THE CONCEPT OF VALUE CHAINS IN AGRICULTURE, CLIMATE ACTION AND ENVIRONMENTAL RESOURCES

GLOBAL ISSUES & LOCAL PERSPECTIVES

Edited by

Ignatius Onimawo

Stephen Ibitoye

Zacharia Yaduma

Lucky Onyia

Femi Ajisafe

Eteyen Nyong

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Published By:

Society for Agriculture, Environmental Resources & Management (SAEREM)

First published 2024

SAEREM World

Nigeria

Typeset in Times New Roman

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

THE CONCEPT OF VALUE CHAINS IN AGRICULTURE, CLIMATE ACTION AND ENVIRONMENTAL RESOURCES (GLOBAL ISSUES & LOCAL PERSPECTIVES)

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Printed at: SAEREM World

TABLE OF CONTENTS

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

[1]Mbube, Baridanu Hope, [1]Kolo, Philip Ndeji, [2]Nwosu, Chidimma Theresa., & [1]Abdulkadir Sabo Ahmad

Chapter Two

Sustainable Value Chains in Aquaculture: Leveraging Climate Action and Environmental Resource Management for Resilience and Growth

Victoria Folakemi **Akinjogunla**

Chapter Three

The Impact of Agricultural Chemicals on Human Health: A Value Chain Analysis of Exposure Pathways

[1]Dr. Nwizia, Baribefii Paagolah & [2]Mbube, Baridanu Hope (Ph.D.)

Chapter Four

Potentials of Local /Scavenging Chicken for Sustainable Protein Production and Poverty Alleviation

Balogun, B.I. PhD

Chapter Five

An Appraisal of Women Participation in Cassava Production and Processing in Ogbia Local Government Area, Bayelsa State, Nigeria

Tasie, C.M. and Wilcox, G. I.

Chapter Six

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Analysis of Cassava Value Addition and its Constraints in Emohua Local Government Area of Rivers State, Nigeria

G. I. Wilcox and C. M. Tasie

Chapter Seven

The Effects of Poultry Manure and NPK 15:15:15 Inorganic Fertilizer on the Growth of Maize (Zea *mays L.*) in Ibadan Oyo State

[1]Omidiran, M.O, [1]Adebisi, A.A, [2]Adedokun, D.O and [1]Geply, O.A

Chapter Eight

Environmental Hygiene and Disease Management Along Beef Value Chain.

Azeez, Abdullahi Akinwale (DVM) and *Salawu, Mutiat Bukola (PhD)*

Chapter Nine

Food safety challenges of antibiotic-resistant foodborne pathogens in street vended foods and report on evolving remedies

[1,*]Clement Olusola Ogidi, [1]Oluwatoyin Ajoke Oladeji, [2]Olubukola Olayemi Olusola-Makinde, and [1]Adeyanmola Oluwaseyi Faturoti

Chapter Ten

The Role of Remittances on Economic Growth in Nigeria 1980-2022

Atiman Kasima Wilson PhD

Part two: THE CONCEPT OF CLIMATE ACTION

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Part three: THE CONCEPT OF VALUE CHAINS AND ENVIRONMENTAL RESOURCES

Chapter Twenty One
Forest Ecosystem Approach toward Food Security

Adebayo, D.O, Bolaji, K.A, and Akanni, O.F

Chapter Twenty Two

Nutrient Profiling of Avocado (*Persea americana*) and African Pear (*Dacryodes edulis*): A Comparative Study for Food and Nutritional Security

Simpson Victor Bamidele[1], Yusuf Ahmed Saliu[2], Akemien Nerioya Neri[3], Akhideno Lawson Oseigbokan[4], Alli Sheriffdeen Abiola[5].

Chapter Twenty Three

Sustainable Poultry Production: The Guinea Fowl Alternative

Balogun, B.I. PhD

Chapter Twenty Four

"A Study on the Anticariogenic Efficacy of Some Ethnobotanical Plants on Oral Bacteria: A Review"

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Simpson Victor Bamidele[1], Akemien Nerioya Neri[2], Akhideno Lawson Oseigbokan[3], Alli Sheriffdeen Abiola[4], Adeleye Opeyemi Adebola[5].

Chapter Twenty Five

Resilience and Restoration: Tropical Ecosystems in the Face of Human Impact

[1,4]Salami, K.D. [2]Akinyele, A.O. [1]Lawal, A. A. [3]Abubakar, A. W. [1]Jibo, A. U.

[3,4]Adeniyi, K. A.

Chapter Twenty Six

Effect of Tigernut on Reproductive Indices of *Clarias Gariepinus*

[1] Tusayi, B.W, [2]Onyia, L.U., [3]Musa, M., [4]Bello, H.A, and [5]Ndibrimta, N.

Chapter Twenty Seven

Assessing Agroforestry Practices Impact on Environment, Income and Food Production In Southwest Nigeria.

Bolaji K.A., Jatto K.A and Adebayo D.O.

Chapter Twenty Eight

Breaking Barriers: Gender Dynamics and Opportunities for Women's Empowerment in Agricultural Value Chains

[1]Mbube, Baridanu Hope, [2]Odekunmi, Seyi Adeloba, [3]Utoko, Vincent Agu & Usman, Christiana Ilebaye

Chapter Twenty Nine

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Ecological Perspectives on Reducing Post-Harvest Losses in Agricultural Value Chains: Implications for Climate Action and Environmental Sustainability

[1]Mbube, Baridanu Hope, [2]Abdulsalam, Rabiu Anate, [3]Ojumu Adedotun Omobayo & [4]Moses, Nueebu Mon

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Preface

This book adopts an exegetical approach as well as a pedagogic model, making it attractive agriculture and environmental economics teachers, professional practitioners and scholars. It is eschews pedantry and lays bars the issues in such clarity that conduces to learning. The book elaborates on contemporaneous ***The Concept of Value Chains in Agriculture, Climate Action and Environmental Resources*** issues of global significance and at the same time, is mindful of local or national perspectives making it appealing both to international and national interests. The book explores the ways in which climate change, food security, national security and environmental resources issues are and should be presented to increase the public's stock of knowledge, increase awareness about burning issues and empower the scholars and public to engage in the participatory dialogue climate change, food security, national security and environmental resources necessary in policy making process that will stimulate increase in food production and environmental sustainability.

The Concept of Value Chains in Agriculture, Climate Action and Environmental Resources: Global issues and Local Perspectives is organized in three parts. Part One deals with The Concept of Value Chains in Agriculture, Part Two is concerned with The Concept of Climate Actions and Part Three deals with the Concept of Value Chains and Environmental Resources.

Eteyen Nyong/ Ignatius Onimawo

April 2025

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Chapter Sixteen

Strengthening Climate Resilience and Adaptive Capacity in African Fisheries: Prioritizing Gender Transformation and Inclusive Approaches to Adaptation, Mitigation, and Risk Management

1st Author: **Victoria Folakemi AKINJOGUNLA,**
Department of Fisheries and Aquaculture,
Faculty of Agriculture,
Bayero University Kano, Kano State, Nigeria.
Vfakinjogunla.faq@buk.edu.ng;
0000-0003-0816-052X

2nd Author: **Mohammed Sani ISIYAKU**
Department of Fisheries and Aquaculture,
Faculty of Agriculture,
Bayero University Kano, Kano State, Nigeria.
Imsani.faq@buk.edu.ng;
0000-0002-9377-0586

3rd Author: **Emmanuel Anietie ESSIEN**
Department of Animal and Environmental Biology,
Faculty of Biological Science,
University of Uyo, Akwa -Ibom State.

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

emeritusessien49@gmail.com
0009-003-1386-668X

Table of Contents

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

1.0 Introduction

Africa as a continent is specifically vulnerable to the impacts of climate change due to its total dependence on agriculture, inadequate infrastructure, and high levels of abject poverty (World Bank, 2020). Excessive weather events such as droughts and floods are becoming more frequent, leading to crop failures, food insecurity, and displacement of populations. The fisheries sector in Africa plays a crucial and very vital role of the continent's socio- economic advancement,

contributing to trade and economic development, providing means of livelihoods and food security for millions of people, particularly those living in the littoral communities (FAO, 2022).

However, the fisheries sector (marine, brackish and freshwater ecosystems) in Africa faces significant challenges and threats posed by climate change, including distorted fish distribution patterns leading to fish migration, changing precipitation patterns, rise in sea levels, temperature fluctuations, ocean acidification, habitat degradation of the coral reefs and mangroves, and extreme weather conditions like heat waves, increased water evaporation, earthquakes, droughts, cyclones, storms and floods causing shifts in the dispersal and abundance of the fish species, as well as alterations in the fish's performance and productivity which affects both the small-scale and large - scale fisheries (Zougmoré *et al*., 2020; Wanyonyi *et al*., 2023).

All of these actions cause existing weaknesses in the sector and also, putting further pressure on already fragile ecosystem and the drained natural resources. It is also noteworthy that the impacts of climate change impacts affects both gender (male and female fishers) in different ways. African nations in general must take proactive procedures to build resistance and / or adjust to the changing climate conditions. Resilience refers to the ability of the fishery ecosystems to predict, suck up, and recuperate from all the effects of climate-related events while still preserving the ecosystem amenities and benefits that sustain fish populations and livelihoods (Sowman & Sunde, 2021)

Building climate resilience and adaptive capacity in Africa's fisheries sector is therefore of utmost importance to ensure that this sector is able to thrive even in the midst of these environmental threats emanating from the changing climate (FAO, 2021). While much emphasis on climate change adaptation, mitigation, and risk management has traditionally and continuously being centered around general solutions and economic strategies, it is also of essence to acknowledge the fundamental role that gender plays in shaping the proficiencies of fisherfolks. Gender-transformative and all-encompassing approaches in the fisheries sector not only contribute

to climate resilience but also uphold social fairness, integrity and unbiased development (UN Women, 2022).

Generally, in the Africa context, the fisheries sector is more often than not, referred to as a male-dominated sector, especially in reference to the aspects of active fishing and commercial activities (boat ownership, direct fishing operations in industrial or large-scale fisheries). However, the female fisherfolks play significant parts in the small-scale fish (processing, managing, smoking, drying, marketing, handling, etc.) trading, distribution of fish and the management of family consumption and income (Onyango & Jentoft, 2020; Asiedu & Nunoo, 2022). However, with climate change gendered impacts, the female fisherfolks repeatedly faces greater vulnerability due to social, economic, and cultural factors, including limited access to resources, decision-making power, and technology (Asiedu & Nunoo, 2022).

1.1 The objectives of strengthening climate resilience and adaptive capacity in African fisheries sector

The objectives are multidimensional with the sole aim of addressing the complex challenges posed by climate change while promoting equity, sustainability, and resilience in the fisheries sector.

i. To address gender inequalities and encourage women in the fisheries sector by ensuring their equal involvement in decision-making, resource access, and economic prospects.
ii. To ensure that climate adaptation strategies are comprehensive, inclusive and addresses the needs of all stakeholders, particularly marginalized groups such as women, youths, and small-scale fisherfolks.
iii. To reduce the carbon footprint of fisheries and promote sustainable practices that alleviate climate change impacts.
iv. To ensure that national and regional policies for fisheries and climate adjustment and adaptations are gender-responsive and inclusive.

v. To uphold the food security and businesses of lots of Africans who solely or partially depend on fisheries for nutrition and income.

vi. To endorse equitable and just outcomes in climate adaptation and mitigation efforts, ensuring that vulnerable and marginalized groups are not left behind.

vii. To track the effectiveness of climate resilience and gender-transformative initiatives in the fisheries sector.

2.0 Strategies for Building Adaptive Capacity in Fisheries

Building adaptive capacity entails supporting and fortifying the proficiency of individuals, communities, and institutions to adjust to all climate-related changes. Adaptive capacity in the fisheries sector can be enhanced through various strategies listed below:

***2.1 Consolidating governance and policy agendas*:** effective governance is paramount to building resilience. Policies that integrate climate change adaptation into fisheries management can enhance adaptive capacity by:

a) Advocating for an inclusive ecosystem-based management that accentuates the management of the entire ecosystems rather than individual fish species.

b) Creation of flexible climate-resilient fisheries policies that will promote sustainable aquaculture practices, fishing activities and reduce overfishing.

c) Considering the transboundary nature of many fish species in Africa waters, collaborative efforts of exchanging research data, improved and sustainable fishing practices, and resources in order to address common climate challenges faced in the fisheries sector in those regions should be encouraged.

2.2 Diversifying Livelihoods and Sustainable Practices: diversifying livelihoods is essential for reducing partial or total dependence on fisheries and its resources alone, particularly in

communities that face unpredictable climate risks. Measures to diversify and sustain livelihoods include:

a) Providing training and support for fisherfolks to engage in alternative livelihoods such as aquaculture, integrated agricultural practices, seaweed farming, or eco-tourism will help to reduce pressure on the limited available fish stocks.
b) Encouraging sustainable fishing practices, such as reducing bycatch, observing open and closed seasons, and using eco-friendly and approved fishing gear, using only licensed boats with accurate sizes for fishing and adhering to agreed catch quotas helps to maintain a healthy and robust fish populations despite climate-related stresses.
c) Developing climate-resilient aquaculture systems that are adaptable to changes in water temperature and quality can provide a stable source of fish in the face of declining wild stocks.

2.3 Leveraging on advance expertise and modernization: Technological innovations can play an imperative role in improving the adaptability of the fisheries sector and help to build a strong climate resilience. Innovations such as:

a) Climate-smart aquaculture techniques like integrated multi-trophic aquaculture (IMTA) or recirculating aquaculture systems (RAS) which reduces water usage and improve resource efficiency should be introduced in order to maximize fish production and at the same time, minimizing environmental impacts.
b) Using satellite data, mobile applications, climate forecasting models, early warning approaches to provide fisherfolks with timely and relevant information about weather patterns, sea temperatures, and fish migration will help them to plan their activities accurately and timely.
c) Use of biodegradable nets and selective passive or active fishing gears to reduce destruction on the ecosystems and improve the long-term sustainability of the fisheries sector.

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

2.4 Capacity Building and Knowledge Transfer: Enhancing the knowledge and skills of local communities, fishers, and fisheries managers is essential for building adaptive capacity. This can be achieved through:

a) Intensive training of fisherfolks on the impacts and effects of climate change alongside the adaptation strategies for survival of the fish stocks.
b) Empowering local communities to monitor fish stocks and environmental changes can improve decision-making and strengthen resilience. Community-based management approaches allow local knowledge to inform climate adaptation strategies.
c) Investing in climate science and fisheries research is essential for understanding the impacts of climate change and developing targeted solutions. Collaborative research between governments, universities, and NGOs can facilitate the development of region-specific adaptation strategies.

3.0 Gender-Transformative Adaptation, Inclusive Mitigation and Responsive Risk Management in Fisheries

Gender-transformative adaptation is not only recognizing the differences in human gender (male and female) but going further to tackle inequality in gender matters and also succeeding in changing the narrative (Seager, 2010; Tacoli, 2014; Nunan *et al*., 2022). It is an adjustment program that create fair playing platforms where both genders (male and female) can actively participate in climate actions processes, make decisions and be involved in the implementation of the decisions taken equally.

While mitigation refers to those activities or procedures that reduces or avert totally the emission of greenhouse gas which has also been documented to contribute to climate change. Risk management in the fisheries sector on the other hand comprises classifying, evaluating, reviewing and reducing the hazards associated with climate change. Gender-responsive risk management

make sure that both gender's exclusive demands, and vulnerabilities are considered in the development of climate resilience strategies (Wanyonyi *et al*., 2023).

Generally, gender transformative and inclusive adaptation, mitigation, and risk management are necessary for developing climate change resilience and adaptive capacity in Africa. These methodologies will focus on addressing and tackling social vulnerabilities, exploit potentials maximally and empowers the marginalized or relegated groups in the communities which eventually will lead to applicable and sustainable resolutions for building climate resilience in the region.

3.1 Practical Approaches for Gender-Transformative and Inclusive Climate Actions in Fisheries

I. Involving all genders and relegated groups in climate change adaptation and mitigation efforts will present rich ideas, diverse perspectives and brilliant solutions to the fora. This diverse inclusion of all and sundry can lead to more operational and novel approaches for building resilience to climate change impacts.

II. The different genders had been built naturally to have different tasks, responsibilities, and knowledge when it comes to climate change adaptation and mitigation. Recognizing and harnessing the different tasks, responsibilities, exposures and strength of both genders creates pathways and potential for building resilience and adaptive capacity which can be maximized.

III. Encouraging and empowering the female folks and relegated groups in the affected communities to take on active roles in policymaking and supervisory activities related to climate change adaptation and mitigation leads to more sustainable local frameworks with identifiable solutions that are initiated by the communities most affected by these climate change effects. This empowerment also helps to strengthen social capital as they are trained to diversify their source of livelihoods

IV. Women should be introduced and trained in innovative fishing practices, sustainable aquaculture techniques, climate-resilient technologies like the use of alternative energy sources, sustainable fish processing/ methods or in the use of new technologies that can reduce the carbon footprint of fisheries operations

V. Inclusive mitigation strategies ensure that both men and women have unrestricted access to resources, and technologies that can help reduce harmful gaseous escapes or emissions.

VI. In the context of climate finance, gender-inclusive strategies ensure that women are not excepted, restricted or marginalized from accessing funds that are meant for the use of ecosystem restoration or climate change adaptations and management.

VII. Providing women with timely and relevant climate forecasts and prompt warning systems that are personalized to their specific roles in the fisheries sector such as fishing, processing, or marketing can help them to make knowledgeable decisions to protect their occupations and invariably, their communities.

VIII. Since women are often responsible for household food security and family well-being, risk management strategies that focus on strengthening household resilience can have a far-reaching impact. By enhancing women's ability to diversify livelihoods and adapt to changing fish availability, families are more likely to withstand climate-related shocks.

IX. Collection and probing of data that is not gender biased can help to better understand how climate change affects both genders in the fisheries sector. This data can initiate the development of policies, strategies and programs that address the specific needs of each group.

4.0 Potentials for Scaling and Replication in the Fisheries Sector to Build Climate Resilience and Adaptive Capacity in Africa

Building climate resilience and adaptive capacity in Africa's fisheries sector requires effective, scalable, and replicable strategies. Many of the approaches developed in specific regions or

countries show potential for broader application, particularly given the shared challenges faced by different communities across the continent. Scaling and replicating successful initiatives can help foster resilience and sustainability in the fisheries sector, benefiting millions of people who depend on it for their livelihoods, food security, and economic stability.

4.1 Community-Based Fisheries Management (CBFM):

- Community-based fisheries management (CBFM) been implemented in so many African countries had recorded tremendous success because of the enormous empowerment these programmes give to the local communities to handle their own fisheries sustainably. These community-based frameworks include measures such as restriction on by-catch, seasonal closures, the creation of marine protected areas (MPAs), and size limits on catches to protect and preserve fish stocks. The methodologies involved in CBFM is quite flexibility, giving room for prompt adaptation to local circumstances in various communities, making it highly replicable across different nations in Africa.
- Also, one of the focal strengths of CBFM is its emphasis on entire inclusivity, thus the name – "Community based". These measures ensures that both genders (male and female) and marginalized group irrespective of their ethnicity, religious, political and / or socio-economic affiliation, are actively involved in decision-making, managing and supervision of local fisheries activities in their communities. African countries like Ghana and Kenya had recorded success in the implementation of CBFM, thus it can also be replicated across Africa's coastal and inland fishing communities as they share same or similar history and challenges with the impacts of climate actions in their fisheries sector.

4.2 Sustainable Aquaculture Practices

- As the fisheries sector faces declining fish stocks majorly due to overfishing and the addition of the impacts of climate change, aquaculture practices come to the rescue of bridging the wide gap between demand for animal source of protein (aquatic) and its supply as the

population increases geometrically. Aquaculture not only helps to meet growing demand of fish in the communities, it also ensures that there are to an extent, stable supply of fish irrespective of any environmental or ecological stress that might be taking place, thereby improving food security. It can also serve as alternate sources of income for inhabitants in these local communities or fisherfolks involved. Sustainable aquaculture practices will also help to reduce dependence or pressure on wild fish stocks.

- Climate change effects like heat waves, droughts, floods, acidification, rise in sea level, unstable water temperatures, etc. are appropriately managed and boycotted with the practice of sustainable aquaculture.
- African countries like Uganda, Kenya, Egypt and Ghana have recorded successes in the practice of sustainable aquaculture in both their inland and coastal and waterways fisheries. With applicable training, availability of funds, and unrestricted access to advance technology, small-scale fish farmers can scale up their operations sustainably in other African countries too.

4.3 Ecosystem Restoration and Conservation Efforts

- Coastal ecosystems like mangroves swamps, seagrasses, and coral reefs serve as habitats for marine life. Initiatives that involve local communities in ecosystem restoration—such as mangrove planting, coral reef rehabilitation, and the protection of fish breeding grounds—can be scaled up in other coastal areas of Africa. Restoring, preserving and protecting these ecosystems enhances the resilience of fisheries by alleviating the impacts of climate change like storms, earthquakes, erosion, and rising sea levels. Successful restoration blueprints in countries such as Kenya, Tanzania, and Mozambique can be replicated across other Africa's coastal regions, where these ecosystems are also noted to be at risk.

- Conserving biodiversity is imperative for climate resilience. Inaugurating and multiplying marine protected areas (MPAs) across the African coastline can help to ensure that fish stocks are sustained, which in turn supports long-term fisheries productivity.

4.4 Climate-Smart Fisheries and Sustainable Fishing Techniques

- The enforcement on the use of climate-smart, sustainable biodegradable passive or active fishing gears and approved use of fishing nets with appropriate mesh sizes will reduce bycatch and minimize environmental damage which will in turn help to safeguard the fish species and the ecosystems.
- Upgrading fishing vessels, storage amenities, and processing equipment can improve efficiency and increase profitability in the fisheries sector, while also building strong resilience to climate-related disruptions.
- Adjusting fishing seasons based on climate predictions, harvesting for fish diversity rather than targeting a single species, and implementing adaptive fishing quotas are some other examples of climate-smart fisheries management models that can also be implemented. The use of climate models for fish stock management in the Indian Ocean, can be replicated in other African regions to help improve the sustainability of fisheries across the Africa continent.
- Data-driven approaches to fish stock management, such as using climate and fisheries data to forecast trends in fish availability, can be improved upon across the Africa continent. Data collection and advanced monitoring systems in countries like Senegal, Ghana, and South Africa can serve as models for other African countries to help improve the efficiency and accuracy of the climate-resilient fisheries management they have adopted.

4.5 Gender-Responsive Climate Adaptation and Mitigation

- Gender-inclusive and transformative adaptation strategies—such as involving women in decision-making processes, providing training in sustainable fishing, and ensuring equal

access to funds, technologies and resources—can be replicated across all African fisheries. These strategies improve adaptive capacity by empowering women, who often play key roles in fish processing, marketing, and community resilience. Replicating gender-sensitive approaches from successful models in countries like Malawi and Zambia can lead to more equitable and sustainable fisheries.

- Inclusive Risk Management and Early Warning Systems: Implementing early warning systems that are accessible to both men and women, especially in coastal and fishing communities, can help reduce vulnerability to climate impacts. Training both women and men on risk management, access to climate information, and coping strategies can be scaled up to strengthen resilience in all fishing communities across Africa.

4.6 Capacity Building and Education

- Training and Knowledge Sharing: imparting training on climate adaptation, sustainable fishing practices, and aquaculture to local inhabitants in the communities and fisherfolks is fundamental for building adaptive capacity. With the regular introduction of relevant educational programs at various levels of interaction (the community, national, and regional levels), more fisherfolks can be armed with the necessary information and competences required to mitigate and/or adjust to climate change.
- Investing in research and monitoring: Supporting scientific study and monitoring schedules can help improve understanding of the impacts of climate change on fisheries and inform decision-making processes
- Regional collaboration and knowledge exchange: promoting collaborations between countries within Africa (South-South cooperation) and with other regions (Triangular cooperation) can facilitate the sharing of best practices, technologies, and knowledge in climate-resilient fisheries management. For instance, sharing best practices from countries like Morocco (in aquaculture) or Senegal (in community-based fisheries management) or

involvement of women in sustainable fisheries (Zambia and Malawi) can help other African countries to adopt similar frameworks or approaches in their own contexts.

- Partnerships with non-governmental organizations and research Institutions: Creating partnerships between government agencies, non-governmental organizations, research institutions, stakeholders and interested individuals can foster rapid innovation and relevant sharing of ideas and experiences to address common challenges faced by these African countries in the fisheries sector. By leveraging research and funding opportunities, successful pilot projects in one region can be scaled up and replicated across different countries.
- Creation of platforms (electronic portals, workshops, and conferences) for proper and faster means of disseminating knowledge to other African countries with similar case studies can facilitate the exchange of experiences and lessons learned in climate-resilient fisheries management, leading to wider adoption and reproduction of successful practices.

4.7 Financial support: Providing financial support through scholarships, free-will donations grants, soft loans, or other mechanisms can help scale up successful climate-resilient fisheries projects and make them more accessible to a larger number of stakeholders.

- Creating market incentives for sustainable and climate-resilient fishing practices, such as eco-certification schemes or premium prices for sustainably caught seafood, can encourage fishers to adopt more resilient practices

5.0 Case Studies of Successful Gender Inclusiveness and Responsiveness in Africa Fisheries Sector

5.1. Lake Victoria, East Africa

Lake Victoria is one of Africa's largest freshwater fisheries, supporting millions of livelihoods in Kenya, Tanzania, and Uganda. Women play a significant role in post-harvest activities, such as fish processing and trading, but face barriers such as limited access to resources and decision-making power.

a) ***Initiative***:

The gender-responsive programs implemented by Lake Victoria Fisheries Organization (LVFO) and her partners to empower women in the fisheries sector are:

i. Providing women with access to solar dryers and improved fish processing technologies to reduce post-harvest losses, thereby increasing their income.
ii. Training women on climate-resilient practices in sustainable fish handling and value addition.
iii. Promoting women's participation in fisheries management committees to ensure their voices are heard in decision-making processes.

b) ***Outcome***:

Women in Lake Victoria have reported increased in their income, observed reduced post-harvest losses, and greater involvement in community decision-making, contributing to improved resilience to climate change impacts.

5.2 Ghana's Coastal Fisheries

In Ghana, women are heavily involved in fish processing and marketing but often lack access to credit, technology, and decision-making platforms. Climate change has intensified these challenges such as declining fish stocks and rising sea levels.

a) Initiative

The USAID Sustainable Fisheries Management Project (SFMP) in Ghana has integrated gender considerations into its climate adaptation efforts. Key activities include:

i. Providing women with access to improved fish processing technologies, such as smoking kilns, to reduce fuelwood use and improve product quality.
ii. Offering training on climate-smart practices, such as sustainable fishing and alternative livelihoods (e.g., aquaculture).
iii. Supporting women's cooperatives to access credit and markets, enhancing their economic resilience.

b) Outcome

Women have gained greater economic independence, reduced their vulnerability to climate shocks, and contributed to sustainable fisheries management.

5.3. Senegal's Small-Scale Fisheries

In Senegal, women are critical to the fisheries value chain but face systemic barriers, including limited access to resources and exclusion from decision-making. Climate change has led to reduced fish stocks and increased competition for resources.

a) Initiative

The FAO-led Enhancing Resilience of Small-Scale Fisheries Initiative in Senegal has focused on gender transformation by:

i. Providing women with training on climate-resilient practices, such as fish drying and preservation techniques.
ii. Establishing women-led cooperatives to improve access to markets and financial services.
iii. Promoting women's participation in local fisheries management committees to ensure inclusive decision-making.

b) Outcome

Women in Senegal have reported improved livelihoods, increased resilience to climate change, and greater influence in fisheries governance.

5.4 Mozambique's Coastal Communities

Mozambique's coastal communities rely heavily on fisheries for food and income. Women are actively involved in fish processing and trading but are disproportionately affected by climate change impacts, such as cyclones and rising sea levels.

a) Initiative

The World Bank-funded Coastal Cities Adaptation Project (CCAP) has integrated gender considerations into its climate adaptation strategies. Key activities include:

i. Providing women with access to climate-resilient infrastructure, such as improved fish storage facilities.
ii. Offering training on disaster preparedness and alternative livelihoods, such as seaweed farming.
iii. Supporting women's participation in community-based adaptation planning.

b) Outcome

Women have become more resilient to climate shocks, with improved access to resources and greater involvement in community decision-making.

5.5. South Africa's Small-Scale Fisheries

In South Africa, small-scale fisheries are a vital source of livelihoods, particularly for women in coastal communities. Climate change has led to declining fish stocks and increased vulnerability to extreme weather events.

a) Initiative

The Department of Environment, Forestry, and Fisheries (DEFF) has implemented gender-responsive policies and programs, including:

i. Providing women with access to fishing rights and resources, such as boats and gear.
ii. Offering training on climate-resilient practices, such as sustainable fishing and ecosystem restoration.
iii. Promoting women's leadership in fisheries cooperatives and management bodies.

b) Outcome

Women have gained greater access to resources, improved livelihoods, and enhanced resilience to climate change.

5.6 Madagascar's Mangrove-Dependent Communities

In Madagascar, women in coastal communities rely on mangrove ecosystems for fishing and other livelihood activities. Climate change and deforestation have threatened these ecosystems, increasing vulnerability.

a) Initiative

The Blue Forests Project, implemented by WWF and partners, has focused on gender-inclusive mangrove restoration and sustainable fisheries management. Key activities include:

i. Engaging women in mangrove restoration and conservation efforts.
ii. Providing training on sustainable fishing practices and alternative livelihoods, such as beekeeping.
iii. Supporting women's participation in community-based natural resource management.

b) Outcome

Women have contributed to ecosystem restoration, improved their livelihoods, and enhanced community resilience to climate change.

6.0 Key Lessons from the Sampled Case Studies

These successful case studies proves that gender-inclusive strategies or methodologies are not only fundamental for tackling climate change impacts in the fisheries sector but also for advocating sustainable development and social equity in Africa. By prioritizing gender transformation, African fisheries can build resilience and guarantee the well-being of millions of Africans who depend on this essential sector

6.1 Empowerment Through Access: Providing women with access to resources, technology, and credit enhances their resilience to climate change.

6.2 Inclusive Decision-Making: Ensuring women's participation in fisheries management and climate adaptation planning leads to more equitable and effective outcomes.

6.3 Capacity Building: Training women on climate-resilient practices and alternative livelihoods strengthens their adaptive capacity.

6.4 Community-Based Approaches: Engaging local communities, particularly women, in climate adaptation efforts fosters ownership and sustainability.

7.0 Conclusion

Building climate resilience and adaptive capacity in Africa's fisheries sector is a complex but essential task that requires coordinated action across multiple levels—government, industry, local communities, stakeholders, and research institutions. While challenges emanating from extreme weather or climate actions remain, a combination of effective governance, sustainable practices, technological innovation, and capacity building can pave the way for a more resilient fisheries sector in the face of extreme climate changes. The key to success in combating with the aftermath of extreme weather conditions in the Africa continent lies in promoting inclusive, context-specific solutions that are tailored to the unique challenges faced by the different African regions by fostering regional cooperation and collaborations, leveraging local knowledge, replicating successful models and investing in the sustainable management of fishery resources.

Encouraging and incorporating gender-transformative and inclusive adaptation, mitigation, and risk management in combating climate change impacts are not just about ensuring fairness, sustenance and equity; they are cardinal for building long-term resilience and sustainability. A fisheries sector that is all encompassing with addressing the different needs, roles, strengths and weaknesses of both women and men will be better equipped to endure, survive and adapt to the challenges posed by climate change, contributing to the broader objectives of sustainable development and social equity. Africa as a continent can build a fisheries sector that is not only

resilient to climate change but also capable of contributing to long-term economic stability and food security.

References

Asiedu, B., & Nunoo, F. K. E. (2022). Gender mainstreaming in climate-smart fisheries: Lessons from West Africa. Frontiers in Marine Science, 9, 789432. https://doi.org/10.3389/fmars.2022.789432

Food and Agriculture Organization (FAO). (2021). Gender, fisheries, and climate change: Empowering women for sustainable fisheries in a changing climate. Food and Agriculture Organization of the United Nations. https://doi.org/10.4060/cb4477en

Food and Agriculture Organization of the United Nations (FAO) (2022). The state of world fisheries and aquaculture 2022: Towards blue transformation. FAO. https://doi.org/10.4060/cc0461en

Gender and Development. (n.d.). Oxford Academic. Retrieved February 19, 2025, from https://academic.oup.com/gend

GenderCC - Women for Climate Justice. (n.d.). Gender and climate justice. Retrieved February 17, 2025, from https://www.gendercc.net/

International Feminist Journal of Politics. (n.d.). Taylor & Francis Online. Retrieved February 19, 2025, from https://www.tandfonline.com/toc/rfjp20/current

Kolding, J., van Zwieten, P. A. M., & Marttín, F. (2021). Sustainable development of African continental fisheries: A regional perspective on climate change impacts and adaptation strategies. ICES Journal of Marine Science, 78(1), 1–12. https://doi.org/10.1093/icesjms/fsaa123

Nunan, F., Cepić, D., Yongo, E., Salehe, M., & Mbilingi, B. (2022). Gender and small-scale fisheries in Africa: Key considerations for climate resilience. Marine Policy, 135, 104846. https://doi.org/10.1016/j.marpol.2021.104846

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1

Onyango, P., & Jentoft, S. (2020). Climbing the hill: Poverty alleviation, gender relationships, and women's social entrepreneurship in Lake Victoria, Kenya. Maritime Studies, 19(3), 317–328. https://doi.org/10.1007/s40152-020-00184-0

Seager, J. (2010). Climate change, gender, and development. *Global Environmental Politics*, **10**(2), 13-23. https://doi.org/10.1162/glep.2010.10.2.13

Sowman, M., & Sunde, J. (2021). Social vulnerability and adaptive capacity in small-scale fisheries: Insights from coastal communities in South Africa. Ocean & Coastal Management, 210, 105689. https://doi.org/10.1016/j.ocecoaman.2021.105689

Tacoli, C. (2014). The gender dimensions of climate change. *Environmental Development*, **11**, 14-24. https://doi.org/10.1016/j.envdev.2014.01.002

UN Women. (2022). Gender equality in the blue economy: A pathway to climate-resilient fisheries in Africa. United Nations Entity for Gender Equality and the Empowerment of Women. https://www.unwomen.org/en/digital-library/publications/2022/03/gender-equality-in-the-blue-economy

UNFCCC. (n.d.). Gender and climate change. United Nations Framework Convention on Climate Change. Retrieved February 16, 2025, from https://unfccc.int/gender

Wanyonyi, I., Macharia, D., & Obura, D. (2023). Climate change impacts on fisheries and aquaculture in Africa: A gender-responsive approach to adaptation and mitigation. Sustainability, 15(4), 3215. https://doi.org/10.3390/su15043215

Wilkins, R. M. K. (Ed.). (2014). Gender and climate change: A feminist analysis for international development. Zed Books. 102pp.

World Bank. (2020). Gender and climate change in fisheries: Building resilience through inclusive policies and practices. World Bank Group. https://doi.org/10.1596/33567

Zougmoré, R. B., Partey, S. T., Ouédraogo, M., Torquebiau, E., & Campbell, B. M. (2020). Facing climate variability in sub-Saharan Africa: Adaptation strategies for smallholder farmers in the

fisheries and agriculture sectors. Climate and Development, 12(5), 417–428. https://doi.org/10.1080/17565529.2019.1664376

SAEREM BOOK CHAPTERS First Published 2025 ISBN 978-978-60709-7-1