CARBON CREDIT PROJECTS IN KENYA: IMPLEMENTATION AND EFFECT ON HUMAN DEVELOPMENT AND ECOSYSTEMS IN LOCAL COMMUNITIES - A CASE OF THE MIKOKO PAMOJA BLUE CARBON INITIATIVE

BY

MURUKU JOY NJAMBI

UNITED STATES INTERNATIONAL UNIVERSITY-AFRICA

SUMMER, 2023

CARBON CREDIT PROJECTS IN KENYA: IMPLEMENTATION AND EFFECT ON HUMAN DEVELOPMENT AND ECOSYSTEMS IN LOCAL COMMUNITIES - A CASE OF THE MIKOKO PAMOJA BLUE CARBON INITIATIVE

BY

MURUKU JOY NJAMBI

A THESIS SUBMITTED TO THE SCHOOL OF HUMANITIES AND SOCIAL SCIENCES, DEPARTMENT OF INTERNATIONAL RELATIONS IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ARTS IN INTERNATIONAL RELATIONS

UNITED STATES INTERNATIONAL UNIVERSITY-AFRICA

SUMMER, 2023

STUDENT DECLARATION

I declare that this thesis is my original work and has not been presented for another academic award in any other University or Institution, other than The United States International University - Africa for academic grading.

Signature ....Date...15th September 2023...

Muruku Joy Njambi – 664059

This Thesis has been submitted for examination with my approval as University Supervisor.

Signature ....Date...18/09/2023..........

Dr. Francis Khayundi

Supervisor

Signature ....Date....18.9.2023..........

Prof. Martin C. Njoroge

Dean, School of Humanities and Social Sciences

COPYRIGHT

ABSTRACT

In the last five decades, climate change has become a global issue, affecting the environment, societies, and economies worldwide, albeit with varying impacts on different countries. To address this challenge, international cooperation has led to agreements such as the Rio Declaration, Stockholm Declaration, Paris Climate Agreement, and the pivotal Kyoto Protocol. The Kyoto Protocol, in particular, laid the foundation for carbon credit projects, aiming to reduce emissions through partnerships between developed and developing nations. However, concerns have arisen regarding the effectiveness of these projects, both in emissions reduction and their impact on development and ecosystems, particularly in Africa. This study delved into these issues, grounded in two international relations theories: realism and liberalism. Realism highlights power dynamics among states, attributing slow climate change progress to disputes over costs and responsibilities among signatories of the United Nations Framework Convention on Climate Change (UNFCCC). In contrast, liberalism promotes international cooperation without direct force, with recent efforts prioritizing shared responsibilities and common goals, exemplified by agreements like the Kyoto Protocol and the 2015 Paris Climate Agreement. The study aimed to evaluate the impact of carbon credit programs on human development within Kenyan communities and their associated ecosystems, focusing on the Mikoko Pamoja Blue Carbon Initiative (MPBCI) as a case study. The research objectives included documenting the MPBCI's implementation approach, assessing its benefits, and identifying challenges in its implementation. The study employed an exploratory research design, combining quantitative and qualitative methods. Questionnaires with both closed-ended and open-ended questions were administered to community members involved in the MPBCI, supplemented by key informant interviews to validate findings. Snowball sampling was used to select participants, resulting in data collected from thirty respondents and insights from five key informants. Data

analysis involved descriptive statistics for quantitative data and content analysis for qualitative insights, presented with illustrative quotations. The findings highlighted the community-centered and inclusive nature of the MPBCI, benefiting the Gazi Bay community. Community engagement and leadership were identified as critical factors for the initiative's success and sustainability. However, the project had limited direct economic impact, with most community members benefiting indirectly through community development projects. It improved access to essential services, such as water, education, and healthcare, and fostered social cohesion. Women's empowerment was evident, driven by alternative income opportunities and increased participation in leadership roles. Ecologically, the initiative led to increased fish stocks, mangrove cover, and a cleaner environment, with behavior changes among community members towards responsible environmental practices. Nonetheless, challenges included transparency issues, conflicts, inadequate job opportunities, insufficient income from carbon credits, funding shortages for community projects, and poor management of established income generation initiatives. The study's recommendations emphasized the importance of comprehensive community awareness programs on carbon credits, climate impacts, and emission reduction projects to foster cooperation and prevent disenfranchisement. Strategies to enhance carbon credit generation and income diversification were proposed, along with the development of a well-defined sustainability plan in collaboration with relevant organizations to secure lasting benefits for future generations.

ACKNOWLEDGEMENT

First and foremost, I extend my deepest appreciation to the Almighty for granting me the strength, resilience, and wisdom to undertake this endeavor. Without His grace, none of this would have been possible.

I am profoundly indebted to my thesis supervisor, Dr. Francis Khayundi, whose guidance, expertise, and support have been instrumental in refining my research and shaping my academic growth.

To my father, Mr. Wilson Muruku, your unyielding belief in my abilities, your boundless encouragement, and the unwavering support you provided have been my anchor throughout this journey. Your constant belief in me have been my driving force, and I am eternally grateful for your presence in my life.

I extend my heartfelt thanks to my greater family for their encouragement, understanding, and patience during my Master's program. Your love and support have been my pillars of strength.

To all my friends and peers who have shared this journey with me, thank you for the camaraderie, the late-night study sessions, and the shared laughter that made this journey memorable.

Lastly, to everyone who has contributed, directly or indirectly, to my growth and success, thank you for your role in shaping me into the person I am today.

DEDICATION

I dedicate this work to my beloved family, with a special acknowledgment of my father Mr. Wilson Muruku Kamau, who has been a steadfast pillar of support, encouragement, and guidance throughout my entire academic endeavor.

TABLE OF CONTENTS

LIST OF FIGURES

ABBREVIATIONS

ACMI	Africa Carbon Markets Initiative
BCEs	Blue Carbon Ecosystems
CBA	Cost-Benefit Analysis
CDCF	Community Development Carbon Fund
CDM	Clean Development Mechanism
CER	Certified Emissions Reduction
CFA	Community Forest Association
CIEL	Center for International Environmental Law
CPA	Component Project Activities
COP21	2015 United Nations Climate Change Conference
CO_2	Carbon Dioxide
tCO2e	Carbon Dioxide Equivalent
DNA	Designated National Authority
FSD	Financial Sector Deepening
GDP	Gross Domestic Product
GHG	Greenhouse Gas
ICROA	International Carbon Reduction and Offset Alliance
IGAs	Income Generating Activities
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
KNBS	Kenya National Bureau of Statistics
KEPSA	Kenya Private Sector Alliance
LDCs	Least Developed Countries

MPBCI	*Mikoko Pamoja* Blue Carbon Initiative
MPCBO	*Mikoko Pamoja* Community Based Organisation
MRV	Monitoring, Reporting, and Verification
NACOSTI	National Commission for Science, Technology and Innovation
NEMA	National Environment Management Authority
NRT	Northern Rangelands Trust
PDD	Project Design Document
PES	Payment for Ecosystem Services
PFMP	Participatory Forest Management Plan
PoA	Programme of Activities
REDD	Reducing emissions from deforestation and forest degradation in developing countries
UNDP	United Nations Development Programme
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
USAID	U.S. Agency for International Development
VCM	Voluntary Carbon Market

CHAPTER 1:

INTRODUCTION

1.1 Overview

This chapter focuses on the problem under study and encompasses the study's background, and problem statement, as well as the research objectives, questions, justification, and scope. Additionally, it includes definitions of key terms relevant to the study and as such presents the fundamental aspects that lay the foundation of the study.

1.2 Definition of Terms

1.2.1 Carbon credits

Carbon credits are certificates that can be traded, granting the holder permission to release a specific amount of carbon dioxide or other greenhouse gases within a defined time frame. Each carbon credit is equivalent to one ton of carbon dioxide or the same amount of another greenhouse gas, referred to as carbon-dioxide equivalent (tCO_2e). This means that possessing one carbon credit prevents the emission of one metric ton of carbon dioxide into the atmosphere (Mezzanotte, 2019).

Carbon credits have their roots in the Kyoto Protocol and are exchanged within a system known as the carbon market, which encompasses four distinct market segments for trading carbon credits: the Clean Development Mechanism (CDM), Joint Implementation (JI), Emission trading, and the Voluntary Carbon Market (VCM) (African Development Bank, 2012).

1.2.2 Ecosystem

An ecosystem is a functional unit within the natural world, where living organisms engage in interactions with each other and their surrounding physical environment. These ecosystems vary significantly in size, ranging from small ponds to vast forests or oceans. Ecosystems are commonly categorized into two fundamental types: terrestrial and aquatic.

Terrestrial ecosystems include environments such as forests, grasslands, and deserts, while aquatic ecosystems encompass areas like ponds, lakes, oceans, wetlands, and rivers (Balasubramanian, 2018).

1.2.3 Co-benefits

Co-benefits in carbon offset/credit projects refer to positive impacts beyond reducing greenhouse gas emissions. These benefits encompass various aspects of daily life, including food, community, education, and the economy. Carbon offsets not only support universal climate action plans but also generate socio-economic advantages. These co-benefits typically overlap, occurring simultaneously as carbon emissions decrease. They can be categorized into four main groups: environmental, educational, economic, and social co-benefits (Secondnature, 2020).

1.2.4 Development

In the context of this study, development is a multi-faceted concept influenced by various authorities. The Kenya Climate Change (Amendment) Bill, 2023, articulates one dimension of development by emphasizing the importance of considering and enhancing the economic, social, and cultural well-being of local communities, thereby acknowledging the crucial role of community livelihoods in carbon credit projects (Kenya Ministry of Environment, Climate Change and Forestry, 2023).

However, the World Bank Community Development Carbon Fund provides for an expanded typology that encompasses five critical categories of development: improved local infrastructure, increased access to cleaner and affordable energy, enhanced income and employment opportunities, improved access to electricity and energy-efficient lighting, and betterment of natural resource management and environmental services (World Bank Group, 2011).

As such, this study explores the concept of development encompassing these five categories, taking into consideration socio-cultural factors and co-benefits. This comprehensive assessment aims to capture the developmental benefits derived from carbon credit projects, benefiting both human communities and the environment.

1.3 Background

1.3.1 Climate change

The United Nations (UN) in the United Nations Framework Convention on Climate Change (1992) describes climate change as a long-term shift in temperatures and weather patterns, on account of direct or indirect human activities that alter the composition of the atmosphere. The pursuit of economic progress and dominance, illustrated by the rapid industrialization of the global economy is at the centre of the rising phenomenon of climate change. As the world has intensified technological innovations and infrastructure amongst other forms of development, so has the rate of Greenhouse Gas (GHG) emissions spiked alarmingly (Wandadana et al., 2020).

The ecological impact of climate change is immense with evidence widespread across the ecosystem, including air, water, and land. Experts note a slight increase in global average temperatures can cause ripple effects that extend over long periods. According to the Intergovernmental Panel on Climate Change’s (IPCC) Working Group I Sixth Assessment Report released in 2021, the planet’s average surface temperature could rise by 1°C to 5.7°C by the year 2100. Consequently, the steady rise in global mean sea level count increased from 0.32 meters to 1.01 meters in the same period (National Climate Change Secretariat, 2023).

1.3.2 Impact of climate change

Over the next two decades, even a slight increase in average global temperatures could have dire effects on the planet, including increased risks of heat waves, droughts, and floods (IPCC, 2022). These climate hazards could exceed the tolerance of various animal and plant species, potentially leading to the destruction of endangered plant species such as trees and corals. The impacts of climate change extend to millions of people worldwide, particularly in Africa, Asia, and Central, and South America, where water and food insecurity are major concerns.

In Kenya, climate change has significant socio-economic and environmental impacts. The country experiences rising annual temperatures and changes in rainfall patterns, including shorter and unpredictable long rain seasons, as highlighted in the Kenya National Climate Change Action Plan (2018). Floods and droughts have already caused substantial damage, leading to a decline in Gross Domestic Product (GDP) growth, reduced crop and livestock production, and increased costs of electricity generation. The 2008-2011 drought alone cost the Kenyan economy KES 968.6 billion ($70,829,981.14 equivalent), resulting in a significant decrease in GDP growth.

Worse still, vulnerable communities, especially in arid and semi-arid lands, bear the brunt of climate change impacts. Floods and droughts displace people, contribute to food insecurity, and cause health problems. Coastal areas are also at risk from sea-level rise, which poses threats to infrastructure, tourism, and fishing industries. On the same breadth, women, children, the elderly, and people with disabilities are particularly affected due to limited access to resources (Ministry of Environment and Natural Resources - Kenya, 2016).

In regions such as Kwale County where the climate mitigation response program - *Mikoko Pamoja* Blue Carbon Initiative is implemented, the evidence of the impacts of climate change is visible. According to the Kwale County Government (2018), the coastal region has over the last four decades experienced increased temperatures and reduced precipitation thus exposing the county to higher drought risk, heat stress and dry spells. Additionally, the region is not new to floods due to intense rains that have historically characterized the county and are expected to be more frequent. Both phenomena have burdened the county further, presenting socio-economic development challenges such as low agricultural food production and loss of pasture.

As Ambrosino et al. (2021) note, the disruption of economic activities has led to the emergence of detrimental activities such as destructive fishing practices impacting reef habitats. It has further intensified deforestation with mangrove forests becoming the subject of massive destruction leading to a 45% loss of mangrove cover. As such, climate change is seen to have a compounding effect on the community at large.

1.3.3 Global approach to a global commons problem

Given the expansive global impacts of climate change, it has become apparent that this phenomenon is a global challenge. This means that its impacts transcend national boundaries and are felt across the globe, albeit not equally as Sosa-Nunez and Atkins (2016) note. Universally recognized as a global emergency, world leaders, both political and economic have come alive to the implications of climate change on the future of humanity and have thus found international cooperation paramount in developing sustainable solutions that lead to a significant reduction in greenhouse emissions as a primary contributor to global warming (Ferrari & Pagliari, 2021).

In response, the world has risen to the occasion, by taking a series of actions to mitigate the rapidly evolving impacts of climate change. Amongst these fundamental actions is the development of collective agreements for adoption by countries across the globe to mitigate climate change. As Raymond (2016) notes, one of these collective agreements is the historic Paris Climate Agreement (Accord) which was adopted by 196 parties across the world, in December 2015. Conceived at the UN Climate Change Conference (COP21) in Paris, France and brokered by the United Nations Framework Convention on Climate Change (UNFCCC), the primary objective of this agreement is to reduce global temperature rise by 2 Degrees Celsius, within the current century. A more ambitious goal of the agreement is to lower the increase further to just 1.5 Degrees Celsius. Limiting global warming to this level requires the world to achieve "net zero" by 2050 or at that every leader, to reduce carbon dioxide (CO_2) emissions by 50% of the current levels, by 2030 (Hartmann & Broom, 2020).

The Paris Agreement, a recent international agreement on climate change, has its roots in precursory meetings and agreements as highlighted by the Council on Foreign Relations (2021). The 1992 Rio Earth Summit was particularly important, as it led to some of the first international agreements on climate change that formed the basis for future agreements. One of these agreements was the UN Framework Convention on Climate Change (UNFCCC), which aims to prevent harmful human interference in the climate system, recognizes human activities as a contributor to climate change and identifies climate change as a global concern.

Ludeña et al. (2016) further highlight the 1997 establishment of the Kyoto Protocol at COP 3 in Japan which became the first binding treaty that required developed countries to reduce their emissions by 5% below 1990 levels, it created a system for monitoring countries' progress. The agreement's creation of carbon markets, which allows for emission units to be traded and sustainable development to be encouraged, is the hallmark of the agreement given that it transformed the global approach to climate action and mitigation as we know it today.

Carbon credits represent an innovative solution to address the challenge of balancing economic growth and environmental protection. Their foundation in the Kyoto Protocol of 1997 gave developing countries voluntary targets and support mechanisms, including the Clean Development Mechanism (CDM), to encourage their participation in emission reduction. CDM, along with Joint Implementation (JI) and International Emissions Trading, established the foundation for the international carbon market. The CDM allowed industrialized states to implement emission reduction projects in developing countries and generate Certified Emissions Reduction (CER) credits, also known as carbon credits. Each CER represents one metric ton of carbon dioxide that can be traded or sold to help industrialized countries meet their GHG emissions reduction targets under Kyoto (Mintz, 2022).

To date, carbon credits have seen significant traction as the avenue they provide many global industries to address the unique challenges that they face as they try to balance the need to provide value to populations across the globe while pursuing these economic ventures sustainably and in ways that safeguard the environment from harm. Many economic activities cannot be converted to carbon-free, at least not instantly. As such, carbon credits are based on a model that accounts for such realities where companies pay other entities to either capture their continued carbon emission or reduce them significantly (Hartmann & Broom, 2020) through alternative means. Through such agreements, companies can compensate for their emissions. This makes it possible to achieve net reductions in carbon emissions to the atmosphere as producing entities collaborate particularly with developing countries to reduce emissions through carbon credit contracts.

In Africa, the potential of the carbon market in 2022 led to the launch of the Africa Carbon Markets Initiative (ACMI) on the sidelines of COP 27 in Egypt (Africa Carbon Markets

Initiative, 2022). ACMI was conceived as a response to the challenges impeding Africa's optimal performance and its ability to fully harness the potential in this sphere. Spearheaded by a coalition of multinational entities such as the Bill and Melinda Gates Foundation, the U.S. Agency for International Development (USAID), and Verra - the world's largest verifier of carbon credits, among others, ACMI is purposefully designed to leverage the burgeoning Voluntary Carbon Market (VCM) and catalyze Africa's carbon retirements while simultaneously fostering the creation of millions of job opportunities. Additionally, the initiative aims to elevate the integrity and quality of carbon credits originating from Africa and ensure the equitable distribution of carbon credit revenue across the region (Africa Carbon Markets Initiative, 2022).

The motivations behind the establishment of ACMI, demonstrate the duplicity of the carbon market. Despite the seemingly novel solutions provided through carbon credit and trading arrangements, the approach is not short of challenges and loopholes hence subject to critical reservations by authors such as Coelho (2015) who deem them ineffective on account of their tendency to drive resources away from political actions and technological innovations that can forestall fossil fuel extraction and burning. The same author labels carbon trading at large as unjust, undemocratic, and unethical thus necessitating further investigation into their effectiveness and impact.

1.3.4 Kenya and climate change action

In 2016, Kenya made history by taking a pioneering role in developing the first dedicated framework for climate change law on the continent. Termed the Kenya Climate Change Act 2016, the law provides a regulatory framework aimed at improving national response to climate change and incorporating strategies for a more sustainable and resilient approach with reduced carbon emissions (Wambua, 2019). This move has since paved the way for the country to establish more enabling mechanisms seeking to minimize climate change risks further and optimize the country's access to opportunities. Some of these enabling mechanisms and actions as outlined in the Kenya National Climate Change Action Plan (2018) include the Climate Change Act (No. 11 of 2016) enacted in May 2016; the National Climate Change Policy approved by Parliament in February 2018; Climate Change Fund Regulations enacted in Garissa (2018), Makueni (2015), and Wajir (2016); National Climate Finance Policy approved by Parliament in 2018.

Kenya's proactive action in the global climate change mitigation sphere has seen it emerge as the leading implementor of carbon credit projects in the continent. As the National Climate Change Action Plan (2018) shows, the country had as of 2016 registered 16 CDM projects and 16 programmes of activities in sectors such as reforestation, energy efficiency, geothermal, wind and hydro. Similarly, Kenya has participated actively in the voluntary carbon market by hosting two notable initiatives: the Kasigau Wildlife Corridor Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) Project, which was the first to issue voluntary forestry carbon credits, and the Kenya Agriculture Carbon project, which was the first project on the continent to issue carbon credits for carbon sequestration in soil.

Among Kenya's most recognized carbon credit programs is the *Mikoko Pamoja* Blue Carbon Initiative. Rolled out in 2012, the community-led project focused on the conservation and restoration of mangrove ecosystems in southern Kenya, specifically in the Gazi Bay area of Kwale County. The project aims to incentivize long-term mangrove protection and restoration through community engagement and benefits (Plan Vivo Project, 2020). According to the project's 2022 Annual Report, the estimated carbon benefits derived from the project, including avoided deforestation, prevented forest degradation, and new planting, are approximately 2500 tonnes of carbon dioxide per year with income invested in local projects (Plan Vivo, 2022).

The Kenya Private Sector Alliance ([KEPSA] 2021), underscores the significance of carbon credit schemes in Kenya’s economy noting that the country, between 2016 and 2021 released 26 Metric Tonnes of carbon offsets which is higher than any other African nation and equivalent to around 20% of the continent’s total credits. Moreover, President William Ruto highlighted the importance of Kenya's carbon trading initiatives and described carbon credits as a significant export for the country during the launch of the Africa Carbon Markets Initiative at COP 27, underscoring its significance at a national governance level (Wachira, 2021).

Despite this, critical questions emerge today on the efficacy of carbon trading schemes. This especially follows investigations by top global dailies (The Guardian, 2023 and Die Ziet, 2023) into Verra, the world's leading carbon standard for the rapidly growing $2bn (£1.6bn) voluntary offsets market where it has several projects under its belt among them the Kasigau Wildlife Corridor REDD+ project in Kenya. Investigations showed that Verra's rainforest offset projects bore no evidence of deforestation reductions and that 94% of the credits had no benefit to the climate. Further, human rights issues emerged as a serious concern, particularly in relation to the REDD Project (Greenfield, 2023). Moreover, Ludeña et al. (2016) note that the impact of carbon markets on developing countries is small and not extensively studied.

1.4 Statement of the Problem

Improving the livelihoods of communities in developing countries is one of the dimensions of sustainable development that many carbon projects strive to promote. In fact, this is the formal objective of ‘Clean Development Mechanism’ (CDM) projects regulated internationally under the Kyoto Protocol, and the stated objective of many voluntary projects implemented outside of formal international regulations. As such carbon credit schemes are seen as key contributors to the development of communities in transitional and developing economies wherein, they provide a variety of direct and indirect benefits not limited to cheaper and healthier energy, forest and biodiversity protection and incomes for local people; subsequently contributing to national social and economic development priorities.

Despite this, there is ongoing debate regarding the effectiveness of carbon credit projects in achieving their intended sustainable development objectives. Concerns have been raised about their actual impact on reducing carbon emissions and the potential costs borne by the communities involved. A notable example is the Kasigau Wildlife Corridor REDD+ project in Kenya, where recent investigations have questioned the validity of estimated carbon offsets and highlighted potential infringements on the human rights of pastoralist communities, who are the intended beneficiaries of the project. As carbon credit programs continue to gain momentum in Kenya and interest as a potential revenue stream, it thus becomes essential to scrutinize their efficacy and impact as drivers of development at national and local levels, thereby necessitating further investigation.

In this regard, this study focused on the award-winning *Mikoko Pamoja* Blue Carbon Initiative as a case study. It aimed to document the project's implementation along the southern coast of Kenya and assess its impact on the development of local communities and ecosystems. Additionally, the study sought to identify challenges faced during implementation and provide recommendations that could enhance carbon credit programs on a broader scale in Kenya. By examining the *Mikoko Pamoja* Initiative, this research purposed to offer valuable insights to advance the effectiveness and impact of carbon credit initiatives in the country.

1.5 General Objective

This study sought to determine the impact of carbon credit programs on human development within local Kenyan communities and their associated ecosystems, with a particular focus on the *Mikoko Pamoja* Blue Carbon Initiative as a case study.

1.5.1 Specific Objectives

More specially, the study aimed:

a) To document the implementation approach of the *Mikoko Pamoja* Blue Carbon Initiative (MPBCI).

b) To assess the benefits of MPBCI.

c) To establish the challenges encountered in the implementation of MPBCI.

1.5.2 Research Questions

a) How does the implementation approach of the *Mikoko Pamoja* Blue Carbon Initiative contribute to its overall effectiveness and impact on the involved communities?
b) How effectively has the *Mikoko Pamoja* Blue Carbon Initiative delivered its intended benefits?
c) What are the key challenges faced during the implementation of the *Mikoko Pamoja* Blue Carbon Initiative?

1.6 Justification

While developing countries contribute the least to global emissions, compared to their developed counterparts, the former are worst hit by the effects of climate change. A 2018 report by the Kenya National Bureau of Statistics (KNBS) revealed that Kenya loses 2 – 2.4% of its Gross Domestic Product (GDP) from the adversities of climate change. Other reports paint a gloomier picture, indicating that factors such as drought will, on average, lead to an 8% GDP loss every half a decade (Obulutsa, 2021). As such, carbon credit initiatives provide a lifeline as they increase accountability and responsibility among top carbon-emitting countries in curbing global warming.

Further to the above, while carbon credit programs are promoted as a tool for addressing climate change, research is yet to adequately address their effectiveness in this regard and more so the extent to which they indeed lead to the sustainable development of involved communities based on existing program models and implementation approaches. At the same time, carbon credit programs despite their attractive attributes suffer a slow rate of adoption among developing countries hence begging the question, why?

In view of this, this study positions itself to build on existing knowledge on the efficacy and actual potential of carbon credit programs to drive the development of local communities in the global south and mitigation of climate change. Additionally, the study potentially assesses the barriers and opportunities for the adoption and diversification of carbon credit initiatives in Africa and Kenya and identifies the best practices for successful implementation. It further contributes to the body of knowledge on the impact of international cooperation on addressing climate change, particularly in developing countries.

The findings of this study are relevant for policymakers, international organizations, national governments, and local communities seeking to enhance the effectiveness of carbon credit programs in promoting sustainable development and addressing climate change. Outcomes are useful in equally catalyzing the development of effective strategies for achieving the net-zero goal and ensuring sustainable development and subsequently driving greater reception of carbon credit programs among developing countries, particularly in Africa.

1.7 Scope of the Study

To achieve its research objectives, this study relied on data obtained from local communities, institutions, and experts involved in the implementation of carbon credit initiatives. The study specifically focused on Gazi Bay Village, which Makongeni village, is one of the primary implementers of the *Mikoko Pamoja* Blue Carbon Initiative. This initiative has demonstrated profitable gains and a perceived positive impact on the people in this region. The Gazi and Makongeni communities have a significant population, estimated at around 5,400 inhabitants, who are mainly categorized as poor to low-income earners. The community, along with project implementing partners and subject matter experts from the government, constituted the target population for this study.

1.8 Thesis Organization

This study is structured into five chapters. Chapter 1 introduces the study's background, problem statement, research objectives, questions, justification, and scope, establishing foundational elements. In Chapter 2, the literature review examines carbon credit project implementation, its potential impact on development, and obstacles hindering success. Theoretical frameworks, carbon credit concepts, development parameters, and knowledge gaps are discussed.

Chapter 3 outlines the research methodology including design, population, sampling, data collection, analysis methods, and ethical considerations.

Chapter 4 presents the findings of the study's exploratory research on carbon credit project impact. It addresses implementation approaches, effects on local communities and the ecosystem, and challenges faced.

Chapter 5 concludes the report. It discusses the main findings, draws conclusions based on objectives, and provides recommendations. This section offers insights into the study's outcomes, followed by implications for future research directions.

CHAPTER 2:

LITERATURE REVIEW

2.1 Introduction

This chapter presents relevant literature on the implementation of carbon credit projects, the potential impact of such projects on the development of implementing countries and communities, as well as the obstacles that hinder the successful execution of carbon credit initiatives. The review commences with the theoretical framework, followed by an overview of literature discussing the concept of carbon credits and its association with development. Furthermore, it defines the scope of development as per the parameters of this study and proceeds to assess the literature relevant to the research objectives of this study. Finally, it concludes with a summary of the identified research gaps.

2.2 Theoretical Framework

This study is founded on two theories of international relations, namely realism and liberalism.

2.2.1 Realism

Realism, as a classical theory of international relations, offers insights into the impact of power inequality between states on shaping global climate change policy (Khan, 2016). The slow progress in climate change interventions can be attributed to disagreements over costs and responsibility sharing among signatories to the United Nations Framework Convention on Climate Change (UNFCCC) (Khan, 2016). Realism posits that in an anarchic world, rational actors seek to maximize their interests based on political power. This theory traces its origins to Thomas Hobbes in the 17th century, who described a lawless "state of nature" where individuals are in constant conflict (Gold & McGlinchey, 2017).

According to realism, nations strive to expand their political and economic power to ensure their survival and success (Gold & McGlinchey, 2017). This pursuit of power is the driving force behind social, economic, and political ventures. The history and current reality of climate change support the existence of an "international community" underpinned by self-regarding states (Carlarne & Helal, 2018). However, Carlarne and Helal (2018) argue that humanity remains primarily tribal, creating and justifying authority that benefits specific groups within jurisdictions.

The challenge in global climate change policy lies in reconciling the self-preserving nature of states with the need for collective action. Realism is evident in the resistance of developed countries to legally binding commitments despite acknowledging the adverse impacts of their carbon emissions on developing nations (Carlarne & Helal, 2018). The reluctance of political and economic superpowers to bear the larger costs of reducing greenhouse emissions hinders transformative actions.

Overall, realism provides a framework for understanding the dynamics of power inequality and its impact on global climate change policy. The theory highlights the self-interested nature of states and the challenges in achieving collective action to address climate change.

2.2.2 Liberalism

While the historical conduct of developed nations in the climate change issue aligns with elements of realism, current efforts to address global warming are best understood through the lens of liberalism in international relations. Liberalism promotes international cooperation and a cohesive world order without relying on direct force (Norwich University Online, 2017). Organizations like the United Nations foster liberal values through initiatives such as climate conventions, encouraging nations to collaborate in mitigating climate change.

While self-preservation remains a factor, it is increasingly evident that reducing carbon emissions necessitates international cooperation, shared responsibilities, resources, and values. The Kyoto Protocol, adopted in 1997, exemplifies global cooperation as industrialized countries committed to proportional greenhouse gas (GHG) emission reductions (United Nations Framework Convention on Climate Change, 2018). The principle of "common but differentiated responsibility and respective capabilities" recognizes that developed countries contribute more to GHG emissions. Furthermore, the 2015 Paris Agreement, endorsed by nearly 200 countries, and the net-zero pledges of over 1000 global firms demonstrate the widespread support for climate change initiatives (Blaufelder et al., 2021). Carbon These examples embody the principles of liberal internationalism.

Thus, while realism may explain past actions, the current global efforts to combat climate change align more closely with liberal internationalism. Cooperation shared responsibility, and the pursuit of common goals characterize the approach taken by nations and organizations in addressing the challenges posed by climate change.

2.3 Literature Review

2.3.1 Carbon credits: Exploring the concept and its relationship to development

Carbon credits are traded in carbon markets among various entities with a view to reducing carbon emissions. The concept of carbon credits operates within the framework of the Clean Development Mechanism (CDM), an international policy instrument established under the 1997 Kyoto Protocol. According to Article 12 of the protocol, the CDM allows developing countries to earn certified emission reductions (CERs), with each CER equivalent to one tonne of carbon dioxide (The Kyoto Protocol Mechanisms, 2010).

Through the CDM, developing countries can generate carbon credits through various projects that reduce greenhouse gas emissions or enhance greenhouse gas removals while at the same time stimulating their development. Examples of such projects include renewable energy projects (e.g., solar), energy efficiency initiatives (improved or energy-saving cookstoves) and forestry projects (avoided deforestation, reforestation) among others. One of the stated objectives of these projects is to contribute to the sustainable development of the countries implementing them. In particular, improving the livelihoods of impoverished individuals in developing countries is a key aspect of sustainable development that many carbon projects strive to promote. This objective is formally established within the CDM projects regulated internationally under the Kyoto Protocol and is also emphasized in voluntary projects implemented outside of formal international regulations (World Bank, 2012).

The *Mikoko Pamoja* Blue Carbon Initiative aligns with the developmental angle of the CDM and serves as a prime example of the influence of carbon credit projects on development. This initiative focuses on the protection and restoration of mangrove forests to generate carbon credits. The funds raised from the sale of these credits are utilized for community development projects in the Gazi Bay area. Further, the project aims to drive holistic development by supporting education, health, water and sanitation, and environmental conservation using the generated funds. Moreover, it seeks to generate additional benefits beyond carbon, including increased fishery and biodiversity, shoreline protection, and the development of nature-based livelihood projects such as beekeeping and mangrove ecotourism (Plan Vivo, 2020).

2.3.2 Defining the Scope of Development

As illustrated above, one of the stated primary objectives of CDM projects, which aim to reduce carbon emissions, is to facilitate the sustainable development of host countries. Sustainable development, as defined by the United Nations (1987), refers to "development that meets present needs without compromising the ability of future generations to meet their own needs." However, defining sustainable development within the context of CDM projects has proven to be controversial (Sun, 2011).

Sun notes that while quantitative methods, such as Cost-Benefit Analysis (CBA) of co-impacts/benefits have been employed to assess the economic, environmental, and social impacts associated with climate change mitigation activities beyond greenhouse gas reduction these have remained inconclusive at best.

More recent studies highlight the evaluation of CDM projects in terms of sustainable development as an ongoing challenge. Ottonelli et al. (2023) attribute this challenge to varying definitions of sustainable development across different countries. Each host country applies its criteria, resulting in subjective requirements and indicators that are difficult to verify. Furthermore, some countries equate sustainable development solely with economic growth.

In the context of this study, the Kenya Climate Change (Amendment) Bill, 2023, includes provisions related to the regulation of carbon markets. Article 23E of the bill, under Part IV A on Regulation of Carbon Markets, mandates that projects conducted under the act should consider and aim to improve the economic, social, and cultural well-being of the surrounding community (Ministry of Environment, Climate Change and Forestry, 2023).

However, Nate Hultman et al. (2020) suggest that this perspective may be overly limited and fail to encompass significant qualitative contributions. To address this, Hultman et al. propose a five-category typology based on the World Bank Community Development Carbon Fund's definition. This typology includes enhanced local infrastructure, access to cleaner and affordable energy, improved income and employment, improved access to electricity and energy-efficient lighting, and improved natural resource and environmental services. Hence, this literature review focuses on these five categories alongside socio-cultural factors to comprehensively assess the benefits of carbon credit projects and align them with the provisions outlined in Kenya's Climate Change Bill.

2.3.3 Implementation approach of Carbon Credit Projects

There are two types of carbon markets within the carbon industry that allow for the development of carbon credit projects and the subsequent generation of carbon credits. These are compliance markets (also known as mandatory markets) and voluntary markets (Carbon Market Watch, 2020).

CDM projects follow a project-based implementation approach with two key requirements. First, they must demonstrate that their emission reductions are additional to a Business-as-Usual situation, meaning they go beyond what would have happened without the project, demonstrating their additionality (Ecofys, 2014). Secondly, CDM projects are expected to contribute to the sustainable development of the host country. The economics of the projects can be improved by selling the resulting carbon savings. Implementing renewable energy projects like wind or biomass, introducing energy-saving light bulbs, and implementing forestry methods to store carbon are all qualifying examples of projects for the CDM. A crucial aspect of CDM projects is the Project Design Document (PDD), which outlines the likely greenhouse gas emissions development if the project were not implemented and presents a monitoring plan to assess the project's emissions (Kreibich et al., 2016).

On the other hand, Voluntary Carbon Markets (VCM) operate within the framework of the Paris Agreement's rules and mechanisms, even though the United Nations does not directly oversee voluntary actions. As they develop their capacity to regulate carbon markets, certain nations may adopt preventative measures, such as governance frameworks and monitoring, reporting, and verification (MRV) of results. Transparent regulatory signals are necessary to guarantee high-quality credits and promote investment (London School of Economics, 2023).

VCMs are a private-sector approach to addressing climate change outside the United Nations (UN) climate change regime. In VCM, projects are developed and verified following voluntary standards that outline the rules and criteria.

Organizations continuously develop and monitor these standards, issuing verified carbon credits. Third-party verification ensures that projects comply with the standards. Independent carbon credit registries keep a transparent record of verified projects and issued credits to prevent double counting. In simple terms, VCM allows companies and organizations to voluntarily offset their carbon emissions by supporting projects that reduce greenhouse gases, and they receive verified carbon credits in return (Lang et al., 2018).

While the CDM has dominated the African market (although with a low degree of adoption) in comparison to other regions around the world, VCMs are beginning to gain traction so much so as leading to the establishment of the Africa Carbon Markets Initiative (ACMI), whose aim is to build a vibrant and robust voluntary carbon market in the continent (African Carbon Markets Initiative, 2022).

According to the Eastern Africa Alliance On Carbon Markets and Climate Finance (2023), a total of 501 Clean Development Mechanism (CDM) activities have been successfully registered in Eastern Africa. Among these, there are 52 single project activities and 449 component project activities (CPA) operating within 61 Programme of Activities (PoA). Notably, more than 31.9 million certified emission reductions (CERs) have been produced by

36% of all CDM initiatives in the area. Improved cook stoves (38%), run-of-river hydro projects (23%), and water purification (16%) are the main industries that contribute to these CERs. In a similar vein, the region has 299 activities that have been recognized under the major voluntary carbon market standards, including Gold Standard, Verra, and Plan Vivo. Over 73.6 million credits have been issued as a result of these VCM activities (Eastern Africa Alliance On Carbon Markets and Climate Finance, 2023).

Projects involving blue carbon can be implemented under either the CDM or the VCM, depending on the chosen methodologies. These projects utilize blue carbon ecosystems (BCEs) like mangrove forests, seagrass meadows, and tidal marshes to store carbon while offering additional benefits like coastal protection and improved fisheries (Macreadie et al., 2021).

Globally, the *Mikoko Pamoja* Blue Carbon Initiative is recognized as one of the most successful blue carbon projects. The initiative is a mangrove restoration and reforestation project in Gazi Bay, Kenya. It aims to restore mangrove ecosystems, enhance carbon sequestration, and promote sustainable income for the local community. The community has entered into a Payment for Ecosystem Services[1] (PES) agreement with Plan Vivo (2020), which manages the carbon credits. Mikoko Pamoja is managed through GOGACOFA a local Community Forest Association (CFA) established under the Kenya Forest Conservation and Management Act (2016). This CFA is entrusted with co-managing designated forest areas for desired goods and services and has played a key role in developing a participatory forest management plan (PFMP) for forests within and around Gazi Bay. The management agreement enables *Mikoko Pamoja* to sell carbon credits derived from the designated mangrove area. Mikoko Pamoja is

[1] Payment for Ecosystem Services (PES) – "a voluntary engagement that involves negotiation by sellers and buyers of ecosystem products and services through independent intermediaries" (Kagombe et al., 2018).

verified under the Plan Vivo System and Standards, a framework aimed at assisting communities in more sustainable natural resource management. This approach aims to generate benefits including climate, community, and biodiversity enhancements, achieved through payment for environmental services (Crooks et al., 2019).

The credits worth over US Dollars 12,500 each year are sold to public and private entities and the revenues are used for project implementation and community development. The project has successfully completed its first crediting period and hopes to expand its protected mangrove area. While the carbon credits only account for carbon stored in the mangroves, the project offers various benefits such as offshore fishery, biodiversity conservation, and coastal protection (Plan Vivo, 2020).

A key component in the implementation of emission reduction projects is public participation, particularly in relation to affected communities. Communities in the context of such projects can be defined based on their geographical proximity to project sites or their social interests and the extent of their impact on them (Nielsen et al., 2022). International human rights and environmental law, particularly Article 6 of the Paris Agreement, emphasize the importance of meaningful participation by interested and affected communities and individuals in both the design and implementation phases of carbon credit projects (Center for International Environmental Law [CIEL], 2021). CIEL recognizes public participation as a core policy pillar alongside grievance mechanisms and Social and Environmental Safeguards to protect human rights within the carbon market under Article 6.

In Kenya, public participation is highly regarded in various legislations, such as the Forest Management and Conservation Act 2016 and the Climate Change Act 2016, emphasise the engagement of local communities and minorities in environmental protection, monitoring, and benefit sharing (United Nations Environmental Programme, 2019). However, some studies raise concerns about the extent to which international law fully embraces participatory rights and the specific methods and standards for seeking stakeholder input on projects. For example, CDM rules have been criticized for providing a narrow definition of stakeholders, which excludes important human rights gatekeepers from the participatory process (Olawuyi, 2016).

Such limitations have led to the failure of some projects in upholding the human right of public participation. For example, the Kwale-Okpai CDM project in Nigeria, developed by multinational energy conglomerates to address gas flaring, faced human rights concerns due to its inadequate opportunities for stakeholder consultation and participation (Olawuyi, 2016).

The significance of public participation in developing and implementing carbon credit projects cannot be overstated. The World Bank (2023) emphasizes that this leads to better execution of mitigation strategies and adoption of alternative solutions, such as clean energy technologies. Furthermore, engaging local communities in program design and implementation results in more robust and effective projects. Experts in the sector, like Ceres (2022), recommend that investors seeking to meet net-zero targets through reduction portfolios ensure projects incorporate full and effective community participation, with equal access to resources and information to promote self-determination.

In their study on community-based forest ecosystem service management to reduce emissions, Muttaqin et al. (2019) similarly highlight the significance of public participation noting how efforts by Plan Vivo's *Mikoko Pamoja* Blue Carbon Initiative to involve the community, government, and private sector has increased the sense of ownership and motivation of local communities hence driving the achievement of development goals.

The governance framework of *Mikoko Pamoja* additionally strengthens its effectiveness in involving local communities and perspectives in its administration and activities. As Crooks et al. (2019) note, the project's operations are overseen by a 13-member committee chosen through democratic elections held in participating villages every two years during village consultative gatherings. This process ensures regional representation and gender equality, firmly positioning the community in a leading role.

2.3.4 Carbon credit projects and the development co-benefits for local communities

In 2014, a study was carried out by the International Carbon Reduction and Offset Alliance (ICROA) to investigate the effects of 59 carbon credit projects in Latin America, Asia, and Africa on sustainability co-benefits. The findings from this study revealed that each tonne of carbon dioxide offset can result in up to 664 dollars in additional economic, social, and environmental advantages. According to the International Carbon Reduction and Offset Alliance (2014), these advantages include the creation of jobs, increased household savings, better health, environmental preservation, investments in local economies, technology transfer, improvements to local infrastructure and training, and favourable effects on water resources.

Secondnature (2020) corroborates the potential impact of carbon offset/credit projects and highlights their potential to influence various aspects of daily life such as food, community, education, and the economy. The co-benefits of these projects can be broadly categorized into four areas: educational, environmental, economic, and social co-benefits.

On the educational front, carbon offset projects offer opportunities to enhance knowledge about carbon mitigation measures and climate change adaptation. They can contribute to improved climate literacy and environmental awareness within communities and regions, fostering other emissions reduction projects. The *Mikoko Pamoja* Blue Carbon Initiative serves as an exemplary educational tool, promoting environmental awareness and appreciation for mangrove forest resources in primary and secondary schools (Herr et al., 2019).

Moreover, carbon credit projects create the opportunity for economic co-benefits through the creation of employment opportunities within implementing communities. For instance, the *Mikoko Pamoja* project in Gazi Bay, Kenya, has given residents a source of income by creating both short-term and long-term job opportunities through the necessitation of roles such as program coordinators, forest rangers, and guards (Herr et al., 2019).

Moreover, such initiatives have the potential to address socio-economic challenges faced by both women and the broader community, particularly in disadvantaged and low-income settings. For instance, in these contexts, women often spend a substantial amount of time preparing meals for their families. However, traditional cookstoves lacking proper ventilation expose them to respiratory illnesses. Programs like the Clean Cooking Alliance intervene by providing them with improved and modern cookstoves, thereby enhancing the well-being and quality of life for women and children. The time and energy saved by these advanced cookstoves enable women to engage in alternative income-generating activities (Clean Cooking Alliance, 2020). In the Gazi Bay region of Kenya, the *Mikoko Pamoja* Blue Carbon Initiative efficiently meets the water requirements of 73% of local inhabitants by delivering water through designated points or direct household connections. This accomplishment is made possible by allocating 26% of the revenue derived from carbon credit sales to community development initiatives (Crooks et al., 2019).

Environmental co-benefits are similarly a key impact area for carbon credit projects. Implemented in the rural Mount Kenya region, where biomass fuel is the primary energy source, EcoAct's "Hifadhi-Livelihoods Project" aims to provide communities with affordable, clean, and efficient cookstoves, reducing firewood consumption and emitting less smoke. The project has led to annual savings of over 174,000 tonnes of carbon dioxide and a significant reduction in wood consumption by 40%. This has resulted in improved indoor air quality for 100% of project beneficiaries, along with other advantages such as reduced time spent collecting wood and a reliable income for local artisans trained in cookstove production and maintenance (EcoAct, 2022).

However, despite the potential benefits, several studies raise questions about the equitable distribution of these advantages and the effectiveness of certain projects in delivering them. These studies attempt to investigate the underlying causalities behind these concerns.

In their analysis of carbon credit projects under CDM, Nate Hultman et al. (2020) make two primary observations. First, they find that co-benefits vary depending on countries/regions and technologies; and two that Least Developed Countries (LDCs) benefit the least from such projects.

Variations among countries/regions are attributed to different interpretations of co-benefits and the priorities set by national governments. A study by Cole and Roberts (2011) illustrates this through a comparative analysis of Brazilian and Peruvian CDM projects examining the influence of a country's national priorities and institutional capacity on the delivery of co-benefits. Focused on the project types and the regulatory processes during the domestic Designated National Authority[2] (DNA) approval, the authors found that the Peruvian government placed a greater emphasis on local benefits, requiring DNAs to visit project sites and assess local development needs. Consequently, the Project Design Documents (PDDs) for

[2] Designated National Authority (DNA) - Under the Kyoto Protocol every country is required to set up a DNA which is a body that has been granted responsibility by a Party (to the UNFCCC) to authorize and approve participation in CDM projects. This is a requirement for a Party to participate in CDM.

Peruvian projects included detailed co-benefits that were expected to be delivered. In contrast, the Brazilian government aimed to attract foreign investment and boost the economy through job creation, resulting in PDDs with broad and vague language that lacked specific local benefits. As such, the study found that Peru's approach facilitated the delivery of co-benefits that aligned with local needs, such as employment generation, water purification, improving the local economy, and enhancing local infrastructure.

On the same breadth, the development co-benefits of carbon credit projects vary depending on the technology employed. Nate Hultman et al. (2020) find that large hydropower projects, for example, have been criticized for bringing negative impacts to local communities and are perceived to generate fewer co-benefits compared to small hydropower plants.

The authors base this on a case study that was conducted in Yunnan Province, China, that found that a CDM hydropower project resulted in the loss of land for local smallholders, benefiting wealthy provinces with high electricity demand while negatively impacting local communities. On the other hand, renewable energy projects like small hydropower and wind power are generally acknowledged as having the potential to generate more co-benefits for local communities. These projects are associated with benefits such as employment generation, income generation, improved access to energy, and better local air quality (Olsen & Fenhann, 2008).

However, it is notable that Least Developed Countries (LDCs) benefit the least from the CDM. Challenges such as small-scale projects, high transaction costs, and limited local capacity hinder the realization of co-benefits in Sub-Saharan Africa and other LDCs. The World Bank's study on the Community Development Carbon Fund (CDCF) further emphasizes the unequal distribution of benefits among local communities, with the poorest individuals often not fully benefiting from these projects (Boukerche et al., 2013).

Larsson and Orvehed's (2021) comparative study of carbon offset projects in Ethiopia, Kenya, and Uganda also highlights discrepancies between project visions and documented effects, revealing negative impacts on host communities and limited livelihood impact. While carbon credit projects are promoted as a win-win solution for emissions reduction and development co-benefits, the study highlights the hidden negative impacts on host communities. For instance, Norway's Green Resources, whose stated goal is to mitigate climate change through sustainable timber production, has been said to displace locals and disrupt their livelihoods. Additionally, the authors note that companies selling carbon credits benefit the most, while community members often receive negligible remuneration that they view only as a token of appreciation for helping the environment, consequently, income from carbon credits does not significantly improve the livelihoods of affected communities.

The literature above suggests that while various carbon credit projects hold the potential for substantial economic, social, and environmental impact, it is crucial to address concerns about the equitable distribution of these advantages and the effectiveness of certain projects. Studies examining the underlying causalities can help identify opportunities for improving the delivery and impact of co-benefits. To maximize the positive outcomes, governments, organizations, and project developers need to collaborate and prioritize local needs and sustainable development when designing and implementing carbon offset initiatives. This way, carbon credit projects can contribute not only to emissions reduction but also to the overall well-being and prosperity of local communities.

2.3.5 Challenges: Carbon credit projects

Carbon credit projects such as Forest Carbon Offsets which were developed under the CDM, work to reduce carbon emissions either through afforestation, avoided deforestation and better management of forest covers to increase their carbon storage. In their assessment of the challenges facing such projects, Pan et al. (2022) recognize social costs as one of the challenges that hinder their success. According to the authors, a contributing factor is land rights where local communities run the risk of losing control over their land. Sometimes, project developers make decisions without involving communities, who in turn do not get any money from the sale of carbon credits. Also, Indigenous Peoples often do not get the attention they deserve in these projects, which makes them less likely to participate. In some cases, Indigenous Peoples and local communities have been forced out of their homes in the forests, causing conflicts and problems for their way of life (Pan et al., 2022).

Cases in the Kenyan context give weight to this criticism. News reports have shed light on the questionable impact of carbon credit programs, such as the Kasigau Project implemented by Wildlife Works (Reuters, 2016). This project has been accused of benefiting landowners while depriving residents of the forest's resources, which they rely on for income generation. Additionally, the Northern Kenya Grassland Carbon Project managed by Northern Rangelands Trust (NRT) and utilized by Netflix and Meta to offset carbon emissions has been criticized for allegedly undermining the Borana people's customary grazing practices without obtaining their free, prior, and informed consent (Survival International, 2016).

In this regard, Pan et al. (2022) note that while some projects have rules to protect Indigenous Peoples' rights to their land, these rules are often not enough without bigger changes to land ownership. To make carbon credit projects successful and sustainable, there is a need to deal with these social costs and make sure everyone is treated fairly.

Unstable carbon prices are one of the socio-economic challenges facing carbon credit projects. Fluctuations in carbon prices can make it difficult to develop and sustain carbon offsetting projects. When carbon prices decrease, the high transaction costs associated with developing such projects make them financially unviable. Furthermore, unpredictable carbon prices increase investment risk and uncertainty, deterring potential investors who fear significant financial risks. The forestry carbon offset market's ex-post payment system for example (payment made after the offset has been generated) further exacerbates the problem, as the uncertainty in future prices discourages project supporters from participating in such a payment scheme (St-Laurent et al., 2017).

In the African context, the pricing issue takes on a different form. Research indicates that despite the potential benefits offered by various mechanisms like the Clean Development Mechanism and Voluntary Carbon Markets under the Kyoto Protocol, Africa has not derived as much advantage and has seen lower participation in related projects compared to other regions worldwide. For example, global carbon credit retirements under VCMs were estimated to be over US$700 million between 2016 and 2021. Out of this, Africa only accounted for 11% of total retirements in the same period (Africa Carbon Markets Initiative, 2022).

Bernard et al. (2017) partly attribute Africa’s woes to the absence of carbon pricing frameworks in Sub-Saharan Africa, the continent's struggle to secure conventional finance to kickstart projects, and a lack of sufficient capacity to tackle technical and procedural challenges.

According to the United Nations Framework Convention on Climate Change (2019), one of the main challenges hindering carbon pricing in Africa is the limited availability of financial resources to support emissions reduction projects. These projects are essential for stimulating national carbon markets. Additionally, the region lacks the required expertise and capacity to effectively develop and implement carbon pricing initiatives. This poses a significant obstacle, particularly for renewable energy and energy efficiency projects, which can bring about carbon emission reductions and sustainable development benefits for less developed countries in Africa. However, these projects require substantial initial capital investments before they can start generating power.

Other financial barriers include a lack of financial capacity from project developers, inadequate financial packaging of projects, and limited knowledge of how to sustain revenue streams from carbon credits. These carbon credit opportunities are new to most players in the region, presenting largely unexplored challenges and opportunities (McLellan, 2015).

Additionally, one of the major obstacles to Africa's carbon market is the continent's regulatory market. The complicated and ambiguous legal environment around carbon credit projects presents substantial obstacles for African carbon credit project developers, according to the Africa Carbon Markets Initiative (2022). The viability and execution of carbon credit projects are strongly impacted by regulatory barriers that differ significantly from country to country. One significant issue is the ownership of carbon rights; in certain nations, the state holds all carbon rights, making it necessary for private developers to gain authorization before they may sell carbon credits from their projects. It is also challenging to develop and demonstrate that a carbon project can protect carbon sinks for the necessary 25+ years and acquire the right to sell the resulting carbon credits because many African landowners depend on informal land tenure customs and lack official titles to their properties (Africa Carbon Markets Initiative, 2022).

Moreover, a number of challenges are encountered while validating and verifying carbon credit initiatives, particularly with regard to the accompanying costs. According to research, projects in Africa take a long time to complete (on average, 2–7 years depending on the project type) before the first carbon credits are issued. Due to the lengthy term, a sizable initial investment is required before any returns can be realized. Additionally, there is a continuing requirement for continuous monitoring and validation of carbon emission reductions or removals when these initiatives are operational. Unfortunately, this monitoring process can be expensive, especially if it calls for pricy equipment or techniques that are difficult to apply in an African setting. This is a significant barrier to entry into the carbon market and influences the price of CERs (Tay, 2015).

African projects face additional difficulties as a result of an unfavourable business climate. Eighty-five percent of African nations are ranked in the bottom half of the 2020 Ease of Doing Business Index (Africa Carbon Markets Initiative, 2022). Africa's ability to effectively engage in global carbon markets is hampered by this. The problem is further complicated by trade and investment restrictions, which restrict access to new technologies and raise investment risks in some African countries. These factors can potentially result in lower prices for Certified Emission Reductions (CERs). Furthermore, the policy environment in potential host nations may not be favourable for certain projects due to the high tax burden, high-interest rates, insufficient support for foreign direct investment, and uncertainty over fiscal policies, all of which add to the difficulties encountered (Bernard et al.,2017).

Kenya's legal landscape for carbon trading is built upon international laws and treaties, including the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement. The country also employs national mechanisms to facilitate carbon trading projects Mwania (2020). The Constitution of Kenya (2010) supports the implementation of carbon emissions trading, ensuring that treaties like the UNFCCC and the Kyoto Protocol are part of the country's law. Moreover, it guarantees the right to a clean and healthy environment, along with the mandate to protect the environment for future generations.

Further, the Kenya Energy Act of 2006 and 2019 empowers the Cabinet Secretary of Energy and Petroleum to explore clean energy mechanisms, including carbon credit trading. The Rural Electrification and Renewable Energy Corporation is assigned the role of promoting renewable energy sources, which includes carbon credit trading.

The Climate Change Act of 2016 is a significant legislation in Kenya, developed in collaboration with various stakeholders. It aims to reduce climate change risks and increase the country's access to opportunities. The Act establishes the National Climate Change Council, chaired by the Head of State, to oversee coordination and advisory functions. Additionally, it creates the Climate Change Fund as a financing mechanism to prioritize climate change interventions.

On account of its proactive action in the climate change mitigation sphere, Kenya has emerged as a lead implementor of carbon credit projects in the continent. According to the National Climate Change Action Plan (2018), by 2016, the country had successfully registered 16 Clean Development Mechanism (CDM) projects and 16 programs of activities. These initiatives span various sectors, including reforestation, energy efficiency, geothermal, wind, and hydro projects.

Additionally, a report by the Kenya Private Sector Alliance ([KEPSA],2021) indicates that Kenya has released 26 Metric Tonnes of carbon offsets between 2016 and 2021, which is higher than any other African nation and equivalent to around 20% of the total continent's credits. Furthermore, a Financial Sector Deepening (FSD) Kenya (2023) report acknowledges Kenya as a market leader, responsible for 23% of the value of carbon credit issuances in Africa.

Despite this achievement, FSD Kenya also notes that Kenya's current carbon credit production represents only a fraction of its total maximum annual potential.

Kenya's inability to fully harness its potential in the carbon market can in part be attributed to its inadequate regulatory framework. As experts have pointed out, the Climate Change Act of 2016 in Kenya falls short of adequately addressing carbon trading (Ongaji, 2023). According to FSD Kenya, the country's regulatory framework is limited, lacking essential laws, and as a result, carbon trading in Kenya is shrouded in opacity. They suggest that amending the Act to establish a clear framework for local buying and selling of carbon credits, along with implementing mechanisms to measure carbon absorption through reforestation, among other crucial provisions, is necessary to regularize and improve the business of carbon trading in Kenya (FSD Kenya, 2023).

In their assessment of carbon credit initiatives in Kenya, particularly those executed through the Payment for Ecosystem Services (PES) mechanism among them the *Mikoko Pamoja* Blue Carbon Initiative, Kagombe et al. (2018) echo the aforementioned challenges associated with these projects. Specifically, they emphasize gaps in policies and legislation, highlighting the lack of a comprehensive PES policy and legal framework to firmly establish PES management across relevant sectors. Furthermore, they point out the weak enforcement of existing laws and regulations. Additionally, the authors highlight insufficient engagement of stakeholders and limited awareness about PES at various levels, which hampers the optimal execution of related projects.

Kenya’s Ministry of Environment, Climate Change, and Forestry has acknowledged the deficiencies of the Climate Change Act of 2016, particularly its lack of provisions for engagement and participation in carbon markets, among other gaps. To address these shortcomings, the Ministry has acted this year by initiating amendments through the Climate Change (Amendment) Bill of 2023. The anticipated changes will include the creation of frameworks and rules pertaining to several issues, such as the creation, administration, application, and control of mechanisms to improve climate change resilience and low-carbon development for Kenya's sustainable growth. In accordance with international commitments, the bill will also offer guidelines on the creation and implementation of carbon markets and non-market approaches. Additionally, it will provide national and local governments, the public, and other stakeholders with policy guidance on carbon markets. To guarantee an equitable distribution of benefits, the bill will also establish benefit-sharing mechanisms in carbon markets (Ministry of Environment, Climate Change and Forestry, 2023).

2.4 Research Gaps

Based on the review of existing literature, it is apparent that there are notable gaps in the following areas, requiring further investigation.

2.4.1 Implementation of carbon credit projects

The actual impact of carbon credit projects on the sustainable development of host nations and communities is a significant research gap. Although these programs aim to support goals for economic, social, and environmental development, their effectiveness in reaching these ends is still not sufficiently examined, necessitating greater scrutiny of their concrete contributions.

Furthermore, it is clear that there are not many thorough studies evaluating the success of blue carbon programs.

These initiatives are not given enough attention despite their potential to sequester carbon and provide additional advantages like increased fisheries and coastal protection. Examining these projects' successes can provide insights into their widespread adoption and replication.

Additionally, it is critical to look into the extent to which national and international rules and regulations ensure meaningful public participation in carbon credit projects. Stakeholder consultation methods and implications for inclusion and human rights are inadequately investigated.

Additionally, there exists a critical need to investigate the extent to which international and national laws and regulations ensure meaningful public participation in carbon credit projects. The inclusivity and human rights considerations within stakeholder consultation processes remain insufficiently explored.

There is also a further need for research to assess the sphere of best practices for the involvement of local communities in the design and implementation of carbon credit projects. A better understanding of how effective community participation translates into improved project outcomes can serve as a reference point for future initiatives.

2.4.2 Carbon credit projects and their developmental co-benefits for local communities

It is essential to comprehend the direct impact of income generated from carbon credits on the livelihoods of affected communities. Research efforts must assess whether income derived from carbon credits substantially enhances the well-being of community members or merely assumes a tokenistic role.

Furthermore, it is necessary to look into the unintended negative effects of carbon credit schemes on host communities. The delivery of co-benefits should be closely examined in cases where it falls short of expectations, and in-depth research should probe the underlying causal reasons.

It is also evident that the equitable distribution of co-benefits among diverse stakeholders, especially within vulnerable communities, remains a relatively unexplored terrain. Research should explore whether such groups receive a fair portion of the advantages emanating from carbon credit projects.

2.4.5 Challenges: Implementation of Carbon Credit Projects

Further investigation on how social costs, such as the loss of land rights and community disempowerment, affect the effectiveness of carbon credit schemes is needed. Understanding the complexities of these challenges and identifying potential solutions is essential for the enhanced effectiveness of carbon credit schemes on involved communities.

Further to this, there is a need for more research to assess the equitable distribution of benefits stemming from carbon credit projects, particularly among local communities, landowners, and project developers. Investigating instances where benefits are not equitably distributed can provide valuable insights into the enhancement of fairness and equity.

2.5 Conclusion

In conclusion, this chapter draws attention to important gaps in the existing body of knowledge. These gaps highlight the critical need for further investigation and study, which is essential for gaining a thorough understanding of how carbon credit programs affect local Kenyan communities' human development and their environments.

CHAPTER 3:

METHODOLOGY

3.1 Introduction

This chapter covers the research methodology, including the research design, population, sampling frame, sample size, sampling design, data collection methods, data analysis methods, and ethical considerations adapted to carry out the research study. The study employed a qualitative approach to capture current information available on the social and economic impacts of the *Mikoko Pamoja* Initiative, as well as the challenges encountered in the implementation of this carbon credit project in Kenya's Kwale County.

3.2 Research Design

Researchers employ various research designs to guide their studies based on the nature of the research problem. In the context of this study, the exploratory survey research design was utilized. Guided by Saunders et al. (2009), this study aimed to investigate "what is happening," “gain new insights”, and “assess phenomena from a fresh perspective”. The chosen design was well-suited for the study as it facilitated a comprehensive exploration of Kenya's carbon credit landscape, particularly within the framework of the blue economy. This approach provided an opportunity to generate novel information in this field that remains potent for both research purposes and national development.

3.3 Research Approach

The study employed a mixed-methods approach, which allowed for both the generalization of findings and a more comprehensive understanding of the research problem. To gather data, a combination of quantitative and qualitative methods was used. According to Thyer (2010), quantitative research methods involve collecting and analyzing numerical data to examine relationships and patterns.

Qualitative research methods on the other hand involve the collection of non-numerical data and concentrate on understanding the underlying meanings, perspectives, and experiences of individuals or groups. As such, quantitative and qualitative data were collected through the administration of questionnaires containing both close-ended and open-ended questions. Additionally, key informant interviews were conducted to collect qualitative data, which served to validate the quantitative findings. Furthermore, the study utilized secondary research to supplement primary research findings and address gaps that emerged during data collection.

3.4 Population of the Study

The study was conducted in Gazi Bay, located on the southern coast of Kenya, approximately 50km from Mombasa in Kwale County. The population of the study comprised 5,400 residents who primarily consisted of community members actively involved in implementing and benefiting from the *Mikoko Pamoja Blue Carbon Initiative.* On the same breadth, the study also considered other stakeholders crucial to the project and the resolution of the research problem. These stakeholders included partner institutions, local and national authorities, as well as marketers involved in the initiative.

3.5 Sample Size and Sampling Design

This study employed the snowballing sampling technique. Snowball sampling is a non-probability sampling method where initial participants are selected based on their relevance to the research topic and then asked to recommend additional participants who also fit the study's criteria (Bhattacherjee, 2012). This process is repeated until the desired sample size is reached. Hence snowball sampling was used in this study to arrive at a sample size of 40 respondents.

3.6 Data collection

In this study, primary data was collected using a questionnaire. The questionnaire ensured consistency in the way questions were asked and allowed for comparisons of responses across participants. It also allowed respondents to remain anonymous and was easy to administer. The questionnaires included both structured and semi-structured sections, consisting of close-ended and open-ended questions. Close-ended questions were used to gather quantitative data, while open-ended questions were employed to collect qualitative data. The questionnaires were researcher-aided, meaning that the researcher asked the questions and recorded the responses. This approach was chosen based on the respondents' preference and considering the low literacy levels in the study area.

The questionnaires were organized into several sections aligned with the research questions. These sections included demographic information (Section A), awareness and familiarity with the *Mikoko Pamoja* Blue Carbon Initiative (Section B), economic benefits of *Mikoko Pamoja* (Section C), social benefits of *Mikoko Pamoja* (Section D), ecological benefits of *Mikoko Pamoja* (Section E), and challenges encountered in project implementation and recommendations (Section F).

To gather additional data, key informant guides were utilized. The key informants included the Project Lead from the Kenya Marine and Forestry Research Institution, the *Mikoko Pamoja* Project Coordinator, and an official representative from Zero Emissions, one of the project's carbon credit buyers. The key informant guides facilitated in-depth information gathering. Interviews with the informants were conducted either face-to-face or via telephone and involved semi-structured interview questions. Prior consent was obtained, and the interviews were tape-recorded for later transcription. The informant guides primarily consisted of information-based questions.

3.7 Data Collection Procedure

The data collection process began by acquiring the required permissions to collect data in the study area. This involved obtaining a research permit from the National Council for Science and Technology (NACOSTI). Subsequently, a research assistant was recruited and trained by the researcher to ensure consistency and accurate understanding of the questionnaire. In total, 30 questionnaires were administered to a diverse range of community members. Four key informant interviews, a combination of face-to-face and telephone interviews were conducted by the researcher and were recorded for reference.

3.8 Data Analysis

To ensure accuracy and proper organization for coding and tabulation purposes, the collected data was first edited. This was followed by a coding exercise to enable effective analysis. Statistical techniques for descriptive analysis were used to process and examine quantitative data using the Statistical Package for the Social Sciences (SPSS) application. The quantitative data was condensed using descriptive statistics like frequencies and percentages.

On the other hand, content analysis was used to evaluate qualitative data, where themes were identified from the information gathered and grouped in accordance with the specific questions they addressed. This was accomplished by utilizing Quirkos, a qualitative data analysis software that facilitated the identification and organization of patterns and themes. Moreover, illustrative quotes were included in the presentation of the findings to help illustrate and reinforce the themes that were identified.

3.9 Ethical Considerations

To comply with the ethical guidelines of research, the study obtained clearance from the Institutional Review Board of the United States International University - Africa and further accreditation from the National Commission for Science and Technology (NACOSTI). Prior to and during data collection, the respondents were provided with a comprehensive explanation of the study's objectives and scope. It was explicitly communicated to the participants that the data would solely be used for academic purposes, ensuring their privacy and confidentiality. Further, the respondents were assured that their identities would be protected when presenting the study's findings, maintaining their anonymity. As such, the study endeavoured to uphold the privacy of respondents through the use of aliases in the presentation of findings.

3.10 Limitations of the Study

The study encountered limitations during data collection, primarily due to the timing coinciding with a two-day cultural event at the data collection site. As a result, the questionnaire response rate did not meet the desired optimum, as community members' availability and willingness to participate in interviews were limited during this period. Additionally, the cultural event diverted their attention and time away from engaging in the study, further impacting data collection.

In the case of Key Informant Interviews, despite the researcher's repeated attempts, challenges arose in establishing contact and scheduling interviews with certain key informants. These difficulties led to unsuccessful follow-ups and hindered the acquisition of comprehensive data from these individuals. Consequently, the researcher identified substitute key informants to offer essential insights and concurrently bridged informational gaps by consulting relevant literature.

Furthermore, the study encountered a challenge related to low literacy among the majority of the community members. As a result, the researcher had to adopt an aided approach to assist participants in filling out the questionnaires.

CHAPTER 4:

FINDINGS

4.1 Introduction

This chapter presents the results of an exploratory study conducted to examine the influence of carbon credit projects on the development of local communities in Kenya based on a case study of the *Mikoko Pamoja* Blue Carbon Initiative (MPBCI). The study focused on three main research objectives: documenting the implementation approach of MPBCI, assessing the benefits of MPBCI and identifying challenges faced during its implementation. Additionally, the study aimed to identify ways to enhance the effectiveness of carbon credit schemes based on the lessons learned from these challenges.

The chapter is organized into three sub-sections: response rate, demographic profile, and findings aligned with the research objectives. The findings are further organized into themes that emerged from the analysis of the research study, providing a comprehensive overview of the study's outcomes and insights.

4.2 Response Rate

Response rate refers to the percentage of successfully completed questionnaires or interviews out of the total number administered or targeted (De Vaus, 2014). In this study, a total of 40 researcher-administered questionnaires were issued, and out of those, 30 were completed, resulting in a response rate of 75%. Additionally, the researcher successfully completed five Key Informant Interviews.

4.3 Demographic Profile of the Respondents

In assessing the impact of projects geared towards the socio-economic development of communities, the degree of change effected can to a great extent be determined by the demographic profile of the target population (Babbie, 2020). For the purpose of this study, it was essential to understand the demographic characteristics of men and women in Gazi Bay which provided a foundation for further analysis and understanding of the impact that the *Mikoko Pamoja* Blue Carbon Initiative has had in their development as well as understanding their interactions with the project and their perceptions of it. The demographic variables considered in this study were; age, occupation, education level, length of stay, and the average daily income of the respondents.

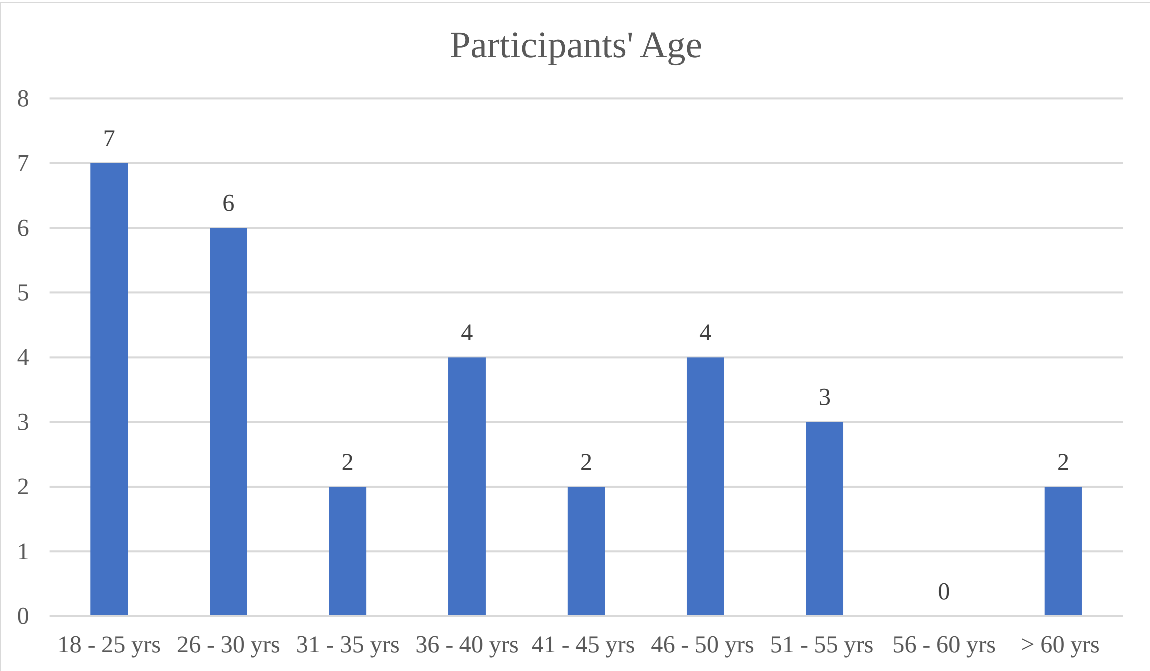

Figure 1: Age of Respondents

The findings revealed important demographic information about the respondents. The largest proportion (23%) fell within the age range of 18-25 years, followed by 20% in the 26-30 age group.

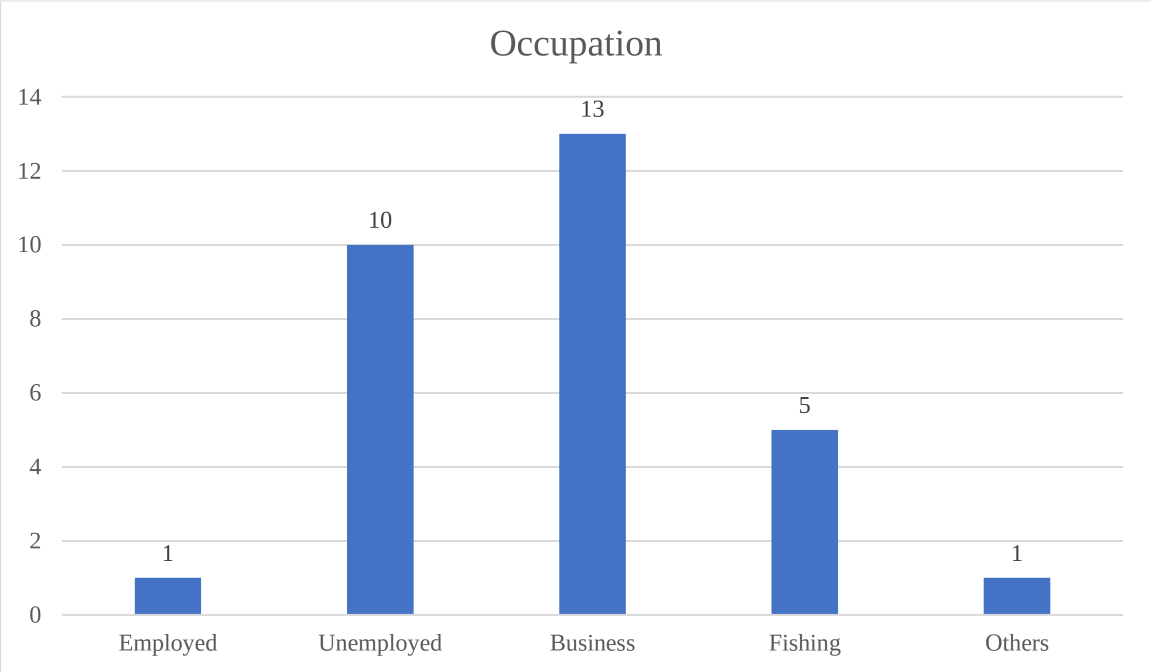

Figure 2:Respondents' Occupation

Among these respondents, the majority (53%) earned their livelihood through small business ventures, including fish supplies, catering, and logistics, among others while 30% were unemployed. These findings suggest that the *Mikoko Pamoja* Blue Carbon Initiative has had a limited impact on the livelihoods of community members in Gazi Bay.

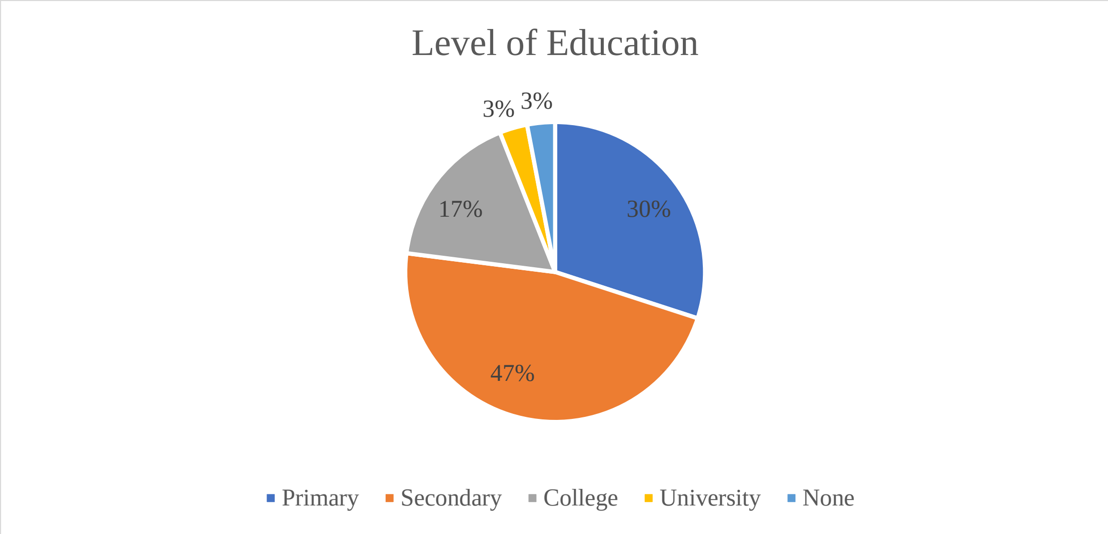

Figure 3: Respondents' level of education

Regarding education, 46.6% of the respondents have attained a secondary-level education, although most of them did not complete it. Another 30% have completed only primary-level education. A small percentage (16.6%) have attended college, while 3% have pursued higher education at the university level.

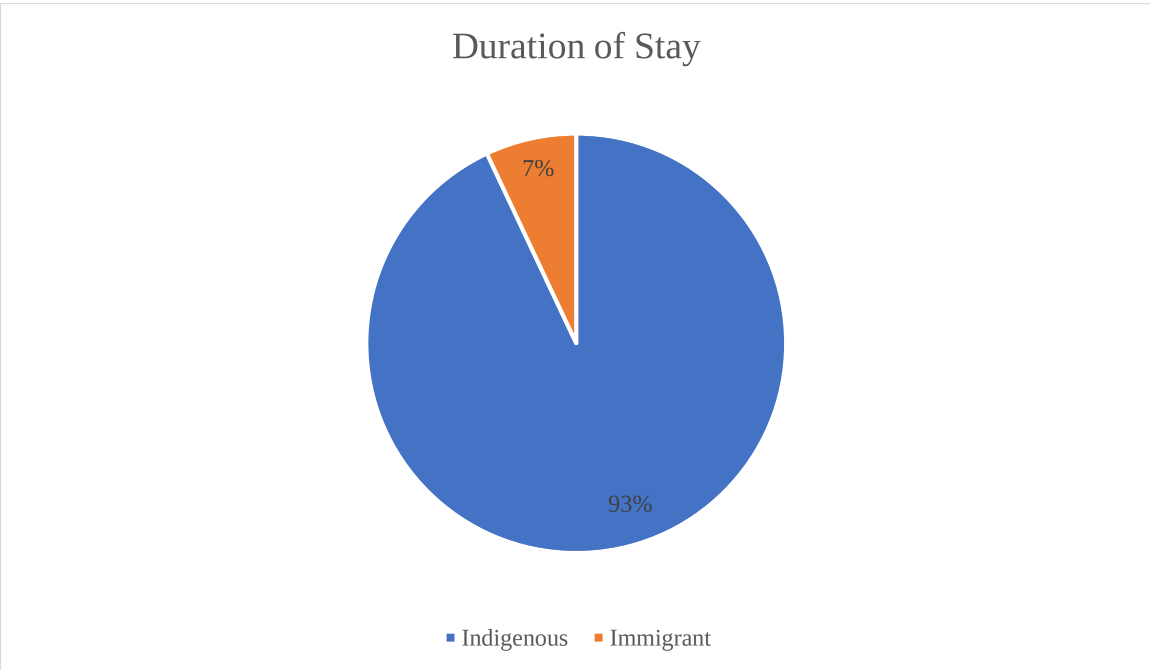

Figure 4: Respondents' duration of stay

In terms of length of stay, 93% of the respondents are indigenous residents of Gazi Bay, suggesting a strong local population. Only a minority (7%) reported immigrating to Gazi Bay, with reasons for relocation primarily being marriage rather than the pursuit of economic opportunities. As such, this finding suggests that the *Mikoko Pamoja* Blue Carbon Initiative has had a limited economic impact on the growth and attractiveness of the Gazi Bay area.

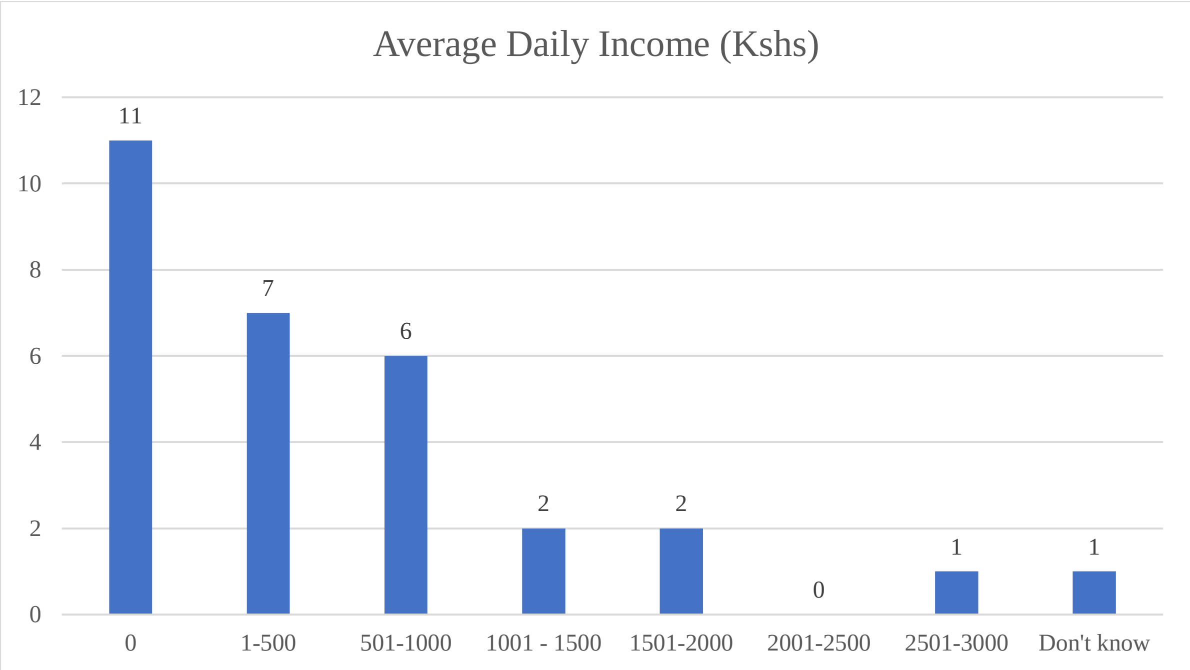

Figure 5: Average daily income of respondents

The *Mikoko Pamoja* Blue Carbon Initiative has had a limited impact on the incomes of community members in Gazi Bay, as evidenced by the fact that the majority (60%) reported having no regular income, with the next largest group (23%) earning between Kshs. 200 to Kshs. 500 per day. These income levels place most respondents well below the international poverty line set by the World Bank Group (2022), which stands at $2.15 per day. Only a few respondents managed to surpass this threshold. This paints a picture of the standard of living among Gazi Bay's community members, indicating potential struggles in meeting their basic needs.

4.4 Findings

4.4.1 Knowledge of the Mikoko Pamoja Blue Carbon Initiative

The assessment of knowledge and familiarity levels with the MPBCI involved querying various aspects. These aspects included knowledge of the project, including its year of initiation, project goals, and stakeholders. Additionally, factors that could potentially influence their knowledge, such as personal involvement in project activities, understanding of the project's implementation model, and community involvement in project leadership, were also examined.

a) Knowledge of Mikoko Pamoja

In the assessment of knowledge regarding the *Mikoko Pamoja* Blue Carbon Initiative, it was found that all respondents were aware of the initiative. This was evidenced through their responses where all of them recognized and acknowledged the project’s existence.

When asked about the goals of the project, the majority of responses centred around helping the community, conserving mangroves and the environment, and generating and selling carbon credits. These responses are to a great extent in line with the project’s objectives. These objectives include facilitating community development in the Gazi Bay area by using funds raised from the sale of Plan Vivo Certificates for projects that benefit the local community. The project also aims to restore degraded mangrove ecosystems through community policing to prevent illegal harvesting and local expertise in planting seedlings. It aims to generate carbon benefits and ecological improvements such as better fisheries, wildlife habitats, and coastal protection. Additionally, the project promotes sustainable income-generating activities related to mangroves, such as beekeeping and ecotourism (Plan Vivo, 2020). Hence, it can be said the respondents overall displayed a general familiarity with the project.

However, when questioned about the various stakeholders involved in the project, 83% of the respondents confirmed their knowledge, but the majority could only mention the Kenya Marine and Fisheries Research Institute (KMFRI) and the community itself. Only a few respondents identified other stakeholders such as the Association for Coastal Ecosystem Services (ACES), Plan Vivo, the Kenya Forestry Service, the county government and other institutions involved in various capacities. Additionally, the majority (93%) of the respondents could not explain the operations, contractual/ management agreements, community development agreements and other foundational and operational features of the Mikoko Pamoja Blue Carbon Initiative including the benefit-sharing arrangement. This indicates that while community members are generally aware of the project, their understanding of the operations of the project is limited.

One of the Key Informants, however, shed more light on the operations of Mikoko Pamoja, noting that the initiative was managed through a community-based organization with a defined benefit-sharing framework.

"Mikoko Pamoja is a community-led initiative that aims to conserve mangroves through the sale of carbon credits. The project started selling carbon credits in 2013 in the voluntary market. The project is mainly run by three groups; Mikoko Pamoja Community Organization (MPCO) which is made up of local villagers from Gazi Bay and Makongeni and is mandated to oversee the implementation of project activities; the Steering Group (made up of KMFRI, KFS, WWF among others) that provides technical advice and assistance voluntarily to MPCO and the Association for Ecosystem Services (ACES). ACES helps us to market the carbon credits generated. After sales, the money is sent to Mikoko Pamoja where we have a sharing structure: 6% is meant for validation and verification after every 5 years, 32% for community

development projects, 36% for restoration, 21% for community wages and 5% which is meant for office expenses," Key Informant 1. [3]

In view of the above, the study concluded that while all respondents knew about the *Mikoko Pamoja* Blue Carbon Initiative, there were variations in their understanding of specific details. Community members displayed a general familiarity with the project's existence and its broad goals such as generating carbon credits, environmental conservation through the regeneration of mangrove cover and avoided deforestation as well as contributing to community development through the channelling of proceeds from the sale of carbon credits to development projects benefitting the whole community. Nonetheless, the community had limited knowledge about the stakeholders involved and the operational aspects of the initiative.

b) Community involvement in the leadership of the Mikoko Pamoja Blue Carbon Initiative

Majority (93%) of the respondents confirmed the involvement of community members in the leadership of the initiative. This involvement is attributed to the establishment of the *Mikoko Pamoja* Community Organization, which consists of elected community members serving as committee members. These committee members are responsible for overseeing the implementation of the project. The committee members are elected every two years, ensuring the engagement of different community members in the leadership of the project.

> *"Community members are elected as committee representatives every two years and alternate between Makongeni and Gazi Bay villages," Respondent 1 .*[4]

[3] Key Informant 1 is a community member of Gazi Bay, one of Mikoko Pamoja's implementation sites and is involved in the day-to-day operational activities of the project.
[4] Respondent 1 is a community member and member of MPCO.

The involvement of community members in leadership is further supported by the appointment of a community member as MPBCI's Project Coordinator and the authority granted to the community in making decisions on the usage of funds from the sale of carbon credits.

> *"Community members are elected to join the leadership committee; and the program employs some community members at the management level for example the project coordinator," Respondent 5*[5].

In view of this, a key finding from this study was that a significant proportion of the respondents are actively involved in project activities, either through committee membership or participation in community initiatives. This demonstrates a strong sense of community engagement and ownership. However, it is important to recognize that personal choice and individual circumstances can also influence levels of involvement. Overall, the active participation of community members contributes to the success and sustainability of the *Mikoko Pamoja* Blue Carbon Initiative.

4.4.2 Social benefits and governance

The evaluation of social benefits and governance elements of the *Mikoko Pamoja* Blue Carbon Initiative (MPBCI) encompassed various aspects. These markers included the project's contribution to social cohesion, community involvement in activities, sharing of benefits, conflict, access to/provision of social amenities, alignment with community priorities, participation in decision-making processes, and women empowerment. The subsequent section presents a summary of the study's findings categorized according to the emerging themes.

---

[5] Respondent 5 is a community member of Gazi Bay.

a) Social well-being

The findings of this study indicate the *Mikoko Pamoja* Blue Carbon Initiative has had a positive impact in enhancing access to social amenities, particularly water, schools, and healthcare. 100% of the respondents reported having access to water at home due to the intervention of the initiative, which involved the construction of three boreholes within the community.

Notably, the water project incorporated a sustainability component whereby each household is required to contribute Kshs.300 for maintenance and electricity expenses related to water pumping.

In concurrence, Key Informant 1 noted that the initiative has enabled over 70% of Gazi Bay residents to have access to clean water.

> *"Through Mikoko Pamoja, five water points have been established in Gazi Bay and Makongeni. These include boreholes and water tanks in common areas within the community," Key Informant 1.*

Furthermore, respondents highlighted other beneficial outcomes of the initiative. A significant number (85%) noted that the *Mikoko Pamoja* Blue Carbon Initiative had facilitated the construction of a classroom block within the local school and provided essential equipment to the local healthcare facility. Additionally, the initiative has supported youth sporting activities by purchasing uniforms, gear, and other necessary equipment. The project has further demonstrated its commitment to community welfare by distributing food (*Iftar*) to community members during the holy month of Ramadhan and overseeing the construction of a *madrassa* (Islamic religious school) equipped with a printer, paper, and other stationery.

" Construction of the madrassa was significant to us; our children can attend classes and have access to all the resources they require during exams. If Mikoko Pamoja had not intervened, we would have had to raise the money to construct the madrassa classroom ourselves and spent money in printing and photocopying during the exams," respondent 11.[6]

A foreign buyer of carbon credits from the *Mikoko Pamoja* Blue Carbon Initiative affirmed the confidence of buyers in the social impacts of the project on the lives of community members hence their continued support of the initiative.

"Through the annual reports from Plan Vivo, we see where the proceeds from the sale of carbon credits go and how this helps improve lives here. But at the same time, we as a company want to see with our own eyes how the projects work. We want to connect with and meet people in the project. We also like to see the impact. Being here I can tell that the proceeds make some difference," key informant 2.

The research study further revealed that all respondents (100%) agreed that the initiatives implemented under the *Mikoko Pamoja* Blue Carbon Initiative aligned with community priorities. This is seeing that community members themselves are actively involved in selecting projects for implementation, ensuring that the initiative serves their social development needs.

In summary, the research study found that the *Mikoko Pamoja* Blue Carbon Initiative has significantly contributed to the improvement and accessibility of social amenities, including water, education, and healthcare. The initiative's endeavours have extended beyond infrastructure development, encompassing support for youth sports activities, provision of *iftar*

[6] Respondent 11 is a community member whose children have benefited from the construction of the madrassa facility.

during Ramadhan, and the construction and equipping of a madrassa, thereby positively impacting the community's well-being and socio-development. Furthermore, implemented development projects align with the most pressing community needs and benefit community members equitably.

b) Social cohesion and conflict

Overall, the respondents overwhelmingly (83%) expressed the belief that the *Mikoko Pamoja* Blue Carbon Initiative has significantly improved and strengthened the relationships among community members, and more so between the residents of Gazi Bay and the neighbouring Makongeni village, which is part of the initiative. This positive outcome was attributed to the design of the project, which has fostered integration through various activities such as community-driven clean-up initiatives, regular *barazas* (community meetings), and collective tree-planting activities.

Related to this topic is the issue of conflicts, and respondents were asked to assess the extent to which the *Mikoko Pamoja* Blue Carbon Initiative has caused disputes among community members in Gazi Bay. While 67% of the respondents indicated that no conflicts had arisen in the community as a result of the project, 33% did not affirm this and provided examples of situations where conflicts have consistently occurred. One such source of conflict is the election of community representatives to the *Mikoko Pamoja* Committee, where certain community members have strong preferences causing disagreements to arise. Another source of conflict relates to discussions about the allocation of funds generated from the sale of carbon credits, as community members often hold divergent opinions on which development projects should be given priority. Furthermore, the study revealed that some community members prefer the proceeds from carbon credits to be distributed directly to individuals rather than being channelled towards community development projects. Additionally, conflicts arise due to the

Mikoko Pamoja Committee's failure to involve the larger community in activities that should be carried out collectively.

> *" Lately, the committee has been selective about the individuals it involves in activities such as monitoring. Only they and some recurrent community members participate in this activity, yet this should be an activity that various community members benefit from time to time," respondent 20.*[7]

Worth noting is that the study revealed distinct conflict among some community members. Specifically, certain individuals believed that they should have the right to harvest mangrove trees for personal and economic purposes, despite the strict prohibition on such activities.

Overall, the study demonstrates that the *Mikoko Pamoja* Blue Carbon Initiative has successfully enhanced community relationships but has also given rise to conflicts in specific areas, such as committee elections, usage of carbon credit proceeds, community engagement, and the restriction on mangrove tree-cutting.

c) Women empowerment

In assessing the social impact of the *Mikoko Pamoja* initiative on the residents of Gazi Bay, a significant theme that emerged was women empowerment. Approximately 67% of the respondents acknowledged that the project had contributed to empowering women in Gazi Bay, while the remaining 33% held a contrary opinion.

The role of the *Mikoko Pamoja* Blue Carbon Initiative in women's empowerment was primarily linked to the Gazi Mangrove Boardwalk. The project's design document emphasizes the objective of promoting sustainable mangrove-related Income income-generating activities

[7] Respondent 20 is one of the youthful community members of Gazi Bay.

(IGAs) such as beekeeping and ecotourism (Plan Vivo, 2020). The boardwalk was established to provide women in Gazi Bay with an alternative source of income and is managed under the Gazi Women Initiative.

Women involved in the initiative earn eco-tourism fees from both local (Kshs.100) and foreign (Kshs.300) visitors and also benefit from catering opportunities when visitors come to the area.

Respondents also identified other ways in which the Mikoko Pamoja initiative contributed to women's empowerment. The project provided an opportunity for women to engage in leadership and decision-making, which was previously not common. This inclusivity is evident through the deliberate effort to ensure gender balance in the MPBCI committee and the opportunity for self-expression in community meetings (*barazas*) discussing the use of funds generated from the sale of carbon credits.

Furthermore, respondents highlighted that women are actively involved in community activities such as tree planting and beach clean-up, which provide them with an allowance.

> *"Initially, women were never involved in meetings now they are. They also participate in tree planting which was previously only done by men. Through the establishment of the mangrove boardwalk, women have the opportunity to make an income through ecotourism, their knowledge on conservation has also improved which they transfer to visitors and the community," respondent 19.*[8]

[8] Respondent 19 is a member of Gazi Boardwalk.

d) Community ownership and benefits sharing

The project's management structure consists of the *Mikoko Pamoja* Community Organization (MPCO), which is a registered Community Based Organization (CBO) comprising community representatives serving a two-year term. The MPCO is responsible for co-managing the mangroves in the project area and overseeing the project's implementation, including the utilization of funds generated from the sale of carbon credits for community development initiatives.

In line with this, two key themes emerged from this study. The first is the community-driven approach of the project, which has fostered community ownership and leadership in its implementation. 87% of the respondents confirmed their inclusion in decision-making processes, particularly in selecting community development initiatives. This inclusivity is attributed to the project's implementation model, which necessitates the organization of community barazas (meetings) to facilitate decision-making on project selection.

> *"No one else other than the community members can decide on what projects will be implemented, it is a collective decision, "respondent 8.*[9]

Additionally, 77% of the respondents stated that they are not excluded from participating in community activities carried out under the *Mikoko Pamoja* Blue Carbon Initiative.

> *"Before barazas are held, announcements are made around the village, market center and even mosque, so everyone is aware. Anyone who is not involved is by choice and is often busy with other things," respondent 25.*[10]

[9] Respondent 8 is a community member of Gazi Bay.
[10] Respondent 25 is a community member of Gazi Bay.

Another key finding is that benefits from funds raised from the sale of carbon credits are shared equally (93% assertion) across the community primarily because proceeds are channelled towards community projects rather than individuals. However, it was worth noting that, amongst the smaller percentage of respondents (7%) that did not think that benefits are shared equally, a key concern was the possibility that members of the MPCO committee, benefited more through allowances that they issued to themselves at different meetings.

Overall, the findings highlight the inclusive and community-centred nature of the *Mikoko Pamoja* Blue Carbon Initiative, where decisions are collectively made, community members actively participate, and benefits are primarily directed towards community development. These aspects contribute to the project's positive social impact and the empowerment of the Gazi Bay community.

4.4.3 Economic benefits of the Mikoko Pamoja Blue Carbon Initiative

In evaluating the economic advantages of the MPBCI, the study aimed to determine the extent to which the project had influenced the livelihoods of the Gazi Bay community. To achieve this, the study examined crucial indicators such as employment, household incomes, and other project initiatives that potentially contributed to an increase in income among the respondents. Findings revealed that 97% of the respondents were indirect beneficiaries of MPBCI, meaning that they were not directly employed under the project. Instead, they benefited from the community development projects implemented for the larger community. Only 13% of the respondents had a family member permanently employed under the project.

Regarding other economic opportunities provided by the project, the majority of the respondents (53%) were of the opinion that the project had not provided any. However, 47% of the respondents linked economic opportunities to factors such as community development projects, which helped them save money that would have otherwise been spent on contributions or other expenses. Additionally, engagement in activities like tree planting, clean-up activities, and monitoring provided opportunities for some individuals, especially the youth, to occasionally earn an allowance. One respondent noted that the project had resulted in increased fish stock, benefiting his business. However, only 11% of those who found that MPBCI had increased economic opportunities could directly link it to an increase in household income.

The study also assessed other potential income-generating activities resulting from MPBCI. Only 3% of the respondents pointed to eco-tourism through the Gazi Women Boardwalk Initiative. Overall, the study highlighted MPBCI's failure to significantly contribute to the economic development of Gazi Bay residents. Any perceived benefits were indirect, with no tangible impact on community members' livelihoods.

Furthermore, the study examined whether the introduction and implementation of the MPBCI had interfered with the livelihoods of community members. Findings showed that 80% of the respondents previously relied on the mangrove ecosystem for firewood and construction poles, but they no longer had access to these resources due to the ban on felling mangrove trees. The majority of respondents (57%) viewed the restriction on tree felling positively, acknowledging the positive impact on the mangrove ecosystem, fish stock, and marine habitats. The increased mangrove cover brought ecological benefits to the community, promoting eco-tourism.

> *"I find that it is okay for them to ban mangrove tree cutting. More mangroves have helped enrich the ecosystem with fish and bees; conservation promotes eco-tourism as people come to see different mangrove species at the boardwalk," respondent 19.*[11]

[11] Respondent 19 is a community member and small business owner.

At the same time, however, 20% of the respondents noted negative impacts, such as increased costs of living and construction expenses. They suggested having responsible cycles for mangrove tree-cutting instead of a complete ban.

"The restriction is not right, it took away economic opportunities from many without providing alternatives, and people have retrogressed economically," respondent 13.[12]

"The restriction has caused the quality of life for many to go backward. Mangroves are hardwood and provide high-quality wood that we sold as poles and other times as firewood. Many lost their livelihoods due to this restriction and no alternative has been provided since then," respondent 30.

In summary, the study revealed that while the MPBCI indirectly benefited community members through community development projects, it failed to effectively contribute to their economic development. The ban on tree felling, though viewed positively by a majority, had both positive and negative impacts on the livelihoods of Gazi Bay residents.

4.4.4 Ecological benefits of the Mikoko Pamoja Blue Carbon Initiative

Another crucial aspect in assessing the impact of the MPBCI on the Gazi Bay community members is the ecological and environmental benefits resulting from the project. The study examined factors such as changes in fish stock, mangrove cover, perceptions towards environmental conservation, and notable changes in behaviour among community members.

The findings of the study demonstrated that the conservation efforts of *Mikoko Pamoja* had led to an increase in fish stock, as reported by 80% of the respondents. This increase can be attributed to the reduced disturbance of the marine ecosystem through the prevention of

---

[12] Respondent 13 is one of the community members affected by the restriction on felling mangrove trees.

deforestation activities. Additionally, 100% of the respondents strongly agreed that the project had resulted in an increased mangrove cover in the Gazi Bay area. The project's conservation activities, including clean-up initiatives, had numerous ecological benefits, such as a cleaner environment facilitated by designated litter points, improved air quality despite the proximity to a titanium mining site, increased downpour during rainy seasons, and the regeneration and protection of mangrove species, as well as a reduction in soil erosion.

"The village is much cleaner now as the project has educated the community on the importance of keeping the environment clean," respondent 29[13].

Noting the impact of climate change in Kwale County such as reduced rainfall, particularly in the northern part of the county alongside the destruction of marine ecosystems as a result of human activity, key informant 4 noted,

"Mikoko Pamoja is important for Kwale County. It has helped us regenerate the mangrove cover, especially in Gazi Bay and improved the general quality of our environment. This is why we support its reafforestation initiatives; we contribute to the purchase of mangrove seedlings[14]*."*

Furthermore, all respondents (100%) reported adopting responsible behaviours as a result of the lessons imparted through the *Mikoko Pamoja* Blue Carbon Initiative. These behaviours included community sensitization on the significance of environmental conservation and mangrove protection, the utilization of alternative sources of wood fuel, active participation in community clean-up and tree planting activities, and the use of designated litter bins to

[13] Respondent 29 is a community member of Gazi Bay.
[14] Key informant for is a representative from the local (Kwale) county administration.

maintain a clean environment. These findings indicate the project's success in influencing behaviour change among the community members in Gazi Bay.

The ecological impacts of MPBCI are even more significant, as demonstrated by the United Nations Development Programme’s ([UNDP], 2020) case study on the project. Aligned with one of its primary objectives, which focuses on the restoration of degraded and depleted mangrove ecosystems in Gazi Bay, the MPBCI achieves this through community efforts to prevent illegal mangrove harvesting and the application of local expertise in mangrove seedling planting. Over time, this initiative has led to a substantial increase in the density of the community forest in protected areas, rising from 3,931 in 2014 to 5,560 in 2016.

Additionally, the project has exceeded its target by planting over 10,000 mangrove seedlings since its inception. Furthermore, in pursuit of its goal to generate carbon credits, the MPBCI has successfully avoided the emission of 12,000 tons of CO2 from 2013 to 2017.

In conclusion, the study highlighted the significant ecological and environmental benefits resulting from the Mikoko Pamoja initiative. The project's efforts in conserving the marine ecosystem, increasing mangrove cover, and promoting responsible behaviours have contributed to the enhancement of the Gazi Bay environment, including increased fish stock, a cleaner village, the adoption of sustainable practices by community members and avoiding emissions in the thousands.

4.4.5 Challenges encountered

The final objective of this study was to identify ways to broadly enhance the effectiveness of carbon credit schemes based on the lessons learned from the challenges encountered in the implementation of the *Mikoko Pamoja* Blue Carbon Initiative. Valuable responses were gathered during fieldwork, providing insights into the issues encountered.

The challenges identified by the community members include a lack of transparency between partners and the community, with insufficient information being shared by top officials. Transparency in the usage of funds is also a concern.

Speaking broadly on the key challenges facing carbon credit projects, a climate expert noted, "*These projects often involve foreign entities in communities with minimal understanding of carbon credits or climate change, which can lead to potential disenfranchisement. Full community awareness is crucial*," key informant 4[15].

Despite efforts to raise awareness, some community members persist in cutting mangrove trees, which undermines the conservation efforts of the project. Internal conflicts among committee members and disagreements during the decision-making process for development projects have been reported. Furthermore, the community feels that job opportunities are not prioritized for them, resulting in outsiders being employed instead. Additionally, the generated income from carbon credits falls short. This is attributed to the project's low carbon credit output. Limited financial resources have resulted in certain community projects being left incomplete. This has further restricted the range of feasible projects and also impeded the community's capacity to address emerging issues and concerns in an ongoing manner, as the funds are depleted upon the implementation of development projects.

[15] Key informant 4 is a climate change expert and professional in Kenya.

Key informant 2 mentioned, "*In the beginning, we bought the majority of the carbon credits being generated here, as much as 1,500 tonnes. Now we buy around 500. We would like to buy more, but there are so few credits. The initiative has found other clients that want to buy credits, so they have spread out more evenly between buyers. If there were more credits, we could buy them."*

Respondent 23[16] noted,"*The project generates about 2,000 tonnes of carbon credits per year. Given the population of Gazi Bay and Makongeni villages (5,400), this doesn't yield substantial resources, especially when returns need to be divided between the two villages for their respective development needs. Generating more carbon credits is necessary to achieve greater impact*."

Reports from other sources have pointed out that the ineffective management of the Gazi Boardwalk project poses a significant obstacle to its potential to generate substantial benefits for the community members. As noted by Runya et al., (2023), issues such as the boardwalk's deteriorating condition due to theft and vandalism, a lack of transparency in management, and limited marketing skills in promoting ecotourism activities have all undermined the long-term development of ecotourism as a significant alternative income source for community members. Additionally, these challenges are exacerbated by low levels of tourism, both from local and international visitors, as well as insufficient accommodation options for those visiting Gazi village.

[16] Respondent 23 is a member of the Mikoko Pamoja Community Organization.

4.5 Conclusion

In conclusion, this chapter presents a comprehensive overview of the research findings regarding the *Mikoko Pamoja* Blue Carbon Initiative's impact on the Gazi Bay community. The initiative has led to significant improvements in social amenities, such as water access, education, healthcare, and community welfare, thereby positively influencing the community's overall well-being. However, it has also given rise to conflicts and challenges, ranging from committee elections to the allocation of carbon credit proceeds.

The study underscores the inclusive and community-centred nature of the initiative, where decisions are collectively made, and benefits are channelled towards community development. While the initiative has successfully empowered women and fostered community cohesion, it has faced economic shortcomings, with limited direct impact on residents' livelihoods. Furthermore, the initiative's ecological benefits are noteworthy, with conservation efforts leading to enhanced fish stocks, a cleaner environment, and the adoption of responsible behaviours.

Lastly, this chapter acknowledges the lessons learned from challenges encountered in the *Mikoko Pamoja* initiative's implementation, suggesting the need for greater transparency, community awareness, and higher carbon credit output to maximize income generation and project completion as well as stronger management of eco-tourism initiatives for greater returns. These insights serve as valuable recommendations for the enhancement of carbon credit schemes and the effective implementation of similar initiatives in the future.

CHAPTER 5:

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides an overview of the research findings, including a discussion of the main findings, conclusions, and recommendations. The first section examines the study's findings. The conclusions are then presented and organized according to the study's objectives. Recommendations stemming from the research are also outlined, alongside suggestions for future studies.

5.2 Discussions

This section presents the study's findings, which are analyzed in relation to other relevant studies. The discussion is structured around the three main study objectives.

5.2.1 Implementation approach of Mikoko Pamoja Blue Carbon Initiative

The findings highlight the inclusive and community-centred nature of the *Mikoko Pamoja* Blue Carbon Initiative, where decisions are collectively made, community members actively participate, and benefits are primarily directed towards community development, ensuring equitable benefit sharing. This approach contributes to the project's positive social impact and the empowerment of the Gazi Bay community. The study further reveals that community members play an active role in the leadership of the initiative through elected committee members and the appointment of a community member as the Project Coordinator. This strong community engagement and ownership significantly contribute to the success and sustainability of the *Mikoko Pamoja* Blue Carbon Initiative.

Wylie et al., (2016) in their assessment of successful blue carbon projects based on global case studies cite the *Mikoko Pamoja* Blue Carbon Initiative as a classic benchmark. This is attributed, in large part, to the active involvement and support of the local community, which has actively participated in the project.

The involvement of community members is facilitated through the *Mikoko Pamoja* Community-Based Organization (MPCBO) which consists of elected members from Gazi Bay and Makongeni villages- both project implementation sites. The MPCBO plays a central role in the project, responsible for generating local support for mangrove conservation, managing carbon payments from the Payment for Ecosystem Services (PES) scheme, mobilizing community members, and executing community development projects. Decision-making for these projects occurs through open assemblies or barazas, allowing for public consensus. The CBO committee remains accountable to the community, ensuring transparency and proper utilization of funds for development initiatives. The MPCBO also raises awareness of conservation, encourages conservation activities, and ensures residents' compliance with conservation-related rules (Huff & Tonui, 2017).

Community members actively participate in barazas, suggesting, critiquing, or raising concerns about community development projects, further fostering transparency and community engagement. In 2022, for example, a total of 501 residents were engaged in a myriad of activities ranging from barazas, mangrove planting, forest surveillance, and environmental and biodiversity monitoring among other activities (Plan Vivo, 2023).

5.2.2 Benefits Mikoko Pamoja Blue Carbon Initiative

a) Economic benefits

The study reveals that the project had a limited direct impact on the economic development of community members. Instead, 97% of the respondents were indirect beneficiaries, benefiting from community development projects rather than direct employment. Only 13% had a family member permanently employed under the project. Economic opportunities provided by the project were perceived to be minimal, with only 47% of respondents linking them to factors such as community development projects and occasional earning opportunities through activities like tree planting, monitoring and clean-ups. Only 11% of respondents directly linked the MPBCI to an increase in household income. The study also revealed that the ban on tree felling, although viewed positively by the majority, had negative impacts on 20% of respondents who experienced increased costs of living and construction expenses. Overall, the MPBCI had a limited direct economic impact on community members, with perceived benefits being primarily indirect through community development initiatives.

In line with its objective of promoting sustainable Income Generating Activities (IGA) related to mangroves (Plan Vivo, 2020), the *Mikoko Pamoja* Blue Carbon Initiative in part assesses its impact based on the extent to which it provides community members with opportunities for private income through restoration and conservation-related employment (Abdalla et al., 2015). As such, relevant milestones feature in the initiative's 2014-2015 annual report (Abdalla et al., 2015), wherein short-term employment opportunities are available during mangrove restoration efforts, such as tree-planting, while longer-term positions, like forest guards and project coordinators, provide sustained employment prospects.

Despite these positive aspects, Wollring (2017) raises concerns that some community villagers feel that current alternative livelihoods and income opportunities are still limited. Additionally, Huff & Tonui (2017), during an interview with a local administrative officer, highlighted that the benefits received by community members and the MPCBO do not fully match what they are sacrificing. Price fluctuations in the carbon market contribute to this disparity, making it an unreliable source of funding. Consequently, the generated income falls short of covering essential administrative activities, to say the least. To address this issue, exploring and establishing alternative income sources becomes imperative (Huff & Tonui, 2017).

b) Social benefits

The Mikoko Pamoja Blue Carbon Initiative has had a significant positive social impact on the Gazi Bay community. The project has significantly improved access to water, schools, and healthcare for the Gazi Bay community with 100% of respondents reporting access to water at home through the construction of boreholes. The project has also supported the construction of a classroom block, provided equipment to healthcare facilities, and contributed to youth sporting activities.

The initiative has fostered social cohesion and strengthened relationships among community members, particularly between Gazi Bay and the neighbouring Makongeni village. This is attributed to activities such as community-driven clean-ups, regular meetings, and collective tree planting. However, conflicts have emerged in areas such as committee elections, allocation of funds from carbon credit sales, and community engagement.

Women empowerment is a notable outcome of the initiative, with approximately 67% of respondents acknowledging its positive impact. The Gazi Mangrove Boardwalk has provided women with alternative income-generating activities, particularly through ecotourism.

The project has also provided an opportunity for women’s involvement in leadership, decision-making, and community activities like tree planting, enhancing their participation and self-expression.

Various studies have provided evidence of the positive social impact of the *Mikoko Pamoja* Blue Carbon Initiative on the local community. Obegi (2018) assessed the impacts of blue carbon trading in Gazi Bay and found that *Mikoko Pamoja* has played a crucial role in catalyzing community development. This has been achieved through the implementation of various projects, such as water initiatives and the provision of books to local primary schools.

Hejnowicz et al. (2015) further support these findings by highlighting that *Mikoko Pamoja* operates an accredited Plan Vivo carbon credit scheme, generating US $13,000 per annum. A portion of this revenue is dedicated to community development projects, contributing to the improvement of the local area.

In a related context, Wanjiru (2017) emphasizes the significant contribution of these community development projects to enhanced water access in Gazi Bay. The region's water points are often affected by high salinity levels due to their proximity to the ocean, making them unsuitable for consumption. However, *Mikoko Pamoja* has emerged as a vital and reliable source of clean water for the community. The study reveals that a majority of residents either utilize *Mikoko Pamoja* water points or have installed *Mikoko Pamoja* water systems in their homes, ensuring improved access to safe drinking water for the community members.

Huff and Tonui (2017) highlight the significant role of M*ikoko Pamoja* in fostering cohesion among community members, emphasizing that funds from carbon sales have played a central role in bringing people together as a united community.

They emphasize that the success of the Payment Ecosystem Service (PES) scheme is crucial for maintaining local support and community-level compliance institutions, including formal governance structures like the Community Forest Association and MPCBO. These institutions, along with the social co-benefits derived from the project's carbon credits, consistently attract buyers and politicians, making them vital for the initiative's continued success. As such, the project is a pivotal driver of unity among community members and ensures the project's overall sustainability and positive impact.

The Gazi Women Mangrove Boardwalk constitutes a crucial element in *Mikoko Pamoja's* community-level project governance mechanism (Plan Vivo, 2020). Managed by a team of 28 female members, this group acts as the project's custodian on behalf of the Gazi Bay community. Revenue generated from entrance fees, commodity sales, and services is reinvested to maintain the boardwalk's structure, support community development projects, and sustain mangrove conservation efforts (Robert Mzungu Runya et al., 2023). Additionally, Herr et al. (2019) underscore the initiative's positive impact on women's empowerment, as they are enabled to earn income by guiding ecotourists through the mangroves near Gazi village centre and offering traditional Swahili foods prepared at their homes.

c) Ecological benefits

The Mikoko Pamoja Blue Carbon Initiative has had a significant positive ecological impact on the Gazi Bay community. The project has led to an increase in fish stock and mangrove cover, as reported by respondents. Conservation activities, including clean-up initiatives, have resulted in a cleaner environment, improved air quality, increased rainfall, and reduced soil erosion. The initiative has also successfully influenced behaviour change, with community members adopting responsible practices such as environmental conservation, participating in clean-up and tree-planting activities, and maintaining a clean environment.

Overall, the project has contributed to the enhancement of the Gazi Bay environment and the sustainability of ecological resources.

Herr et al. (2019) discuss the potential positive and negative impacts of coastal carbon offset projects, highlighting *Mikoko Pamoja's* significant contribution to Gazi Bay. The project's initiatives include promoting environmental awareness and recognizing the value of mangrove forest resources through educational programs in schools and community meetings. Consequently, the community has engaged in voluntary beach-cleaning efforts and participated in international artwork competitions focused on ocean conservation.

Furthermore, one of *Mikoko Pamoja's* objectives is to restore degraded and denuded mangrove ecosystems in Gazi Bay through community policing of illegal mangrove harvesting and local expertise in planting mangrove seedlings (Plan Vivo, 2020). The project aims to replant 4,000 mangrove trees annually (Herr et al., 2019), and in 2022, 1,500 Avicennia marina seedlings were sown during an enrichment mangrove planting activity. The Plan Vivo Project Design Document sets a target of restoring 0.2 hectares of mangroves in Gazi Bay annually (Juma et al., 2023), demonstrating *Mikoko Pamoja's* commitment to achieving this goal.

5.2.3 Challenges

The implementation of the *Mikoko Pamoja* Blue Carbon Initiative has faced several challenges, as highlighted by the community members. These challenges include a lack of transparency between partners and the community, leading to insufficient information sharing. Transparency in fund usage is also a concern. Despite awareness efforts, some community members continue to engage in mangrove tree cutting, undermining conservation efforts. Internal conflicts among committee members and disagreements during the decision-making process have been reported. The community feels that job opportunities are not prioritized for them, resulting in outsider employment. Insufficient income from carbon credits, possibly due to unfavourable pricing, and insufficient funds leading to incomplete community projects are additional challenges faced during implementation.

Agbonifo (2017) emphasizes the failure of CDM projects in achieving development and economic growth objectives, particularly in Least Developed Countries (LDCs). Despite potential benefits like green energy and employment opportunities, CDM projects have limited impact on economic development and fail to address the needs of local communities. The reliance on industrializing economies and Western firms further hinders poverty reduction and sustainable development, with most projects benefiting a few elites. In India and Nigeria, CDM projects have shown limited benefits for poverty alleviation and sustainable development.

Wylie et al. (2016) attribute the insufficient income from carbon credits to price fluctuations caused by an uncertain market. The small size of *Mikoko Pamoja* makes it challenging to attain economies of scale and sell at global carbon market prices, making it difficult to find buyers for the carbon.

Furthermore, Huff and Tonui (2017) cite illegal mangrove pole cutting as a major challenge facing the MPCBO, complicating the task of securing gazetted mangroves from illegal cutting and threatening carbon certification. Huff (2021) adds that while participation has been high, knowledge about carbon forestry remains uneven among community members. Some members of the MPCBO do not fully understand carbon offsetting and related concepts, leading to continued illegal mangrove harvesting despite sensitization efforts.

5.3 Conclusion

The *Mikoko Pamoja* Blue Carbon Initiative has demonstrated a positive impact on the Gazi Bay community, particularly in terms of social and ecological benefits. The community-centric approach, active involvement of community members, and the empowerment of women have contributed to the success and sustainability of the project. The initiative has improved access to water, healthcare, and education, fostering social cohesion and strengthening community relationships. It has also led to an increase in fish stock and mangrove cover, improved air quality, and reduced soil erosion, highlighting its positive ecological impact.

However, the implementation of the initiative has not been without challenges. Transparency issues, insufficient income from carbon credits and economic opportunities, as well as continued illegal mangrove harvesting pose significant obstacles to the project's effectiveness. Despite these challenges, the *Mikoko Pamoja* Blue Carbon Initiative serves as a benchmark for successful blue carbon projects, as recognized by Wylie et al. (2016). The strong community engagement, leadership by elected committee members, and the active involvement of the *Mikoko Pamoja* Community-Based Organization (MPCBO) have been vital in achieving positive outcomes. The project has also encouraged responsible environmental practices and behaviour change among community members, ensuring the conservation of ecological resources.

As such the *Mikoko Pamoja* Blue Carbon Initiative demonstrates the potential for community-driven projects to achieve significant social and ecological benefits. By addressing the challenges and building on its successes, the initiative can continue to be a model for development and conservation efforts in the future. Further research and evaluation are essential to monitor the project's long-term impacts and inform improvements for similar initiatives in other regions.

5.4 Recommendations

Drawing from the study's findings and conclusions, several recommendations are suggested for enhancing the implementation of the Mikoko Pamoja Blue Carbon Initiative and its developmental impact on local communities. These recommendations also offer valuable insights for the execution of carbon credit projects in Kenya.

5.4.1 Community awareness and education

This study found that community members had varying levels of understanding about the *Mikoko Pamoja* Blue Carbon Initiative, including its stakeholders, operations, and the broader carbon market. To bridge this gap, there is a need to invest in comprehensive community awareness programmes. These programmes should educate the community about key aspects such as carbon credits, climate change impacts, the initiative's goals, benefits, and stakeholders. This education will show how these factors, alongside community participation, contribute significantly to environmental preservation and livelihood protection. Increasing community awareness can help mitigate misconceptions and resistance, particularly towards impactful measures like the restriction on tree felling.

Considering the input from key informants, who stressed the importance of heightening local community understanding of carbon credits, this recommendation extends to the national level. This is crucial for the success of carbon credit projects and communities' ability to fully draw from their potent benefits. As such it is essential for the Kenya Ministry of Environment, Climate Change and Forestry to create a framework for spreading knowledge about carbon credits at both national and county levels and lead these efforts.

5.4.2 Carbon credit generation and income diversification

The study revealed that the income generated from carbon credits fell below expectations due to the project's limited carbon credit output. To tackle this issue, the initiative should consider strategies to boost carbon credit generation. This might involve expanding the project's area beyond the current 117 hectares to increase mangrove coverage and consequently raise carbon credit output. Exploring additional carbon offset opportunities could also be beneficial.

Moreover, for sustainable socio-economic progress, diversifying the community's income sources beyond the Gazi Boardwalk, which benefits only a portion of the population, is crucial. This diversification could encompass promoting local economic activities such as eco-tourism, sustainable agriculture, and small-scale enterprises. Introducing low-interest loan schemes to facilitate local business establishment and growth could improve community members' income, creating more value beyond the collective benefits of community development projects.

Additionally, enhancing the skills of community members through training and education would empower them to pursue new, marketable opportunities. This expansion of skills would open up greater prospects, allowing individuals to explore new economic activities and improve their income generation potential for themselves and their families.

5.4.3 Sustainability plan

The absence of a well-defined project sustainability plan poses a significant challenge to the initiative's long-term impact. To ensure the continuity of positive ecological and socio-economic outcomes, the initiative must proactively develop a comprehensive sustainability plan. This plan should encompass both environmental and community-focused aspects.

Strategies could involve capacity-building programs to equip community members with skills for sustainable natural resource management, offering incentives for responsible behavior and forest conservation, and exploring mechanisms to ensure the long-term regeneration of mangrove trees and the viability of carbon credit generation. Collaboration with relevant governmental and non-governmental organizations can provide support in creating and implementing the sustainability plan, ensuring that the project's benefits endure for generations to come.

5.5 Recommendation for further studies

Kenya is currently revising the 2016 Climate Change Bill. The Amendment Bill of 2023 seeks to improve the local carbon market by providing clearer guidelines and encouraging more public and private sector engagement, including public participation. Given this legal change, the study suggests doing more long-term research to understand how the *Mikoko Pamoja* initiative continues to make a difference. This research would consider the new legal changes and show how the project keeps benefiting the community as the legal landscape evolves.

REFERENCES

Abdalla, S., Kairo, J., Huxham, M., & Ruzowitzsky, L. (2015). 2014-2015 Plan Vivo Annual Report Mikoko Pamoja. Mombasa; Mikoko Pamoja Community Organization.

Ambrosino, C., Hufton, B., Nyawade, B. O., Osimbo, H., & Owiti, P. (2021). Integrating climate adaptation, poverty reduction, and environmental conservation in Kwale County, Kenya. African Handbook of Climate Change Adaptation, 2713–2731. https://doi.org/10.1007/978-3-030-45106-6_118

Africa Carbon Markets Initiative. (2022). (rep.). *Africa Carbon Markets Initiative (ACMI): Roadmap Report* (pp. 5–64). Africa Carbon Markets Initiative. https://www.seforall.org/system/files/2022-11/ACMI_Roadmap_Report_Nov_16.pdf

Agbonifo, P. (2017). The pursuit of climate protection and the uneven global distribution of Clean Development Mechanism (CDM) projects: Lesson from Least Developed Countries (LDC). European Journal of Sustainable Development, 6(1), 1–10. https://doi.org/10.14207/ejsd.2017.v6n1p139

Babbie, E. R. (2020). The practice of Social Research. Cengage Learning Asia Pte Ltd.

Balasubramanian, A. (2018). Ecosystem and its components. University of Mysore. https://www.researchgate.net/publication/314213426_ecosystem_and_its_components#:~:text=in%20the%20subject%20of%20ecology,a%20park%20or%20an%20aquarium

Blaufelder, C., Levy, C., Mannion, P., & Pinner, D. (2021, January 29). *A blueprint for scaling voluntary carbon markets to meet the Climate Challenge*. McKinsey & Company. https://www.mckinsey.com/capabilities/sustainability/our-insights/a-blueprint-for-scaling-voluntary-carbon-markets-to-meet-the-climate-challenge

Bernard, B., Wang'ombe, D., & Kitindi, E. (2017). Carbon Markets: Have They Worked for Africa. Review of Integrative Business and Economics Research, 6(2), 90–104.

Bhattacherjee, A. (2012). Social Science Research: Principles, methods, and practices. A. Bhattacherjee.

Boukerche S B, Dulal H, Brodnig G and Quesne B 2013 CDCF making an impact: carbon finance delivers benefits for the poor Working Report 77741 Washington DC, World Bank

Clémençon, R. (2016). The two sides of the Paris Climate Agreement. *The Journal of Environment & Development*, *25*(1), 3–24. https://doi.org/10.1177/1070496516631362

Carlarne, C. P., & Helal, M. S. (2018). A conversation about climate change law and the 'International Community.' *Climate Law*, *8*(3–4), 229–243. https://doi.org/10.1163/18786561-00803008

Climate Change Act, 2016. National Council for Law Reporting. https://www.kenyalaw.org/kl/fileadmin/pdfdownloads/2019/Acts/ClimateChangeAct_No11of2016.pdf, accessed 23 March 2023

Climate Change Action Plan (2018). Government of Kenya. http://www.kenyaclimatechange.org/wp-content/uploads/2018/02/Kenya-NCCAP-2018.pdf, accessed 03 April 2023

Constitution of Kenya, 2010. Kenya Law Reports. https://kenyalaw.org/kl/fileadmin/pdfdownloads/constitution/Constitution_of_Kenya_2010.pdf, accessed 14 April 2023

Coelho, R. (2016). The high cost of cost-efficiency: A critique of carbon trading. Berlin; Research Gate. https://www.researchgate.net/publication/309761670_The_high_cost_of_cost-efficiency_A_critique_of_carbon_trading

Counsell, S., & Survival International. (2023). *These people have sold our air* (pp. 2–74). Nairobi: Survival International. https://assets.survivalinternational.org/documents/2466/Blood_Carbon_Report.pdf

Dufrasne, G. (2020). (Rep.). *Carbon markets 101: The ultimate guide to global offsetting mechanisms* (pp. 1–12). Brussels: Carbon Market Watch. https://carbonmarketwatch.org/wp-content/uploads/2020/07/cmw-english-carbon-markets-101-the-ultimate-guide-to-market-based-climate-mechanisms-final-2020-web.pdf

FSD Africa. (2023). *How regulation hitches are limiting carbon trading*. FSD Africa. Retrieved 28, March, 2023 from https://fsdafrica.org/news/how-regulation-hitches-are-limiting-carbon-trading/

Gold, D. & McGlinchey, S. (2021). International Relations Theory. E-International Relations. Retrieved March 10, 2023, from https://www.e-ir.info/2017/01/09/international-relations-theory/

Government of Kenya . (2001). *Kenya government guidelines on the Clean Development Mechanism (CDM) of Kyoto protocol to the UNFCCC* (pp. 1–8). Nairobi: GOK.http://meas.nema.go.ke/cdm/download/Kenya%20National%20Guidelines%20on%20the%20CDM.pdf

Government of Kenya. (2023). The Climate Change (Amendment) Bill, 2023. Nairobi; GOK. https://www.environment.go.ke/wp-content/uploads/2023/03/26.3.23-climate-change-amendment-bill-2023.pdf

Greenfield, P. (2023, January 18). *Revealed: More than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows*. The Guardian. https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe

Ecofys. (2004). Introduction Guide Clean Development Mechanism Projects in the Early Transition Countries. London, United Kingdom; Ecofys.

Farand, C. (2023, March 30). *Analysis-Kenya Banks on carbon credits - but at what cost to communities?* Reuters. https://www.reuters.com/article/kenya-climate-carbonoffset/analysis-kenya-banks-on-carbon-credits-but-at-what-cost-to-communities-idUKL8N35N4EJ

Hartmann, T., & Broom, D. (2020). *What are carbon credits and how can they help fight climate change?* World Economic Forum. https://www.weforum.org/agenda/2020/11/carbon-credits-what-how-fight-climate-change/

Hejnowicz, A. P., Kennedy, H., Rudd, M. A., & Huxham, M. R. (2015). Harnessing the climate mitigation, conservation and poverty alleviation potential of seagrasses: Prospects for developing Blue Carbon Initiatives and payment for Ecosystem Service Programmes. *Frontiers in Marine Science*, *2*. https://doi.org/10.3389/fmars.2015.00032

Henshaw, K. (2023, May 24). *What are carbon credits?* Submer. Retrieved 11, June, 2023 from https://submer.com/blog/what-are-carbon-credits/

Herr, D., Blum, J., Himes-Cornell, A., & Sutton-Grier, A. (2019). An analysis of the potential positive and negative livelihood impacts of coastal carbon offset projects. Journal of Environmental Management, 235, 463–479. https://doi.org/10.1016/j.jenvman.2019.01.067

Huff, A. (2021). Frictitious commodities: Virtuality, virtue and value in the carbon economy of repair. *Environment and Planning E: Nature and Space*, 2–22. https://doi.org/10.1177/25148486211015056

Huff, A., & Tonui, C. (2017). (Publication). *Making 'Mangroves Together': Carbon, conservation and co-management in Gazi Bay, Kenya.* (pp. 1–21). STEPS Centre.

Hultman, N., Lou, J., & Hutton, S. (2020). A review of community co-benefits of the Clean Development Mechanism (CDM). *Environmental Research Letters*, *15*(5), 1–19. https://doi.org/10.1088/1748-9326/ab6396

Hoch, S., Waweru, P., Cowman, T., Owino, T., & Imbugwa, D. (2023). (Rep.). *Regional Carbon Market Profile* (pp. 1–10). Kampala: The Eastern Africa Alliance on Carbon Markets and Climate Finance. https://www.climatefinanceinnovators.com/wp-content/uploads/2023/06/Regional-Carbon-Report_-2023-1.pdf

Intergovernmental Panel on Climate Change (IPCC). (2023). *Climate Change 2022 – Impacts, Adaptation and Vulnerability*. https://doi.org/10.1017/9781009325844

Juma, K., Wanjiru, A., Shilland, R., & Huxham, M. (2023). (Rep.). *Mikoko Pamoja Annual Report 2022* (pp. 1–36). https://www.planvivo.org/Handlers/Download.ashx?IDMF=3f2d85b1-2e0c-412d-92e5-b7c520988d2d

Ludeña, C., de Miguel, C., & Schuschny, A. (2016). Climate change and carbon markets: Implications for developing countries. *CEPAL Review*, *2015*(116), 61–84. https://doi.org/10.18356/68536e46-en

Juma, K., Wanjiru, A., Shilland, R., & Huxham, M. (2023). (Rep.). *Mikoko Pamoja Annual Report 2022* (pp. 1–36).

Ludeña, C., de Miguel, C., & Schuschny, A. (2016). Climate change and carbon markets: Implications for developing countries. *CEPAL Review*, *2015*(116), 61–84. https://doi.org/10.18356/68536e46-en

Kenya Energy Act, 2006. Kenya Law Reports. https://www.nema.go.ke/images/Docs/Legislation/Sessional_paper_no_4_of_2004_on_energy.pdf

Kenya Energy Act, 2019. Kenya Law Reports. http://kenyalaw.org/lex//actview.xql?actid=No.%2020%20of%202019

KEPSA. (2023). *Scaling Kenya's carbon market: Context, challenges, and opportunities.* https://www.kepsa.or.ke/kepsanews/scaling-kenya-s-carbon-market-context-challenges-and-opportunities

Khan, M. Climate Change, Adaptation and International Relations Theory. E-International Relations. Retrieved March 10, 2023, from https://www.e-ir.info/2016/04/29/climate-change-adaptation-and-international-relations-theory/

Kotut-Sang, J., & Somorin, O. (2023, February 7). *Could carbon credits be Kenya's next leading export product?* Business Daily. https://www.businessdailyafrica.com/bd/opinion-analysis/columnists/could-carbon-credits-be-kenya-s-next-leading-export-product--4115202

Kreibich, N., Hermwille, L., Warnecke, C., & Arens, C. (2016). An update on the Clean Development Mechanism in Africa in times of market crisis. *Climate and Development, 9*(2), 178–190. https://doi.org/10.1080/17565529.2016.1145102

Kwale County Government (2018). Kwale County Integrated Development Plan: 2018-2022

Kwale county Government. (2016). The Kwale county disaster management fund act, 2016. Kwale; Kwale County. https://faolex.fao.org/docs/pdf/ken184797.pdf

Lang, S., Blum, M., & Leipold, S. (2018). What future for the Voluntary Carbon Offset Market after Paris? An explorative study based on the discursive agency approach. *Climate Policy*, *19*(4), 414–426. https://doi.org/10.1080/14693062.2018.1556152

Larsson, C., & Orvehed, M. (2021). *Carbon Offsetting, a new form of CO2lonialism? Local implications of tree-planting projects in East Africa* (dissertation). Södertörn University, Huddinge. https://www.diva-portal.org/smash/get/diva2:1564383/fulltext01.pdf

Ludeña, C., de Miguel, C., & Schuschny, A. (2016). Climate change and carbon markets: Implications for developing countries. *CEPAL Review*, *2015*(116), 61–84. https://doi.org/10.18356/68536e46-en

Macquarie, R., & Stern, L. N. (2023). (Rep.). *The voluntary carbon market and sustainable development* (pp. 1–8). London: Grantham Research Institute on Climate Change and the Environment. https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2023/03/The-voluntary-carbon-market-and-sustainable-development-policy-brief.pdf

Macreadie, P. I., Costa, M. D., Atwood, T. B., Friess, D. A., Kelleway, J. J., Kennedy, H., Lovelock, C. E., Serrano, O., & Duarte, C. M. (2021). Blue Carbon as a natural climate solution. *Nature Reviews Earth & Environment*, *2*(12), 826–839. https://doi.org/10.1038/s43017-021-00224-1

McLellan, R. (2015). *Renewables for Africa*. WWF. http://www.wwf.org.za/15761/African-launches-renewable-energy-initiative%20/

Mwania, J. M. (2020). Climate Change Policies in Kenya: A Policy and Institutional Analysis. International Journal of Climate Change Strategies and Management, 12(1), 49-65. DOI: 10.1108/IJCCSM-11-2018-0149

National Climate Change Action Plan (2018). Government of Kenya. Retrieved 18, February, 2023 from http://www.kenyaclimatechange.org/wp-content/uploads/2018/02/Kenya-NCCAP-2018.pdf

Obegi, B. (2018). Impacts of Blue Carbon Trading in Gazi Bay Mombasa Kenya. 43(1), 13–21

Ongaji, P. (2023, January 17). *Carbon trading: Gaps, opportunities and structures*. Nation. https://nation.africa/kenya/health/carbon-trading-gaps-opportunities-and-structures-4088966

Olsen, K. H., & Fenhann, J. (2008). The role of renewable energy in climate mitigation and sustainable development. Energy Policy, 36(2), 461-475.

Ottonelli, J., Lazaro, L. L., Andrade, J. C., & Abram, S. (2023). Do solar photovoltaic clean development mechanism projects contribute to sustainable development in Latin America? Prospects for the Paris agreement. *Energy Policy*, *174*, 113428. https://doi.org/10.1016/j.enpol.2023.113428

Pan, C., Shrestha, A., Innes, J. L., Zhou, G., Li, N., Li, J., He, Y., Sheng, C., Niles, J.-O., & Wang, G. (2022). Key challenges and approaches to addressing barriers in forest carbon offset projects. *Journal of Forestry Research*, *33*(4), 1109–1122. https://doi.org/10.1007/s11676-022-01488-z

Peterson St-Laurent, G., Hagerman, S., & Hoberg, G. (2017). Barriers to the development of forest carbon offsetting: Insights from British Columbia, Canada. *Journal of Environmental Management, 203*, 208–217. https://doi.org/10.1016/j.jenvman.2017.07.051

Runya, R. M., Karani, N. J., Muriuki, A., Maringa, D. M., Kamau, A. W., Ndomasi, N., Njagi, K., Munga, C., & Okello, J. A. (2023). Local perceptions, opportunities, and challenges of community-based ecotourism in Gazi Bay, Kenya. *Western Indian Ocean Journal of Marine Science, 21*(2), 95–108. https://doi.org/10.4314/wiojms.v21i2.

Saunders, M., Lewis, P., & Thornhill, A. (2023). Research methods for business students. Pearson.

Second Nature. (2020). Co-Benefits of Carbon Offset Projects: Information for Carbon Offset Procurement. Second Nature.

Sun, Q. (2011). *Understanding the Clean Development Mechanism and its dual aims – The case of China's projects* (thesis). Royal Institute of Technology (KTH), Stockholm, Sweden.

Sosa-Nunez, G., & Atkins, E. (2016). *Environment, Climate Change and International Relations Front Cover*. E-International Relations Publishing.

Tay, N. (2015), "Africa: COP 21 – the good, the bad ... and the okay", Retrieved 05, March, 2023 from http://allafrica.com/stories/201512161522.

The World Bank Group. (2011). (rep.). *Community Development Carbon Fund CBP Synopsis* (pp. 1–40).

https://documents1.worldbank.org/curated/en/835541468162275800/pdf/765180WP0CDCF000Box374376B00PUBLIC0.pdf

The World Bank Group. (2012). (rep.). *Carbon livelihoods: Social Opportunities and Risk of Carbon Finance* (pp. 1–86). Washington: The World Bank Group. https://documents1.worldbank.org/curated/en/287981468340804935/pdf/691630WP00PUBL0on0Livelihoods0WEB20.pdf

The World Bank Group. (2011). (rep.). Community Development Carbon Fund CBP Synopsis (pp. 1–40).

World Bank Group. (2022). Fact Sheet: An adjustment to global poverty lines. *World Bank*. https://www.worldbank.org/en/news/factsheet/2022/05/02/fact-sheet-an-adjustment-to-global-poverty-lines#:~:text=The%20new%20international%20poverty%20line,in%20this%20situation%20in%202019.

Thyer, B. (2010). The Handbook of Social Work Research Methods. Sage Publications, Inc.

UNDP. (2020). Mikoko pamoja. UNDP. https://www.equatorinitiative.org/wp-content/uploads/2020/03/Mikoko-Pamoja-Kenya.pdf

UNEP RISO Centre. (2012). (rep.). *Carbon Markets and Africa: A quick fact sheet for journalists* (pp. 1–11). https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Carbon%20Market%20Quick%20Facts%20%20ACF%202012.pdf

United Nations. (1992). United Nations framework convention on climate change. Geneva; United Nations. https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf

United Nations Framework Convention on Climate Change. (2010). (rep.). *The Kyoto protocol mechanisms* (pp. 1–20). Berlin: United Nations Framework Convention on Climate Change. https://cdm.unfccc.int/about/cdm_kpm.pdf

Vaus, D. (2014). Surveys in social research. Routledge.

Wambua, C. (2019). The Kenya Climate Change Act 2016: Emerging lessons from a pioneer law. *Carbon and Climate Law Review*, *13*(4), 257–269. https://doi.org/10.21552/cclr/2019/4/6

Wanjiru, A. (2017). A Report of Mikoko Pamoja Social Survey. https://www.aces-org.co.uk/wp-content/uploads/2015/01/Social-survey-report-jan-2017.pdf

Wandana, S., Arachchige, U., Wadanambi, R., & Preethika, P. (2020). The effects of industrialization on climate change. *Journal of research technology and engineering*, *1*(4), 86–94.

Wollring, S., 2017. How Can Community-Based Payments for Ecosystem Services Schemes Be Sustained over Time? Lessons from Mikoko Pamoja at Gazi Bay. University of Birmingham, Kenya. https://www.planvivo.org/Handlers/Download.ashx?IDMF=63453055-c765-4c0e-b89b-e6754039196b

World Commission on Environment. (n.d.). (Rep.). *Report of the World Commission on Environment and Development: Our Common Future* (pp. 1–300). World Commission on Environment.

Wylie, L., Sutton-Grier, A. E., & Moore, A. (2016). Keys to successful blue carbon projects: Lessons learned from global case studies. *Marine Policy*, *65*, 76–84. https://doi.org/10.1016/j.marpol.2015.12.020

Zafarullah, H. M., & Huque, A. S. (2021). *Handbook of Development Policy*. Edward Elgar Publishing Ltd.

APPENDICES

Appendix I: Questionnaire and Key Informant Guides

Questionnaire

I am a researcher from the Department of International Relations at the United States International University- Africa; Nairobi, Kenya. As a requirement of the degree programme, I am conducting a research project titled **Carbon Credit Programs and the Development of Local Kenyan Communities. A Case Study of the Mikoko Pamoja Blue Carbon Initiative**.

Please respond to the subsequent items, as your views are considered important to this study, based on your competence and honesty. To ensure anonymity, we will not write your name anywhere on the instrument. Please note that any information provided will be treated with utmost confidentiality and will only be used for the purposes of this study. Thank you for your cooperation.

Kind Regards

Joy Njambi Muruku
MA in International Relations
United States International University- Africa

Section 1: Demographic Information

#	**Question**	**Response**
1.1.	Gender:	{ }Male { } Female
1.2	Age:	{ }Years
1.3	Occupation:	
1.4	Marital Status:	{ } Married
		{ } Single
		{ } Separated
		{ } Widowed
1.5	Average monthly income (man):	{ } Kshs
1.6	Average monthly income (wife):	{ } Kshs
1.7	Number of children:	
1.8	Highest level of education:	{ }University
		{ }College
		{ }Secondary
		{ }Primary
		{ } Other

1.9	Are you an immigrant or an indigenous member of the Gazi Bay area?	{ }Immigrant { }Indigenous
1.10	If indigenous, how long have you been a resident of the area?	{ }Years
1.11	Are you familiar with the Mikoko Pamoja Blue Carbon Initiative?	{ }Yes { }No
1.12	How are you involved in the restoration activities of the Mikoko Pamoja Project?	

Section 2: Economic benefits of the Mikoko Pamoja Carbon Initiative

2.1	Are you a direct or indirect beneficiary of the project? (you may select all applicable responses)	{ } Direct (directly employed by the project) { } Indirect (a beneficiary on the community development projects implemented by the project)
2.2	Is any member of your family employed by the initiative?	{ } Yes { } Number of family members employed { } No
2.3	In your view, has Mikoko Pamoja increased economic opportunities and enhanced access to social amenities for members of the community?	{ } Yes { } No
2.4	Has the level of your household income increased as a result of Mikoko Pamoja?	{ } Yes { } No
a)	If yes, by how much or what percentage would you say it has increased on a monthly average?	{ } Kshs/%
b)	If yes, which of the following have resulted in the experienced increase in income?	{ } Sale of carbon credits { } Kshs. { } Beekeeping { } Kshs. { } Eco-tourism { } Kshs. { } Others { } Kshs. { } Others { } Kshs.
2.5	Which of the following social amenities have improved or do you have access to	{ } Roads { } Hospitals

	as a result of development projects implemented under the Mikoko Pamoja Project?	{ } School { } Water Others (specify)
2.6	What other incentives other than what is listed above are offered to encourage your participation in the mangrove restoration and protection activities implemented under Mikoko Pamoja?	
2.7	Do you think that development projects under Mikoko Pamoja are aligned with the priorities of your community?	{ } Yes { } No
a)	If no, why?	
2.8	Do you feel involved in the decision-making process on the priority projects to be invested in?	{ } Yes { } No
2.9	If yes, briefly state how your engagement in decision-making is encouraged.	
3.10	Which of the following is used as a primary fuel energy source in your household?	{ } Charcoal { } Firewood { } Kerosene { } LPG gas { } Biogas { } Briquettes { } Others (specify)
a)	Has the Mikoko Pamoja Project influenced the choice of fuel energy in your household?	{ } Yes { } No
b)	If yes, briefly explain how.	
3.10	Which of the following is used as a primary light source in your household?	{ }Kerosene lamp { }Solar { }Electricity { }Candle { } Others (specify)
a)	Has the Mikoko Pamoja Project influenced the choice of lighting in your household?	{ } Yes { } No
b)	If yes, briefly explain how.	
3.11	Are there any environmental resources that you had access to and relied on prior to the introduction of Mikoko	{ } Yes { } No

	Pamoja that you now no longer have access to?	
a)	If yes, please list them.	
b)	What is your view on this restricted access?	

Section 3: Ecological Benefits

#	Question	Response
To what extent do you agree with the following statements?		
3.1	There has been increased fish stock as a result of the mangrove protection and regenerative activities implemented under Mikoko Pamoja.	{ } Strongly Agree { } Agree { } Neutral { } Disagree { } Strongly Disagree
3.2	Mikoko Pamoja has resulted in improved mangrove coverage in the Gazi Bay area.	{ } Strongly Agree { } Agree { } Neutral { } Disagree { } Strongly Disagree
3.3	Members of the community have access to natural resources offered by the mangrove ecosystem around the Mikoko Pamoja Project Site.	{ } Strongly Agree { } Agree { } Neutral { } Disagree { } Strongly Disagree
3.4	My attitude towards environmental conservation has changed as a result of the Mikoko Pamoja Project?	{ } Strongly Agree { } Agree { } Neutral { } Disagree { } Strongly Disagree
3.5	List the ways in which your actions/activities have changed to prioritize environmental sustainability due to the Mikoko Pamoja Project.	
3.6	List other ways in which the Mikoko Pamoja Project has enhanced the environmental conditions in the environs of Gazi Bay / Makongeni.	

Section 4: Social Cohesion and Security

4.1	In your opinion, has the project has promoted social cohesion within your family and in your community?	{ } Yes { } No
a)	Briefly explain your answer.	
4.2	Do you experience a sense of social exclusion or being left out from actively engaging in community activities related to the project?	{ } Yes { } No
b)	Briefly explain your answer.	
4.3	Are there differences in power between those involved in the project and those not directly involved?	{ } Yes { } No
4.4	In your opinion, are benefits from the project equitable/shared equally?	
4.5	Has there been an increase or decrease in crime and conflict since the inception of the project, or has the situation remained unchanged?	{ } Increase { } Decrease { } No change
4.6	Are there conflicts between groups in the community?	{ } Yes { } No
a)	If yes, which groups and why?	
b)	How can conflict triggers be resolved?	

Section 5: Development and well-being of the community

To what extent has the Mikoko Pamoja project assisted in achieving the following?

#	**Area**	**Contribution with one (1) being the lowest and five (5) the highest**				
		1	2	3	4	5
5.1	**Improved living standard**					
	Food					
	Shelter					
	Clothing					
	Increased income					
	Access to new job opportunities					
	Access to clean sources of energy					
5.2	**Improved health**					
	New health centres constructed					
	Cost of health services					
	Improved healthcare amenities & services					
	Feeling healthy and strong					
5.3	**Safety**					
	Secure environment					

	Peace of mind					
5.4	**Social Relations**					
	Stronger connection with community					
	Strong family relations					
	Involvement in community activities					
5.5	**Spiritual fulfillment**					
	Belief in God					
	Participation spiritual activities (Church, Mosque, Shrines)					
5.6	**Clean environment**					
	Access to clean drinking water					
	Distance to nearest fresh water source					
	Enhanced quality of air					
	Enhanced serenity of environment					
5.7	**Education**					
	New schools established					
	Improved school infrastructure					
	Access to education (bursaries)					

Appendix II: Key Informant Guide I

Key Informant Guide I

I am a researcher from the Department of International Relations at the United States International University- Africa; Nairobi, Kenya. As a requirement of the degree programme, I am conducting a research project titled **Carbon Credit Programs and the Development of Local Kenyan Communities. A Case Study of the Mikoko Pamoja Blue Carbon Initiative**.

Please respond to the subsequent items, as your views are considered important to this study, based on your competence and honesty. Please note that any information provided will only be used for the purposes of this study. Thank you for your cooperation.

Kind Regards

Joy Njambi Muruku
MA in International Relations
United States International University- Africa

1. Can you briefly describe your role and involvement in the implementation of the Mikoko Pamoja Blue Carbon Initiative?
2. How long have you been involved in this initiative?
3. What is the total area of land under Mikoko Pamoja?
4. What has been the total amount of carbon sequestrated in the area since inception?
5. What has been the change in mangrove cover in Gazi Bay since the inception of the project?
6. How much does Mikoko Pamoja Community Organization receive under the Voluntary Carbon Market per year?
7. How is the amount mentioned above shared?
8. How is the amount above channelled to communities?
9. What other benefits does the community enjoy as a result of Mikoko Pamoja?
10. How does the population in the project site differ today from when Mikoko Pamoja began?
11. Have you observed immigrants to the project area? If yes to what extent to you attribute this to Mikoko Pamoja?
12. What avenues does the project use to encourage community engagement in conservation activities?
13. How does the project arrive at decisions on community development projects to invest in?
14. Has the project faced any form of community resistance in terms of the implementation approach and benefit sharing? If yes, how has this been resolved?
15. What is the extent of additionality achieved by the Mikoko Pamoja Blue Carbon Initiative, and how does it contribute to the overall effectiveness of the initiative in promoting carbon sequestration and community development?
16. What is the potential risk of leakages in the implementation of the Mikoko Pamoja Blue Carbon Initiative, and what strategies has the project employed to mitigate these leakages to ensure the effectiveness of carbon sequestration and community development outcomes?
17. Is there any additional information or insights you would like to share ?

Appendix III: Key Informant Guide II

Key Informant Guide II

I am a researcher from the Department of International Relations at the United States International University- Africa; Nairobi, Kenya. As a requirement of the degree programme, I am conducting a research project titled **Carbon Credit Programs and the Development of Local Kenyan Communities. A Case Study of the Mikoko Pamoja Blue Carbon Initiative**.

Please respond to the subsequent items, as your views are considered important to this study, based on your competence and honesty. Please note that any information provided will only be used for the purposes of this study. Thank you for your cooperation.

Kind Regards
Joy Njambi Muruku
MA in International Relations
United States International University- Africa

	Briefly describe your role.
	Is climate change an area of concern for the people of Kwale County? { } Yes { } No
	If yes, please explain how.
	What policy/ strategic priorities has Kwale County put in place to mitigate the impact of climate change on its people?
	Are you aware of the Mikoko Pamoja Blue Carbon Initiative? { } Yes { } No
	If yes, to what extent do think it helps meet the county's: • Economic priorities • Social development priorities • Environmental and conservation priorities Explain your answers briefly.
	Overall, do you consider the Mikoko Pamoja Project successful? { } Yes { } No
	If yes, which of the following do you attribute its' success to? • Benefits the community gets { } • Community involvement { } • Community awareness { } • Employment opportunities { } • Environmental conservation { } • Improved cultural conservation { } • Improved social cohesion { } • State any other reason

	In your own opinion, can the implementation of the Mikoko Pamoja Blue Carbon Initiative be enhanced to better meet the developmental needs of affected community members and Kwale County at large? { } Yes, there are some areas of improvement { } No, the implementation approach is okay
	If yes, briefly explain how.
	Is there any additional information or insights you would like to share ?

Thank you for your time!

Appendix IV: Key Informant Guide III

Key Informant Guide III

I am a researcher from the Department of International Relations at the United States International University- Africa; Nairobi, Kenya. As a requirement of the degree programme, I am conducting a research project titled **Carbon Credit Programs and the Development of Local Kenyan Communities. A Case Study of the Mikoko Pamoja Blue Carbon Initiative**.

Please respond to the subsequent items, as your views are considered important to this study, based on your competence and honesty. Please note that any information provided will only be used for the purposes of this study. Thank you for your cooperation.

Kind Regards
Joy Njambi Muruku
MA in International Relations
United States International University- Africa

1	Please state your name and current role.
2	What is the involvement of the Kenya Marine and Fisheries Research Institute in the Mikoko Pamoja Blue Carbon Initiative?
3	Based on your experience with Mikoko Pamoja, to what extent does the implementation approach of Mikoko Pamoja meet its intended development objectives in relation to: conservation and carbon emissions reduction, community, and economic development?
4	Do you in your own opinion consider Mikoko Pamoja a success? If yes, what do you attribute this to?
5	In your own opinion, are there any potential negative consequences or unintended impacts associated with the benefits provided by the Mikoko Pamoja Blue Carbon Initiative and how can these be mitigated in your expert opinion?
6	In your own opinion, are there potential areas of improvement to enhance the project ’ s contribution to local and even national development priorities?
7	Based on your experience with Mikoko Pamoja, are there any lessons to be learnt in the design of national policies and carbon credit projects for optimum outcomes?
8	Is there any additional information or insights you would like to share ?

Thank you for your time!

Appendix V: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **727069**

Date of Issue: **24/May/2023**

RESEARCH LICENSE

This is to Certify that Miss.. Joy Muruku of United States International University Africa, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Kwale on the topic: Carbon Credit Programs and the Development of Local Kenyan Communities: A Case Study of the Mikoko Pamoja Blue Carbon Initiative for the period ending : 24/May/2024.

License No: **NACOSTI/P/23/26012**

727069

Applicant Identification Number

Director General

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix VI: IRB Clearance

United States International University-Africa

REF: USIU-A/IRB/SS0165-2023

10th May, 2023

TO: MURUKU JOY NJAMBI

Dear Sir/Madam

RE: CARBON CREDIT PROGRAMS AND THE DEVELOPMENT OF LOCAL KENYAN COMMUNITIES: A CASE OF THE MIKOKO PAMOJA BLUE CARBON INITIATIVE.

This is to inform you that ***IRB*** has reviewed and approved your above research proposal. Your application approval number is **USIU-A/IRB/SS0165-2023.** The approval period is from ***10th May 2023*** to ***10th May 2024.***

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***IRB***.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***IRB*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***IRB*** within 72 hours
v. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vi. Submission of an executive summary report within 90 days upon completion of the study to ***IRB***

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely

Juliana M. Namada, Ph.D.
Institutional Review Board (IRB) Chair
Email: irb@usiu.ac.ke

p.o.box 14634-00800 Nairobi, Kenya | tel:254-730-116-000 | info@usiu.ac.ke
www.usiu.ac.ke