (Amanor 2020). Indigenous practices such as agroforestry, rotational grazing, and water harvesting techniques have been found to promote soil fertility, enhance ecosystem resilience, and reduce greenhouse gas emissions. Indigenous practices have demonstrated resilience to climate variability and have the potential to enhance local communities' adaptive capacity (Nyong et al 2020). It is on the basis of this that an African perspective becomes not only interesting but significant.

The opening chapter begins with the general state of affairs regarding climate change and particularly, Africa's vulnerability in the face of the present ecological crisis evident in rising temperatures, altered precipitation patterns, flood, drought, and other extreme weather events. These changes pose significant threats to ecosystems, agriculture, water resources, and livelihoods across the continent. Several conservation strategies were discussed, such as sustainable land management practices, ecosystem-based adaptation approaches, and the incorporation of indigenous knowledge systems. These strategies hold immense potential for

mitigating climate change impacts and promoting environmental sustainability in Africa. The burden of this research was articulated in the following questions that guided the research: Has the present ecological crises affected the people of Africa in any way? Has the dominant western approach to addressing ecological problems been very effective in finding sustainable solutions? Is there a need for alternative approaches towards the preservation of the environment? Are there African traditional/indigenous strategies for the conservation of the environment?

To determine the gap in literature, the researcher went through several related works related to this research. These works provided great insight towards the development of this research. For the achievement of the aim and objectives of the research, varied theories were adopted, which include: Igwebuike Conservation Theory, Environmental Kuznets Curve (EKC) Theory, Political Ecology Theory, and Environmental Justice Theory. The work was weaved around these theories so as to limit the scope of the relevant data by focusing on specific variables and defining the specific viewpoint that the researcher will employ for the analysis and interpretation of data gathered.

This research identified various challenges that hinder effective environmental conservation in Africa. These challenges include financial constraints, governance issues, conflicts, and the dominance of Western ideologies that often devalue traditional ecological knowledge. To address these challenges and harness the opportunities for environmental conservation in Africa. The research provided a comprehensive overview of the challenges and opportunities for environmental conservation in Africa. It highlighted the importance of incorporating indigenous knowledge, addressed the key barriers to conservation efforts, and presented actionable recommendations for promoting sustainable development in the face of climate change.

The potency of African indigenous strategies for environmental conservation was analyzed, demonstrating their effectiveness in managing the environment and addressing the challenges posed by climate change. Case studies and empirical evidence showcased the positive impact of indigenous practices on soil fertility, erosion control, water conservation, and biodiversity preservation. The integration of these strategies into mainstream environmental policies and practices is crucial for achieving sustainable environmental management in Africa. However, several barriers to the adoption of African indigenous strategies were identified. Westernization, urbanization, policy gaps, and a lack of awareness and recognition of indigenous knowledge systems were significant hindrances. Overcoming these barriers requires a shift in mindset, increased collaboration between traditional knowledge holders and policymakers, and the integration of indigenous practices into formal environmental management frameworks.

The final chapter, after a summary of the entire research and a conclusion, a set of recommendations were presented. These recommendations encompasses strengthening policy frameworks that has a place for indigenous methods of environmental conservation, enhancing capacity building and knowledge sharing as it relates to the value of indigenous environmental preservation strategies, promoting sustainable agriculture and land management practices that have ensured the sustainability of the environment among the local people, and strengthening ecosystem conservation and restoration efforts that have concretely proven to be successful over the years.

5.2 Conclusion

During the past decades, the dominant approach towards environmental conservation has played a key role in the efforts towards the sustainability of the environment. However, a cursory glance reveals that the ecological crisis facing humanity has not been abated. This, therefore, calls for alternative approaches towards the preservation of the environment. It is within this context that the African alternative is proposed. The African indigenous strategies for environmental conservation have long played a crucial role in mitigating the effects of climate change and promoting ecosystem resilience. Indigenous communities possess deep knowledge of their local ecosystems and have developed adaptive practices over generations. These strategies, such as agroforestry, rotational grazing, and traditional water management systems, have been effective in enhancing soil fertility, biodiversity conservation, and water availability, thus contributing to climate change mitigation.

Th importance of African indigenous strategies for environmental conservation in the face of climate change cannot be underestimated, given the role it has played in the preservation of the African environment even long before the contact of Africa with the West. There is the need for recognizing and valuing indigenous knowledge systems, addressing barriers to adoption, and integrating these strategies into environmental management practices. By doing so, Africa can effectively tackle the challenges of climate change within her own indigenous categories without undermining the relevance of other alternative perspectives that have proved success over time in the management of environmental challenges. The long-term sustainability of the African ecosystems and communities is based on the recognition of the role that the indigenous strategies can play.

5.3 Recommendations

The recommendations given below is based on the understanding that the planet is home to more than 476 million indigenous people living in 90 different countries of the world. Together, these indigenous peoples own, manage or occupy about one-quarter of the the lands in the world. These territories occupied by indigenous peoples are among the places that have fared far better than most of the rest of the Earth. This indicates that indigenous peoples are often better placed to provide information on local biodiversity and environmental change, and are important contributors to the governance of biodiversity at local and global levels.In light of these, the following recommendations are, therefore, proposed:

1. Governments should enact laws and develop policies that would ensure the recognition, continued vitality and protection of indigenous traditional knowledge systems, especially as they relate to the preservation of the environment. The world absolutely needs to protect, preserve and promote traditional knowledge systems, customary sustainable use and expertise of indigenous communities if it wants to halt the damage on the environment.
2. Indigenous peoples should be encouraged to share with the world their cultural, social and environmental practices relating to the sustainability of the environment. This is very important especially at this time when it is becoming obvious that the dominant approach towards the preservation of the environment is no longer capable of ensuring environmental sustainability.
3. Indigenous peoples should be involved and their views incorporated in all aspects of the work and decision-making regarding the global effort towards the sustainability of the environment. This is based on the recognition that cultural heritage and traditional

knowledge of indigenous peoples and local communities significantly contribute to conservation and can enhance national and global action on climate change.

4. African countries should develop and implement policies that prioritize the integration of indigenous strategies for environmental conservation. These policies should provide incentives and support for sustainable practices, promote the recognition of indigenous knowledge systems, and foster collaboration between traditional knowledge holders and policymakers.
5. Efforts should be made to build the capacity of local communities, policymakers, and researchers in understanding and implementing indigenous strategies for environmental conservation. This can be achieved through training programs, workshops, and knowledge exchange platforms that facilitate the sharing of experiences and best practices.
6. Governments and stakeholders should encourage the adoption of sustainable agricultural practices, such as agroforestry, rotational grazing, mixed cropping and organic farming. These practices that are indigenous can enhance soil fertility, biodiversity, and climate resilience, while also improving food security and livelihoods.
7. The value of indigenous methods of environmental sustainability should be part of our education system, right from the elementary stages to the tertiary levels of education. In this way, it becomes a way of life for the next generation and not just theories they come across at some point in their educational process.

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APPENDIX I

QUESTIONNAIRE

African Indigenous Environmental Conservation Strategies And Climate Change Mitigation

A study examining the relevance of indigenous strategies for environmental sustainability is being conducted. Kindly participate in the study by honestly completing the questionnaire below. Your responses will be treated confidentially and used solely for the purpose of this study.

Thank you.

Ikechukwu Anthony Kanu

Student/researcher

PART 1: PERSONAL INFORMATION

Kindly check (√) the option that applies to you.

1. **Gender and Location**

   (a) Male ☐ (b) Female ☐

2. **Age**

   (a) Below 20 years ☐ (b) 20 – 30 years ☐ (c) Above 30 years ☐

3. **Educational Background**

   (a) Undergrad. ☐ (b) Graduate ☐ (c) Post-Grad. ☐

PART 2: AFRICAN INDIGENOUS ENVIRONMENTAL CONSERVATION STRATEGIES AND CLIMATE CHANGE MITIGATION

Please check (√) the option that applies to you.

Response Categories

Response	Acronym	Points
Strongly Agree	SA	5
Agree	A	4
Undecided	U	3
Disagree	D	2
Strongly Disagree	SD	1

S/N	Item Statements	Responses				
		SA	A	U	D	SD
Cluster A: The effect of the present ecological crises on the people of Africa						
1	Has the present ecological crises affected Nigeria in the form of flood?					
2	Has the present ecological crises affected Nigeria in the form of drought?					
3	Has the present ecological crises affected Nigeria in the form of forced migration?					
4	Has the present ecological crises affected Nigeria in the form of pollution?					
5	Has the present ecological crises affected Nigeria in the form of deforestation?					

6	Has the present ecological crises affected Nigeria in the form of loss of biodiversity?					
Cluster B: The effectiveness of the dominant western approach in addressing ecological problems						
7	Is the dominant approach mechanistic and materialistic?					
8	Is the dominant approach legalistic?					
9	Is the dominant approach profit oriented and consumeristic?					
11	Is the dominant approach secularistic?					
13	Does it see nature only as an object for utility?					
14	Does it understand the environment as an unconscious space?					
Cluster C: The need for alternative approaches towards the preservation of the environment						
15	Is the dominant approach at the base of the present ecological crises?					
16	Does the dominant approach have the capacity to solve the present crises?					
17	Are there other alternative perspectives or approaches?					
18	Have these alternative approaches been able to address ecological crises locally?					
19	Is there a need for alternative approaches?					
20	Are people more attracted to approaches that are within their categories?					
Cluster D: African traditional/indigenous strategies for the conservation of						

the environment						
21	Are these strategies able to promote a better understanding of the environment?					
22	Are they able to promote respect, love and respect, etc., for the environment?					
23	Are they able to promote sustainability of the environment?					
24	Do they emphasize the dangers of exploiting the environment?					
25	Are they able to inspire commitment of the African people towards the preservation of the environment?					
26	Is a new perspective able to decolonize the discourse on environmentalism?					