University of Cape Coast https://uir.ucc.edu.gh

UNIVERSITY OF CAPE COAST

POTENTIAL SOCIO-ECONOMIC IMPLICATIONS OF ESTABLISHING MARINE PROTECTED AREAS (MPAs) IN THE WESTERN REGION OF GHANA

VANESSA OFOLIORKOR BLESSYN

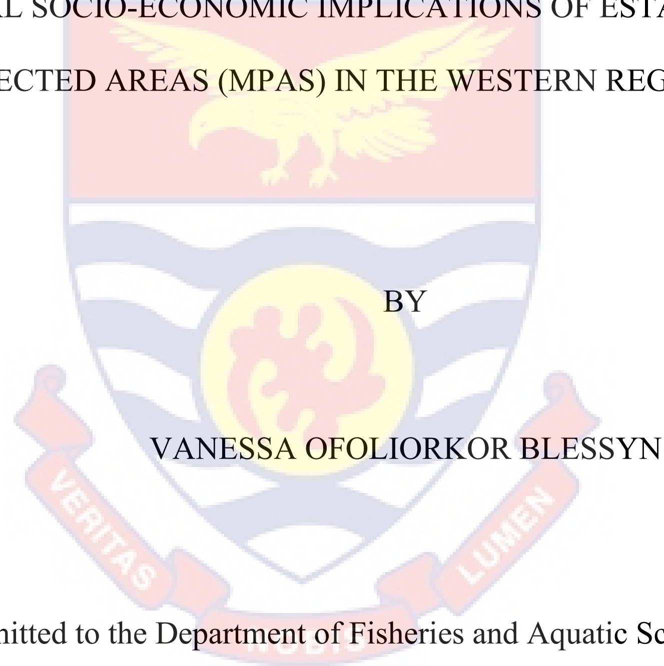
2026

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

UNIVERSITY OF CAPE COAST

POTENTIAL SOCIO-ECONOMIC IMPLICATIONS OF ESTABLISHING MARINE PROTECTED AREAS (MPAS) IN THE WESTERN REGION OF GHANA



BY

VANESSA OFOLIORKOR BLESSYN

Thesis submitted to the Department of Fisheries and Aquatic Sciences of the School of Biological Sciences, College of Agriculture and Natural Sciences, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Philosophy Degree in Integrated Coastal Zone Management

APRIL, 2026

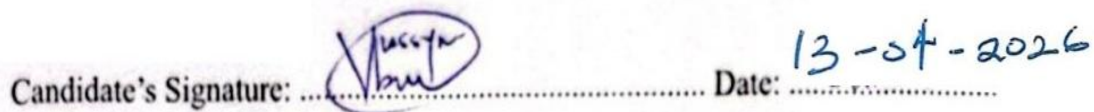
Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

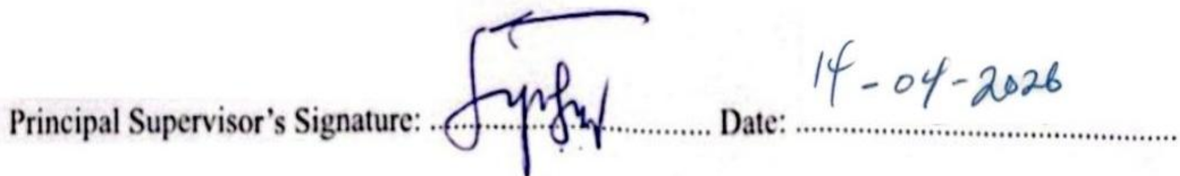


Candidate's Signature: .... Date: 13-04-2026

Name: Vanessa Ofoliorkor Blessyn

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.



Principal Supervisor's Signature: .... Date: 14-04-2026

Name: Prof. Joseph Aggrey-Fynn

Co-Supervisor's Signature: .... Date: 14-04-2026

Name: Prof. Noble Kwame Asare

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

ABSTRACT

Marine Protected Areas (MPAs) are increasingly promoted as tools for sustainable fisheries management and biodiversity conservation. However, their implementation often generates significant socio-economic and cultural implications for coastal communities, particularly in regions highly dependent on marine resources. As Ghana moves advances effort to designate MPAs, understanding local-level perspectives on marine resource dependence, anticipated socio-economic and cultural impacts, and preferred mitigation measures becomes critical for equitable and effective conservation planning. This study assessed marine resource dependence, community perceptions of the potential socio-economic and cultural effects of the proposed MPA, and locally preferred mitigation strategies across eight coastal communities in Ghana's Western Region. Employing a convergent parallel mixed-methods design, the study combined quantitative data from 394 structured interviews with qualitative insights from focus group discussions. Quantitative data were analysed using descriptive statistics, the Marine Resources Dependency index (MRDI), and inferential statistics, including One-Way ANOVA, Bonferroni post-hoc tests and chi-square tests to examine differences and associations across communities, while Qualitative data were analysed through thematic analysis. The findings reveal a moderate-to-high level of marine resource dependence across the studied communities, driven primarily by human and economic capital. Although communities acknowledged the possible ecological benefits of MPAs, they widely perceived them as threats to livelihoods, food security, cultural practices and social cohesion. Access to financial services and compensation schemes were identified as the most preferred mitigation strategies. The study recommends that policymakers develop context-specific conservation approaches that integrate socio-economic and cultural evidence into MPA design, promote inclusive governance, and ensure livelihood resilience through financial inclusion and equitable compensation frameworks.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

KEY WORDS

Marine Protected Areas

Marine Resources Dependence

Socio-economic Implications

Mitigation Measures

Coastal Communities

Western Region

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

ACKNOWLEDGEMENTS

I am deeply grateful to the World Bank, the Government of Ghana, the Africa Centre of Excellence in Coastal Resilience (ACECoR), and the Feed the Future Ghana Fisheries Recovery Activity (GFRA) for funding my studies and making this academic journey possible.

I extend my heartfelt appreciation to my supervisors, Professor Joseph Aggrey-Fynn and Professor Noble Kwame Asare, for their invaluable guidance, time, and dedication throughout this work. Special thanks also go to Dr Richard Adade, Mr Richmond Korang and Dr Eric A. Avorkpo for their unwavering mentorship and support during this journey.

I would like to express my sincere appreciation to my field assistants and the key stakeholders in the Ahanta West and Nzema East Municipalities for their invaluable assistance in gathering the data required for this study.

I am also grateful to my friends and colleagues for their consistent encouragement and support, which greatly contributed to my academic and personal growth.

Lastly, I owe deepest gratitude to my parents, Mr and Mrs Blessyn, and my siblings for their immeasurable love, prayers, and support throughout this academic pursuit. Their belief in me has been a pillar of strength.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

DEDICATION

I dedicate this work to Mr Bryan Nii Okaikwei Blessyn, my late brother.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

TABLE OF CONTENTS

DECLARATION ii

ABSTRACT ii

KEY WORDS iii

ACKNOWLEDGEMENTS iv

DEDICATION v

LIST OF ACRONYMS xi

CHAPTER ONE: INTRODUCTION

Background to the study 2

Statement of the Problem 7

Purpose of the study 10

Specific Objectives 10

Research Questions 10

Significance of the Study 11

Delimitation of the Study 12

Limitations of the study 13

Organisation of the Study 14

CHAPTER TWO: LITERATURE REVIEW

Introduction 16

Theoretical Review 16

Conceptual Framework for the study 19

The Historical Background of Marine Protected Areas and Milestones for Their Establishment 23

Categories of Protected Areas According to Management Objectives 25

Types of Marine Protected Areas (MPAs) 26

Policy Contexts and Legal Basis for Establishing Marine Protected Areas 27

International Legal Frameworks Supporting MPAs 27

Legal and Policy Framework for Marine Protected Areas (MPAs) in Ghana 32

Effectiveness of Marine Protected Areas: Key Factors and Considerations 34

Conceptualising Marine Resource Dependency 36

Measurement of Marine Resource Dependency 38

The Relationship Between Marine Resource Dependency and Marine Protected Areas (MPAs) 40

Incorporating Marine Resource Dependency into MPA Planning and Management 41

Empirical Review on Socio-Economic Impacts of Marine Protected Areas (MPAs) 42

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Case Studies on Socioeconomic Outcomes of MPAs 45
Chapter Summary 55
CHAPTER THREE: METHODOLOGY
Introduction 56
Research Design 56
Study Area 58
Brief Description of the Communities 60
Population 65
Sampling Procedure 66
Sample Size Determination 67
Data Collection Methods and Instruments 69
Validity and Reliability of Research Instrument 70
Data Collection Procedures 71
Field Challenges 72
Data Processing and Analysis 73
Ethical Consideration 76
Chapter Summary 77
CHAPTER FOUR: RESULTS
Introduction 78
Demographic Characteristics of Respondents 78
Level of Marine Resource Dependency of the selected coastal communities in the Western Region of Ghana 81
Sub-index Values by Community 87
Perspectives on the Economic and Social Implications of MPAs among the selected coastal communities 91
Awareness and Knowledge of Proposed MPA Establishment 91
Sources of Information on Proposed MPAs 93
Attitudes Toward Conservation Goals 94
Systemic Exclusion and Inequality in Marine Policy Governance 97
Economic Impacts of Proposed Marine Protected Areas (MPAs) 100
Livelihood Fragility and Economic Insecurity in Coastal Communities 100
Impact on Food Security and Nutritional Health 103
Social and Cultural Impacts of Proposed Marine Protected Areas (MPAs) 106
Cultural and Ritual Disruptions 106
Anticipated Strains on Community Cohesion 109
Displacement and Migration Risks 110

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Strategies to Minimise the Potential Socio-economic Negative Effects Associated with Establishing MPAs 112

CHAPTER FIVE: DISCUSSION

Introduction 115

Background of Respondents 115

Level of Marine Resource Dependency of the Selected Coastal Communities in the Western Region of Ghana 118

Potential Economic and Socio-Cultural Implications of MPAs on Coastal Communities 126

Strategies to minimise the potential negative effects of Marine Protected Areas 138

CHAPTER SIX: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction 145

Summary 145

Conclusions 147

Recommendations 149

Suggestion for Future Research 151

REFERENCES 152

APPENDICES 203

APPENDIX A: Interview Protocol 203

APPENDIX B: Focus Group Discussion Guide 211

APPENDIX C: Resource Dependence Index Indicators 214

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

LIST OF TABLES

Table		Page
1	Projected Population for the Study Communities	66
2	Distribution of sample size among the eight (8) selected communities	68
3	Demographics of the respondents from selected coastal communities	79
4	Overall Marine Resource Dependence Index by Studied Community	82
5	Natural Capital Indicators by Community	83
6	Human Capital Indicators by Community	84
7	Social Capital Indicators by Community	85
8	Economic Capital Indicators by Community	86
9	Skewness-Kurtosis Test for Normality of MRDI	89
10	One-Way ANOVA of MRDI Scores by Community	89
11	Bonferroni-Adjusted Pairwise Comparisons of MRDI Scores	91
12	Preferred Strategies to Minimise Potential Negative Effects of MPAs by Community	112

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

LIST OF FIGURES

Figure Page

1 Conceptual framework of the study 22

2 Map indicating the study area 65

3 Sub-index values by community 88

4 Community Awareness of Proposed Marine Protected Areas (MPAs) Establishment 92

5 Sources of Information on the Proposed MPAs 94

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

LIST OF ACRONYMS

ANOVA	Analysis of Variance
CBD	Convention on Biological Diversity
EPA	Environmental Protection Agency
FAO	Food and Agricultural Organisation
FC	Fisheries Commission
FGD	Focus Group Discussion
FSSD	Fisheries Scientific Survey Division
GFRA	Feed the Future Ghana Fisheries Recovery Activity
MOFAD	Ministry of Fisheries and Aquaculture Development
MPAs	Marine Protected Areas
MRDI	Marine Resource Dependency Index
NGOs	Non-Governmental Organisations
SDGs	Sustainable Development Goals
SES	Socio-Ecological Systems
SLF	Sustainable Livelihoods Framework
SPSS	Statistical Package for Social Sciences
UNDP	United Nations Development Programme

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

CHAPTER ONE

INTRODUCTION

Marine Protected Areas (MPAs) are globally considered vital for conserving marine biodiversity and ecosystem services (Strain et al., 2019). While the benefits of MPAs are well documented, their effectiveness often depends on integrating socio-economic and cultural considerations into their planning and management (Charles & Wilson, 2009; Mascia, 2003; Price, 2022). Understanding the social, cultural, and economic dimensions is crucial for gaining community support, ensuring compliance and mitigating potential conflicts during implementation (Bennett & Dearden, 2014; Claudet & Guidetti, 2010). Research increasingly emphasises the importance of considering the socio-economic and cultural implications when designing, implementing and managing MPAs (Bennett & Dearden, 2012; Gurney et al., 2014; Pascual et al., 2016; Rees et al., 2014). This consideration is especially relevant in underdeveloped countries, where coastal communities are typically more dependent on marine resources (Bennett & Dearden, 2014; Mascia et al., 2010; Taimur, 2015). Ghana's effort to move from an open-access fisheries governance regime to a restricted-access regime through the establishment of MPAs warrants careful consideration of the potential socio-economic and cultural implications to ensure the success of any MPA initiative in the country (Voyer et al., 2012). Aligning the objectives of MPAs with fisheries management requires a nuanced understanding of these impacts to ensure they deliver both conservation and fishery benefits effectively (Gall & Rodwell, 2016). This study assesses the potential socio-economic and cultural implications of establishing MPAs in the Western Region of Ghana, offering insights to inform the MPA planning process and guide the implementation of conservation policies in the Region.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Background to the study

Marine ecosystems are critical to the health of the planet, providing essential services such as food, climate regulation, and biodiversity conservation. Globally, coastal and marine environments support the livelihoods of over 500 million people, particularly in developing countries where fisheries are a primary source of income and food security (United Nations Environment Programme [UNEP], 2019). Anthropogenic activities and the escalating impacts of climate change provide significant challenges to the marine environment, leading to the global degradation of coastal and marine ecosystems (Laffoley et al., 2008). Over the last few decades, a high value has been placed on protection as a means of conserving marine biodiversity and its associated resources. In light of the aforementioned, there is a global trend towards establishing Marine Protected Areas (MPAs) (Laffoley et al., 2008). Marine Protected Areas (MPAs) are designated areas of water managed through a zoning system to promote the sustainable management of marine resources and their environments (Kusumawati & Huang, 2015). When managed effectively, MPAs show positive ecological outcomes, including the recovery of fish populations, maintenance or recovery of habitat quality and quantity, increases in species abundance and biomass, and the preservation of endangered species (Cabral et al., 2020; Lester et al., 2009; Marcos et al., 2021). The development of MPAs has been shaped by international organisations, national efforts, and scientific approaches to conserve biodiversity and reconcile protection with human use (Wells et al., 2016). Their expansion has been driven by global targets and increased awareness of ocean threats (Wells et al., 2016). The recently adopted Kunming-Montreal Global Biodiversity Framework (GBF) has increased the MPA coverage target from 10% of the global ocean (Convention on Biological Diversity [CBD] Aichi Target 11) to at least 30% by 2030 (Convention on Biological Diversity [CBD], 2010; 2022). The commitment aligns with broader Sustainable

Digitized by Sam Jonah Library

Development Goal (SDG) 14, which seeks to conserve and sustainably use ocean and marine resources(United Nations General Assembly, 2015). At the regional level, the African Union's Agenda 2063, especially Aspiration 1 and the African Blue Economy Strategy, emphasises sustainable utilisation of marine resources and promotes the expansion of MPAs as a key strategy for safeguarding marine biodiversity, enhancing fisheries productivity, and building climate-resilient coastal communities (African Union – Inter-African Bureau for Animal Resources (AU-IBAR), 2019; African Union, 2015).

Building on these global and regional commitments, several countries have implemented robust national programmes and policies to advance the establishment and management of MPAs. For example, the United States has strengthened marine conservation through the National Marine Sanctuaries Act, which has led to the designation of large MPAs, including Papāhanaumokuākea Marine National Monument (Plunkett, 2025). Australia manages one of the world's most comprehensive MPA networks through its Commonwealth Marine Reserves programme, supported by the Environment Protection and Biodiversity Conservation Act (Fitzsimons & Wescott, 2018). The United Kingdom has expanded its MPA coverage through the Marine and Coastal Access Act, complemented by designations across its Overseas Territories (Joint Nature Conservation Committee, 2025). Island nations such as Palau have introduced bold initiatives, notably the Palau National Marine Sanctuary, which protects over 80% of its Exclusive Economic Zone (EEZ) (Republic of Palau, 2015). Similarly, Seychelles has designated 30% of its EEZ as MPAs through its Marine Spatial Planning Initiative and Blue Economy Strategic Framework (Seychelles Marine Spatial Plan Initiative (SMSP), 2020). Chile has advanced large-scale MPAs under its National System of Protected Wild Areas and subsequent expansions (Petit et al., 2018), while France has created multiple Marine Natural Parks under its national Biodiversity Act (Lewis et al., 2017). African countries are not left behind, with remarkable progress in declaring MPAs

Digitized by Sam Jonah Library

(United Nations Environment Programme – Nairobi Convention Secretariat, 2021). South Africa, through the Operation Phakisa Oceans Economy Programme, expanded its MPA network by declaring 20 new MPAs in 2019 (Department of Environmental Affairs, 2019). Mauritius, Mozambique, Tanzania and Kenya continue to strengthen MPA governance through national biodiversity strategies, marine spatial planning and integrated coastal management policies (United Nations Environment Programme – Nairobi Convention Secretariat, 2021). Together, these efforts demonstrate increasing global and regional commitment to marine protection and offer valuable lessons for countries like Ghana, which is currently pursuing the establishment of its first MPA.

Ghana's coastal and marine ecosystems exhibit a wide array of habitats and species that provide essential services to numerous fishing communities, thus playing a crucial role in the country's economy, cultural heritage, and overall welfare. The fisheries sector alone directly employs around 2.4 million people in coastal regions and contributes nearly 1.5% to the national agricultural Gross Domestic Product (GDP) (Doku et al., 2018). However, a review of Ghana's fisheries sector has revealed a prolonged crisis, with Ghana's total marine fish landings falling from about 492,776 metric tons in 1999 to 333, 524 metric tons in 2011, which represents a roughly 30% decrease (United States Agency for International Development [USAID]-University of Rhode Island [URI], 2013). Small pelagic species, which are important for coastal livelihoods and economies, have experienced a drastic decline in landings. According to more recent analyses, small pelagic stocks reached their lowest recorded biomass levels during the time series from 1990 to 2019, despite increasing fishing effort (Lazar et al., 2020). Economic analyses estimate that overfishing and its related expenses have cost the economy roughly US$233 million annually, equivalent to about 0.4% of GDP in 2017 (World Bank Group, 2020). The sustainability of these resources is seriously threatened, and environmental degradation is spreading because of

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

the progressively decreasing fish capture, which is exacerbated by governance issues and disputes (Coastal Resources Center, 2013b; Finegold et al., 2010; Lazar et al., 2018; World Bank Group, 2020). To address these challenges, Ghana has initiated plans to establish Marine Protected Areas (MPAs) in strategically important regions of its coastal and marine zone as a tool to conserve marine biodiversity and promote sustainable development of its ocean resources (MOFAD, 2015; Nunoo, 2018). To that effect, the Fisheries Commission (FC) under the purview of the Ministry of Fisheries and Aquaculture Development (MOFAD) developed a document on strategies, action plans and implementation framework for Marine Protected Areas (MPAs) in Ghana (Nunoo, 2018). The report outlines the objective for the development of MPAs and presents 20 potential sites across the four coastal administrative regions of Ghana, with careful attention given to ecological significance, biodiversity, and fisheries advantages. More recently, the Feed the Future Ghana Fisheries Recovery Activity (GFRA) sought to support MOFAD/FC to establish MPAs, as outlined in Strategic Action 4.1 of Ghana's Marine Fisheries Management Plan (2022-2026). The MPAs are expected to contribute to the management and recovery of small pelagic fishes, whose production is currently at its lowest since the 1970s (Finegold et al., 2010) and enhance marine biodiversity (Ghana Fisheries Recovery Activity [GFRA], 2023; Ministry of Fisheries and Aquaculture Development [MoFAD], 2022). Based on available data and information, the MOFAD/FC, with the support of GFRA, has considered the Greater Cape Three Points enclave in the Western Region as a potential MPA site for small pelagic fisheries management and recovery (GFRA, 2023). Ecological assessments have identified key sites in the Western Region where nearshore MPAs could be established to support this goal (GFRA, 2023).

The Western Region of Ghana stands out as a prime location for the establishment of a Marine Protected Area due to its rich marine biodiversity and natural resources crucial

Digitized by Sam Jonah Library

for the advancement of fishery, tourism and industry (Coastal Resources Center [CRC] & Friends of the Nation [FoN], 2011; Ministry of Fisheries and Aquaculture Development [MOFAD], 2015). Additionally, the region faces severe threats from coastal habitat loss, bycatch of endangered species, pollution, and overexploitation of marine resources, prompting calls for conservation efforts (deGraft-Johnson et al., 2010). Research and environmental assessments have long supported establishing an MPA in the Western Region. The Integrated Coastal and Fisheries Governance (ICFG) initiative, which ran from 2009 to 2013, focused on addressing the region’s coastal and marine challenges, highlighting areas of biological significance and opportunities for creating MPAs (Ateweberhan et al., 2012; USAID-URI, 2013). The Environmental Protection Agency of Ghana also published the State of the Marine Environment report for the coastal districts in the country's Western region. The report provides an overview of the condition and health of marine and coastal resources in the Western region, highlighting the importance of conservation measures to effectively manage resource exploitation and promote long-term sustainability (Environmental Protection Agency [EPA], 2021). Other studies have been conducted to determine the critical areas requiring protection in specific coastal ecosystems in the Western Region of Ghana. These studies also highlighted the management issues associated with these selected habitats (deGraft-Johnson et al., 2010; Jonah, 2020). Additionally, within the broader Blue Economy discourse, Ansah & Oduro (2025) caution that weak governance, resource overexploitation, and inadequate institutional coordination pose major risks to Ghana’s coastal development agenda, reinforcing the need for place-based measures, such as MPAs, to secure long-term ecological, social, and economic benefits. However, while the ecological rationale for establishing MPAs is promising, the potential socio-economic and cultural implications for communities that rely on marine resources remain uncertain.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

This study adopts a comprehensive methodology to ascertain the potential socio-economic and cultural implications from the perspectives of local resource users before the establishment of Marine Protected Areas (MPAs), using the Western Region of Ghana as the study area. Investigating local-level perspectives is critical because coastal communities possess place-based indigenous knowledge and lived experiences that reflect their long-term interactions with marine ecosystems (Anokye, 2022; Karakara et al., 2024). Such knowledge systems offer nuanced insights into resource conditions, ecological changes, livelihood vulnerabilities, and cultural values or factors that are often overlooked in top-down conservation planning (Arthur & Nsiah, 2011; Effah, 2022). Incorporating these perspectives will enhance the accuracy and relevance of these socio-economic and cultural impact assessments, as well as strengthen ocean governance by providing information for designing socially acceptable restrictions, promoting compliance and achieving context-specific MPA management in the Western Region.

The findings of this study will thus serve as a fundamental reference to guide sustainable and inclusive decision-making during the subsequent stages of MPA implementation, ensuring that the transition adheres to principles of "Blue Justice" and equitable governance (Chuenpagdee & Jentoft, 2025; Okafor-Yarwood et al., 2022).

Statement of the Problem

The establishment of Marine Protected Areas (MPAs) is internationally recognised as an effective strategy for mitigating biodiversity loss and fostering resilient marine ecosystems (Grorud-Colvert et al., 2021). International environmental agreements and policy frameworks, such as the Convention on Biological Diversity, the Sustainable Development Goals (SDGs), and the International Union for Conservation of Nature (IUCN), strongly emphasise the need for well-designed and effectively managed MPAs to meet global marine protection targets(Grorud-Colvert et al., 2021; IUCN, 2023). Despite

Digitized by Sam Jonah Library

their ecological justification, implementing MPAs is inherently complex, as it requires a careful balancing act between ecological objectives and the socioeconomic needs of coastal communities reliant on marine resources (Gollan & Barclay, 2020; Ojea et al., 2017; Voyer et al., 2015). While MPAs are designed to address both ecological and socioeconomic considerations, the conservation priorities often overshadow livelihood considerations, leading to unintended consequences for resource-dependent communities (Beare et al., 2013; McNeill et al., 2018). MPAs often introduce management measures such as no-take regulations, fishing gear restrictions and spatial or temporal closures, which can significantly alter resource access to marine resources, reshaping usage patterns and disrupting traditional livelihoods and socio-economic dynamics of coastal populations (Campbell et al., 2018; Cinner et al., 2009; Katikiro et al., 2014). While these measures may yield long-term ecological benefits, their short to medium-term socio-economic consequences for resource-dependent communities are frequently uneven and context-specific (Gollan & Barclay, 2020; Ojea et al., 2017; Voyer et al., 2015). Empirical evidence from diverse geographical contexts such as South Africa, Indonesia, Australia and Tanzania demonstrates that socio-economic outcomes of MPAs are highly context-specific, with both positive and negative effects observed depending on governance arrangements, enforcement and community engagement (Gurney et al., 2015; Mann-Lang et al., 2021; McNeill et al., 2018; Sowman & Sunde, 2018).

The proposed transition in Ghana's fisheries governance from an open-access to restricted access through the establishment of MPAs occurs in a context of earlier management interventions that have historically overlooked the socio-economic and cultural complexities of coastal life. Recent reforms, such as the National Closed Fishing Season implemented by the Ministry of Fisheries and Aquaculture Development (MoFAD), serve as a cautionary indicator for the potential trajectory of MPAs. While these temporal closures

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

are biologically sound and grounded in strong justification for stock recovery, their implementation has been frequently undermined by significant social friction, non-compliance, and severe economic hardship among fishers (Mensah et al., 2025; Owusu et al., 2023). This discrepancy points to a systemic 'blind spot' where ecological goals are prioritised at the expense of the human dimension. Furthermore, in the Western Region, where marine resources sustain local economies and cultural identities, coastal communities currently face a spatial squeeze between industrial exclusion zones created by the offshore oil and gas industry and the intensifying environmental threats. Within this contested space, the proposed MPAs, which threaten to further limit their remaining traditional fishing grounds, further raise critical uncertainties regarding potential socio-economic and cultural impacts (Finegold et al., 2010; Nunoo, 2018; Owusu, 2019). Even though ecological and policy frameworks strongly support the establishment of MPAs in Ghana, existing research has predominantly focused on biophysical and ecological aspects. This means there is a significant knowledge gap regarding the potential effects of MPAs on livelihoods, food security, social relations, and cultural practices of coastal communities (Ateweberhan et al., 2012; EPA, 2021; Sagoe et al., 2021). The Nature-based Solutions (NBS) framework, championed by the International Union for Conservation of Nature (IUCN) and the European Union (EU), emphasises the need to incorporate socio-economic considerations into ecosystem management (Blampied et al., 2023; Di Cintio et al., 2023; Sowińska-Świerkosz & García, 2022). Without such assessments, MPA implementation in the Western Region risks alienating local communities, provoking conflict and undermining long-term conservation success (Chaigneau & Brown, 2016; Gollan & Barclay, 2020; Voyer et al., 2012). Poorly managed MPAs can impose undue stress on communities, reduce adaptive capacity and lead to non-compliance, ultimately compromising both ecological and socio-economic objectives (Baker et al., 2021; Castrejón et al., 2024; Gollan & Barclay,

Digitized by Sam Jonah Library

2020; Mizrahi et al., 2020). Given these risks, there is an urgent need for comprehensive research to provide empirical evidence on the potential socio-economic and cultural implications of proposed MPAs in Ghana's Western Region, in order to ensure that the transition to MPAs in Ghana adheres to ecological soundness while engendering social and economic sustainability.

Purpose of the study

This research aims to assess the potential socio-economic and cultural implications of establishing proposed Marine Protected Areas (MPAs) in the Western Region of Ghana.

Specific Objectives

The specific objectives were to:

1. Assess the level of marine resource dependency of selected coastal communities in the Western Region of Ghana.
2. Examine the perceived economic and socio-cultural effects of establishing Marine Protected Areas in selected coastal communities in the Western Region of Ghana.
3. Identify community-preferred strategies to minimise potential negative socio-economic effects of establishing Marine Protected Areas in the Western Region of Ghana.

Research Questions

1. To what extent do selected coastal communities in the Western Region depend on marine resources for their livelihoods?
2. How do coastal communities perceive the economic and socio-cultural effects of Marine Protected Areas (MPAs)?
3. What strategies do coastal communities prefer to mitigate potential negative socio-economic effects of MPAs on local communities?

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Significance of the Study

This study addresses a globally relevant dimension of marine conservation by examining the socio-economic and cultural implications of Marine Protected Areas (MPAs), a critical factor that influences their long-term effectiveness (Giakoumi et al., 2018). By contributing empirical evidence from Ghana's Western Region, the study directly supports Sustainable Development Goal (SDG) 14.5 under the 2030 Agenda for Sustainable Development, which specifically targets the effective establishment and management of MPAs (United Nations General Assembly, 2015). Beyond SDG 14.5, the research makes substantial progress towards several other SDGs that are directly related to marine-dependent livelihoods. By analysing how MPA-induced restrictions might alter socio-economic equilibrium, particularly on income, food security, employment and equity, the study provides insights relevant to SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities) (United Nations General Assembly, 2015). Understanding how MPAs may affect access to fish and livelihood opportunities is very important for ensuring that conservation measures do not unintentionally aggravate poverty, hunger, or socio-economic inequities within coastal communities. Regionally, the study aligns with Africa's Agenda 2063, particularly Aspiration 1, which aims to create a prosperous Africa based on inclusive and sustainable development. By encouraging socially responsible marine governance and emphasising the importance of local knowledge in ocean stewardship, the study further supports the African Union's Blue Economy Framework (African Union – Inter-African Bureau for Animal Resources (AU-IBAR), 2019).

The study directly supports Ghana's Blue Economy Agenda at the national level, which prioritises inclusive economic development, community well-being, coastal resilience, and sustainable fisheries management. By identifying potential socio-economic and cultural

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

impacts of proposed MPAs, the study offers evidence relevant to ongoing national processes such as the National Fisheries Management Plan and the National Ocean Policy. This ensures that management measures are context-specific and aligned with national blue growth strategies (Government of Ghana, 2025; Ministry of Fisheries and Aquaculture Development [MOFAD], 2022).

At the community level, the study is significant because it foregrounds the experiences, expectations and concerns of local stakeholders. By integrating community perceptions with scientific assessments, the study aligns with Nunoo's (2018) call to prioritise local perceptions and concerns, offering insights critical to developing communication and stakeholder engagement plans that generate enthusiasm and support for MPA initiatives. Furthermore, by identifying strategies to minimise potential negative effects while maximising benefits, the study promotes adaptive management approaches that enhance community resilience, ultimately contributing to the design of sustainable, socially inclusive MPAs and fostering long-term conservation success in the region.

Delimitation of the Study

This study is geographically limited to selected coastal communities in the Western Region of Ghana, particularly those within the vicinity of the proposed Marine Protected Areas. Based on the Marine Protected Area Site Selection Report (GFRA, 2023), 18 prospective communities in Ahanta West and Nzema East Municipalities are included in the proposed MPA area. The focus of the study has been narrowed to the following communities: Busua, Dixcove (Upper and Lower), Akwidaa, Achonwa, Princess Town, Akatekyi, Agyan and Akonu. These communities were chosen based on their proximity to the proposed MPA and their varying level of fishing-related activities to provide a critical context for understanding how MPAs might impact local livelihoods and communities. The study specifically focuses on three main aspects: assessing the marine resource dependence

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

levels of selected communities, examining the perceived economic and socio-cultural effects of establishing MPAs on selected communities, and identifying strategies to mitigate any negative socio-economic consequences. Although the ecological dimension of MPAs is acknowledged, it is beyond the scope of this research, which places a higher priority on socio-economic dimensions. This delimitation ensures a focused investigation of the interplay among MPAs, communities, and local livelihoods and offers valuable insights for sustainable marine resource management in the Western Region.

Limitations of the study

This study is contextually focused on selected coastal communities in the Western Region of Ghana, which limits the generalisability of the findings to other coastal areas of Ghana or to regions with different socio-economic and cultural contexts. To improve internal representativeness within the study area, a multi-stage sampling procedure was used that included communities with varying levels of fishing intensity, geographic characteristics, and livelihood structures. To further enhance the reliability and generalisability of the findings to comparable small-scale fisheries contexts, a relatively large sample (n = 394) was used, and eight diverse coastal communities were included. Additionally, since the proposed Marine Protected Area (MPA) has not yet been established, the study's assessment of potential socio-economic implications is anticipatory. This means that it relies on projected impacts and perceived risks rather than observed outcomes. To address this limitation, the study triangulated quantitative survey data with qualitative insights from focus group discussions to enable more in-depth community concerns and locally grounded interpretations of the potential implications of MPAs. Although every attempt has been made to guarantee robust analysis, these limitations signal the need for additional empirical assessments once the MPA is operational in order to refine the study's projections.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Definition of Some Key Terms

To ensure clarity and a shared understanding, the terms used in the study are defined in this section.

Potential: This refers to the capacity of a project to yield particular outcomes based on latent resources and anticipated scenarios (Arponen & Salomaa, 2023). In this study's context, this means that the socio-economic outcomes of the proposed Marine Protected Areas (MPAs) in the Western Region of Ghana have not yet been realised but are anticipated based on available data and stakeholder expectations.

Socio-Economic Implications: The term refers to the "intended and unintended social consequences, both positive and negative, of planned interventions" (Vanclay, 2003). The term "socio-economic implications" in this study refers to the positive or negative effects of an intervention, policy, or project on the social, cultural and economic (e.g. income, employment, access to resources, social cohesion, etc.) standing of coastal communities in the Western Region.

Marine Resource Dependency: The term refers to the degree to which individuals, households or communities depend on ocean resources, such as fish, shellfish and other organisms, for their subsistence, livelihood, or income (Selig et al., 2019).

Organisation of the Study

This thesis is structured into six chapters.

Chapter One provides the foundation for the study, starting with the background of the research topic. It outlines the statement of the problem, the purpose of the study, the significance of the research, and delineates the delimitations and limitations of the study. Furthermore, it includes definitions of key terms used throughout the study to ensure a common understanding.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Chapter Two comprehensively reviews relevant literature on the study's topic. It synthesises existing knowledge, theories, and research findings on major concepts related to the research area, providing a conceptual framework to guide the study.

Additionally, Chapter Three outlines the research methodology used to conduct the study. It describes the study areas, research design, population, sampling method, research instruments, and procedures for data collection and analysis.

Chapter Four presents the findings derived from the study's investigation. It includes a detailed account of the data gathered and analysed during the research process, presented through tables, graphs, diagrams, and narratives.

Chapter Five provides an in-depth discussion of the findings, highlighting major findings and their implications. The discussion is organised around the study's specific objectives and research questions, providing insights into the significance of the findings and their relevance to addressing the research problem.

Chapter Six synthesises the study's findings and presents conclusions based on the analyses conducted. Additionally, it offers recommendations for further action based on the study's findings.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter provides an overview of Marine Protected Areas (MPAs) in three distinct sections. The first section explores the fundamental concept of MPAs, including their different types and the legal frameworks governing their establishment and management. The second section explores the diverse impacts associated with MPAs. This includes both positive and negative effects, drawing on case studies conducted around the globe that provide empirical evidence of their socio-economic impacts. The third section presents an empirical review of the existing literature on the research topic, offering a nuanced understanding of the current state of knowledge and the gaps within those studies.

Theoretical Review

The concept of MPAs is based on theories that aim to balance the conservation of natural resources with the socio-economic needs of communities that depend on them. Amongst the most relevant theoretical frameworks is the Socio-Ecological Systems (SES) theory, which provides an integrated lens for understanding the interdependence between human societies and natural ecosystems.

Social-Ecological Systems (SES) theory

According to the SES theory, the world is a complex, interconnected system because human societies and natural ecosystems are intertwined and mutually influence one another (Berkes & Folke, 1998). The SES theory highlights how human societies are an essential part of natural ecosystems, with institutions and decisions that both influence and are impacted by ecological processes. Later advancements in SES thinking, particularly by Ostrom (2009), provided analytical tools for examining the governance of common-pool resources such as fisheries. The framework identifies four core subsystems, i.e. resource

Digitized by Sam Jonah Library

systems, resource units, governance systems and users, and emphasises how interactions among these components influence sustainability outcomes. This is especially relevant to MPAs, where local socio-economic contexts, governance structures and stakeholder participation influence ecological outcomes. Petrosillo et al. (2015) further expanded the SES perspective by highlighting the importance of integrating stakeholder perceptions, institutional arrangements, and adaptive capacity into conservation planning. Importantly, the SES theory recognises that marine resources in coastal communities extend beyond economic value and are embedded within social relationships, cultural identities, customs, and indigenous knowledge systems(Berkes et al., 2009; Ostrom, 2009). These socio-cultural dimensions influence community responses to conservation and the support they provide for its establishment. In the past, ecological goals dominated the design of Marine Protected Areas (MPAs) with limited attention given to social outcomes (Salm et al., 2000). However, the shortcomings of ecologically oriented MPAs, which often neglect human factors and frequently result in non-compliance, displacement, or even resource conflict, are demonstrated by an increasing body of research (e.g., Christie, 2004; Jones et al., 2013). This recognition has contributed to a paradigm shift towards a more integrated socio-ecological approach, especially in regions where livelihoods and cultural practices are directly related to marine resources (Christie, 2004). The SES framework has been widely applied by scholars such as López-Angarita et al. (2014) and Rees et al. (2018), who also emphasise the importance of understanding local perceptions, cultural contexts, and social dynamics alongside ecological goals in the planning and governance of MPAs. All these theoretical developments collectively reinforce the need to view MPAs through a socio-ecological lens that explicitly acknowledges the interconnectedness of social, economic, and cultural dimensions in conservation outcomes. Within the SES framework, socio-cultural impacts such as changes to cultural practices, social cohesion, traditional

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

livelihoods, and local government arrangements are critical for acceptance and sustainability (Bennett & Dearden, 2014). In the context of the Western Region of Ghana, where marine resources play a vital role in livelihoods and cultural identity, viewing MPAs through the SES framework provides a justified basis for examining the social, economic and cultural impacts of proposed MPAs and further enhances the potential for MPAs to achieve long-term sustainability, ecological resilience, and strong local support.

A key strength of the SES framework lies in its holistic and integrative nature. It explicitly recognises that marine resources are not merely economic assets but are embedded within social relations, cultural identities, customary institutional and indigenous knowledge systems (Berkes et al., 2009). This makes the framework suitable for analysing MPAs in the context of developing-countries such as Ghana. The SES supports adaptive management, allowing for iterative learning and adjustment as social and ecological conditions change (Folke et al., 2016). Despite these strengths, the SES theory has some limitations. Critics argue that, while the framework is effective at mapping interactions within systems, it often underplays issues of power, politics and inequality (Cote & Nightingale, 2012). The SES framework tends to obscure how political interests, elite capture and unequal enforcement shape access to resources and conservation outcomes.

Political Ecology

To address the above limitations, the Political Ecology theory complements the SES framework. Political ecology theory examines how governance, power relations, and political-economic structures influence resource access, control, and the distribution of benefits and costs, as well as their role in shaping environmental outcomes and livelihood vulnerabilities(Robbins, 2020). In the context of MPAs, political ecology provides a lens for understanding how government decisions to establish marine protected areas can disproportionately affect small-scale fishers while benefiting politically connected or

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

industrial actors (Ayilu et al., 2023). Studies applying political ecology to marine conservation have highlighted how selective enforcement, elite capture and unequal compensation mechanisms can undermine conservation legitimacy and undermine socio-economic realities (Fabinyi et al., 2014; Sowman & Sunde, 2018). In Ghana, political ecology perspectives have been used to analyse challenges in fisheries governance, including conflicts over closed seasons, enforcement inequities, and the marginalisation of artisanal fishers (Ansah et al., 2022; Nolan, 2019; Owusu & Adjei, 2021). By integrating political ecology, this study interrogates who gains, who loses and why, in the process of MPA establishment.

Relevance of the theoretical Frameworks to the study

The combined application of the SES and Political Ecology theories provides a robust theoretical foundation for this study. The SES framework supports the assessment of the marine resource dependency (objective 1) and informs the examination of the perceived socio-economic and cultural impacts of MPAs (Objective 2). Political ecology strengthens the analysis of objectives 2 and 3 by highlighting how policy implementation and institutional arrangements shape community perceptions and their preferred mitigation strategies. The integration of SES and Political Ecology theories provides a justifiable and contextually appropriate lens for analysing the potential socio-economic and cultural implications of proposed MPAs.

Conceptual Framework for the study

The conceptual framework for this study is grounded in the Sustainable Livelihoods Framework (SLF) and complemented by insights from the SES and Political Ecology. This framework provides a comprehensive analytical structure for understanding how Marine Protected Areas (MPAs) as governance interventions interact with community livelihood

Digitized by Sam Jonah Library

systems, perceptions, and response strategies to ultimately shape livelihood outcomes in coastal communities in the Western Region of Ghana.

The Sustainable Livelihoods Framework (SLF) is a conceptual tool designed to assess the capabilities, activities and assets necessary for sustainable living, particularly in resource-dependent communities. Developed in the late 1990s and popularised by the United Kingdom's Department for International Development (DFID), the SLF offers a comprehensive approach to understanding how policies, institutions, structures, and processes influence household assets and vulnerability contexts (trends, shocks and seasons) (DFID, 1999). Central to the Sustainable Livelihoods Framework are five livelihood capitals including; human capital (skills, knowledge, health and labour capacity), natural capital (access to environmental resources), social capital (networks, norms, institution and collective actions), financial capital (access to credit, saving, income sources), and physical capital (infrastructure, tools) (Nayak, 2017; Schaumlöffel, 2015; Shah et al., 2022). These capitals collectively determine the capacity of households and communities to pursue sustainable livelihoods and to respond to external shocks and interventions. The SLF has been widely applied in coastal livelihood studies and small-scale fisheries contexts (Allison & Ellis, 2001; Allison & Horemans, 2006), making it particularly relevant for the study. In this study, the SLF serves as a diagnostic tool to measure the reliance of coastal communities on marine resources across the capital categories and examine how this dependency affects community vulnerability to external governance interventions, particularly the proposed establishment of Marine Protected Areas (MPAs) (Schaumlöffel, 2015; Shah et al., 2022). In the context of this study, MPAs are conceptualised as key institutional and regulatory interventions within the marine governance system, comprising laws, policies, zoning measure and enforcement mechanisms that directly influence access to marine resources (Christie & Pollnac, 2011).

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Within this framework, MPAs are situated within the existing vulnerability context, alongside other stressors such as overfishing, declining fish stocks, climate variability, and seasonal fluctuations in fisheries productivity. These stressors and policy interventions interact dynamically with livelihood assets, altering the availability, accessibility and security of the five capitals. The framework further incorporates Marine Resource Dependency (Objective 1) as an analytical construct derived from the livelihood capitals. The level of dependency reflects the extent to which households rely on marine-based activities for food, employment, income and social identity. Higher dependency is expected to increase sensitivity to changes in resource access, thereby intensifying the perceived risks associated with MPA establishment. Building on this, the framework explicitly integrates community perceptions of the socio-economic and cultural impacts of MPAs (Objective 2). The changes in livelihood assets and resource access triggered by MPAs are expected to shape how communities perceive potential economic, social and cultural consequences. These perceptions are informed by local ecological knowledge, lived experiences and historical interactions with marine governance systems, which are consistent with the principles of SES theory. To minimise potential negative effects of MPAs, the framework includes community-preferred mitigation strategies (Objective 3). It recognises that households articulate adaptive and mitigation strategies in response to policy or intervention outcomes. Political Ecology is also integrated to highlight the role of institutions and governance in shaping resource access and conservation outcomes. Finally, the framework links these interactions to livelihood outcomes that can be either positive (e.g. improved income stability, resource sustainability, and strengthened social cohesion) or negative (e.g. increased vulnerability, income loss, or increased social conflict). These outcomes are conceptualised as feeding back into livelihood assets, governance systems and community strategies to reflect the adaptive nature of socio-ecological systems. Overall, the conceptual

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

framework provides a holistic structure that integrates marine resource dependency, perceived socio-economic and cultural impacts of MPAs and community-preferred mitigation strategies, while situating them within broader ecological, institutional and political contexts. By doing so, it supports a nuanced understanding of how MPAs may reshape livelihoods and social systems in coastal communities, further informing more socially responsive MPA planning and effective coastal governance (Bennett & Dearden, 2014; Schreckenberg et al., 2016).

Conceptual framework Linking Marine Resource Dependency, MPA governance, Socio-Economic Impacts, and Livelihood Outcomes

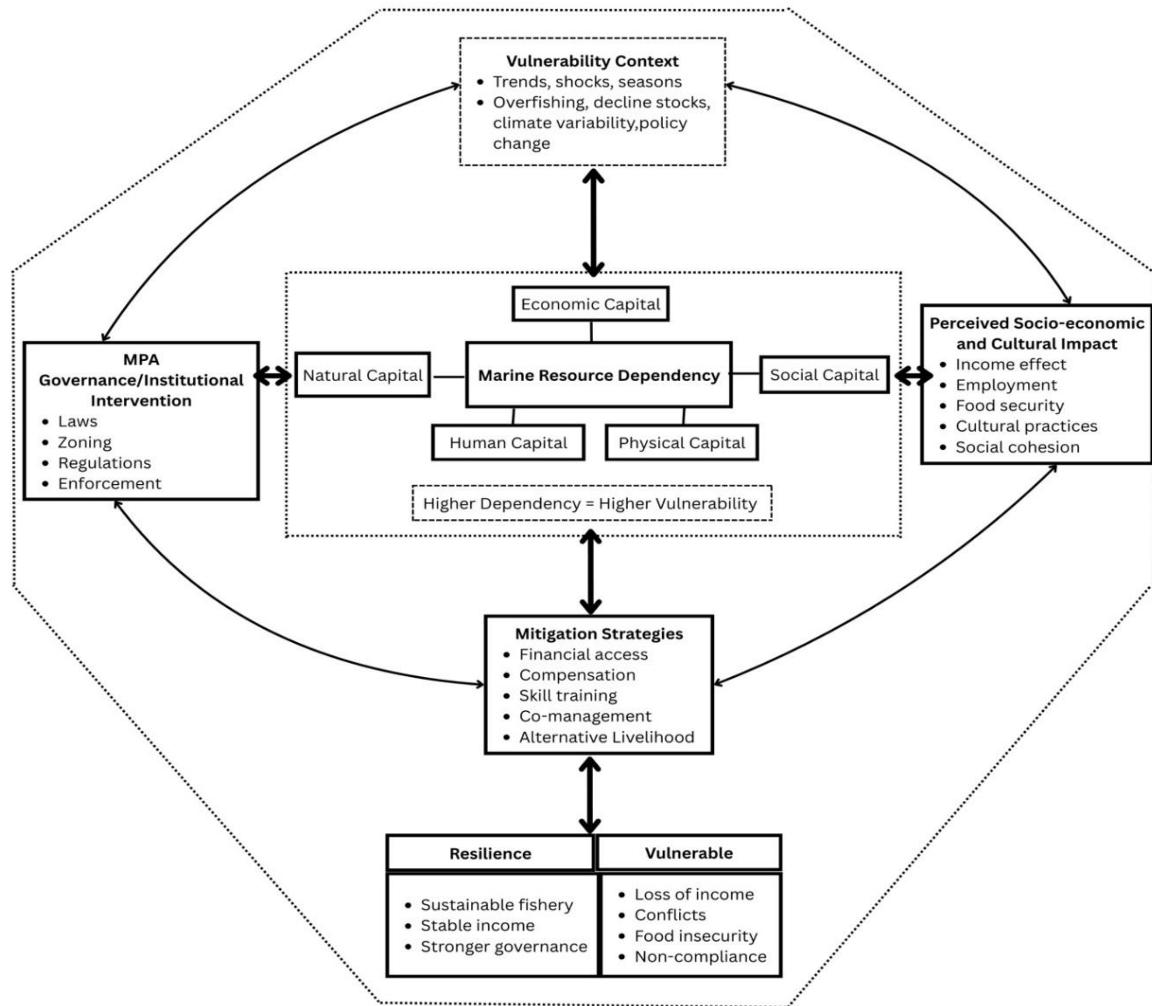


Figure 1: Conceptual framework of the study

Source: (Adapted from Department for International Development, 1999)

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

The Historical Background of Marine Protected Areas and Milestones for Their Establishment

The global establishment of Marine Protected Areas (MPAs) has been a significant step forward in efforts to conserve marine biodiversity. While the vast expanse of the Earth's surface is covered by oceans (71%), the official designation of MPAs for conservation purposes has been a relatively recent endeavour. This represents a significant shift towards proactive conservation efforts, spurred by the growing environmental awareness and scientific advancements (Hoyt, 2018). Historically, MPAs have been rooted in customary protection practices, with the formal designation of conservation areas emerging in the late 19th century. The concept evolved from early efforts to protect specific species or scenic locations to a more comprehensive approach focused on safeguarding diverse marine habitats. Key milestones include the designation of Royal National Park in Australia in 1879 as the first documented example of an MPA in the world and the establishment of Fort Jefferson National Monument in the United States in 1935, which is believed to be the first MPA that exemplified an ecosystem-based approach to marine conservation (Laffoley et al., 2019). International events and agreements have played a crucial role in advancing the establishment of MPAs. An important turning point was the first World Congress on National Parks (1962) and the 1982 meeting that called for the inclusion of freshwater, marine, and coastal sites in the global network of protected areas (Humphreys & Clark, 2019a; Laffoley et al., 2019). Subsequently, the 1982 UN Convention on the Law of the Sea (UNCLOS) mandated countries to protect and preserve the marine environment, laying the groundwork for global marine conservation efforts and further driving the momentum for MPA establishment. In the late 20th and early 21st centuries, there was a concerted effort to expand MPA coverage globally. Recommendations for a globally representative network of MPAs were made in 1995, followed by the publication of guidelines for MPA planners

Digitized by Sam Jonah Library

and managers in 2000. International commitments, such as the UN Convention on Biological Diversity (CBD) and the World Summit on Sustainable Development (WSSD) in 2002, have played a crucial role in setting targets for marine conservation. The WSSD called for the creation of global MPA networks by 2012, and years later, the CBD supported the WSSD's call by adopting a goal of effectively conserving at least 10% of the world's marine ecosystems by that year (CBD, 2004). However, despite significant progress, the target was not fully met by 2012, leading to a revision and extension to the year 2020, with targets outlined in the Aichi Biodiversity Targets (Laffoley et al., 2019). Central to Aichi Target 11 was the equitable and effective management of Marine Protected Areas (MPAs), complemented by Target 18, addressing the need to include Indigenous and local perspectives in conservation planning, and Target 14, delineating the importance of ecosystems that provide services, such as wellbeing and health (CBD, 2010). Another commitment that supports the expansion of MPAs in both number and scope is the United Nations Sustainable Development Goal (SDG) 14, which addresses the sustainable use of seas, oceans, and marine resources (CBD, 2010; United Nations General Assembly, 2015). This dedication to conservation is demonstrated by the Kunming-Montreal Global Biodiversity Framework (GBF), which was adopted in 2022. The third target of the framework aims to conserve 30% of terrestrial, inland water, coastal, and marine regions by 2030 (CBD, 2022). Implementing MPAs is integral to achieving this goal, given their multidimensional role in social, economic, health, governance, cultural, and environmental domains (Blampied et al., 2023; Giakoumi et al., 2018). However, achieving these ambitious targets requires better guidance and global cooperation to overcome existing challenges (Laffoley et al., 2019).

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Categories of Protected Areas According to Management Objectives

The International Union for Conservation of Nature (IUCN) developed a comprehensive structure for categorising protected areas, providing a framework for understanding their management objectives, governance types and conservation goals (Grorud-Colvert et al., 2021; International Union for Conservation of Nature [IUCN], 2019). A Marine Protected Area (MPA) is defined by the IUCN as "any area of intertidal or subtidal terrain, along with its overlying water and associated flora, fauna, historical, and cultural features, designated by law or other effective means to protect part or all of the enclosed environment" (IUCN, 1994; Kelleher, 1999). For a site to be eligible for any of the IUCN Categories, it must first fulfil this requirement. The categories of Marine Protected Areas (MPAs), based on their management objectives, have been classified by the IUCN into six types (Day, 2012; Dudley, 2008; IUCN, 2019) and are outlined as follows:

Category I refers to Strict Nature Reserves and Wilderness Areas, which are managed primarily for scientific research or the protection of the wilderness. It includes two subcategories: **Ia**, which comprises strict nature reserves preserved exclusively for scientific purposes, such as ecological baseline studies and long-term monitoring; and **Ib,** which includes areas maintained for wilderness protection, where natural conditions are left largely undisturbed to preserve the area's pristine character and ecological processes.

Category II encompasses National Parks, which are protected mainly for ecosystem conservation, particularly to maintain large-scale ecological functions and processes. These areas also allow for culturally appropriate educational and recreational activities that do not compromise conservation objectives.

Category III refers to Natural Monuments, which are usually small areas designated for the protection of specific natural features such as seamounts, coral reefs, caves, or ancient

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

groves. Despite their size, these areas are often of exceptional ecological, cultural or aesthetic value.

Category IV includes Habitat or Species Management Areas, which are managed through targeted interventions to maintain habitats or meet the specific needs of particular species. These sites often require ongoing, active management to sustain conservation goals.

Category V, often defined as Protected Landscapes or Seascapes, recognises areas that are valued for their aesthetic, recreational or cultural significance due to their interaction with people over time. These areas are managed to safeguard both natural and human-made features, while supporting recreation and community-based conservation.

Category VI represents Protected Areas with Sustainable Use of Natural Resources. These are typically large landscapes or seascapes that allow for low-level, non-industrial use of natural resources. The main goal is to balance biodiversity conservation with the sustainable livelihood needs of local communities.

Types of Marine Protected Areas (MPAs)

Different conservation goals and management purposes are served by the different types of Marine Protected Areas (MPAs). Each type is characterised by the range of activities permitted and the level or degree of protection afforded to the marine environment. However, it is important to note that the ecological objectives of the MPA, the condition of the sites, and the intensity of human activities in the area all influence the required level of protection (Schratzberger et al., 2019). The following are the main types of MPAs:

Marine reserve, also known as an ecological reserve or no-take zone. These areas offer the highest level of protection by strictly prohibiting extractive activities and consumptive use of marine resources. Specifically, no fishing, harvesting, or habitat alteration is allowed.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

The only activity typically permitted in these zones is the removal of organisms for scientific research under strict regulation.

Multiple-use MPA, which integrates conservation efforts with sustainable use. These areas often include designated zones where certain activities, such as recreational or small-scale commercial fishing, may be permitted. To maintain ecological balance, management measures such as seasonal closures, catch limits, and gear restrictions are applied to specific zones within the MPA.

Marine Park, which operates under a concept similar to terrestrial parks, aims to conserve biodiversity while also enabling human activities that are environmentally compatible. Marine parks are usually governed by structured regulations that seek to balance ecosystem protection with educational, recreational, and, at times, tourism-related uses.

Policy Contexts and Legal Basis for Establishing Marine Protected Areas

The establishment of Marine Protected Areas is underpinned by a robust legal framework that includes international agreements, national laws and regional conventions to ensure its effectiveness and promote international cooperation. These legal instruments provide the basis and guidelines for the designation, management, and enforcement of MPAs, ensuring the protection of marine biodiversity and the sustainable use of marine resources.

International Legal Frameworks Supporting MPAs

The international legal framework is a complex web that contains binding and non-binding instruments which provide the foundation for a country's development and the establishment of MPAs. It includes mechanisms that can be used to achieve a country's commitment to the conservation, preservation, and sustainable use of living resources and biological diversity (Young, 2007). While these instruments offer guidance, their effectiveness hinges on strong national implementation and international cooperation to

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

ensure well-managed MPAs that can effectively conserve marine biodiversity and ecosystems. Ghana has ratified several international agreements that provide a legal basis for MPA establishments. Key ones among these include:

Foundational Legal Frameworks for Ocean Governance

1. The United Nations Convention on the Law of the Sea (UNCLOS) was adopted in 1982 and came into effect in 1994. This is the foundational principle of international ocean governance that outlines the rights and responsibilities of nations concerning the use of the oceans and their resources, thereby serving as a complete regime of law and order in the marine environment. An identifiable strength of the UNCLOS that relates to the establishment and management of an MPA is how it emphasises the protection, conservation and management of the marine environment as a general obligation of states as found in Articles 192 and 194 (Duan & Shen, 2024). Article 192 of UNCLOS obligates states to protect and preserve the marine environment. This provision forms a fundamental basis for creating MPAs aimed at conserving marine biodiversity and ecosystems (United Nations, 1982). Article 194(1) explicitly states that countries must "take all measures necessary to prevent, reduce, and control pollution of the marine environment from any source". This includes establishing MPAs to mitigate environmental degradation and protect marine ecosystems (United Nations, 1982). Article 194(5) emphasises the protection of rare or fragile ecosystems, as well as the habitat of depleted, threatened, or endangered species. This provision supports the creation of MPAs to protect these vulnerable marine areas and species (United Nations, 1982). While UNCLOS does not explicitly mention MPAs, it provides the general legal framework for establishing them within national jurisdiction (the territorial sea and the exclusive

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

economic zone) or through international cooperation on the high seas (areas beyond national jurisdiction).

2. The Convention on Biological Diversity, adopted in 1992, is a central agreement built upon UNCLOS and has been instrumental in promoting biodiversity by making specific provisions for MPAs. The convention even has a definition of the term 'protected area' stated clearly in Article 2 as a geographically defined area that is designated, regulated, and managed to achieve specific conservation objectives (Secretariat of the Convention on Biological Diversity, 2011). The CBD recognises the importance of *in situ* conservation, including through the establishment of protected areas (Article 8). It also makes provision for protected areas related to the marine ecosystem through various CBD Programmes of Work (PoW) on Marine and Coastal biodiversity, inland water ecosystems, traditional knowledge, tourism and biodiversity, and island biodiversity, which makes mainstreaming of marine and ecosystem approaches into guidelines for national legislation on the establishment and management of MPA very effective. Additionally, the CBD requires member states to develop and implement national biodiversity strategies and action plans, which often include the designation of MPAs as a key conservation measure (Secretariat of the Convention on Biological Diversity, 2011). The Kunming-Montreal Global Biodiversity Framework under CBD introduces the "30x30" target, aiming to protect 30% of the world's land and ocean by 2030 (CBD, 2022). This commitment provides Ghana with an opportunity to expand its MPA network in line with global conservation goals.

Legal Instruments Supporting Marine Biodiversity Protection

1. The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat, adopted in 1971, is an international treaty primarily focused on

Digitized by Sam Jonah Library

the conservation and wise use of wetlands, which are broadly defined under the convention to include certain coastal and marine areas. Parties to the Convention are obligated to designate wetlands of international importance that meet specific ecological criteria as nature reserves (Article 4) and to maintain their ecological character through effective management (Ramsar Convention Secretariat, 1971, 2013).

2. The World Heritage Convention (WHC), adopted in 1972, focuses on safeguarding cultural and natural heritage sites of exceptional universal value for biodiversity conservation. It also works closely with the UNESCO MAB programme to identify and protect biosphere reserves to improve interaction between people and their surroundings. The convention allows for the designation of marine and coastal areas as World Heritage Sites. There are specific guidelines and criteria for qualifying an area for nomination to the World Heritage List. The sites have to be recognised for their extraordinary ecological, geological, or cultural significance, including cultural landscapes, heritage routes, heritage canals, historic towns, and town centres (United Nations Educational, Scientific and Cultural Organisation [UNESCO], 1972). With the creation of the WHC Marine Programme in 2005, the WHC also demonstrated a special interest in MPAs. Since then, it has enhanced the management of numerous large, iconic MPAs and developed a best-practice manual (Douvere, 2015; Wells et al., 2016).

3. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) Man and Biosphere (MAB) programme (1971) promotes the establishment of Biosphere Reserves, which offer a framework for managing protected areas that integrates conservation with sustainable development practices (UNESCO, 2017). The MAB programme provides a framework to support national governments in

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

managing protected areas through facilitating the exchange of knowledge and best practices to ensure the long-term sustainability of both ecological and social systems.

4. The United Nations Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention), adopted in 1979, focuses on the conservation of migratory species, including many marine species such as whales, turtles, and seabirds, as well as their habitats. The Bonn Convention plays a vital role in MPA development by identifying conservation priorities, such as migratory species that require protection. Parties to the Bonn Convention are encouraged to develop and implement agreements through Memoranda of Understanding for specific migratory species, which can help foster international collaboration in establishing transboundary MPAs (United Nations, 1979).

Regional Agreement and Cooperation

1. The Abidjan Convention for the Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central and Atlantic Africa Region (Abidjan Convention), adopted in 1981 and entering into force in 1984, establishes a framework for regional cooperation among member states. Recognising the ecological interconnectedness of the region's marine ecosystems, the Convention emphasises the need for a coordinated approach to their protection (UNEP, 2014). A key aspect of the Abidjan Convention's approach to marine conservation is its focus on Marine Spatial Planning (MSP). Developing a framework for MSP promotes a comprehensive approach to managing marine and coastal resources, including the potential for incorporating MPAs into national and regional plans. Article 11 of the Convention empowers contracting parties, including Ghana, to establish MPAs. It calls on contracting parties to take

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

measures to protect and preserve ecosystems and habitats, and to establish protected areas "such as parks and reserves" (UNEP, 2014).

Legal and Policy Framework for Marine Protected Areas (MPAs) in Ghana

National legislation for MPAs is developed by aligning them with obligations under international agreements. To ensure the effectiveness of the international legal framework, strong implementation at the national level is required. The establishment of Marine Protected Areas (MPAs) in Ghana is anchored in a combination of constitutional mandates, sector-specific legislation, and policy frameworks. These legal instruments align with Ghana's commitments under international environmental agreements, ensuring that national legislation supports marine conservation objectives. Key legal and policy frameworks that guide the development and management of MPAs in Ghana include:

Constitutional and Legislative Basis for MPAs

1. The Constitution of Ghana (1992) provides a broad legal foundation for environmental protection. While it does not explicitly mention MPAs, Article 268 mandates the protection and preservation of Ghana's land and resources, including its marine environment. This overarching principle enables subsequent laws, such as the Fisheries Act and the Environmental Protection Agency Act, to define more specific frameworks for marine conservation (Government of Ghana, 1992).
2. The Fisheries Act, 2002 (Act 625), is the cornerstone of fisheries management in Ghana. It establishes the Fisheries Commission and empowers it to regulate fishing activities, enforce catch limits, and designate fisheries management areas that can serve as de facto MPAs. Section 13 of the Act provides for the creation of restricted fishing zones. This provision can be instrumental in Ghana's recent attempts to establish MPAs, facilitating their creation, with a focus on protecting fish stocks and their habitats (Government of Ghana, 2002).

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Wildlife and Environmental Protection Laws Relevant for MPAs

1. The Wildlife Resources Management Act, 2023 (Act 1115), provides a legal basis for the sustainable management of both protected areas and wildlife. While the Wildlife Resources Management Act primarily addresses terrestrial wildlife, several provisions make it highly relevant for the establishment and management of Marine Protected Areas (MPAs) in Ghana (Government of Ghana, 2023). The Act creates a unified legal framework for all protected areas in Ghana, which, by definition, would include MPAs, since they are specific types of protected areas often designated to conserve marine ecosystems and fisheries. It provides clear categories of protected areas and their management objectives, which offer a template that can be applied to marine ecosystems. While the law can be extended to cover the conservation of marine species, its lack of specific provisions for marine environments creates gaps in enforcement and would require targeted implementation methods to address unique aspects of marine conservation. Countries such as Kenya and Tanzania have revised their wildlife laws to explicitly integrate MPAs, an approach that Ghana may consider adopting (IUCN-ESARO, 2020).
2. The Environmental Protection Agency (EPA) Act, 1994 (Act 490), established Ghana's Environmental Protection Agency (EPA) and empowered it to take measures to protect the environment and conserve natural resources, including marine and coastal ecosystems. As a regulatory body, the EPA can utilise this act to develop regulations and policies to establish and manage MPAs, ensuring the protection of critical marine habitats (Environmental Protection Agency, 1994).

Specific Policy Frameworks Supporting MPAs in Ghana

1. The Marine Fisheries Management Plan (MFMP) of Ghana, 2022 - 2026, developed by the Fisheries Commission of Ghana, builds on the 2015 - 2019 MFMP, which

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

initially aimed to protect marine ecosystems through the 'creation of marine ecosystem protection areas.' However, due to governance challenges, the 2015 - 2019 MFMP was unable to carry out this action. The revised plan (i.e., the 2022-2026 MFMP) further strengthens MPA's commitment by drawing on lessons learned from the old plan, along with other scientific data, in its development. In the current MFMP, the Fisheries Commission, under Section 13 of the Fisheries Act, 2002 (Act 625), shall collaborate with relevant institutions to designate sites as MPAs, develop legal frameworks for their protection, and establish management plans to ensure the effectiveness of the designated areas (MoFAD, 2022). This strategic shift acknowledges lessons from past failures and incorporates scientific data and stakeholder input, thereby improving the likelihood of effective implementation.

Effectiveness of Marine Protected Areas: Key Factors and Considerations

Marine Protected Areas (MPAs) have shown varied success in achieving conservation goals, with numerous case studies highlighting both effective management and significant challenges. Their effectiveness often hinges on factors such as design, enforcement, and community engagement, which determine whether they contribute to biodiversity conservation or fail to meet their objectives (Huang et al., 2024). Ecologically, MPAs enhance biodiversity, restore degraded ecosystems, and support sustainable fisheries. By restricting destructive activities, they serve as safe havens for marine organisms, allowing populations to recover and thrive from exploitation, particularly endangered species (Edgar et al., 2014; Humphreys & Clark, 2019a). MPAs also protect vital habitats such as estuaries, mangroves, and coral reefs, safeguarding ecological processes, such as nutrient cycling and biochemical flows, that are essential for ecosystem health (Halpern, 2003; Salm et al., 2000). Furthermore, they act as genetic reservoirs, facilitating the restoration of degraded areas and contributing to sustainable fisheries by protecting

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

spawning and nursery grounds, which, in turn, increases fishery yields beyond MPA boundaries (Goñi et al., 2010; Harrison et al., 2012). Beyond ecological benefits, MPAs offer significant social and economic advantages, including sustainable fishery yields, enhanced ecosystem services, educational opportunities and income through marine-based tourism (Bertelli & Unsworth, 2014; Moscardo et al., 2017; National Oceanic and Atmospheric Administration, 2023; Selig & Bruno, 2010). However, to fully realise these potential benefits, MPAs must be effectively designed and managed; otherwise, they risk becoming ineffective "paper parks" (Di Cintio et al., 2023; Relano & Pauly, 2023). The design and planning of MPAs are foundational to their success. Key considerations include age, size, historical fishing intensity, and habitat representation, all of which influence effectiveness in varying degrees across ecosystems (Smith et al., 2025). The location of MPAs is equally critical, as their ability to protect coastal ecosystems depends on their alignment with the biogeographic distributions of species and local environmental conditions (Zucconi et al., 2024). Size also plays a crucial role, with larger MPAs generally providing greater ecological benefits by encompassing diverse ecosystems and adequately protecting migratory species (Ban et al., 2011; Gaines et al., 2010). Effective management and governance require clearly defined goals and objectives to guide actions, along with robust enforcement mechanisms to ensure compliance with regulations (Agardy et al., 2011). Strong enforcement not only deters illegal activities but also fosters a sense of legitimacy and fairness among local communities, which is essential for long-term conservation success. Studies indicate that MPAs with rigorous enforcement exhibit higher fish densities and biomass, signalling healthier ecosystems (Karr et al., 2024). Additionally, fair administration of regulations enhances compliance, while perceptions of corruption can undermine adherence (Ibbett et al., 2025). Stakeholder engagement is another critical factor influencing MPA success. Recent research underscores the importance of involving local

Digitized by Sam Jonah Library

communities in the establishment and management of MPAs, as their support and cooperation are crucial (Huang et al., 2024; Oyanedel et al., 2016, 2017). Effective communication with stakeholders throughout the MPA process, from design to implementation and ongoing management, enhances legitimacy and compliance (Di Cintio et al., 2023; Russi, 2020). When local communities participate in decision-making, they are more likely to accept and adhere to conservation measures, which will lead to improved management outcomes (Horta e Costa et al., 2022). This link between regulatory compliance and stakeholder support and acceptance reinforces the importance of participatory planning. Best practices in MPA design involve incorporating legitimate stakeholder interests, as this fosters trust and results in more credible, widely accepted decisions (Horta e Costa et al., 2022). This approach has proven effective in cases involving MPA zoning and rezoning, where integrating stakeholder perspectives has improved conservation outcomes (Giakoumi et al., 2018; Horta e Costa et al., 2022). By carefully considering design, enforcement, and stakeholder engagement, MPAs can maximise their ecological, social, and economic benefits, ensuring they serve as effective tools for marine conservation rather than symbolic, ineffective "paper parks."

Conceptualising Marine Resource Dependency

Resource dependency refers to the reliance of individuals, communities or regions on natural resources for sustenance, economic activities and cultural practices (Bailey & Pomeroy, 1996; Marshall et al., 2010). Marine resource dependency, a subset of this broader concept, specifically addresses reliance on goods and services provided by marine ecosystems, such as fish stocks, seabed minerals, and marine space, for sustenance, income, and cultural identity (Thanh et al., 2020; Xue & Wang, 2013; Yanda et al., 2023). It is a multidimensional concept that encompasses ecological, economic, and socio-cultural interactions between humans and the marine environment (Marshall et al., 2010). Marine

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

resource dependency manifests through both direct and indirect engagements with marine environments. Direct engagements include fishing, aquaculture, and coastal resource harvesting, while indirect engagements encompass marine-based tourism, transportation, and ecosystem services such as coastal protection and carbon sequestration (Thanh et al., 2020; Xue & Wang, 2013). It can also be broadly categorised into three key dimensions:

1. **Ecological Dependence**

   This refers to the reliance on marine ecosystems for ecosystem services such as fish stocks, coastal protection, and biodiversity conservation (Selig et al., 2019). Healthy marine environments sustain fisheries, aquaculture, and tourism industries while mitigating climate impacts such as sea-level rise and extreme weather events (Costello et al., 2016). This helps support lower dependency rates and enhance community resilience to external shocks (Cinner & Pomeroy, 2012).

2. **Economic Dependence**

   Many coastal communities depend heavily on marine resources for livelihoods, with activities such as small-scale fishing, aquaculture, and tourism forming the backbone of local economies (Cinner et al., 2018; Marshall et al., 2017). Fisheries and aquaculture contribute significantly to global food security and local economies, particularly in developing nations, where income sources are scarce (Pauly et al., 2002, 2005). Marine-based tourism, including ecotourism, diving, and recreational fishing, is another major contributor to economic growth (Hall, 2001; Yanda et al., 2023). However, economic dependence on marine resources makes communities vulnerable to market fluctuations, environmental changes, and regulatory policies (Cinner & Barnes, 2019).

3. **Socio-Cultural Dependence**

   Marine activities and resources are deeply embedded in the traditions, identities, and belief systems of many coastal and indigenous communities (Ameworwor et al., 2023;

Digitized by Sam Jonah Library

Eliska et al., 2020). Cultural heritage, for example, plays a significant role in determining the types of marine resources communities utilise and how they are valued (Eliska et al., 2020; Marshall et al., 2017). Cultural fisheries, traditional marine governance systems, and customary marine tenure reflect the intrinsic connection between societies and marine environments (Hicks et al., 2015; Johannes, 2002). This cultural attachment to the sea often reinforces dependence on marine resources, as generations continue to rely on traditional practices and beliefs (Ameworwor et al., 2023).

It is significant to note that resource availability plays a crucial role in shaping the degree and nature of dependency on marine resources. The abundance, accessibility and sustainability of resources determine the extent to which individuals, communities and economies rely on them for livelihoods, food security, cultural identity and economic development (Cinner & Barnes, 2019; Pauly et al., 2002). Changes in marine resources, whether due to overexploitation, environmental shifts, or regulatory restrictions, can have profound socio-economic impacts, including income loss, food insecurity, and cultural disruptions (McClanahan et al., 2015). Understanding marine resource dependency thus requires a holistic perspective that balances resource use with conservation to ensure the long-term sustainability of both ecosystems and the communities that depend on them (Glaser et al., 2012). This balance is particularly critical in regions where coastal economies are closely intertwined with marine resources, requiring strategies that address socio-economic needs while fostering ecological resilience (Cullen, 2007).

Measurement of Marine Resource Dependency

Assessing resource dependency requires a multidimensional approach that considers the social, economic, and cultural dimensions of marine use to help policymakers, economists, and conservationists address anticipated socio-economic risks and tailor

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

conservation strategies to minimise negative impacts on livelihoods while promoting sustainable resource use. Researchers over the years have systematically assessed the various dimensions of resource dependency using qualitative and quantitative measures. Marshall et al. (2017) employed quantitative methods to investigate how different stakeholder groups depend on the Great Barrier Reef, thus contributing valuable empirical data to the field of marine resource management. The concept of resource dependency was operationalised by examining a wide range of indicators across economic, demographic, psychological, and cultural dimensions. Somoebwana et al. (2021b) also advanced the discourse on resource dependency in rural settings by employing a quantitative approach to measure marine resource dependence, specifically by calculating the proportion of household income derived from ocean-fishery activities. Additionally, the study incorporated a multidimensional perspective, which is critical for understanding the welfare implications of resource dependency within the coastal community context. Somoebwana et al. (2021a) combine quantitative data from statistical models with qualitative insights obtained from interviews to give a detailed account of how social and cultural factors influence marine fishery dependence in the coastal lowlands of Kenya. Aldasoro-Said and Ortiz-Lozano (2021) employed the Sustainable Livelihood Framework (SLF) as a conceptual basis for measuring marine resource dependency among rural communities in the southwest Gulf of Mexico. This method allows for a nuanced understanding of how various factors contribute to resource dependence, acknowledging the complex interplay of different SLF capital forms. Selig et al. (2019) employed a Human dependence framework to quantify nutritional, economic and coastal dependence on marine ecosystems.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

The Relationship Between Marine Resource Dependency and Marine Protected Areas (MPAs)

Marine resource dependency encompasses a variety of socio-economic activities intrinsically linked to marine ecosystems, including subsistence and commercial fishing, small-scale aquaculture, marine-based tourism, seaweed harvesting, and coastal agriculture (Bailey & Pomeroy, 1996). For many coastal communities, these activities not only sustain livelihoods but also provide food security and reinforce cultural identity (Cinner & Barnes, 2019). However, implementing Marine Protected Areas (MPAs) presents a complex paradox. While MPAs are designed to conserve marine biodiversity and ensure long-term resource sustainability, they can also restrict access to critical resources, thereby disrupting established socio-economic systems (Bennett & Dearden, 2014; Edgar et al., 2014). This complex and often paradoxical relationship between marine resource dependency and MPAs often creates tensions arising from altered resource access and shifting economic opportunities. For communities that rely heavily on marine resources, MPAs can pose significant challenges by limiting fishing areas, restricting harvesting activities, and imposing regulatory barriers. These changes may undermine income stability, exacerbate food insecurity, and weaken cultural ties to traditional marine practices (Byers, 1996; Lundquist et al., 2017). Furthermore, MPAs can reshape the distribution of ecosystem services provided by coastal and marine ecosystems, sometimes redistributing economic and ecological benefits in ways that disproportionately disadvantage small-scale fishers and resource-dependent communities (Nuttle & Bergh, 2013). As a result, the establishment of MPAs must account for the extent of local dependency on marine resources and the potential socio-economic impacts of conservation measures. This underscores the need to integrate socio-economic considerations into MPA design and management to ensure equitable outcomes.

Digitized by Sam Jonah Library

Incorporating Marine Resource Dependency into MPA Planning and Management

Marine Protected Areas (MPAs) are most effective when they account for the socio-economic dependencies of local communities on marine resources. A robust understanding of resource dependency ensures that conservation measures are both equitable and sustainable (Marshall, 2011). Stakeholders usually exhibit varying levels of dependency, with vulnerable households often experiencing the risk of conservation-related restrictions (Gimton et al., 2010; Wilson et al., 2005). Assessing dependency is therefore critical for identifying the groups that would require compensatory mechanisms or alternative livelihoods (Marshall et al., 2009). MPA zoning and regulations must reflect local socio-economic realities to avoid unintended harm and ensure community support. Studies demonstrate that restrictions without adequate alternatives often provoke resistance from communities and hence undermine conservation goals (McClanahan et al., 2015). For instance, in cases where high-dependency communities are faced with abrupt fishing bans, compliance would be low unless accompanied by compensation or alternative income sources, which are known to mitigate adverse effects and improve community support for MPAs (McClanahan et al., 2015; Samonte et al., 2016a). This underscores the importance of integrating dependency data into planning and management to ensure that conservation goals and socio-economic needs align, thereby further improving both ecological and social outcomes (Andradi-Brown et al., 2023). Additionally, since resource use dependence reflects the flexibility and adaptability of local users when access to natural capital is restricted, it also influences community perceptions of risk and willingness to engage with conservation initiatives (Cinner et al., 2009; Marshall et al., 2010). Incorporating dependency assessments alongside evaluations of social resilience and institutional trust can help policymakers anticipate conflicts and design more adaptive management strategies (Marshall et al., 2009). Literature has consistently highlighted resource dependency as a

Digitized by Sam Jonah Library

prioritised socio-economic factor in MPA planning (Cinner & McClanahan, 2006; Eriksson et al., 2019; Levine et al., 2015). By explicitly addressing dependency through participatory zoning, compensatory mechanisms and alternative livelihood programmes, MPAs can achieve the dual goals of safeguarding marine biodiversity while supporting communities that depend on it (Marshall, 2011; Tidball & Stedman, 2013).

Empirical Review on Socio-Economic Impacts of Marine Protected Areas (MPAs)

According to empirical studies conducted across diverse geographical contexts, Marine Protected Areas generate varying socio-economic outcomes for adjacent coastal communities. These impacts are shaped by governance arrangement, enforcement effectiveness, livelihood dependence and stakeholder inclusion. The existing body of literature shows that MPAs can produce positive outcomes in several ways, particularly through fisheries spillover, improvements in ecosystem services and the development of tourism (Bertelli & Unsworth, 2014; Harrison et al., 2012). For instance, in Cu Lao Cham, Vietnam, Ngoc (2018) observed improved catch rates, household incomes, and food security as the economic benefits as a result of reef protection and tourism. Similarly, Mann-Lang et al. (2021) found that older and well-enforced MPAs in South Africa correlated with higher well-being indicators, especially in cases where community engagement has been sustained over time. Benefits from tourism have been widely cited as a key driver of economic growth in communities adjacent to MPAs. Gollan and Barclay (2020) found that businesses near MPAs experienced growth in revenue and employment due to increased visitation and improved ecosystem health. In Europe, Rodríguez-Rodríguez and López (2020) discovered that national-level stakeholders strongly supported MPAs due to their perceived role in local development and sustainability. By creating jobs in hospitality, guiding services, and food industries, these advantages often extend beyond fishing households to entire coastal economies (Jones et al., 2017; Moscardo et al., 2017).

Digitized by Sam Jonah Library

Despite the documented benefits, a substantial body of literature shows that MPAs have negative and uneven socio-economic impacts, particularly for small-scale and subsistence fishers. While ecological recovery within MPAs can generate benefits such as fishery enhancement and tourism growth, they may also impose costs, including restricted access to resources, loss of income, and social tensions, especially among small-scale fishers and marginalised communities (Charles & Wilson, 2009; Mascia et al., 2014). In South Africa, Sowman and Sunde (2018) studied five MPAs and documented widespread negative effects, including loss of tenure, food insecurity, reduced income, and cultural dislocation. Similarly, Eriksson et al. (2019) reported that nearly half of local respondents experienced a worsening of their livelihoods following shark and manta conservation policies, largely due to disruptions to fishing-dependent income. This kind of economic pressure can be a significant problem, exacerbating poverty and food insecurity in communities with limited livelihood options (Bartlett et al., 2009; Charles & Wilson, 2009; Mangora et al., 2014). These highlight the fact that the costs and benefits of MPAs are not evenly distributed. Socioeconomic burdens are often borne by poorer and more resource-dependent communities, especially in cases where governance processes lack transparency, participation and trust (Gollan and Barclay, 2020; Rodríguez-Rodríguez and López, 2020). The key to achieving net positive socio-economic outcomes lies in inclusive governance, which ensures equitable benefit-sharing and appropriate participatory planning to proactively address community concerns (Day et al., 2019; Horta e Costa et al., 2022).

Empirical evidence on Marine Protected Areas in Ghana

Although global literature provides a roadmap of possible impacts, empirical research on MPAs in Ghana remains limited and fragmented. Comprehensive socio-economic impact analysis has received less attention than ecological assessments and fisheries governance. Interestingly, no study has conducted a holistic ex-ante assessment of

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

socio-economic and cultural implications of proposed MPAs in the Western Region of Ghana.

Sagoe et al. (2021) examined community participation in the assessment of fishing-related ecosystem services toward MPA establishment in the Greater Cape Three Points area in the Western Region of Ghana. The study uses cost-benefit analysis and ecosystem service valuation to provide insights into stakeholder perception and the trade-offs between conservation and livelihoods. However, rather than methodologically examining household-level dependency, vulnerability and anticipated livelihood outcomes under proposed MPA scenarios, the study focused primarily on ecosystem services and participatory processes.

Baseline ecological and environmental studies have been conducted in the region. To provide vital data on marine biodiversity and habitat condition, Ateweberhan et al. (2012) conducted baseline ecological surveys of nearshore rocky reefs in the Western Region. In a similar vein, the Environmental Protection Agency (2021) documented the deteriorating health of ecosystems and the different pressures they face in a state of the marine environment report for selected coastal districts in the Western Region. While these studies are essential for the ecological justification of MPAs, they do not consider the socio-economic and cultural implications for coastal communities.

At the national level, Karakara et al. (2024) examined the relationship between traditional cultural practices and modern marine conservation efforts in Ghana, identifying existing cultural practices that could support Marine Protected Area (MPA) initiatives. However, the study provides a national-level perspective and does not provide region-specific or community-level analysis relevant to the Western Region.

Additionally, the Integrated Coastal and Fisheries Governance (ICFG) programme collected baseline livelihood data from coastal communities in Ghana's Western Region(Kruijssen et

Digitized by Sam Jonah Library

al., 2013). Although the work provides valuable information on income sources, seasonal vulnerability, and fish consumption patterns, it does not link these livelihood characteristics to MPA establishment or project how they might change under restricted access regimes. The reviewed literature reveals critical gaps in ex-ante socio-economic impact assessments of proposed MPAs in Ghana, particularly in the Western Region. Additionally, in the studies currently available, marine resource dependency, community perceptions, and preferred mitigation strategies are not included in a single analytical framework. This study addresses gaps, providing context-specific evidence to support MPA planning.

Case Studies on Socioeconomic Outcomes of MPAs

The socioeconomic impacts of Marine Protected Areas are multifaceted, with outcomes varying widely depending on governance, community involvement, and local context. This review synthesises key case studies from different regions, illustrating the diverse socio-economic effects (both positive and negative) that MPAs can have on local communities and economies.

Enhance Fisheries

- Case Study: Apo Island Marine Reserve, Philippines

The Apo Island Marine Reserve (AIMR) demonstrates how MPAs can enhance fisheries through the "spillover effect" (Lester et al., 2009). Established in 1982 on the Philippine Island of Negros Oriental, the AIMR exemplifies the efficacy of community-based MPA management and its positive impact on fisheries (Raymundo, 2003). The AIMR implemented a community-based management system with a 7 km^2 no-take zone along the island's southeast coast, complemented by regulated fishing areas (Alcala, 2004; Raymundo, 2003). This configuration allowed the fish population to recover within the sanctuary, leading to increased biomass and species diversity in adjacent fishing areas. Fishers benefited from larger catches, supporting both income and food security (Abesamis

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

et al., 2006; Mecha et al., 2022; Russ & Alcala, 2011; Walmsley & White, 2003). The reserve also improved the overall health and resilience of the surrounding coral reef ecosystems, contributing to ecological and socio-economic resilience (Russ & Alcala, 2011; Walmsley & White, 2003). This case serves as a model for sustainable marine resource management worldwide. It underscores the critical role of community involvement and collaboration in achieving conservation and socio-economic goals, providing a compelling argument for implementing similar marine protected areas (MPAs) elsewhere.

Promoting Tourism and Economic Development:

- Case Study: Great Barrier Reef Marine Park, Australia

MPAs with rich biodiversity and healthy ecosystems have the potential to drive tourism as they raise the profile of an area, making it an attractive destination for other recreational activities. This generates significant revenue streams and creates employment opportunities for local communities (Bushell et al., 2007; Toropova et al., 2010). The Great Barrier Reef Marine Park (GBRMP), located 2300 km along Australia's northeast coast, is a prime example of how MPAs can drive economic development through tourism. Known to be one of Australia's national treasures, it was designated as a UNESCO World Heritage Site in 1981, spanning over 348,000 km² and encompassing the world's largest coral reef system (Deloitte Access Economics, 2013). The GBRMP protects not only coral reefs but also includes islands, beaches, estuaries, mangroves, and other parts of the marine system (Creighton et al., 2021; Stoeckl et al., 2014). To balance conservation with human use, the park employs a zoning system with varying levels of protection. At its core are highly protected "marine parks" with strict regulations on fishing and other potentially damaging activities. Surrounding these core areas are "multiple-use zones" where activities such as snorkelling, diving, and limited commercial fishing are permitted under strict guidelines. This zoning approach allows for the protection of sensitive ecosystems while enabling

Digitized by Sam Jonah Library

tourism and economic activity in designated areas (Day et al., 2019). According to a report by Deloitte Access Economics report (2013), tourism associated with the GBRMP generates over $4 billion annually and supports more than 64,000 jobs, making it the largest employer in Queensland. The reef's economic contributions extend beyond tourism, bolstering local infrastructure and services and highlighting the importance of MPAs in promoting regional development (Creighton et al., 2021).

Preservation of Cultural Values

- Case Study: Haida Gwaii Marine Protected Area, Canada

Marine Protected Areas (MPAs) can play a vital role in preserving cultural values by safeguarding archaeological sites, historical landmarks, sacred spaces, and areas of traditional significance. These protected areas foster a sense of belonging and strengthen the cultural heritage of local communities (MEA, 2005). The Haida Gwaii MPA, also known as the Gwaii Haanas National Marine Conservation Area Reserve and Haida Heritage Site, is an exemplary case of integrating cultural preservation with marine conservation. Located off the northern coast of British Columbia, Canada, the Haida Gwaii MPA spans over 3,400 square kilometres of ocean area and encompasses the waters around the southern portion of the Haida Gwaii archipelago (University of British Columbia, 2017). This region is renowned for its rich biodiversity and cultural heritage. The MPA employs a zoning system to balance conservation objectives with sustainable use, ranging from no-take zones that prohibit all extractive activities to areas permitting sustainable fishing and low-impact activities. The MPA's co-management framework, shared between the Haida Nation and the Government of Canada, ensures that conservation measures respect and incorporate Haida cultural values and traditional practices (Shields, 2020). Traditional Haida knowledge is integrated with contemporary scientific research, creating a holistic approach to conservation. This structure enables the Haida Nation to play a central role in

Digitized by Sam Jonah Library

decision-making processes, maintain their cultural continuity, and foster respect for ancestral wisdom (Shields, 2020). The waters of Haida Gwaii hold numerous culturally significant sites, including ancient villages, petroglyphs, burial grounds, and ceremonial sites. Legal protection under the MPA prevents disturbance and degradation of these sites, allowing the Haida people to continue spiritual and cultural practices in their sacred spaces (Guzide, 2022). This integration of cultural values into the management plan fosters a strong sense of ownership and responsibility among the Haida Nation, contributing to the long-term ecological and cultural success of the MPA.

Research and Education:

- Case Study: The Monterey Bay National Marine Sanctuary, USA

Marine Protected Areas (MPAs), characterised by minimal disturbance and reduced extraction activities, often serve as reference locations for scientific research and surveillance.

Acting as living laboratories, MPAs enhance the understanding of species demographics, ecosystem interactions, and the effects of conservation measures. They also provide invaluable opportunities for students and researchers to engage with marine ecosystems through field studies, training, and collaborative research initiatives (Thebaud et al., 2023). The Monterey Bay National Marine Sanctuary (MBNMS), established in 1992 along the central coast of California, exemplifies the role of MPAs in advancing research and education. Spanning over 6,000 square miles, it is one of the largest MPAs in the United States and encompasses diverse marine habitats, including kelp forests, deep-sea canyons, and underwater seamounts (Wood, 2017). Managed by the National Oceanic and Atmospheric Administration (NOAA), the sanctuary employs a zoning system to balance conservation and human activities. Specific zones are designated for research, education, and recreational activities such as diving and sustainable fishing. The MBNMS supports

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

over 30 world-class research institutions within the greater Monterey Bay area, fostering a collaborative environment for scientific innovation (Monterey Bay National Marine Sanctuary, 2021). Its diverse habitats offer unique opportunities to study ecosystem dynamics, while "no-take" zones provide pristine reference areas for comparing protected ecosystems with those impacted by human activities.

The MBNMS recognises the critical role of education in fostering a generation of ocean stewards. The sanctuary offers a wealth of educational resources, including teacher training programmes, curriculum materials, and interactive exhibits at its visitor centres. These initiatives engage the public and build awareness of marine conservation, ensuring that the benefits of the sanctuary extend beyond scientific research to broader societal impact (Monterey Bay National Marine Sanctuary Foundation, 2022; Wood, 2017).

Alternative Livelihood Creation:

- Case Study: Chumbe Island Coral Park (CHICOP), Tanzania

MPAs can also support local livelihoods by fostering sustainable resource use and providing diverse livelihood opportunities. By engaging in ecotourism, community-related jobs, and enterprises, communities near MPAs can diversify their income sources and reduce their reliance on traditional fishing activities (Christie & Pollnac, 2011). The Chumbe Island Coral Park (CHICOP), established in 1994 off the coast of Zanzibar, Tanzania, is a prime example of how marine conservation and community development can complement each other. Covering approximately 55 hectares, CHICOP comprises a no-take marine reserve (Coral reef sanctuary), a protected terrestrial area, an eco-lodge, a nature walk, and a visitor and education centre (Chumbe Island Coral Park [CHICOP], 2017). Its establishment has preserved the island's unique ecosystems while significantly improving local livelihoods. The park employs residents as rangers, guides, and eco-lodge staff, providing a stable, sustainable income that reduces reliance on traditional livelihoods such as fishing

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

(CHICOP, 2017). CHICOP also invests in capacity building through training programmes in hospitality, eco-tourism, and environmental management. Additionally, it supports community-based enterprises that produce handicrafts and souvenirs for visitors, offering alternative income sources for local artisans. Revenue generated from tourism activities is reinvested in community projects, including healthcare, education, and infrastructure development, thereby further enhancing the quality of life for residents (CHICOP, 2017; Salm et al., 2000).

This integrated approach has made CHICOP a global model for private MPA management, demonstrating that conservation efforts can simultaneously achieve ecological sustainability and socio-economic development. By creating alternative livelihoods and reinvesting in community welfare, CHICOP highlights the potential of MPAs to foster resilience and empower communities.

Negative Impacts of MPAs

While Marine Protected Areas (MPAs) are established primarily for ecological conservation, their implementation frequently generates complex socio-economic trade-offs that disproportionately affect coastal communities (Mascia et al., 2010). The following case studies demonstrate how various structural shortcomings translate into tangible negative impacts:

Cultural Displacement and Social Disruption

- Case Study: Galapagos Marine Reserve, Ecuador

The Galapagos Marine Reserve (GMR), established in 1998, is one of the world's largest Marine Protected Areas (MPAs), covering 137,000 km² of coastal and marine environments (Burbano & Meredith, 2020; Castrejón & Charles, 2013). Managed by the Galapagos National Park Directorate (GNPD) in collaboration with governmental and non-governmental organisations, the GMR aims to protect vital habitats and ecosystem services.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

However, its implementation highlights the potential socio-economic challenges of MPAs, particularly cultural displacement and social disruption. The GMR initially employed a participatory management regime with stakeholders, resulting in a zoning plan in the year 2000 that excluded industrial fishing within the reserve. However, in 2016, a second zoning plan expanded conservation areas from 10% to 33%, encompassing an additional 47,000 km^2. While this aimed to enhance ecosystem protection, it significantly reduced fishing grounds, directly impacting local fishers' livelihoods (Galapagos National Park Service, 2014; Zapata, 2005). The rezoning led to social conflicts, with fishers staging a nonviolent four-month protest from April to August 2016, after a three-day strike. This unrest prompted a one-year moratorium on the new zoning plan to allow further consultations and adjustments. Despite these efforts, the fisheries sector continued to object to the restrictions, leading to the moratorium being extended three times (Burbano et al., 2020). The strict conservation measures disrupted traditional fishing practices, leaving fishers feeling disconnected from their way of life. This loss of traditional livelihoods had not only economic but also cultural implications. Additionally, the increasing focus on tourism within the GMR overshadowed traditional practices and values, contributing to cultural displacement. Many local communities felt marginalised as tourism activities took precedence, further eroding their connection to the marine environment (Burbano & Meredith, 2020).

This case underscores the significance of balancing conservation objectives with the socio-economic realities of nearby communities. It highlights the need for inclusive management approaches that respect traditional practices and ensure equitable benefit-sharing to minimise cultural displacement and social tensions.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Increased Costs for Fishers

- Case Study: Hol Chan Marine Reserve, Ambergris Caye, Belize

The Hol Chan Marine Reserve, established in 1987 off the coast of Ambergris Caye in Belize, is one of the first Marine Protected Areas (MPAs) in the Caribbean (Cho, 2005). Covering approximately 18 km², the reserve is a multiple-use area with zones designated to conserve marine biodiversity and promote sustainable resource use. Its zones include coral reefs (Zone A), seagrass beds (Zone B), mangrove forests (Zone C), and Shark Ray Alley (Zone D), where sharks and rays congregate (Jacobs, 2019; E. R. Young & Bilgre, 2002). While the reserve has contributed to the recovery and sustainability of marine ecosystems, it has also imposed high economic costs on local fishers. The creation of no-take zones reduced the number of accessible fishing grounds, forcing fishers to travel farther offshore to catch fish. This increased fuel consumption and operational expenses, thereby raising the financial burden on small-scale fishers (Garaway & Esteban, 2002; Ramsubeik et al., 2006). Additionally, new licensing and monitoring regulations introduced compliance costs, including permit fees and fines for non-compliance, further straining fishers' finances (Garaway & Esteban, 2002). The success of the reserve in promoting ecotourism has also intensified competition for marine space. Fishers must navigate tourist zones and contend with recreational boats and divers, which complicates their fishing activities and reduces efficiency (Cho, 2005). Moreover, the influx of tourists has altered local market dynamics. While some fishers have transitioned into alternative roles, such as tour guides or eco-tourism service providers, the increased cost of living in the area has offset these benefits for many (Cho, 2005; Garaway & Esteban, 2002). The Hol Chan Marine Reserve illustrates the dual-edged impact of MPAs. While they can achieve ecological success and foster alternative economic opportunities, the costs to fishers, both direct and indirect, highlight

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

the importance of equitable resource management and the need to mitigate socio-economic burdens on resource-dependent communities.

Displacement and Migration

- Case Study: Chagos Marine Protected Area

The Chagos Marine Protected Area (MPA), established by the British government in 2010, is one of the largest marine reserves in the world, encompassing approximately 640,000 km² in the Indian Ocean. Comprising 60 low-lying coral islands and a 200-nautical-mile MPA, it aims to conserve marine biodiversity and protect the unique ecosystems of the Chagos Archipelago (Dunne et al., 2014). However, while ecologically significant, the creation of this MPA has had profound and far-reaching social and economic consequences for the Chagossian community. The Chagossian community, previously displaced from the archipelago during the construction of a U.S. military base on Diego Garcia, has long sought the right to return to their homeland (Dunne et al., 2014). The establishment of the Chagos MPA further compounded these challenges, effectively denying access to traditional fishing grounds and other marine resources. Critics argue that the MPA was implemented without adequate consultation or consideration of the Chagossians' right to return to their ancestral lands (Jeffery, 2013; Waibel, 2015). Despite numerous legal challenges in both British and international courts, the Chagossians have been unable to reclaim their homeland (De Santo, 2013; Evers & Kooy, 2011). This has deepened their economic struggles and intensified feelings of marginalisation (Gifford & Dunne, 2014; Sand, 2015). The Chagos Marine Protected Area case demonstrates the socio-economic trade-offs and ethical challenges of marine conservation. While the MPA contributes to biodiversity protection, it highlights the importance of integrating human rights into conservation efforts. Addressing the needs and rights of displaced communities is essential to achieving equitable and ethical MPA management.

Digitized by Sam Jonah Library

Economic Hardship

- Case Study: Cabo de Gata-Nijar Natural Park

The Cabo de Gata-Nijar Natural Park, established in 1987 on the south-eastern coast of Spain, spans approximately 495km² and includes both marine and terrestrial environments (Cortes-Vazquez, 2014). While the park has delivered ecological benefits, its creation has had significant socio-economic repercussions on the local communities reliant on traditional economic activities such as fishing and agriculture. The implementation of stringent conservation measures restricted access to essential natural resources, adversely affecting livelihoods. Local fishers, for instance, are prohibited from fishing in certain areas, resulting in reduced catch and income (Cortes-Vazquez, 2014). Similarly, farmers faced limitations in land use, pesticide application, and water extraction to protect the park's landscapes and biodiversity, leading to decreased agricultural productivity and income (Latorre et al., 2001; Sánchez-Picón et al., 2011). These regulations are particularly burdensome for small-scale farmers and fishers who lack alternative livelihoods (Cortes-Vazquez, 2014). While the park also promoted eco-tourism as an alternative economic activity, the benefits have been unevenly distributed. Many residents lack the skills or resources to transition into tourism-related jobs, resulting in unemployment and economic instability (Latorre et al., 2001). Furthermore, the promotion of ecotourism made it difficult for residents to afford housing and essentials, as rising property and living costs were driven by the development of ecotourism (El País, 2024).

The Cabo de Gata-Níjar Natural Park exemplifies the socio-economic trade-offs often associated with conservation initiatives. While the park contributes to environmental protection, its restrictive measures and uneven economic benefits have led to economic hardship and displacement. Addressing these impacts through inclusive management

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

practices and the development of equitable alternative livelihoods is essential to ensure a balance between conservation and community well-being.

Chapter Summary

The chapter provided a theoretical review essential for understanding Marine Protected Areas (MPAs). It detailed the historical background and legal bases that underpin their establishment. Subsequently, the chapter examined case studies and empirical research concerning the socioeconomic impacts of MPAs, highlighting how these conservation measures affect coastal communities. Additionally, the chapter delved into the concept of marine resource dependence, emphasising its significance in the design and management of MPAs. The relevance of the Sustainable Livelihoods Framework in this context was also highlighted. By integrating theoretical perspectives, empirical evidence, and the SLF, this chapter effectively enriches the analytical framework for addressing the research problem.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

CHAPTER THREE

METHODOLOGY

Introduction

This chapter provides a detailed methodological framework employed to assess the potential socio-economic implications of establishing Marine Protected Areas (MPAs) in the Western Region of Ghana. It encompasses the research design, including the selection of the study area, the target population, the sampling approach, and the determination of the sample size. Additionally, the chapter elaborates on data collection methods, analysis techniques and the ethical considerations integral to the research process, ensuring rigour and adherence to academic and community norms.

Research Design

This study adopted a convergent parallel design, a mixed methods approach grounded in pragmatist research philosophy. The pragmatist research philosophy prioritises the application of practical solutions over adherence to a single ontological or epistemological position and emphasises the use of multiple methods to understand complex social phenomena (Creswell & Creswell, 2018; Morgan, 2014). Because pragmatism is predicated on the idea that reality is pluralistic and shaped by lived experiences, it is appropriate for studies that examine both quantifiable patterns and subjective meanings (Morgan, 2014). The socio-economic implications of proposed MPAs represent realities that are both objective (e.g., dependence on marine resources) and subjective (e.g., fears of livelihood loss, cultural attachment to the sea). Pragmatism, therefore, provides the foundation for examining these multidimensional issues by enabling the integration of quantitative and qualitative evidence to answer the research questions effectively.

In line with the pragmatist stance, the study adopted a mixed-methods research approach. This approach allows the researcher to examine a phenomenon that cannot be fully

Digitized by Sam Jonah Library

understood through a single approach (Shannon-Baker, 2016). The study's objectives, which include assessing the levels of marine resource dependency, examining perceived socio-economic impacts, and identifying preferred mitigation strategies, require both quantitative and qualitative inquiry. Creswell and Plano Clark (2018) argue that mixed methods are particularly useful for investigating human perceptions and experiences within socio-ecological systems. In alignment with this, the study utilised a convergent parallel mixed-methods design. This design was selected for its capacity to simultaneously capture and integrate both quantitative and qualitative data, enabling a holistic understanding of the research phenomenon (Creswell & Creswell, 2018). By combining numerical data analyses with in-depth qualitative insights, the approach leverages the strengths of each method while mitigating the limitations inherent in using either method in isolation (Choy, 2014; Mehrad & Zangeneh, 2019). The design was chosen because understanding local perspectives on the potential socio-economic implications of MPAs requires examining both statistical patterns (e.g., levels of dependency, frequency distributions) and contextual interpretations (e.g. narratives of perceived livelihood threats). Quantitative data provide numerical evidence of dependency levels, while qualitative data captures the rich nuances and the cultural context, which are essential when studying community perceptions and experiences (Cohen et al., 2017). Using both methods strengthens the credibility of the findings. As Ivankova & Wingo (2018) argue, convergent parallel designs are powerful for verifying results across datasets and minimising the risk of overgeneralisation, hence yielding robust and well-rounded conclusions. Additionally, the design's efficiency in collecting both qualitative and quantitative data concurrently allows the research to be completed within a single fieldwork phase, optimising time and resource use (Creswell & Plano Clark, 2018). Ultimately, by integrating multiple perspectives and triangulating data, the study offers an evidence base that reflects the complex socio-economic dynamics surrounding MPAs,

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

thereby improving the relevance of the research for policy development, stakeholder engagement, and adaptive MPA planning within Ghana's Western Region.

Study Area

This study was carried out in eight communities, namely Busua, Dixcove (Lower and Upper), Akwidaa, Achonwa, Princess Town, Akatekyi, Agyan, and Akonu, in the Western Region of Ghana. The Western Region is situated in the equatorial climate zone and covers approximately 2391 square kilometres, representing about 10% of Ghana's total land area. The region experiences moderate temperatures and receives 1600 mm of rainfall on average each year (Amoasah, 2010). Its topography exhibits predominantly low-lying characteristics, with elevations that do not surpass 30 meters. The Western Region has a coastline of approximately 202 kilometres, characterised by a broad continental shelf extending up to 200 nautical miles, which translates to approximately 80 kilometres from the shore of Cape Three Points (Boye et al., 2018). This coastal zone supports a rich tapestry of coastal ecosystems and habitats, including mangrove swamps, estuaries, lagoons, headlands and sandy beaches, which harbour a wealth of biodiversity and provide critical goods and services that fuel socio-economic development in the region (Ateweberhan et al., 2012; CRC & FoN, 2011). Despite its ecological significance, the region faces significant threats, including pollution, overfishing, coastal habitat degradation, harmful algal blooms, and the bycatch of endangered species (deGraft-Johnson, 2010). These challenges undermine the ecological integrity of the coastal and marine environment and the socio-economic benefits it provides. According to the MPA site selection report, the proposed area for a nearshore MPA encompasses 18 coastal communities within the Ahanta West and Nzema East Municipal Assemblies (GFRA, 2023).

The Ahanta West Municipal, with Agona Nkwanta (Agona Ahanta) serving as its capital, covers an overall land area of 591 square kilometres (deGraft-Johnson et al., 2010).

Digitized by Sam Jonah Library

It is located in the southernmost part of Ghana, lying between latitudes 4° 45´N and 4° 57´N and longitudes 1° 45´W and 2° 13´W (Asante-Yeboah et al., 2022; Coastal Resources Center, 2013a). According to the 2021 Population and Housing Census report, the municipality has a population of 153,140 inhabitants (GSS, 2021). The Gulf of Guinea borders the municipality to the south, Mpohor District and Tarkwa Nsuaem Municipal to the north, Nzema East Municipal to the west, and Sekondi-Takoradi Metropolitan Assembly (STMA) to the east (Fisheries Scientific Survey Division [FSSD], 2022). Ahanta West falls within Ghana's southwestern equatorial climatic zone characterized by; a moist semi-deciduous forest ecosystem, double-maxima receiving annual rainfall (peaks in June and October), Annual rainfall ranging between 1250mm and 1750mm, making it one of the wettest areas in Ghana (Ghana Statistical Service (GSS), 2014a; United Nations Development Programme [UNDP], 2007). The relative humidity is very high, about 70-80% year-round, peaking at 75-80% during the rainy season (UNDP, 2007). The monthly mean temperature fluctuates between 20° C (August) and 34° C (March-April) (Ahanta West Municipal Assembly, 2018 [AWMA]). The municipality lies within the country's coastal belt, with elevations ranging from zero (0) to 121 metres above sea level. Its coastline features capes and bays, including the notable Cape Three Points, sandy beaches, rocky shores, mangrove stands, estuaries, wetlands and supports diverse fish and invertebrate species (Coastal Resources Center, 2013a; GSS, 2014a). The local economy is driven by agriculture, fishing, trade, and formal-sector employment. Key fish species in the area include sardinellas (*Sardinella aurita and Sardinella maderensis*), tunas, Congo dentex (*Dentex congoensis*), Frigate Mackerel (*Auxis thazard*), Angola dentex (*Dentex angolensis*) and Lobsters (*Abramis spp*.) (FSSD, 2022).

The Nzema East Municipal, with its administrative capital at Axim, is located at the southernmost border of Ghana's Western Region, lying between longitudes 2º 05' W and

Digitized by Sam Jonah Library

2º 35’ W and latitudes 4º 40’ N and 5º 20’ N (CRC & FoN, 2010). Covering a total land area of 1,084.0 square kilometres, it shares boundaries with Jomoro Municipal to the west, Amenfi Central District to the north, Ahanta West Municipal, and Tarkwa Nsuaem Municipal to the east, and the Gulf of Guinea to the south. In 2023, the district’s population was projected to be 98,851 (Agyapong et al., 2024). Nzema East lies within the wet semi-equatorial climate zone of the West African Sub-region, experiencing year-round rainfall with double maxima peaks from May to July and September to November (FSSD, 2022; GSS, 2014b). Annual rainfall averages 1800-2000 mm, with Axim recording the highest rainfall in Ghana (2000 mm annually) (GSS, 2014b). The mean monthly temperatures range between 25 °C and 30 °C, with an annual average of 29.4 °C. Additionally, the district records high relative humidity, ranging from 26.6% to 27.6% between May and June and from 27.3% to 27.9% during the rest of the year. Fishing and farming form the backbone of the local economy, engaging over 65% of the economically active population (FSSD, 2022). Similarly, the municipality possesses extensive coastal and marine resources, including lagoons, estuaries, mangrove ecosystems, sandy beaches and productive nearshore waters, making it a significant hub for artisanal and semi-industrial fishing. The primary catches include tunas, small pelagic fishes, and demersal fishes such as sardinellas (*Sardinella aurita and Sardinella maderensis*) (FSSD, 2022).

Brief Description of the Communities

For this study, the study areas were restricted to eight (8) communities, namely Busua, Dixcove (Lower and Upper), Akwidaa, Achonwa, Princess Town, Akatekyi, Agyan, and Akonu (represented in Figure 2). These communities, per the MPA site selection report, constitute part of the 18 communities that will be adjacent to the proposed area for the nearshore MPA in the Western Region (GFRA, 2023). These communities rely primarily on fishing for their livelihoods and represent varying degrees of dependence on marine

Digitized by Sam Jonah Library

resources (the criteria and procedures for selecting these communities are discussed in detail in the Sampling procedure).

Busua is a coastal fishing village located at coordinates 1° 56' 18.62"W 4° 48' 24.46" N in the Ahanta West District of Ghana's Western Region, approximately 30 km west of the regional capital, Takoradi (GSS, 2014a). The community shares boundaries with Butre to the east and Dixcove to the west, with its shoreline extending eastward towards Butre. According to the 2010 Population and Housing Census, Busua has an estimated population of 1,667 (GSS, 2014a). Fishing is the primary occupation in Busua, with the community operating approximately 53 canoes and supporting around 290 fishermen (CRC & FoN, 2010; FSSD, 2022). The main catch includes sardinellas, which are typically smoked and sold by fishmongers at the local market (Adjei & Sika-Bright, 2019; Nunoo et al., 2015). Busua is a well-known tourist destination, recognised for its relatively pristine beach and reputation as one of Ghana's safest and most suitable locations for water sports, particularly surfing (Dylewska, 2009; GSS, 2014a). Compared to other communities along Ghana's western coast, Busua is relatively developed, partly due to its long-standing status as a tourist hub (Adjei & Sika-Bright, 2019; GSS, 2014a).

Dixcove is a historic fishing community located at latitude 1° 56' 47.99" W and longitude 4° 48' 11.73" N in the Ahanta West District of Ghana (Ameyaw et al., 2020; Coastal Resources Center [CRC] & Friends of the Nation [FoN], 2010). The community is bordered by Busua to the east, Achonwa to the west, and Sunkoe to the north. Dixcove is divided into two distinct sections: Lower Dixcove (east) and Upper Dixcove (west), separated by the main road leading into the settlement (Ameyaw et al., 2020; CRC & FoN, 2010). The shoreline is characterised by rocky shores, distinguishing it from neighbouring sandy beaches. Dixcove is one of the oldest and most prominent fishing communities in Ghana, serving as a central hub for the fish trade and supplying surrounding rural

Digitized by Sam Jonah Library

settlements (Adjei, 2024). Fishing is the primary livelihood for approximately 90% of the population. Dixcove is particularly renowned for its tuna fisheries, attributed to the use of drift gill nets, favourable water depths, and extensive fishing expeditions (Ameyaw et al., 2020; CRC & FoN, 2010). Other commonly harvested species include sardinellas and sharks (CRC & FoN, 2010; Nunoo et al., 2015). According to recent data, the community operates a total of 197 canoes and supports 1,246 fishers across Lower and Upper Dixcove (Fisheries Scientific Survey Division [FSSD], 2022).

Achonwa is a small coastal community situated at latitude 4° 46' 6.44 " N and longitude 1° 58' 36.82 " W in the Ahanta West District, bordered by Upper Dixcove to the east, Akwidaa to the west, and Doahorodo to the north. The terrain is relatively hilly, with large rock formations. The shores of Achonwa are occasionally visited by sea turtles migrating from neighbouring communities or habitats (Coastal Resources Center [CRC] & Friends of the Nation [FoN], 2010). Traditionally reliant on fishing, Achonwa has experienced a shift in livelihoods from strict dependence on fishing to a combination of fishing and farming due to declining fish stocks (CRC & FoN, 2010). From recent data, the community operates 20 canoes, most of which are one-man canoes, supporting a total of 29 active fishermen (FSSD, 2022).

Akwidaa is a coastal community located at latitude 4° 45' 35.64"N and longitude 2° 01' 33.15 " W in the Ahanta West District (Effah, 2014). The community is bounded by Achonwa to the west and Cape Three Points to the east. Its topography features a distinctive landscape of hills and valleys. The local economy is primarily dominated by fishing, although residents often engage in farming to supplement household incomes during periods of low fish catches (CRC & FoN, 2010). The current fishing infrastructure includes 107 operational canoes supporting 668 fishermen. The community's fishermen typically harvest diverse marine species, including dolphins, round sardinella (*Sardinella aurita*), cassava

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

croaker (*Pseudotolithus senegalensis*), and West African ilisha (*Ilisha africana)* (CRC & FoN, 2010; FSSD, 2022).

Princess Town, formerly known as Prince's Town, is a coastal settlement located at latitude 4° 47' 41.10" N and longitude 2° 08' 02.90" W in Ghana's Ahanta West District. The community is characterised by relatively level coastal terrain, with two rivers that meet and flow into the sea on the town's outskirts. Princess Town is bordered to the east by Aketekyi and to the west by Miemia, two other coastal villages (CRC & FoN, 2010; Nyarko, 2013). It is among the few coastal communities in the Ahanta West district which exhibit well-planned characteristics with an organised road network interspersed among residential structures. Subsistence farming is the mainstay of this coastal town, though some community members engage in fishing; the activity has been lower than in years past. This can be attributed to the decline in fish stocks and the rocky nature of the landing beach, which occasionally ruins canoes (CRC & FoN, 2010). Current fishing capacity includes 26 operational canoes supporting 144 fishermen. The principal catch harvested includes Cassava fish/law croaker (*Pseudotolithus* spp.), Shine-nose/common threadfin (*Galeoides decadactylus*) (FSSD, 2022).

Akatekyi is a coastal community located at latitude 4° 47' 5.88" N and longitude 2° 06' 32.48" W in Ghana's Ahanta West District, bounded by Princess Town to the west and Cape Three Points to the east. The eastern part of the community features a distinctive hilly terrain, while its coastal waters are notably deep (CRC & FoN, 2010). The community's eastern boundary is marked by the Epuho Lagoon, an ecologically significant wetland that supports a population of crocodiles and serves as a local tourist attraction (CRC & FoN, 2010). Additionally, whales and dolphins are often sighted a few meters away from the coast, and turtles make seasonal appearances, particularly during March. The mainstay of this community is the fishing industry, but a fairly large portion also engages in farming

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

(CRC & FoN, 2010). The community maintains active fishing operations with 63 canoes and 488 fishermen. The primary marine species harvested include common dolphin (*Coryphaena hippurus*), round sardinella (*Sardinella aurita*), cassava croaker (*Pseudotolithus senegalensis*), and West African ilisha (*Ilisha africana*) (CRC & FoN, 2010; FSSD, 2022).

Agyan is positioned at the easternmost part of the Nzema East Municipal. The community is located at latitude 4° 49' 45.93" N and longitude 2° 11' 57.72" W. It is bounded to the east by Egyambra and to the west by Akonu. The community's northern part exhibits distinct geomorphological characteristics marked by dense vegetation and hilly terrain. The coastal environment features two lagoons: Agyani Wanlea lagoon (eastern boundary) and Tonzu lagoon (western boundary), which merge with the sea during the wet season. The rocky, curved beach features a little green island just a few meters from the coast. Seasonally, whales can be sighted five miles away offshore, particularly in August (CRC & FoN, 2010). The community maintains active fishing operations with 81 canoes and 136 fishermen (FSSD, 2022).

Akonu is a small coastal village in the Nzema East Municipality, located at latitude 4° 50' 6.58" N and longitude 2° 12' 14.83" W. The community's geographic boundaries are Domunli to the west and Agyan to the east. The community exhibits distinct topographical features, including a predominantly flat coastal landscape and a steep, bushy northern section. The shoreline is defined by an open sandy beach. The major economic activities of the people of Akonu are small-scale fishing and farming (CRC & FoN, 2010).

Digitized by Sam Jonah Library

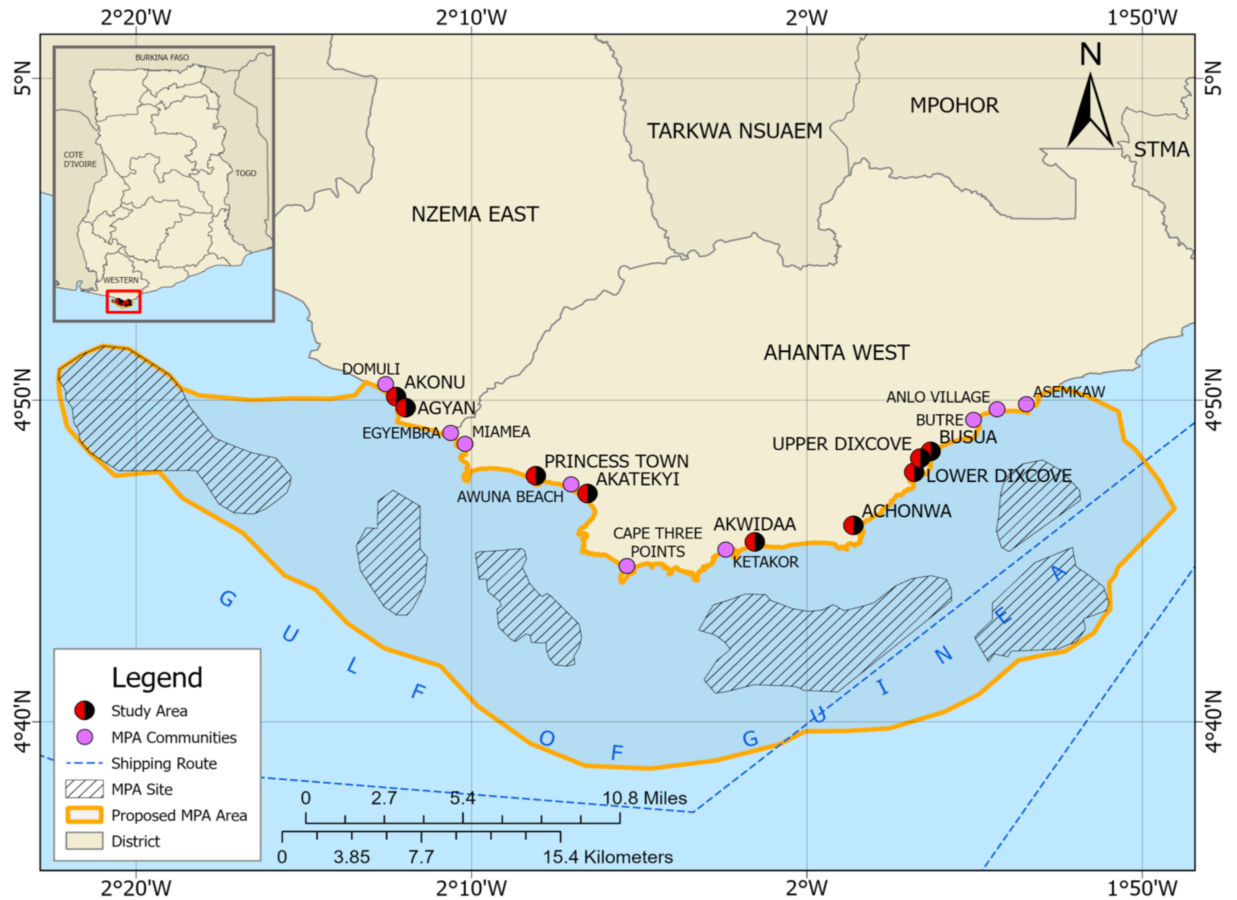


Figure 2: Map indicating the study area

Source: Adapted from the proposed MPA site map (GFRA, 2023)

Population

In research, the term "population" refers to the entire set of individuals or elements from which data can be collected to make broad conclusions (Creswell & Creswell, 2018). In this study, the target population comprised households whose livelihoods are directly reliant on marine-related or fishing activities, including fishers, fish processors, fish traders and canoe owners in the selected coastal communities, including Busua, Dixcove (Lower and Upper), Akwidaa, Achonwa, Princess Town, Akatekyi, Agyan, and Akonu (Figure 2) in the Western Region. These groups represent the primary occupations whose livelihoods are directly linked to marine resources and are most likely to be affected by the establishment of a Marine Protected Area.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

To establish a sample frame, the study relied on household population data from the 2010 Population and Housing Census (GSS, 2014a; 2014b) as the baseline. Given the absence of more recent census data, the 2010 figures were projected to the year 2024 using Ghana's annual population growth rate of 2.18% (GSS, 2016). The projection was computed using the standard demographic formula: Projected Population (P_t) = $P_0 (1 + r)^n$, where P_t is the Projected population in the target year (2024), P0 is the base population (i.e., 2010 data), r is the annual population growth rate (0.0218), and n is the number of years between the base year and the projection year (14 years).

Table 1: Projected Population for the Study Communities

Communities	P_0 (2010)	r	n	1+r	Projected Population (2024)
Busua	449	0.0218	14	1.0218	607.25
Dixcove	1385	0.0218	14	1.0218	1873.15
Achonwa	720	0.0218	14	1.0218	973.76
Akwidaa	858	0.0218	14	1.0218	1160.41
Princess Town	446	0.0218	14	1.0218	603.19
Akatekyi	977	0.0218	14	1.0218	1321.35
Agyan	504	0.0218	14	1.0218	681.64
Akonu	270	0.0218	14	1.0218	365.16
Total					**7585**

Sampling Procedure

The study employed distinct sampling procedures for the quantitative and qualitative components. The quantitative component utilised a multi-stage sampling technique to ensure representativeness and diversity in participant selection for the survey component.

Digitized by Sam Jonah Library

At the first stage, the communities were selected from the 18 coastal communities identified in the MPA site selection report as adjacent to the proposed nearshore MPA (GFRA, 2023). These 18 communities have been classified into four distinct clusters based on geographical proximity, historical relations and accessibility. From these clusters, eight communities (two per cluster) were purposively selected to ensure balanced representation. The selection of communities was further informed by data from the Ghana Canoe Frame Survey (FSSD, 2022). Priority was given to communities exhibiting varying levels of fishing intensity, measured by the number of active fishers and canoes (high and low concentrations), to capture differences in fishing dependence and socioeconomic dynamics. The second stage involved the household selection process. Within each selected community, households engaged in marine-related livelihoods were identified with support from community leaders and fisheries informants. A simple random sampling technique was then applied to ensure that all eligible households had an equal chance for participation. For the third stage, which involved the respondent selection, within each selected household, an eligible respondent was selected based on their primary involvement in marine-related activities. This approach ensured that respondents possessed direct knowledge of marine resource use and were likely to be affected by the establishment of an MPA. For the qualitative component, purposive sampling was employed, independent of the quantitative sampling process. Participants were selected based on experience, livelihood roles and involvement in marine resource use.

Sample Size Determination

The sample size for the household survey was determined using Yamane's formula (1967).

The formula is expressed as: $n = \frac{N}{1+N(e)2}$, where n = sample size, N = estimated household population and e = sampling error (established at 0.05).

Digitized by Sam Jonah Library

Substituting values: $n = \frac{7585}{1+7585(0.05)2} = 379.96$

Therefore, Sample size (n) = 380 (380 respondents)

To account for potential non-response and incomplete surveys, the initial sample size was increased by 10%, in line with standard survey methodology (Beard, 2015; Tumiran, 2024). The adjusted sample size was calculated as:

n(adjusted) = n × 1.10 = 380 × 1.10 = 418 respondents

Thus, the target sample size was set at 418 respondents. However, during data collection, 394 usable responses were obtained, representing a 94.3% response rate relative to the adjusted target (418). This achieved sample, while slightly below the adjusted target, exceeds the original minimum requirement of 380 (per Yamane's formula), and maintains a margin of error of 4.95%, improving on the initial 5% threshold.

Table 2: Distribution of sample size among the eight (8) selected communities

Community	Participants
Busua	30
Dixcove	90
Achonwa	48
Akwidaa	57
Princess Town	34
Akatekyi	64
Agyan	51
Akonu	20
Total	394

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Data Collection Methods and Instruments

A combination of both quantitative and qualitative data collection methods was employed in consistency with the convergent parallel design. The quantitative data were collected through a household-based survey, which enabled the collection of numerical data on marine resource dependence, perceptions of the proposed MPAs, and preferred mitigation strategies across the selected coastal communities. The qualitative data were collected through focus group discussions (FGDs), which facilitated in-depth exploration of shared perceptions and community narratives regarding MPAs. The primary data collection instruments included a structured interview schedule and a focus group discussion guide (FGDs). Each instrument was meticulously designed in alignment with the study's specific objectives, ensuring that the data collected effectively addressed the research questions.

For the quantitative data, the structured interview schedule was designed to elicit detailed and relevant responses through researcher-administered questioning. The instrument encompassed both limited open-ended and closed-ended questions, based on all the specific objectives of the study and was organised into five sections. The first section of this instrument covered the socio-demographic characteristics of the respondents; the second section captured the marine resource dependence indicators operationalised through the Sustainable Livelihood Framework (SLF) (Aldasoro-Said & Ortiz-Lozano, 2021) with indicators adapted to local contexts: natural capital (land ownership or access to marine), human capital (education levels, fishing labour relevance, and economic burden), social capital (Informal (family and community networks) and formal (memberships in organisations) and economic capital (Income sources, work independence, monthly expenditure, subsidies received, and food dependency) (See Appendix C for indicators). The third section covered perceptions of the proposed MPA establishment, and the fourth

Digitized by Sam Jonah Library

section comprised strategies to minimise potential negative impacts of the MPA. Qualitative data were collected using a semi-structured focus group discussion guide, which comprised both open-ended questions and probing prompts centred on marine resource use, perceptions of the proposed MPA, and perceived socio-economic and cultural impacts, as well as mitigation strategies.

Validity and Reliability of Research Instrument

Validity and reliability are essential concepts in research methodology that determine the overall quality and credibility of a study (Taherdoost, 2018). Validity refers to how accurately a method measures what it is intended to measure, ensuring that the research methods and instruments are appropriate for the study's objectives. In contrast, reliability refers to the consistency of the measurement and the ability of the instrument to produce stable results, minimising random error (Middleton, 2020; Mohajan, 2017). Together, these concepts indicate how well a research methodology, data collection technique, or analysis is designed to measure study variables, thereby improving the precision and accuracy of the research (Taherdoost, 2018; Tavakol & Dennick, 2011).

To ensure the validity of this research, a thorough review of the existing literature on MPAs and their socio-economic impacts was conducted to inform the selection of survey questions. Experts in marine conservation and socio-economic research, as well as colleagues familiar with the subject matter, were consulted to review the research instrument. Their insights helped refine the questions to ensure they were clear, relevant, and comprehensive. Furthermore, a pre-test of the instrument was conducted with a small sample (n = 30) of respondents from the target communities. The feedback from the pre-test was used to identify unclear questions and ensure they were understandable and captured the intended information. This led to the achievement of both face and content validity.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

To evaluate the reliability of the research instrument, a Cronbach's Alpha coefficient (r) was calculated. Cronbach's Alpha is commonly used to assess the internal consistency of a set of items within a research instrument, ensuring that they measure the same underlying construct reliably. In this study, the calculated Cronbach's Alpha was 0.8, indicating satisfactory reliability for the instrument used to collect the data. According to Izah et al. (2024), a coefficient value above 0.75 is generally considered to reflect strong internal consistency, meaning that the items are consistently related to one another and can be relied upon to evaluate the intended construct. Therefore, the reliability test confirmed that the instrument was appropriate for further analysis and supported the credibility of the data collected.

Data Collection Procedures

The data collection took place between July 2024 and August 2024 through structured interviews and focus group discussions (FGDs). Entry into the study communities was facilitated through traditional channels, including community leaders, chief fishermen, and representatives of local fisheries associations. This was done to help introduce the study and seek permission to ensure community acceptance of the research. Quantitative and qualitative data were collected concurrently. The household surveys were conducted through face-to-face interviews, while FGDs were undertaken to complement and deepen the understanding of community perspectives. The procedures for administering each data collection method are described below.

Interview Schedule

To facilitate the data collection from respondents, field assistants were recruited based on their prior experience in field data collection and their fluency in local languages (Fante, Twi and Nzema). They were trained by the researcher on the objectives of the study, the administration of data collection instruments, the use of the Computer-Assisted Personal

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Interviewing (CAPI) system, and ethical protocols, including informed consent, confidentiality, and anonymity. Interviews were conducted in respondents' households to minimise disruptions and enhance comfort, following a face-to-face interview approach. This enabled the researcher or their representative to explain the instrument vividly to get relevant and detailed information. Most of the respondents were interviewed while mending their fishing nets, particularly during July (the closed fishing season), when fishers were more available. The interviews were conducted in the respondents' preferred local dialect (Fante, Twi or Nzema) to ensure effective communication and cultural appropriateness. The responses were recorded using the Computer-Assisted Personal Interviewing (CAPI) system (Kobo Toolbox/ODK Collect™), which helped minimise errors commonly associated with manual data collection and ensured standardised data entry. Each interview lasted approximately 60 minutes.

Focus Group Discussions (FGDs)

Eight focus group discussions were held, one in each study community. Each group comprised nine (9) to ten (10) participants, including fishermen and fish processors/traders, to facilitate participatory dialogue and capture diverse concerns and expectations regarding the establishment of Marine Protected Areas. Participants were purposively selected, with the help of community leaders and local fisheries associations, to ensure representation across gender, age, and occupational roles within the fisheries value chain. Additionally, participants were required to have at least ten (10) years of experience in marine-related livelihoods. The FGDs followed a semi-structured discussion guide and lasted an average of 90 minutes, and were audio-recorded with participants' consent.

Field Challenges

A few challenges were encountered that affected participation. Some participants expressed strong emotional reactions, including threats to the researcher's safety, because

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

the study addressed issues of access restrictions, prompting many to recall negative experiences with past fisheries interventions, such as the closed season policy. These challenges were managed by adhering to ethical protocols and using trained research assistants familiar with local dialects.

Data Processing and Analysis

Quantitative data were thoroughly cleaned to ensure completeness and accuracy. The cleaned dataset was then coded and analysed using the Statistical Package for the Social Sciences (SPSS) version 25.0 and Stata version 17.0. Descriptive statistics such as central tendencies, frequencies, and percentages were employed to summarise the quantitative data obtained from structured interviews. In addition, inferential statistical tests, including Analysis of Variance (ANOVA), Bonferroni post hoc tests, and Chi-square tests, were conducted. Qualitative data were processed following an established thematic analysis approach (Braun & Clarke, 2006). This approach was supported using NVivo software for effective data management, coding, and interpretation. The processes involved are described below:

Marine Resource Dependence Index (MRDI) Values

The data were systematically processed and analysed according to the methodology outlined by Aldasoro-Said and Ortiz-Lozano (2021) to compute the Marine Resource Dependence Index (RDI). All categorical variables (e.g., land ownership and social capital membership) were coded numerically for analysis.

To ensure comparability across households and maintain consistency with the Marine Resource Dependence Index (RDI) methodology, indicator values were standardised using min-max scaling. For indicators that increase marine resource dependence, standardisation was performed using equation (1):

Digitized by Sam Jonah Library

$$Is = \frac{Sd - Smin}{Smax - Smin} \quad (1)$$

Where:

- Sd = Value of the indicator for a given household
- Smax and Smin = Maximum and minimum values observed across all households, respectively

For indicators that reflect resource independence (e.g., diversified income sources, number of alternative livelihoods), a direction-sensitive normalisation formula was applied using equation (2):

$$Is = \frac{Smax - Sd}{Smax - Smin} \quad (2)$$

This adjustment, following methods used in other studies (Albasri & Sammut, 2021; Jones & Andrey, 2007), allows the standardisation of indicators that are inversely related to the outcome variable, which in this case is "marine resource dependence." Applying the transformation directly during the normalisation stage ensures that higher standardised values consistently indicate greater dependence on marine resources, thereby maintaining directional consistency across all indicators. While Aldasoro-Said and Ortiz-Lozano (2021) addressed this issue using a post-standardisation inverse transformation (X = 1 – Is), this study integrates the adjustment directly into the normalisation stage, as recommended by other studies to improve interpretive clarity. Each sub-index representing the four livelihood capitals, i.e. natural, human, social, and economic, was calculated by averaging the standardised values of its constituent indicators. The final RDI score for each household and community was computed as the sum of the four sub-indices: RDI = Natural Capital + Human Capital + Social Capital + Economic Capital

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

In this study, the RDI includes 11 indicators, and thus the theoretical range of the index is from 0 (low dependence) to 11 (high dependence). Although the original authors stated a range up to 12, this appears to be a minor inconsistency, as their model comprises 11 components. The corrected range has been adopted here for methodological precision.

To facilitate interpretation, RDI scores were categorised into three levels of dependency using the equal interval threshold method: Low dependence (0.00 - 3.66), Moderate dependence (3.67 - 7.33), and High dependence (7.34 - 11.00). This classification approach provides a straightforward and interpretable framework suitable for comparing community-level marine resource dependence.Furthermore, one-way ANOVA was used to compare RDI scores across communities; when a significant difference was found, a Bonferroni post hoc test was used to identify which communities differed.

Perceived Economic and Social Implications of MPAs

For qualitative data processing and analysis, all audio recordings from FGDs were verbatim transcribed and imported into NVivo. Subsequently, coding was done to capture recurrent concepts and perceptions using the inductive approach. After initial coding, the related codes were examined and grouped into broader themes. Each theme was clearly defined and named to reflect the research objectives. Descriptive summaries were written for each theme and then supported by illustrative verbatim quotations from participants to ensure authenticity. This qualitative analysis approach enables the identification of recurring themes, patterns, and relationships within the textual data, enriching the understanding of participants' perspectives and experiences.

Strategies to mitigate the potential negative effects of the MPAs

Pearson’s chi-square test was used to determine whether there were significant differences between the eight communities in showing support for the most effective strategy to mitigate the potential negative socio-economic effects of MPAs.

Digitized by Sam Jonah Library

Ethical Consideration

Researchers need to adhere to a code of conduct that guides research designs and practices to protect participants, uphold scientific integrity, and enhance the study's credibility (Bhandari, 2021). Ethical principles in research commonly address voluntary participation, informed consent, anonymity, confidentiality, respect for participants and minimising harm (Bhandari, 2021; Ramírez, 2024). In this study, several ethical measures were implemented to safeguard participants and maintain research integrity. Prior to data collection, ethical approval was sought from the University of Cape Coast Institutional Review Board (UCCIRB). The study was reviewed for ethical soundness and granted clearance with the reference number UCC-436/2024.

Participants in the eight selected communities were fully informed about the research objectives, data collection methods, and any potential risks or benefits associated with participation. Informed consent was obtained from all participants using both written and digitally recorded consent procedures for the quantitative survey and the Focus Group Discussions, respectively, to ensure their voluntary participation. This consent process ensured that participants understood the study details and made informed decisions about whether to participate (Ramírez, 2024). Participants were also allowed to ask questions and express concerns, and they were informed of their right to withdraw from the study at any time without consequences. This protected their autonomy and prevented participants from being forced to engage in the research if it conflicted with their values and cultural norms (Mumford et al., 2021). Furthermore, personal identifiers such as names, contact details, religion, and addresses were excluded from the research data to ensure participants' privacy and maintain anonymity. This encouraged open and honest responses, thereby enhancing the reliability of the findings (Saunders et al., 2015). Additionally, strict confidentiality measures were enforced. These included access controls and data encryption to prevent

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

unauthorised access or disclosure of sensitive information. This ensured that participants' data remained private unless otherwise permitted by the participants for exposure (Laryeafio & Ogbewe, 2023; Sen & Nagwanshee, 2016).

Chapter Summary

This study followed a pragmatic paradigm and employed a convergent parallel mixed-methods design to assess the potential socio-economic impacts of MPAs in Ghana's Western Region. The design allowed for a robust examination of the research aim by merging datasets from quantitative surveys and qualitative interviews. The processes for population sampling, data collection, instrument validity and reliability testing, and data processing and analysis were followed, with all stages guided by ethical protocols.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

CHAPTER FOUR

RESULTS

Introduction

This chapter presents the findings of the study, which aimed to assess the potential socio-economic implications of establishing Marine Protected Areas (MPAs) in the Western Region of Ghana. The chapter begins by outlining the socio-demographic characteristics of the respondents, followed by a presentation of the results structured according to the study's objectives.

Demographic Characteristics of Respondents

This section presents a demographic profile of survey respondents (n = 394) across selected communities, covering gender, age, educational background, marital status, ethnicity, place of origin, household size, and years of occupational experience. These characteristics are presented to establish the social and livelihood context of the communities. They provide the background needed to understand the study's analysis. The demographic characteristics summarised in Table 3 are essential for contextualising later analysis.

From the results, most respondents were male (57.4%), with females accounting for 42.6%, indicating a slight predominance of males. The age distribution showed that the majority were in the working-age bracket of 36 to 45 years, representing 28.4% of respondents, while 25.4% were aged 26 to 35 and 23.4% were aged 46 to 55. Only 4.1% of the respondents were 66 years or above, indicating a predominantly younger population. Most respondents (56.4%) had basic-level education, while 33.5% reported having no formal education. Only a small fraction (1.0%) have a tertiary education, suggesting limited formal educational attainment among respondents. Regarding marital status, a majority of the respondents (66.2%) were married, while smaller proportions were single (10.2%), widowed (9.6%),

Digitized by Sam Jonah Library

separated (4.6%), divorced (3.8%) or cohabiting (5.6%). Household sizes were primarily between 1 and 5 persons (52.8%), followed by households with 6 to 10 persons (41.1%), and households with more than 10 members (6.1%). This trend toward smaller household sizes could indicate a shift toward nuclear-family setups in these communities. The ethnic composition was 54.3% Ahanta, making them the largest group, followed by Nzema (27.9%) and Fante (17.3%). Notably, 82.2% were native to the communities, indicating a predominantly local population with a shared cultural background and community ties. Occupation experience levels varied; the data show that 27.2% have been engaged in their primary occupation for 1 to 8 years and 30.2% for 9 to 18 years, with fewer respondents having been engaged for 19 to 38 years.

Table 3: Demographics of the Respondents from Selected Coastal Communities

Variable	Subscale	Frequency (N=394)	Percentage (%)
Gender			
	Male	226	57.4
	Female	168	42.6
Age (years)			
	18-25	31	7.9
	26-35	100	25.4
	36-45	112	28.4
	46-55	92	23.4
	56-65	43	10.9
	66 and above	16	4.1
Educational level			
	No formal education	132	33.5

Digitized by Sam Jonah Library

Table 3: Continued

	Basic	222	56.4
	Secondary/Vocational	36	9.1
	Tertiary	4	1.0
Marital status			
	Single	40	10.2
	Married	261	66.2
	Divorced	15	3.8
	Separated	18	4.6
	Cohabiting	22	5.6
	Widowed	38	9.6
Household size			
	1 - 5	208	52.8
	6 - 10	162	41.1
	More than 10	24	6.1
Ethnicity			
	Fante	68	17.3
	Nzema	110	27.9
	Ahanta	214	54.3
	Ga	1	0.3
	Ewe	1	0.3
Native of community			
	Natives	324	82.2

Digitized by Sam Jonah Library

Table 3: Continued

	Non-natives	70	17.8
Main Livelihood			
	Artisanal fisher	224	57.0
	Fish monger/processor	165	42.0
	Tourism operator	12	2.9
	Canoe owner	2	0.5
	Canoe builder	2	0.5
	Fishing gear shop owner	1	0.5
Years in Occupation			
	1-8	107	27.2
	9-18	119	30.2
	19-28	82	20.8
	29-38	49	12.4
	39-48	31	7.9
	49-58	6	1.5

Level of Marine Resource Dependency of the selected coastal communities in the Western Region of Ghana

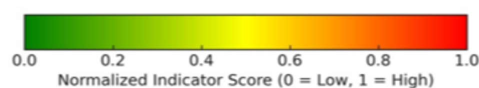
The first objective of the study was to assess the level of marine resource dependency of the selected coastal communities in the Western Region of Ghana. The Marine Resource Dependency Index (MRDI) was calculated based on four sub-indices: Natural Capital, Human Capital, Social Capital, and Economic Capital, aggregated from eleven indicators (Table 4). The dependency levels were quantified on a scale of 1 to 11,

Digitized by Sam Jonah Library

where higher values indicate greater reliance on marine resources for livelihoods and household sustenance. The results reveal significant variations in dependency, with some communities exhibiting higher dependence than others. Table 4 presents the MRDI scores and sub-index values across the study communities.

Table 4: Overall Marine Resource Dependence Index by Studied Community

Sub index	Natural Capital		Human Capital			Social Capital			Economic Capital			
Indicators	Allotment ownership	Fishing areas access	Educational level	Fishing labour relevance	Economic Burden	Informal social capital	Formal social capital	Work independence	Expenditure	Subsidies	Food dependency	**MRDI**
Averaged Indicator	0.60			0.81		0.65			0.72			7.80
Busua	0.47	0.97	0.78	0.81	0.83	0.52	0.90	0.83	0.38	0.93	0.79	8.22
Dixcove	0.40	0.96	0.71	0.88	0.85	0.56	0.70	0.83	0.35	0.90	0.80	7.95
Achonwa	0.19	0.96	0.77	0.72	0.85	0.58	0.85	0.68	0.31	0.94	0.85	7.69
Akwidaa	0.21	0.96	0.79	0.87	0.86	0.52	0.91	0.83	0.32	0.98	0.84	8.09
Akatekyi	0.13	0.96	0.76	0.73	0.88	0.53	0.86	0.68	0.33	0.94	0.83	7.62
Princess Town	0.18	0.96	0.76	0.91	0.91	0.53	0.77	0.87	0.31	0.97	0.82	7.97
Agyan	0.12	0.98	0.70	0.81	0.89	0.42	0.55	0.77	0.38	0.90	0.92	7.44
Akonu	0.20	1.00	0.63	0.51	0.88	0.32	0.75	0.60	0.29	1.00	0.95	7.12



The assessment of marine resource dependency across eight coastal communities in the Western Region yielded Marine Resource Dependency Index (MRDI) scores ranging from 7.12 to 8.22 (Table 4). The MRDI scores indicate relatively moderate to high levels of dependence on marine resources across the study areas. To facilitate interpretation, the index values were categorised using the equal interval threshold method, which divides the full theoretical range of the MRDI (0 -11) into three equal-width categories: Low Dependence (0.00 -3.66), Moderate Dependence (3.67 -7.33), and High Dependence (7.34 -11.00). The results reveal that seven out of the eight communities, i.e., Busua (8.22), Akwidaa (8.09), Dixcove (7.95), Princess Town (7.97), Achonwa (7.69), Akatekyi (7.62), and Agyan (7.44), fell within the high marine resource dependence category. This suggests a strong reliance on marine resources for livelihoods, food security, and economic stability.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

In contrast, one community, Akonu, had the lowest score (7.12) and fell within the moderate dependence category, with an RDI score marginally below the high-dependence threshold. To better understand the drivers of the MRDI scores, the following subsections present the disaggregated results for each livelihood capital, i.e. Natural, Human, Social and Economic, based on their respective indicators.

Table 5: Natural Capital Indicators by Community

Community	Allotment ownership	Fishing areas access	Natural Capital Sub-Index
Busua	0.47	0.97	0.72
Dixcove	0.40	0.96	0.68
Achonwa	0.19	0.96	0.58
Akwidaa	0.21	0.96	0.59
Princess Town	0.13	0.96	0.57
Akatekyi	0.18	0.96	0.55
Agyan	0.12	0.98	0.55
Akonu	0.20	1.00	0.60
Average	**0.24**	**0.97**	**0.60**

The natural capital sub-index, comprising allotment ownership and fishing area access, yielded an average score of 0.60 (Table 5), reflecting a moderate overall contribution to marine resource dependency. However, the two indicators exhibited starkly contrasting trends. Fishing area access scores were consistently high across all communities (0.96 to 1.0), with all communities scoring above 0.95 (Table 4). The high scores suggest that households have limited access to diverse fishing areas, heightening their reliance on the available marine resources. Communities such as Akonu (1.0), Agyan (0.98), and Busua (0.97) were particularly constrained in their access to alternative fishing grounds, thereby

Digitized by Sam Jonah Library

driving up their dependency levels. Conversely, allotment ownership scores were uniformly low (<0.5) across all communities, with Busua (0.47) being the highest. These lower values indicate broader land ownership, which helps reduce dependence on marine resources across communities.

Table 6: Human Capital Indicators by Community

Community	Educational level	Fishing labour relevance	Economic Burden	Human Capital Sub-Index
Busua	0.78	0.81	0.83	0.81
Dixcove	0.71	0.88	0.85	0.81
Achonwa	0.77	0.72	0.85	0.78
Akwidaa	0.79	0.87	0.86	0.84
Princess Town	0.76	0.73	0.88	0.79
Akatekyi	0.76	0.91	0.91	0.72
Agyan	0.70	0.81	0.89	0.80
Akonu	0.63	0.51	0.88	0.67
Average	**0.74**	**0.78**	**0.87**	**0.81**

The human capital sub-index, which includes fishing labour relevance, educational level, and economic burden, emerged as the highest contributor to marine resource dependency, with an overall average score of 0.81 (Table 6). Among these indicators, fishing labour relevance was particularly high in Princess Town (0.91) and Dixcove (0.88), emphasising fishing as a primary livelihood activity in these communities, with limited occupational diversification. Similarly, Akwidaa (0.87) and Agyan (0.81) also showed high scores, reflecting deep-rooted expertise in marine-related livelihoods accumulated over the years. In contrast, Akonu (0.51) recorded the lowest score, suggesting comparatively greater

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

experience in alternative income sources. There were notable variations in educational attainment. Communities like Akonu (0.63) and Agyan (0.70) exhibited the lowest values, reflecting relatively stronger educational attainment and greater potential for economic diversification. In contrast, Akwidaa (0.79) and Busua (0.78) achieved relatively higher values for educational level, indicating comparatively lower educational outcomes, likely limiting opportunities for diversification away from marine-based livelihoods. The economic burden indicator made the most significant contribution to marine resource dependence related to human capital across all communities, with most scores exceeding 0.85. Princess Town (0.91), Agyan (0.89) and Akatekyi (0.88) recorded particularly high scores, indicating economic pressures from supporting a large household size with fewer income-contributing members.

Table 7: Social Capital Indicators by Community

Community	Informal Social Capital	Formal Social Capital	Social Capital Sub-Index
Busua	0.52	0.90	0.71
Dixcove	0.56	0.70	0.63
Achonwa	0.58	0.85	0.72
Akwidaa	0.52	0.91	0.72
Princess Town	0.53	0.86	0.69
Akatekyi	0.53	0.77	0.65
Agyan	0.42	0.55	0.48
Akonu	0.32	0.75	0.53
Average	**0.50**	**0.79**	**0.65**

The social capital sub-index, encompassing informal social capital, formal capital, and work independence, demonstrated a moderate overall contribution to marine resource

Digitized by Sam Jonah Library

dependency, with an average score of 0.65 (Table 7). Among these indicators, informal social capital, which represents a reliance on family and community networks, contributed the least to marine dependency across all communities. Most communities displayed mid-range values for this indicator, including Achonwa (0.58), Dixcove (0.56), Princess Town (0.53), Akatekyi (0.53), Busua (0.52), and Akwidaa (0.52), demonstrating moderate-level support from informal systems. However, Akonu (0.32) and Agyan (0.42) recorded the lowest values, suggesting stronger informal networks that may help reduce reliance on marine resources. In contrast, formal capital emerged as the most significant social capital contributor to marine resource dependency, with the highest values observed in Akwidaa (0.91), followed closely by Busua (0.9), Akatekyi (0.86), Achonwa (0.85), Princess Town (0.77), Akonu (0.75), Dixcove (0.7) and the lowest value observed in Agyan (0.55). This indicated particularly low membership in formal institutions within these communities. Conversely, Agyan (0.55) displayed the lowest formal capital-related contribution to dependency, indicating comparatively stronger institutional engagement that may reduce over-reliance on marine resources.

Table 8: Economic Capital Indicators by Community

Community	Work independence	Expenditure	Subsidies	Food dependency	Economic Capital Sub-index
Busua	0.83	0.38	0.93	0.79	0.73
Dixcove	0.83	0.35	0.90	0.80	0.72
Achonwa	0.68	0.31	0.94	0.85	0.69
Akwidaa	0.83	0.32	0.98	0.84	0.74
Princess Town	0.68	0.33	0.94	0.83	0.69
Akatekyi	0.87	0.31	0.97	0.82	0.74
Agyan	0.77	0.38	0.90	0.92	0.74

Digitized by Sam Jonah Library

Table 8: Continued

Akonu	0.60	0.29	1.00	0.95	0.71
Average	**0.76**	**0.34**	**0.95**	**0.85**	**0.72**

The economic capital indicators, including work independence, expenditure, subsidies, and food dependency, contributed substantially to marine resource dependency, with an average score of 0.72 (Table 8). Among these indicators, work independence, a measure of livelihood diversification, exhibited moderate to high values, with Princess Town (0.87) and Busua (0.83) showing the strongest reliance on marine-based livelihoods, indicative of limited occupational alternatives. In contrast, Akonu (0.60), Akatekyi (0.68), and Achonwa (0.68) exhibited comparatively lower values, indicating greater diversification into non-marine income sources. Food dependency was another prominent contributor to marine resource dependency, particularly in Akonu (0.95), Agyan (0.92), Achonwa (0.85), and Akwidaa (0.84). These scores indicate a substantial dependence on marine resources for household food security. Notably, subsidies emerged as the most influential economic indicator, with consistently high scores across all communities. There were near-maximum scores in all communities, particularly in Akonu (1.0), Akwidaa (0.98), and Princess Town (0.97), indicating that communities had minimal or no access to subsidies to reduce resource dependency. In contrast, expenditure scores were uniformly low across communities, with marginal variations. Comparably, Busua (0.38) and Agyan (0.38) recorded the highest scores, while Akonu (0.29) reported the lowest amongst the communities.

Sub-index Values by Community

Figure 3 presents the individual contributions of sub-indexes to marine resource dependence across the eight coastal communities. Human capital is the dominant

Digitized by Sam Jonah Library

contributor in most communities, particularly in Agyan, Akwidaa, and Dixcove. Economic capital shows high contributions in Agyan, Princess Town, and Achonwa. Natural capital contributions are moderate across communities but are relatively lower in Akwidaa and Akatekyi. Social capital shows more variation, with lower contributions in Agyan and Akonu, and higher values in Akatekyi and Akwidaa.

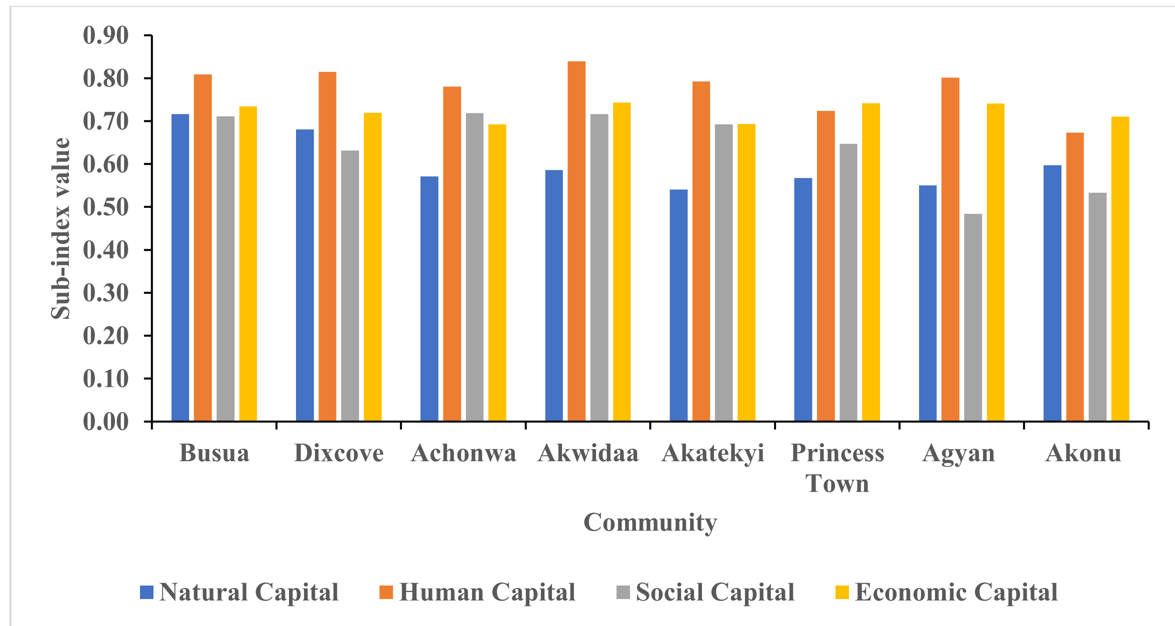


Figure 3: Sub-index values by community

Statistical Comparison of Marine Resource Dependence Among Communities

Before conducting statistical comparisons, a joint Skewness-Kurtosis test was performed to determine the appropriate statistical approach. As shown in Table 9, the joint Skewness-Kurtosis test produced a p-value of 0.0606, which exceeded the 0.05 threshold ($p < 0.05$). This indicates that the MRDI scores do not deviate significantly from a normal distribution, thereby justifying the use of parametric tests (e.g., ANOVA) for further analysis.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Table 9: Skewness-Kurtosis Test for Normality of MRDI

Skewness and Kurtosis tests for normality					
				----- Joint test -----	
Variable	Observation	Pr(skewness)	Pr (kurtosis)	Adj chi2(2)	Prob>chi2
MRDI	394	0.0188	0.7804	5.61	0.0606

One-Way ANOVA Comparing Marine Resource Dependency Index (MRDI) Across Communities

Table 10 presents the results of a one-way ANOVA examining whether MRDI scores differ significantly across the eight study communities. The analysis revealed a statistically significant difference between groups (F (7, 386) = 4.53, p < 0.0001).

Table 10: One-Way ANOVA of MRDI Scores by Community

Source	**SS**	**df**	**MS**	**F**	**Prob>F**
Between groups	31.7904	7	4.5415	4.53	0.0001
Within groups	387.0128	386	1.0026		
Total	418.8031	393	1.0657		

The one-way ANOVA results indicate a statistically significant difference in mean MRDI scores across the eight coastal communities (F (7, 386) = 4.53, p < 0.0001). This suggests that marine resource dependency is not uniform across the study area. Although the communities exhibit moderate to high levels of dependence, the significant F-statistic indicates that the degree of dependence varies meaningfully across communities, reflecting differences in livelihood structures, access to resources, and socio-economic conditions.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Additionally, Bartlett's test confirmed the assumption of equal variances across groups (χ^2 (7) = 6.9456, p = 0.435). The significant F-value (F = 4.53, p = 0.0001) indicates differences in mean MRDI scores across communities, further strengthening the robustness of the ANOVA results. Ultimately, it shows that the observed differences in the MRDI are unlikely to be driven by unequal variability across the communities.

Bonferroni-Adjusted Pairwise Comparisons

To identify which community pairs differ significantly in their MRDI scores, post hoc tests/pairwise comparisons (i.e., Bonferroni-adjusted pairwise comparisons) were performed. Because there are eight (8) communities, there are 28 pairwise comparisons. The Bonferroni adjustment controls for Type I error by effectively setting a stricter significance level. The analysis reveals that differences in marine resource dependency are concentrated between communities with relatively high MRDI scores and those with comparatively lower scores, rather than being uniformly distributed across all community pairs. In the analysis, the pairwise comparisons (see Table 11) indicate the following key differences:

Akwidaa and Busua, both recording the highest scores, showed statistically significant differences when compared with Agyan (p = 0.020 and p = 0.021, respectively). This indicates that levels of marine resource dependency in Akwidaa and Busua are significantly higher than in Agyan. Other comparisons involving Akonu (e.g., Akonu vs Akwidaa (p = 0.006), Akonu vs Busua (p = 0.005), Akonu vs Dixcove (p = 0.027), and Akonu vs Princess Town (p = 0.080)) also yielded p-values that remain significant after adjustment. These results highlight Akonu as a distinct community with lower marine resource dependence than the rest.

Digitized by Sam Jonah Library

Table 11: Bonferroni-Adjusted Pairwise Comparisons of MRDI Scores

Row Mean	Achonwa	Agyan	Akatekyi	Akonu	Akwidaa	Busua	Dixcove
Agyan	1.000						
Akatekyi	1.000	1.000					
Akonu	0.935	1.000	1.000				
Akwidaa	1.000	0.020	0.249	0.006			
Busua	0.681	0.021	0.188	0.005	1.000		
Dixcove	1.000	0.108	1.000	0.027	1.000	1.000	
Princess Town	1.000	0.460	1.000	0.080	1.000	1.000	1.000

Perspectives on the Economic and Social Implications of MPAs among the selected coastal communities

The second objective was to examine the perceived potential economic and social implications of MPAs. To accomplish this objective, the study investigated awareness and understanding of MPAs, attitudes towards conservation, and perceptions of how MPAs could potentially affect livelihoods.

Awareness and Knowledge of Proposed MPA Establishment

To determine awareness of the respondents on the proposed MPA establishment, participants were asked whether they had heard of the designated sites. Before responding, each participant received a brief explanation of MPAs to ensure clarity. As shown in Figure 4, 62% of respondents reported being aware of the proposed MPA, while 38% were unaware.

Digitized by Sam Jonah Library

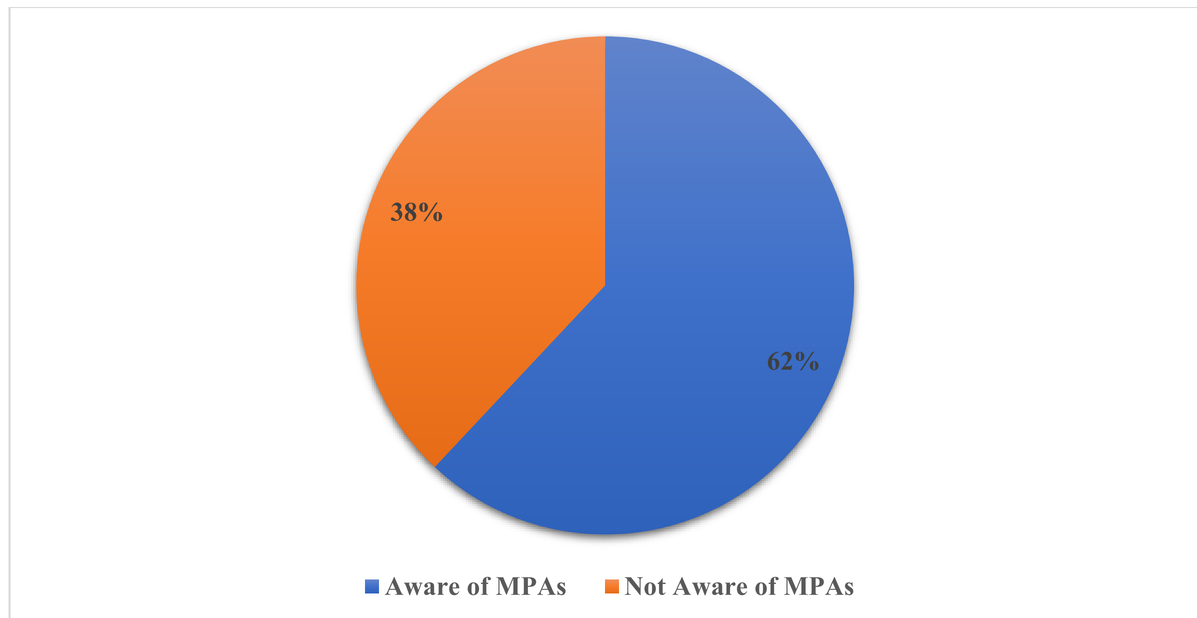


Figure 4: Community Awareness of Proposed Marine Protected Areas (MPAs) Establishment

To further explore awareness of the proposed establishment of MPAs, focus group discussions (FGDs) were conducted. Assessing awareness was necessary because knowledge and understanding of MPAs influence how coastal communities perceive proposed restrictions and socio-economic impacts. The qualitative findings reveal that awareness and understanding of MPAs varied across *communities, with some demonstrating informed recognition of conservation principles and others* expressing uncertainty and limited exposure to the initiative. In some communities, there was a clear recognition of MPAs as designated zones for marine conservation, emphasising restrictions on fishing to protect fish breeding grounds and ensure long-term ecological benefits. For instance, one discussant framed the MPA as a scientifically informed intervention:

"*…Like we are saying, there is a place where the fish breed. So, the Government researched about it and wants to protect that area; we support it because it will bring more fish…FGD 02.*"

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Similarly, another participant demonstrated an awareness of the temporal nature of spatial fisheries management measures, describing MPAs as involving periodic closures and reopening of fishing grounds to allow for ecological recovery and sustainable harvesting;

"*We have heard of the MPA. They said that a portion has been selected which would be fishing-free for a period. The purpose is to allow the fish to grow and also encourage appropriate fishing practices when the time is due for harvesting…FGD 04*"

Conversely, other communities reported minimal exposure to MPA-related discussions, with awareness often emerging indirectly through neighbouring villages. Participants reported that discussions about MPAs were taking place in neighbouring areas but not within their own communities. This led to feelings of exclusion and uncertainty regarding the proposed MPA. As one participant noted: "*Concerning MPAs, we don't have such meetings here, but there are such discussions if you go to Dixcove and Akwidaa. I learned that soon we will have those discussions…FGD 03*".

Sources of Information on Proposed MPAs

To understand how community members became aware of the proposed MPAs, respondents who indicated awareness were further asked to identify their sources of information. Figure 5 shows the responses across six primary sources. A total of 42.5% of respondents (n=136) reported learning about the proposed MPA through community meetings. Although this represents the single largest source, it also indicates that fewer than half of the respondents obtained information through formal community meetings. The second most cited source was Traditional leaders, such as the chief fisherman (25.0%), emphasising the influence of traditional authorities in conservation discussions. Government officials were a source of awareness for 18.4% of respondents, indicating some level of governmental outreach, although limited. Other sources included Information Centres (8.4%), Non-Governmental Organisations (NGOs) (7.9%), and informal social

Digitized by Sam Jonah Library

networks such as family and friends (4.1%). This distribution of sources represents a variety of information channels, with awareness arising from a mix of traditional, communal, institutional and informal routes. The findings suggest that while community meetings and traditional authorities play important roles in information dissemination, awareness of the proposed MPA is shaped by varied communication contexts across communities. This indicates differences in exposure, engagement mechanisms and stakeholder involvement.

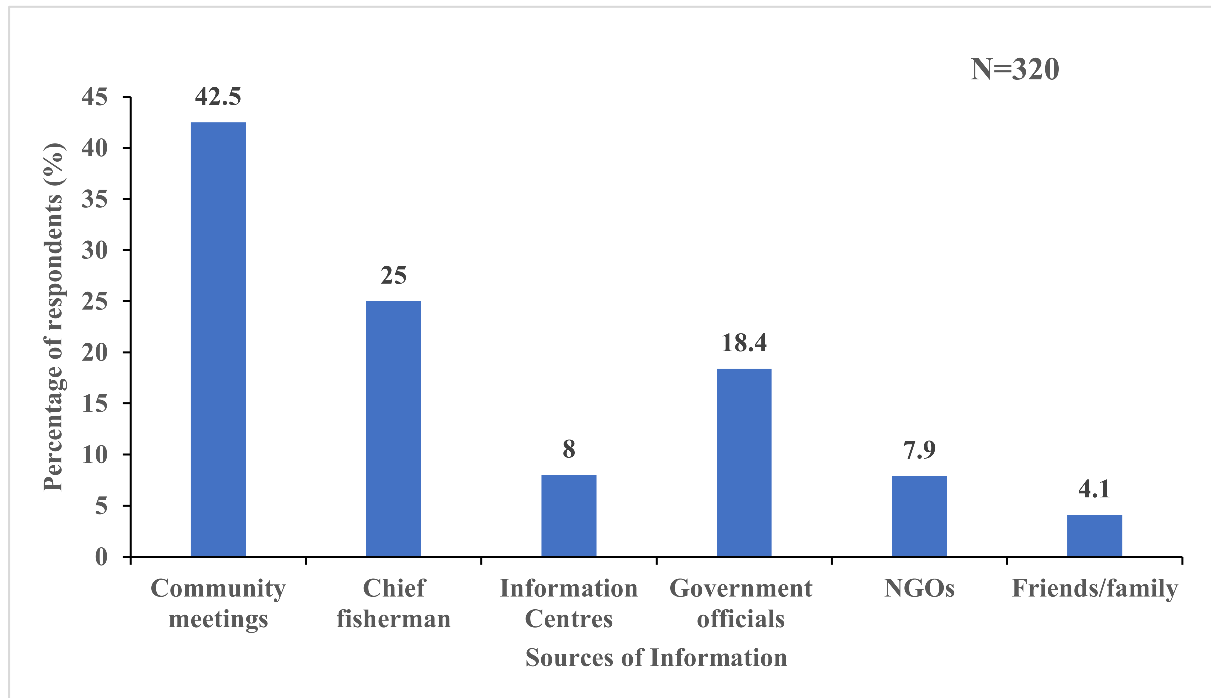


Figure 5: Sources of Information on the Proposed MPAs

Note: Multiple responses

Attitudes Toward Conservation Goals

Community attitudes toward the proposed MPAs varied significantly across the study sites, ranging from enthusiastic support to outright resistance. These attitudes were shaped by a combination of cultural understanding of marine stewardship, perceptions of institutional credibility and concerns about economic survival.

Across all the studied communities, participants generally recognised the importance of conserving marine resources, especially given declining fish stocks. Participants from

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Dixcove and Busua, for instance, recognised the need to protect marine life to promote long-term sustainability. Many acknowledge the potential of MPAs to protect breeding habitats and support ecological recovery by increasing fish availability. Illustratively, one participant in Dixcove likened the need for fish to find sanctuary to human birthing processes, stating, "*Humans go to the hospital to give birth before resuming their daily life, and I believe fish need the same protection…FGD 04*"

However, despite the widespread agreement on the principle of conservation, support for MPAs was rarely unconditional. Instead, it hinged on several factors such as the historical inconsistencies of implementing agencies, weak enforcement mechanisms and anticipated impacts on their livelihoods. Participants in Aketekyi and Agyan, for example, questioned the logic of implementing MPAs without first addressing rampant illegal fishing practices such as light fishing, trawling in unapproved areas and the use of unapproved nets. Many believed that illegal fishing posed a more immediate and severe threat than open access fishing by locals. One participant in Aketekyi argued:

"*The primary issue is to stop light fishing; the light is destroying everything, and when they do that, there will be no need for the MPA…FGD 05.*"

This sentiment reflected a common thread that MPAs, without enforcement of existing regulations, would be ineffective.

In communities like Busua and Princess Town, some participants expressed hope that MPAs could bring long-term ecological and economic benefits. However, these attitudes leaned towards conditional support as they believed MPAs might work depending on the effectiveness of the policy and those managing it. One participant in Princess Town shared, "*MPAs are places where fish come to lay eggs; I believe if they are managed well, they will allow us to harvest more in the future…FGD 06.*"

Digitized by Sam Jonah Library

While this hopeful outlook existed, other communities like Akwidaa were far more resistant. For a community deeply reliant on fishing for their livelihoods, any restriction was viewed as a direct threat to their survival. One participant articulated the stance of the community:

"*We would prefer the Government keep the MPAs to themselves. Even if they offered us a building full of money in exchange for implementing it, we would reject it. No matter what they say about it, we will not accept the MPA…FGD 04*"

For these participants, MPAs symbolised loss of access, marginalisation, and policy imposed without their consent. Their resistance occurred within a context of high marine resource dependence and limited livelihood diversification. As shown in Table 4, Akwidaa recorded one of the highest MRDI scores (8.09), driven largely by high fishing labour relevance, economic burden, limited alternative work, and substantial food dependency. Additionally, qualitative evidence further revealed that resistance in Akwidaa was shaped by awareness and participation-related factors. These findings show that their resistance was not rooted in indifference to marine degradation but in lived experiences and apprehensions regarding economic vulnerability and procedural inclusion.

Notably, several participants across multiple communities framed conservation in intergenerational terms to show their support for marine protection. In Akonu, a participant explained this using a well-known Akan proverb:

"*Our coast is our future. At the moment, we are doing this for our children so the fish in our waters will not go extinct anytime soon…FGD 08*"

Such framing suggests that values on stewardship were widespread and could serve as an entry point for culturally grounded conservation approaches.

Ultimately, attitudes towards MPAs were not driven by rejection of conservation but by deep-rooted concerns about institutional implementation. Support for MPAs, where it

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

existed, was heavily dependent on trust and a desire for fairness, and even among supporters, there was a consensus that MPAs would be ineffective unless harmful fishing practices such as light fishing and unapproved nets were strictly regulated and enforced.

Systemic Exclusion and Inequality in Marine Policy Governance

Participants perceived the proposed Marine Protected Areas (MPAs) as more than being about conservation. Rather, they saw MPAs as part of a broader governance system characterised by exclusion, inequality and political interference. Concerns were generally centred around two major areas: limited community participation in decision-making and unequal distribution of MPA-related benefits and enforcement efforts.

Limited Representation in Decision-Making Processes

Across nearly all the communities, there was a deep and recurring concern that MPA-related decisions were being made without genuine local input. While some acknowledged that consultation meetings had occurred, many described them as tokenistic, noting they offered no real opportunity for influence or responsiveness. This fostered a sense of powerlessness and alienation. As one participant in Dixcove shared,

"*Sometimes, our views are not taken into consideration, which makes us hesitant to attend meetings.. FGD 01.*"

Others expressed frustration that research and planning for the MPA designation occurred in their fishing areas without prior consultation. This framed the MPA as a Government-imposed decision rather than a collaborative effort with affected communities. One participant in Akwidaa expressed,

"*The Government came, did their research, and concluded that this area would hold the MPA without consulting us…FGD 04*"

In Achonwa and Princess Town, participants felt overlooked altogether, with some highlighting little representation during discussions, while others only learned of

Digitized by Sam Jonah Library

consultations taking place in neighbouring areas. Even in communities such as in Busua, Akonu and Agyan, where participants reported more inclusive engagement, there remained doubts about their value. The main concern was that these consultation processes lacked transparency and rarely led to tangible action, especially regarding promised support for fishers during restricted periods. This further undermined confidence in any future engagement.

In Aketekyi, participants expressed a deeper distrust, not only in the consultation process but also in the political motivations behind enforcement practices. Participants explicitly linked decision-making failures to political interference and selective enforcement. One participant revealed the disconnect between public commitments and the on-the-ground realities by explaining;

"*The idea (establishment of MPAs) is good, but they should engage with us more. Nowadays, politics is encouraging illegal fishing practices. Some time ago, the Minister (Fisheries and Aquaculture) called us to Accra to discuss why the light should be banned, but still, the light is being used…FGD 05*"

This lack of transparency and responsiveness has eroded trust, not only in the MPA process but in the broader system of marine governance.

Inequality in Resource Distribution and Policy Enforcement

The mistrust among participants extended beyond consultation and translated into how they believed the MPA would be implemented, should it be approved. Based on past experiences with other programmes, many anticipated that any future support, such as compensation or alternative livelihoods, would be distributed unfairly, favouring wealthier or politically connected individuals. Participants described the system as rigged, expressing frustration over how government support mechanisms were often monopolised and distributed. One participant in Dixcove described,

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

"*Whenever there's an opportunity, it always goes to the rich in the community... FGD 01*"

This sentiment was echoed in Akwidaa, where fishers recounted previous government programmes that failed to reach them, further increasing scepticism about MPA-related assistance. One participant in Akwidaa remarked,

"*We were told the Government would help with nets, but to this day, we have received nothing…FGD 04*"

Participants in Achonwa expressed fears that the MPA support scheme would follow the same pattern of helping only a select few and cautioned against it.

"*If the MPA is for all of us, then everyone should benefit. Not that it will help only some people while the rest of us suffer…FGD 03*"

Concerns extended beyond past disappointments to policy enforcement, where participants alleged unequal punishment of fishers. Wealthier or politically connected actors were seen as protected, while small-scale fishers were penalised. One participant in Busua emphasised: "*The big boats will still find ways to fish while we, the small ones, are left to suffer…FGD 02*"

Another participant in Aketekyi stated,

"*Some time ago, the Minister (Fisheries and Aquaculture) called us to Accra to discuss why the light should be banned, but still, the light is being used. The big men have the boats, so they don't stop it…FGD 05*"

These accounts reveal a perception that marine conservation is being carried out along existing socio-economic fault lines and is likely to reinforce inequality rather than resolve it. From tokenistic consultation to elite-dominated benefit distribution and unequal enforcement, this deep-seated distrust in policy implementation has led to scepticism about whether MPAs would be enforced fairly or simply worsen existing economic disparities, reproducing the same injustices as experienced in the past.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Economic Impacts of Proposed Marine Protected Areas (MPAs)

The introduction of Marine Protected Areas (MPAs) presents a complex economic challenge for coastal fishing communities. While MPAs are designed to replenish fish stocks and promote long-term sustainability, fishers worry about the immediate economic disruptions they may cause. The findings from the study reveal three interrelated themes shaping the concerns of the communities.

Livelihood Fragility and Economic Insecurity in Coastal Communities

Fishing communities across the study area were experiencing increasing economic insecurity due to a convergence of ecological, systemic, and policy-related pressures. Participants consistently described how declining fish stocks, rising operational costs and lack of viable alternatives have undermined their ability to sustain their households. This context influenced how MPAs were viewed with anxiety and scepticism.

A common concern among participants was the decline in fish availability, largely driven by illegal practices such as light fishing, trawling, and the harvesting of fingerlings. These were perceived to disproportionately benefit industrial and semi-industrial vessels while harming small-scale fishers who rely on traditional gear and techniques. One participant in Dixcove noted,

"*About 10 years ago, the large boats didn't fish where we used to go with our small canoes. But now, they harvest the fingerlings, and we don't get the fish anymore…FGD 01*"

Participants expressed feeling disadvantaged compared to larger boat users who are better equipped to access deeper and more productive waters. As one participant from Agyan explained, "*For those using the boats, they harvest more and leave nothing for us using the canoe because they can go farther out to sea...FGD 07*".

Beyond these illegal practices, climate-related changes have further compounded the challenges faced by fishermen. In Princess Town, for instance, participants highlighted the

Digitized by Sam Jonah Library

growing invasion of sargassum (seaweed), which obstructed their nets and complicated fishing processes. One participant remarked, *"When you cast your net, all you pull out is seaweed, so how will we bring home a harvest for our families?...FGD 06"*

As a result of these challenges, operational costs have also risen sharply. Fishers across several communities described how dwindling catches have forced them to travel longer distances and spend more hours at sea, at a higher cost, only to return with smaller and less valuable catches. A participant in Dixcove shared,

"*The nets and fuel we buy now are expensive, and sometimes we don't get enough fish to make it worth the trip…We incur expenses of about GHS 10,000 to fish, but when we sell the catch, we make at most GHS 4,000…FGD 01*"

Another in Aketekyi expressed;

"*At first, we could harvest five containers easily, but ever since light fishing became rampant, we can cover a very long distance for 10 days, and we won't get even two containers…FGD 05*"

These testimonies illustrate a vicious cycle of financial losses, where increased effort yields diminishing returns. The trend has left many households in debt and has translated directly into economic insecurity. As catches decline, families are increasingly unable to meet basic needs. Many reported that the unpredictability of their income now prevents them from keeping their children in school. In Aketekyi, one participant shared:

"*Since the harvest has gone down, this difficulty has happened, and nobody can even take their children to the university. Even at the JHS level, when they demand 700 cedis at the end of the year, we can't afford it. Currently, I have not been able to pay 100 cedis for my kid in school...FGD 05*"

For many households, fishing was described not just as a source of income but as a lifeline, and its near collapse triggered cascading effects. For many, the absence of alternative

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

livelihood options meant that even small fluctuations in catch could leave their household needs unmet. Several participants noted increasing signs of social issues within their communities. Some mentioned school dropouts, increased theft, and youth involvement in illegal mining ("galamsey"), as emerging consequences of financial desperation. A participant in Aketekyi shared, "*Now, children don't go to school anymore, issues of theft are rampant, and others are involved in galamsey… FGD 05*"

Against this backdrop of struggle, the proposed MPAs were viewed with ambivalence. While some participants believed that well-managed MPAs could improve the income of fishers over time, they also viewed the restrictions associated with MPAs as a potential source of hardship that could impose new burdens on communities that were already struggling to survive.

One participant in Dixcove expressed: "*We depend on fishing for everything, so if they stop us, how will we survive?...FGD 01* "

Another participant in Achonwa echoed this sentiment:

"*We have no other work apart from fishing, so any stoppage will affect us badly… FGD 03*"

In Akwidaa, the strong opposition to MPAs was evident, with participants fearing their potential to disrupt their only source of income. One participant asserted, "*Fishing is our means of income and survival; If the MPA is introduced, it will bring a lot of hardship upon us…FGD 04*"

There were also concerns about the timing of potential restrictions, with participants fearing that MPAs could coincide with peak harvest months, further undermining economic resilience. As one participant in Agyan expressed, "*If they stop us during the good harvest months, we won't have money to survive… FGD 07"*

Digitized by Sam Jonah Library

Smaller-scale fishers, particularly those with limited gear or capacity, felt especially vulnerable and were concerned about the financial strain they would endure during potential closure periods. One participant in Akonu expressed,

"*For those using smaller gears, it will be very hard for us to make money during that time… FGD 08*"

Despite these concerns, a few participants believed that MPAs could lead to improved incomes and better living conditions for their families if properly managed. A participant in Akonu remarked, "*When the men bring in more fish, we can smoke them and sell them, which will help us cater for our children… FGD 08*"

These mixed perceptions reflect that while people want ecological recovery, they fear that MPAs, when introduced without viable alternative livelihood options or support, will leave them trapped in a cycle of poverty, further deepening the risk of socio-economic insecurity.

Impact on Food Security and Nutritional Health

The decline in fish stocks has directly affected household food security and nutrition across coastal communities. Participants consistently expressed that reduced access to fish, which is the primary source of affordable protein, has disrupted diets, raised food prices, and triggered fears of malnutrition and hunger.

In communities like Dixcove, Busua, and Akwidaa, participants described how reduced fish availability has increased food prices and made nutritious meals harder to afford. Fish, once a staple, has become a luxury for many households. A Dixcove participant explained:

"*If there's no fish, how can we feed our families? We rely on fish for protein, and without it, our children will suffer… FGD 01*"

A participant in Busua also shared, "*We used to eat fish with every meal, but now it's a luxury. This is affecting our health… FGD 02*"

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

In several communities, participants highlighted that the area designated for the proposed MPA is where their major fishing grounds are located, and they believed it would worsen food insecurity once established. One participant remarked,

"*There will be issues of hunger because where we will get to fish is where the MPA will be established…FGD 02*"

In Akwidaa, Achonwa and Akatekyi, participants connected fish scarcity directly to health deterioration: One Aketekyi participant warned, "*The MPA will bring sickness. We won't have good food to eat, and that will bring sickness and financial challenges…FGD 05*"

Participants in Akonu drew parallels between MPAs and likened their potential effect to that of the closed season, expressing fears of recurring food shortages:

"*Implementing the MPA will bring about hunger in the community. As it is closed season now, there are fish in the sea, but we are not supposed to go fishing, and we are hungry, so if the MPA comes, it is going to do the same, and we will face hunger… FGD 08*"

While some voices were more hopeful, they emphasised the need for fair and transparent implementation. A female participant explained:

"*There are challenges when you begin anything, but when we do it well, it will help. If the leaders are truthful and fair, when we struggle for a while, and the fish become abundant, we are the same people who will go and fish. We will get money to buy from the crop farmers, and they will, in turn, grow more crops. Now, because they don't get enough fish, there is no money to buy cassava and other foodstuffs, and most of it has rotted away. So, if they implement it well, it will help us…FGD 02*"

As the data suggest, this optimism, however, was conditional and hinged on trust, integrity, commitment to a good cause, compensation and short-term support mechanisms.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Gendered Impacts of Food Scarcity

A recurring sub-theme was that food insecurity was deeply gendered. Women, who often manage the household food and earn income from fish processing, are disproportionately affected when fish availability is low. In Dixcove, participants emphasised that women would bear the brunt of the economic challenges caused by the establishment of MPAs. One participant explained,

"*If the men don't catch fish, the women have nothing to sell. This will affect the entire family because they feed the home… FGD 01*"

Similar concerns were echoed in Busua, where women highlighted that they often shoulder emotional and economic burdens during hardship. Participants acknowledged that while men might struggle with fishing restrictions, women would bear the economic ripple effects, particularly in securing food for their families. One participant explained,

"*When everything about fishing is put together, the women are those who suffer. If it should affect the men, it will not be as bad compared to the women, because when the men do not get fish, all they care about is having food on the table. Wherever you get money, they don't care… FGD 02*"

In Princess Town, women described how they are often left with full responsibility of managing the household when men migrate in search of alternative work. One participant expressed,

"*In times of difficulty and hardship, we, the ladies, suffer more because when my husband goes to harvest fish is when I can also get something to do for the family. Another reason is that in times of difficulty, husbands just leave home in search of something to cater for the family. Once he is gone, our kids cry, looking to us for food, which becomes the burden of the wife… FGD 06*".

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

In Aketekyi, participants reported that women often sell personal belongings to support their households during economic difficulties. One woman shared,

"*Women suffer when our children are going to school, and there is no money. We can even sell our clothes, but the men will not do the same. So, there should be jobs for us, the women… FGD 05*"

The gender imbalance was put succinctly by a participant in Agyan, who shared,

"*In difficult times, we, the ladies, suffer more. When it happens, there is no money, so when the kid goes to their dad for anything, he tends to direct them to us to cater or provide for the needs of the child, because he also has nothing since the sea has been closed, and they are unable to harvest fish to sell and make enough cash. With that, whether I have or not, I will have to provide for the kids, so in times of difficulty, we, the ladies, suffer a lot...FGD 07"*

These findings reveal that food insecurity in the context of MPAs is multidimensional. It shows that food insecurity in coastal communities is not only about the availability of fish, but also about who manages food, who suffers when food is scarce, and how gender roles influence vulnerability. While MPAs may improve fish stocks over time, community members fear that short-term restrictions will deepen food insecurity, especially for women, who are at the forefront of household provisioning. These highlight that any successful MPA implementation must therefore be gender-sensitive and nutritionally informed to prevent intensifying household hunger as well as widening gender inequalities.

Social and Cultural Impacts of Proposed Marine Protected Areas (MPAs)

Cultural and Ritual Disruptions

Cultural traditions and rituals tied to the marine environment were evident across all communities. Many described the sea as not just a site for their economic activity, but as a vital cultural and spiritual element. Many participants emphasised that traditional rituals,

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

beliefs in sea deities, and ceremonies to ensure safe passage and a good harvest were integral to their fishing practices. The proposed establishment of MPAs raised concerns about the potential disruption they could cause to sacred practices tied to the sea.

In Dixcove, participants spoke of rituals performed at the seashore to honour a sea god named "Nana Ekow Broni." These rituals were believed to ensure good harvests and provide fishers protection from misfortune at sea. One participant expressed concern about the potential consequences of MPAs on these traditions:

"*If the MPA restricts our fishing, it will provoke our gods in the community. They don't like the closed season, and the MPA might unleash their anger…FGD 01.*"

Similarly, in Busua, participants highlighted historical traditions such as pouring libations to a sea god called "Nana Abrekow." These rituals, though less frequently practised today, were credited with ensuring bumper harvests in the past. One participant noted,

"*In the old days, these rituals were serious, and they brought us good harvests. Maybe if we try them again, things will improve… FGD 02*"

In Akwidaa, rituals remain a vital part of cultural life. Participants described annual ceremonies performed to honour a god called "Asaase Wura," particularly during festive seasons. A participant noted that while MPAs may not directly prevent these rituals, they could indirectly disrupt their livelihoods, making it difficult to get the economic means required to sustain these practices:

"*These rituals are important to us. If the MPA is implemented, it may not disrupt the rituals themselves, but it will disrupt us, the fishermen… FGD 04*"

Other communities reflected a gradual decline in traditional rituals, which they linked to the shift in religion, as many elders who led such practices were no longer alive. A female participant in Achonwa attributed the erosion of marine rituals to the growing influence of Christianity. She explained,

Digitized by Sam Jonah Library

"*There used to be rituals for the ocean, but now Christianity has taken over, and these practices have diminished… FGD 03*"

A similar trend was observed in Akonu, where a participant explained:

"*We used to perform some rituals here every year, and it helps us with harvest, but it's been five years since we performed traditional practices for the sea… FGD 08*"

In contrast, Aketekyi continues to perform annual rituals to honour the lagoon deity "Nana Apugu", who is believed to bring bountiful harvest and protect fishers. The rituals reflect a belief in maintaining harmony with the marine environment, viewing the sea as a provider that must be respected. Similar beliefs were echoed in Agyan, where participants described performing rituals at a sacred island or stone to bless their fishing efforts and protect the community in general. Some believed that the decline in fish stocks was a direct consequence of abandoning these rituals. One participant revealed, "*We used to worship gods before the arrival of the Bible. We now find ourselves turning our backs on the sea and the gods who protect us here. After the introduction of Jesus Christ, we have now turned our backs on the gods who help us when we perform rituals for them. Since that has reduced, it has also affected our harvest… FGD 07*."

In Princess Town, cultural practices were mentioned in passing but did not appear to play a central role in local concerns about the MPAs. Most participants instead focused on the practical implications of the MPA on their daily lives rather than the spiritual consequences. Overall, these findings indicate that the proposed MPAs intersect with spiritual belief systems in several communities by potentially restricting access to marine spaces culturally recognised as sacred, limiting the performance of sea-related rituals, and disrupting livelihoods that provide the material means to sustain ritual practices. Hence, their implementation must also consider the cultural and spiritual aspects of managing marine resources.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Anticipated Strains on Community Cohesion

While many fishing communities described themselves as generally peaceful and united by their shared dependence on the sea, the introduction of MPAs raised fears of disunity and conflict. These concerns were rooted in the belief that unfair restrictions, support or enforcement could threaten unity, trust and result in social conflict within their communities. As one participant in Dixcove expressed clearly:

"*There is peace and unity here because we understand each other, but if the MPA is introduced and some benefit while others don't, it will create conflict… FGD 01"*

A similar concern came from Busua, where participants feared that resource restrictions or unequal distribution of benefits might create conflict among community members and stressed that fair implementation was key to maintaining social harmony. One participant remarked:

"*If the benefits are shared fairly, there will be unity. But if leaders take advantage, it will bring chaos… FGD 02"*

These views were echoed in Agyan, where participants warned that unequal enforcement of the law could divide communities rather than unite them.

"*If the rules apply to some and not others, it will cause conflict… FGD 07"*

Such concerns show that social cohesion is not guaranteed and is likely to be threatened by perceived injustice. Some communities even went further, linking hardship from MPA restrictions to a potential increase in theft and other social problems. In Akwidaa, the outlook was particularly grim. One participant foresaw worsening conditions:

"*We live in peace now because we understand each other, but when the MPA is introduced, I foresee a lot of conflict and theft arising. They should not bring it at all… FGD 04"*

Similarly, in Akonu, participants feared the MPAs could create social discord;

Digitized by Sam Jonah Library

"*If the Government does not treat us equally, it will bring problems in the community… FGD 08*"

However, not all shared pessimism. In Achonwa and Princess Town, participants expressed confidence in the community bonds, doubting that MPAs would harm their unity. They attributed this faith in their community to a strong sense of mutual care and understanding. However, even here, they cautioned that poor management could erode trust in government initiatives. A participant in Achonwa shared,

"*We are one big family here, so there is no conflict of any sort, and we live in harmony. We will just plead with the authority to ensure that once the MPA is implemented, things will be done properly to ensure that the MPA benefits fisherfolk and the community at large. Otherwise, we will be disappointed…FGD 03*"

This suggests that even within more cohesive communities, the anticipated implementation of MPAs has raised genuine concerns about social fragmentation. It underscores that social cohesion must be actively safeguarded through fair governance and equitable distribution in conservation planning.

Displacement and Migration Risks

Participants across study communities expressed fears that the proposed MPAs, if implemented without viable economic alternatives, would lead to both physical migration and cultural displacement. These concerns were especially prominent in communities where fishing is not only the main livelihood but the foundation of their identity and belonging.

In nearly every community, participants stressed that fishing is not only their primary occupation but their only viable option for survival. Particularly in Akwidaa and Aketekyi, participants described their connection to the sea as generational and irreplaceable, with one participant in Aketekyi stating,

"We have been fishing in these waters for generations. Where else can we go?...FGD 05"

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Participants anticipated that once access to traditional fishing zones was restricted, they would be pushed out of their trade, further heightening the risk of forced migration. One participant in Akonu expressed,

"*There is no work here apart from fishing. If we cannot fish, many will leave… FGD 08*"

Participants repeatedly expressed concerns that the youth, who were already vulnerable due to declining fish stocks and were faced with joblessness, would be the first to either migrate to urban areas or engage in illegal mining operations. This concern was not hypothetical, as many recounted past experiences in which declining fish stocks forced many youths to migrate in search of work, and they feared that establishing an MPA might exacerbate the situation. One participant in Achonwa revealed,

"*There was an instance where there was no fish to harvest, which drove most of the youth out of the town in search of work. Most of them ventured into galamsey to make ends meet because work on the sea had changed. They only returned when there was a slight improvement in the fishing activities… FGD 03*"

Another participant in Busua confirmed this fear and warned,

"If the MPA is not managed well, our young people will leave for galamsey (illegal mining), and our community will lose its vibrancy… FGD 02"

Beyond this concern, participants expressed a deeper fear that migration would disrupt family structures and dissolve communal identity.

These statements reveal that displacement and migration are not a future fear, but an ongoing pattern which could accelerate under MPA restrictions. The emotional loss attached to this, particularly involving the loss of family and the removal of members from a particular way of life, is just as important as any financial loss. The finding shows that without clear, careful planning, MPAs may inadvertently catalyse outward migration and erode coastal community life.

Digitized by Sam Jonah Library

Strategies to Minimise the Potential Socio-economic Negative Effects Associated with Establishing MPAs

This section presents the findings from the third objective, which aimed to identify strategies to minimise potential negative effects associated with establishing marine protected areas (MPAs) in selected communities. The results are organised into subsections, each corresponding to specific strategies analysed. The statistical significance of the observed differences across communities is highlighted, with chi-square test results provided to indicate the strength of the associations between variables.

Table 12: Preferred Strategies to Minimise Potential Negative Effects of MPAs by Community

	Community name									
	Achonwa	Agyan	Akatekyi	Akonu	Akwidaa	Busua	Dixcove	Princess Town	Total	Chi^2 (Pr)
Compensation support schemes for affected individuals										
No	43.7	39.2	54.7	45.0	31.6	33.3	32.2	67.7	41.9	20.7(0.004)
Yes	56.3	60.8	45.3	55.0	68.4	66.7	67.8	32.3	58.1	
Training and Educational programmes										
No	39.6	82.4	46.9	90.0	43.9	33.3	36.7	73.5	51.3	54.4(0.000)
Yes	60.4	17.6	53.1	10.0	56.1	66.7	63.3	26.5	48.7	
Increase access to financial services										
No	39.6	45.1	54.7	10.0	43.9	26.7	31.1	44.1	39.3	19.6(0.006)
Yes	60.4	54.9	45.3	90.0	56.1	73.3	68.9	55.9	60.7	
Collaborative decision-making processes										
No	54.8	86.3	68.7	100.0	63.2	60.0	48.9	44.1	62.7	39.0(0.000)
Yes	45.8	13.7	31.3	0.0	36.8	40.0	51.1	55.9	37.3	

Digitized by Sam Jonah Library

Table 12: Continued

Enforcement of existing marine regulations										
No	58.3	43.1	62.5	65.0	52.6	76.7	74.4	44.1	60.4	22.7(0.002)
Yes	41.7	56.9	37.5	35.0	47.4	23.3	25.6	55.9	39.6	
Strengthen community-based organisations										
No	81.3	98.0	89.1	95.0	78.95	86.7	88.9	82.3	87.1	12.7(0.080)
Yes	18.7	2.0	10.9	5.0	21.05	13.3	11.1	17.7	12.7	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

From Table 12, access to financial services received the highest support (60.7%) from respondents across all communities, indicating significant support ($Chi^2 = 19.6$, $p = 0.006$), with strong approval in communities such as Akonu (90.0%) and Busua (73.3%). This underscores the critical role of financial inclusion in mitigating the socio-economic impacts of MPAs. The lower support in Akatekyi (45.3%) suggests a need for targeted financial outreach programmes in less receptive areas.

Compensation schemes were the second-most supported strategy (58.1%). The proportion of support varied significantly ($Chi^2 = 20.7$, $p = 0.004$). With notable endorsement in Akwidaa (68.4%). Lower support in communities like Princess Town (32.2%) indicates potential scepticism about the feasibility or fairness of such schemes. Tailored compensation models addressing specific community concerns may enhance their effectiveness.

Training and educational programmes were identified as an effective strategy by nearly half of the respondents (48.7%), although significant variability was observed ($Chi^2 = 54.4$, $p < 0.001$). Communities such as Agyan and Akonu showed low support for training programmes (17.6% and 10%, respectively), whereas Achonwa and Busua demonstrated

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

higher approval rates (60.4% and 66.7%). These findings suggest that perceptions of the effectiveness of training programmes are context-dependent.

Enforcement of existing marine regulations garnered support from 39.6% of respondents, reflecting its limited appeal. While communities such as Agyan (56.9%) showed stronger approval, others, such as Busua (23.3%), were less supportive, indicating the need for complementary strategies to enhance regulatory acceptance.

Collaborative decision-making processes were supported by 37.3% of respondents overall ($Chi^2 = 39.0$, $p < 0.001$). Princess Town (55.9%) and Dixcove (51.1%) had relatively high support, highlighting the importance of inclusive management approaches. Akonu, however, recorded no support for this strategy (0%), pointing to significant challenges in fostering participatory governance in some areas.

Strengthening Community-Based Organisations received limited support, with only 12.7% of the respondents endorsing it ($Chi^2 = 12.7$, $p = 0.080$). Across all communities, low levels of approval were observed, with the highest support in Achonwa (18.8%) and the lowest in Agyan (2.0%). The low endorsement suggests that these organisations may lack the visibility, resources, or trust needed to be effective in supporting MPAs. Strengthening these institutions will require significant investment in capacity and trust-building measures.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

CHAPTER FIVE

DISCUSSION

Introduction

This chapter presents the discussion on the findings of the study, addressing its research objectives. First, it assesses the level to which coastal communities in Ghana's Western Region depend on marine resources for their livelihoods. Next, it explores local views on the possible economic and social effects of Marine Protected Areas (MPAs). Finally, it evaluates strategies to mitigate negative impacts associated with establishing MPAs, focusing on solutions that work within the local context. This supports sustainable marine conservation while considering the needs of coastal communities.

Background of Respondents

The gender distribution of respondents shows higher male participation in the study, which reflects the gender structure of coastal livelihoods in Ghanaian fishing communities. This can be attributed to the fact that cultural norms and traditional beliefs largely confine sea-going activities to men, while women dominate the shore-based post-harvest sector (Adjei & Sika-Bright, 2019). Findings from the study further indicate that fishing is the primary livelihood activity across the selected communities. This serves as evidence that men are the group most directly affected by spatial restrictions associated with MPAs. Consequently, conservation policies that tend to limit access to fishing grounds are likely to have immediate economic implications for fishermen, who often serve as the primary income earners and providers for their families (Food and Agriculture Organization [FAO], 2018a). However, this does not imply that women are unaffected.While men face the immediate impact of spatial exclusion, women, some of whom are referred to as "Fish Mammies' might face a secondary but equally devastating economic shock. In most fishing communities in the Western Region, women serve as the primary financiers of fishing

Digitized by Sam Jonah Library

expeditions, suggesting that any reduction in landings due to MPA restrictions can directly affect their invested capital and household food provisioning (Adjei & Chan, 2023; Samonte et al., 2016). The age distribution of respondents shows 77.2% were falling between the ages of 26 and 55. This age bracket represents the economically active population and constitutes the primary resource users in coastal fisheries in the Western Region (Crawford et al., 2016). This demographic is not only the primary driver of fishing effort but also the group with a higher level of resource dependency and overall pressure on marine resources. Compared with Ghana's national demographic profile, the study sample shows key structural similarities and contextual differences. According to the 2021 Population and Housing Census, Ghana's population is predominantly youthful, with a median age of approximately 21.5 years, and economically active adults (25-54) constitute the largest working-age population (Ghana Statistical Service, 2021). Given that the majority of respondents are within the economically active age group, their perceptions and livelihood needs have direct implications for patterns of resource extraction and are therefore important for decision-making in the communities. Educational attainment among the studied population was generally low, with 33.5% having no formal education and an additional 56.4 % completing only basic education. This trend reflects broader patterns observed in many Ghanaian coastal communities, where access to higher education is limited, and livelihoods predominantly hinge on traditional knowledge and skills rather than formal academic training (Amevenku et al., 2019). For many fisherfolk, formal education is perceived as secondary to practical experience, as sea navigation, securing large catches and obtaining competitive market prices are learned through hands-on training rather than institutional education (Ginting, 2018). In terms of MPA administration and marine governance, low formal educational attainment has implications for effective communication, enforcement and compliance. Conservation frameworks that rely on

Digitized by Sam Jonah Library

technical language and written regulations are often inaccessible to primary resource users, thereby creating a communication gap that undermines legitimacy. This has been documented in Ghana's fisheries governance, where a limited understanding of the scientific rationale behind policies such as the national closed seasons and the 'Tuesday Non-Fishing Day' led to resistance or non-compliance (Ansah et al., 2022; Owusu et al., 2023). Additionally, limited educational attainment not only perpetuates a cycle of dependence on traditional livelihoods but also restricts access to formal-sector employment opportunities (Selig et al., 2019). Marital status data revealed that 66.2% of respondents were married, reflecting the family-oriented nature of coastal communities in the Western Region. In these settings, household structures are not merely social units but are the primary economic systems of the blue economy. Married couples in fishing families often support each other in the fishing business by pooling resources and sharing labour to increase total household income (Karakara et al., 2025). Furthermore, because fishing labour activities are often divided along genderlines within a marriage, the establishment of an MPA becomes a household-level shock. As documented by Issah (2024), the economic impact on a married fisher directly translates into a capital deficit for the wife, who typically processes and trades the catch. Findings from this study also indicate that family members and social networks were recognised sources of information about proposed MPAs. This shows that in predominantly married communities, information about MPAs is likely to circulate within households, shaping their perception and acceptance of conservation measures. The dominant ethnic groups were Ahanta (54.3%) and Nzema (27.9%), which reflects the regional ethnic composition and could influence cultural perspectives and acceptance of Marine Protected Areas (MPAs). Additionally, the study found that 82.2% of respondents were natives of the communities, signifying a strong sense of local attachment. Household sizes were predominantly one to five (1-5) members (52.8%). While this might

Digitized by Sam Jonah Library

appear small, in highly resource-dependent coastal communities, household sizes still exert considerable pressure on marine resources, particularly when fishing serves as the primary source of income and food (Enema & Quezon, 2024). This pressure is reinforced by the livelihood structure of the study communities, where artisanal fishing was the main occupation for 57 % of respondents, while fish processing and trading accounted for 42%. These findings resonate with prior studies on coastal livelihoods in Ghana, where fishing and its associated activities serve as the economic backbone of coastal communities (Danquah et al., 2021). Notably, a significant proportion (57.4%) of respondents reported having over nine years of experience in their occupation. This implies that the majority possess the knowledge needed to anticipate potential socio-economic changes associated with MPAs. Their experience in resource use allows them to observe trends over time and assess both direct and indirect impacts of environmental interventions. Importantly, such depth of experience is likely to shape their perceptions of the risks and benefits associated with MPAs. According to Bennett (2016), perceptions grounded in long-term, lived experience represent a valuable form of social evidence. These insights are embedded within local ecological knowledge systems and can enrich decision-making processes by reflecting historically informed understandings of environmental and socio-economic dynamics.

Level of Marine Resource Dependency of the Selected Coastal Communities in the Western Region of Ghana

The Marine Resource Dependency Index (MRDI) findings provide a foundational understanding of the socio-economic dynamics within selected coastal communities in the Western Region of Ghana, demonstrating the extent of reliance on marine resources for livelihoods. Guided by the Socio-Ecological Systems (SES) framework, the MRDI results are interpreted as outcomes of interactions between ecological conditions, governance

Digitized by Sam Jonah Library

arrangements, and household-level socio-economic characteristics. The dependency levels observed across communities therefore reflect not only ecological reliance but also feedbacks arising from livelihood structure, institutional capacity and adaptive options available to resource users (Berkes & Folke, 1998; Ostrom, 2009).

The MRDI scores indicate that most coastal communities are highly dependent on marine resources. The relatively close clustering of scores (between 7.12 and 8.22) in Table 4 reflects a homogenous socio-economic profile across the communities, characterised by limited access to fishing areas, limited livelihood alternatives, high economic burden, high food dependence, low levels of external income support (subsidies), and insufficient presence of formal institutional structures. This finding aligns with studies that highlight the significance of marine and coastal resources in Ghana as a fundamental component of the coastal economy, offering essential nourishment, income, and livelihood assistance to several coastal fishing communities (Hasselberg et al., 2020; Ofori-Danson et al., 2019). While Akonu was classified as having moderate dependence, its MRDI score (7.12) approaches the threshold for high dependence, suggesting widespread vulnerability to disruptions in resource access across all communities. From the SES perspective, such high levels of dependence signify a state of low resilience and reduced adaptive capacity. When a social system (e.g., a community) is highly specialised in a single resource, it loses the flexibility needed to absorb ecological shocks or policy-induced changes (Biggs et al., 2015). As noted by Albasri and Sammut (2021), a high dependence on coastal resources is strongly linked to increased livelihood vulnerability and could pose significant threats in the face of regulatory restrictions. Consequently, this vulnerability presents a significant management risk to MPAs.

The results for the natural capital sub-index reveal that limited access to fishing areas significantly increases marine resource dependency, while higher land ownership, although

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

not prevalent across all communities, provides a potential pathway to reducing reliance on marine resources. The consistently high scores for fishing area access (above 0.95 in all communities) suggest that households have limited access to diverse fishing grounds, thereby increasing their reliance on available marine resources. Within the SES framework, the results for the natural capital sub-index reflect ecological constraints interacting with governance and spatial use conflicts, where limited spatial access to "Resource units" (fish stocks) directly intensifies marine resource dependency. Empirical evidence indicates that limited access to fishing areas leads to increased fishing pressure, overexploitation, declining Catch Per Unit Effort (CPUE), and engagement in illegal or unregulated fishing practices, which paradoxically increases reliance on the remaining resource to meet basic needs (Davis & Harasti, 2020; Kraus & Diekmann, 2018). This challenge is evident in the Western Region, where spatial competition between small-scale fishers and offshore oil and gas companies, the presence of several exploration and research vessels and spread of invasive species such as sargassum seaweed have constrained fishing mobility thus reducing access to fishing grounds (Ackah-Baidoo, 2013; Adjei & Overå, 2019; Mohammed et al., 2023; Owusu, 2019). These spatial restrictions exacerbate dependence on available marine resources and heighten the vulnerability of communities to changes in resource access, especially with potential external interventions such as Marine Protected Areas (MPAs), which further limit fishing opportunities (Hampton et al., 2023). However, the SES perspective also highlights the role of alternative resource systems. The comparatively low allotment ownership score, typically below 0.5 across most communities, indicates that a significant proportion of households hold allotments. This represents a latent form of social-ecological resilience. While land ownership is not currently a primary driver of the economy, it can contribute to economic diversification within these communities. Land and housing ownership in coastal areas can often create opportunities for alternative income

Digitized by Sam Jonah Library

sources, ultimately reducing their dependence on marine resources (Fabinyi, 2020). Beyond fishing, farming serves as a major complementary livelihood, particularly during seasonal lean periods when fish catches naturally decline, as well as during periods of reduced catches caused by overfishing or environmental changes (Fisher et al., 2017). Given the high rate of allotment ownership among respondents, the introduction of MPAs presents a strategic opportunity to promote context-specific alternative livelihood strategies. Specifically, leveraging local land ownership can facilitate the development of viable alternatives such as aquaculture or agroecological farming. These land-based alternatives can reduce pressure on marine ecosystems while also generating more revenue. A growing body of literature has underscored the importance of livelihood diversification as a means to mitigate the socio-economic costs associated with restricted fishing access (Cinner et al., 2009; Torell et al., 2017). Recognising land as a key developmental asset within MPA planning allows for a "win-win" SES outcome which involves reducing anthropogenic pressure on the marine "Resource System" while simultaneously strengthening the economic "Social Subsystem" (Ostroom, 2009).

Human capital indicators contributed the greatest to marine resource dependency, with fishing labour relevance and economic burden emerging as the most influential factors. This aligns with findings by Aldasoro-Said and Ortiz-Lozano (2021), who identified that fishing labour relevance and economic burden contributed the most to marine resource dependence in relation to human capital in rural coastal communities. The high fishing labour relevance in communities such as Princess Town (0.91) and Dixcove (0.88) characterises these communities as highly specialised social subsystems. This means that members have developed deep expertise in marine resource exploitation, hence have limited diversification into other forms of labour. Increased experience often correlates with a deeper understanding of marine ecosystems, leading to heightened appreciation and greater

Digitized by Sam Jonah Library

reliance on these resources. Within the SES framework, such specialisation creates a path to dependency, in which the collective expertise becomes a barrier to transformation (Folke et al., 2005) and increases exposure to ecological and institutional shocks, as households possess limited capacity to reallocate labour when marine resource access is constrained. As noted by Cinner and Pomeroy (2012), such lived experiences often lead to strong socio-cultural identification with marine ecosystems, where individuals feel that their livelihoods are intertwined with the health of these ecosystems. The case of Akonu presents an instructive contrast, with its markedly lower fishing labour relevance (0.51) reflecting greater experience in alternative livelihoods than in marine-related activities. This finding is consistent with reports from the Coastal Resources Center and Friends of the Nation (2010), which describe Akonu as a farming-oriented coastal community with fewer members engaged in fishing. The comparative analysis between these communities supports Béné et al.'s (2010) contention that limited economic alternatives correlate strongly with heightened marine dependency. The substantial economic burden on households, reflected in scores exceeding 0.85, reveals a critical stressor in the dependency equation. The findings suggest a pattern of financial precarity in which primary income earners shoulder disproportionate responsibility. This indicates that financial responsibility often falls on a single individual within these households due to the lack of diversified income streams, exacerbating stress and vulnerability to resource shocks. This finding aligns with Somoebwana et al. (2021b), who demonstrated that households with fewer financial contributors face greater economic challenges, reinforcing the link between financial pressures and reliance on a singular livelihood source. The present findings further corroborate the literature that warns of the compounding effect of such a burden on the adaptive capacity of households in terms of shifts in resources (Cinner et al., 2012). Furthermore, the low educational attainment within the communities also contributes to

Digitized by Sam Jonah Library

marine resource dependency, with 33.5% of respondents having no formal education and 56.4% completing only basic education. The educational profile of these communities reveals significant barriers to livelihood diversification. This limited human capital development restricts occupational mobility, where community members face structural barriers to entering alternative employment sectors. As demonstrated by Somoebwana et al. (2021a), such educational limitations reinforce marine dependency by restricting access to formal employment opportunities that typically require specific credentials or skill sets. The convergence of high labour specialisation, low educational attainment, and high economic burden exacerbates the cycle of marine resource dependency, making it difficult to transition from fishing-based livelihoods. These dynamic mirrors Aldasoro-Said and Ortiz-Lozano's (2021) findings in Mexican coastal communities, suggesting common patterns across developing coastal economies.

The analysis of the social capital reveals a critical dichotomy in how formal and informal institutions mediate marine resource dependence in coastal communities. Within the SES framework, institutions function as a "governance system" that influences how people use resources and interact with the environment. The limited presence of formal institutional structures across most study communities represents a fundamental barrier to development opportunities (Speranza et al., 2014; Vallury et al., 2022). This institutional deficit restricts the external links required to access microfinance, government subsidies or technical training programmes, thereby locking communities into a state of high dependency on the immediate resource system. As Karakara et al. (2024) note, only 23% of fishers in Ghana's coastal communities participate in formal associations, thereby limiting access to institutional support mechanisms. This finding aligns with Pellowe & Leslie (2020) governance analysis, which reveals ineffective resource management as a result of government inadequacies failing to address the unique needs and practices of

Digitized by Sam Jonah Library

communities when developing institutional support mechanisms. Communities with weaker formal networks, such as Akwidaa (0.91) and Busua (0.9), have a lower capacity to access alternative livelihood training or participate in training programmes promoting sustainable fishing practices, leaving them dependent on traditional fishing methods. This resonates with Cinner et al.'s (2012) assertion that communities with better access to formal institutions are more likely to adopt sustainable practices and manage marine resources effectively. However, the presence of a comparatively stronger informal capital suggests that it may help reduce reliance on fishing by facilitating immediate crisis response through kinship networks, enabling informal knowledge sharing about fishing, which can help communities cope with challenges such as fishing regulation and environmental changes (Gómez-Andújar et al., 2022; Lavoie & Himes-Cornell, 2019). Overall, the findings emphasise that while informal social capital provides essential day-to-day support, the lack of strong formal social structures across communities represents a structural vulnerability, limiting opportunities for resilience through institutional mechanisms.

Economic capital indicators collectively represent the second most significant contributor to overall marine resource dependency, with an average score of 0.72. The work independence sub-indicator shows variation across communities, with Princess Town (0.87) and Busua (0.83) exhibiting particularly limited livelihood diversification. Conversely, Akonu (0.6) and Akatekyi (0.68) exhibited greater work diversification, suggesting these communities may possess enhanced buffers against fluctuations in marine resource availability and access (Sène-Harper et al., 2019). Notably, food dependency and subsidies emerged as significant drivers of marine resource dependency. The high food dependency scores across all communities, particularly Akonu (0.95), Agyan (0.92), Achonwa (0.85), and Akwidaa (0.84), confirm the vital role of marine resources in household food security and nutritional sustenance (FAO, 2018b; Tacon & Metian, 2015). Coastal populations

Digitized by Sam Jonah Library

increasingly rely on marine resources for food security, primarily from small-scale fisheries, which are their main source of dietary protein and income (Cohen, 2013). Studies indicate that approximately 70% of Ghana's total animal protein intake comes from fish, emphasising its role in addressing nutritional deficiencies among the population (Hasselberg et al., 2020; Sumberg et al., 2016). This assertion is reinforced by the study conducted by Fisher et al. (2017), which highlighted significant fish dependency in 12 of the world's most food-insecure countries, including Ghana. The study revealed that fish play a crucial role in household diets, serving as climate-sensitive nutritional safety nets for many households. However, the heavy reliance on fisheries for both food and income exacerbates vulnerability within these coastal communities as livelihoods are simultaneously exposed to ecological pressures such as overfishing and climate change, as well as fisheries management intervention, which threaten the sustainability of marine resources and, consequently, food security (Ansah & Oduro, 2024; Lam et al., 2012). Consequently, any fisheries management intervention (e.g. MPA) that restricts access without providing a protein substitute could trigger a social-ecological collapse rather than a sustainable transition. Furthermore, the presence of subsidies as a significant contributor to resource dependency in most communities indicates limited access and inequities in resource distribution and policy implementation, emphasising the need for effective subsidy programmes as highlighted by Sumaila et al. (2010). This finding mirrors global patterns of unequal subsidy distribution, in which small-scale fishermen receive disproportionately fewer subsidies than those engaged in industrial fisheries (Dorofeeva et al., 2021; Sumaila et al., 2019). In Ghana, the disparity in access to essential subsidised fishing inputs is more evident, as access to inputs such as fishing nets, premix fuel, and outboard motors is markedly influenced by unequal power dynamics between the politically connected and less connected individuals within fishing communities (Owusu & Adjei, 2021). The finding

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

reinforces this assertion, underscoring the need for effective subsidy programmes that alleviate economic pressure and promote sustainability and responsible fishing practices (Dorofeeva et al., 2021; Sumaila et al., 2010). The observed low expenditure patterns across communities indicate that living costs in fishing communities are lower. This low cost of living often masks multidimensional poverty. This finding is supported by research that reveals fishing communities are often marked by low incomes, poor housing conditions, and limited access to education and healthcare, and the low costs of living phenomenon is due to the inability of their earnings to meet basic level expenses (Enema & Quezon, 2024; Ginting, 2018).

Altogether, the MRDI results show a closely intertwined Social-Ecological System in which high dependence on marine resources is a structural outcome of interrelated factors. Furthermore, the interaction between ecological constraints (declining stocks), social factors (low education, high economic burden) and governance mechanisms (subsidies, prospective MPAs) shapes the adaptive capacity of coastal households, reinforcing a cycle of vulnerability.

Potential Economic and Socio-Cultural Implications of MPAs on Coastal Communities

Community Awareness and Sources of Information on Proposed MPAs

The finding that 62% of the respondents were aware of the proposed MPA indicates a relatively informed public. Analysis of the sources of this awareness reveals that community meetings (42.5%), traditional leaders (25.0%), and Government officials (18.4%) were the predominant information channels. This highlights the pivotal role of community-based and traditional communication structures in shaping the public's understanding of conservation initiatives. These results corroborate existing scholarship emphasising the role of local institutions in effective environmental governance. Gorris and

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Koch (2024) demonstrate that socially embedded communication networks and the presence of trusted local actors are not merely supportive elements but foundational to mobilising community buy-in for conservation initiatives. Such networks foster trust, mediate conflicts, and create conditions conducive to sustained collaboration, which are core components of successful co-management. In the context of this study, the prominence of traditional authorities as information conduits emphasises their influence within the local governance landscape. Within a SES framework, such actors function as institutional intermediaries, linking resource users to governance processes and thereby shaping collective responses to conservation interventions. However, it is equally significant that 38% of respondents remained unaware of the proposed MPA. This sizable portion highlights gaps in outreach and information equity, suggesting that existing communication strategies may not be effective in reaching all segments of the population equally. In environmental interventions, awareness is often the first step in a chain leading to engagement, compliance, and policy effectiveness, and its importance has been shown in numerous studies (e.g., Ban et al., 2019; Mann-Lang et al., 2021). The lack of awareness among over one-third of the population, therefore, poses a critical risk to the legitimacy and effectiveness of the proposed MPA. Importantly, the study also reveals that awareness does not necessarily equate to understanding. While some communities demonstrated a clear grasp of the ecological rationale for establishing MPAs, including concepts such as breeding-zone protection and temporal fishing restrictions, others viewed MPAs as external decisions discussed only in neighbouring communities, contributing to feelings of exclusion and marginalisation. Unequal access to information risks generating distrust, which can undermine conservation goals and lead to community resistance. These findings align with theories of participatory environmental governance, which emphasise that conservation

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

success is not solely about technical planning, but about equity in voice, meaningful inclusion, and the co-production of knowledge and values (Bixler et al., 2015; Reed, 2008).

Attitudes Toward Conservation

The study's exploration of community attitudes towards the proposed Marine Protected Areas reveals mixed attitudes, ranging from conditional support, rooted in ecological awareness and stewardship, to outright resistance, grounded firmly in economic vulnerability. Most participants acknowledge the need to conserve marine resources, particularly given declining fish stocks. In several communities, the role of MPAs in replenishing depleted fish stocks and protecting breeding grounds was recognised. This aligns with existing evidence that well-enforced MPAs can lead to significant recovery of fish stocks (Edgar et al., 2014; Gaines et al., 2010; Vilas et al., 2020). Among more supportive communities, the language of stewardship and intergenerational responsibility shaped their positive attitudes. Participants referenced traditional Akan proverbs to assert that marine protection is a duty owed to future generations. This finding aligns with broader research indicating that communities with strong cultural ties to marine ecosystems tend to be more conservation-minded, particularly when conservation policies align with their local belief systems and indigenous knowledge (Cinner et al., 2009). However, as shown in the findings, support was not unconditional and was often predicated on effective enforcement of current fisheries regulations, especially against illegal practices such as light fishing and industrial trawling in prohibited inshore areas. In Akwidaa, where livelihoods are heavily dependent on fishing for economic survival, MPAs were perceived as a direct threat to their survival. The shift from conditional support to outright resistance reflects concerns raised in literature that conservation policies risk being perceived as unjust when basic needs are not safeguarded (Bennett et al., 2017). Rather than embracing MPAs, many advocated for targeted enforcement against illegal fishing as a more immediate and fair intervention. They

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

argued that existing illegal fishing practices, not a lack of marine reserves, were to blame for declining fish stocks. This viewpoint is consistent with studies showing that MPAs are unlikely to yield desired outcomes when key drivers of fish stock depletion remain unaddressed (Grüss et al., 2014). Indeed, global evidence suggests that effective enforcement, rather than designation alone, is the most critical determinant of MPA success (Harris & Stevens, 2024). These findings must be understood in light of the larger social transformation and governance challenges that Ghanaian fishing communities are currently facing. The "Tuesday Non-Fishing Day" initiative provides evidence that non-compliance with conservation is not frequently caused by ignorance or disregard for environmental sustainability, but rather economic precarity, weakened traditional authority, and distrust of state-led interventions (Ansah et al., 2022).

Systemic Exclusion and Inequity in Marine Policy Governance

The study's findings reveal that many community members perceived the planning and implementation of proposed MPAs in Ghana's Western Region as symbolic rather than genuinely participatory. Although some consultation activities were reported, many perceived these engagements as tokenistic or perfunctory. Community members frequently expressed that their involvement did not meaningfully influence final decisions, leading them to feel sceptical and distrustful toward conservation authorities. These findings reflect broader concerns in conservation governance literature about the gap between nominal participation and genuine co-management. For example, in the case of Cu Lao Cham MPA in Vietnam, co-management frameworks existed on paper, yet many fishers still perceived their participation as deficient (Ngoc, 2018). The perceived symbolic participation reflects what Arnstein (1969) described in the ladder of citizen participation as non-participation disguised as inclusion. Even in areas where engagement was reported as positive, participants remained uncertain as to whether their voices would influence final policy

Digitized by Sam Jonah Library

outcomes. Some even believed that the designation of MPAs had already been decided way before consultations occurred. These findings resonate with Reed's (2008) argument that effective participatory processes should not just be about consultation but must include deliberation, knowledge co-production and shared decision-making authority. Similarly, Mishra (2022) emphasises the importance of authentic deliberation that enables communities to influence outcomes rather than merely provide input.

The findings of this study suggest that deeper, more transformative forms of participation were largely absent or inconsistently applied, reinforcing the view that the MPA process was externally imposed and politically motivated, with community input used to validate actions rather than to influence policy. The sense of procedural exclusion echoes concerns raised in political ecology literature, which warns that conservation interventions can unintentionally reproduce or exacerbate social inequalities when implemented without meaningful local accountability (Büscher & Dressler, 2007; Robbins, 2012).

Concerns over selective enforcement, political interference, and the unequal distribution of benefits directly shaped how communities assessed the implementation of MPAs. Small-scale fishers feared that MPAs would disproportionately affect them, while industrial fleets, which are often accused of destructive practices, would evade regulation through political shielding and weak enforcement. These perceptions align with critiques of "elite capture", where powerful actors manipulate conservation policies to serve their interests, further exacerbating existing inequalities (Lucas, 2016). The concerns that industrial fishers would benefit at their expense are not unfounded. Globally, research shows that MPAs in nearshore areas impose the greatest costs on small-scale fishers, while benefits, such as spillover effects, accrue to offshore fleets or external actors. (Charles, 2010; Sanchirico et al., 2002). In this study, such fears were amplified by historical precedents of biased enforcement of fisheries regulation, which have led communities to

Digitized by Sam Jonah Library

doubt that MPAs would be implemented equitably. This scepticism aligns with Humphreys and Clark's (2019b) findings that demonstrate that perceived weak or selective enforcement can be a significant barrier to conservation success. Further evidence from Ngoc (2018) indicates that inequitable benefit distribution within MPAs often reduces compliance among local fishers. The study highlights a form of distributional injustice in the sharing of anticipated benefits from conservation interventions, such as compensation, livelihood support, and subsidies, which Gurney et al. (2015) caution can deepen poverty and incite conflict when MPAs are implemented unfairly, thereby undermining both social and ecological goals of these initiatives. The findings highlight that behavioural outcomes within the SES, specifically compliance with fishing regulations, are linked to the perceived legitimacy of the governing institution. This aligns with studies showing that perceptions of unfairness and exclusion significantly reduce compliance and willingness to cooperate with conservation rules (Bennett, 2016; Ibbett et al., 2025).

Economic and Socio-cultural Implications of Marine Protected Areas (MPAs)

Economic Insecurity and Financial Hardship

The economic precarity and persistent livelihood insecurity significantly shape how coastal communities in the study perceive the proposed establishment of MPAs. Fishing remains the primary economic activity across the studied communities, providing income, food security, and social stability. However, worsening marine conditions, driven by overfishing, illegal practices, and environmental degradation, have significantly eroded profit margins. Participants described a context in which the cost of fishing operations exceeds the returns, resulting in debt and increased financial strain. This backdrop of instability influenced how communities perceive MPAs. While some acknowledged the potential long-term ecological and economic benefits of fish stock recovery, they viewed the short-term implications as an immediate threat to their already fragile economic system.

Digitized by Sam Jonah Library

These findings echo global patterns in small-scale fisheries, where conservation initiatives often intersect with socio-economic fragility (Saksono et al., 2023; Sazzad, 2024). Samonte et al. (2016) found that within the initial three years following the establishment of an MPA, fishermen experience a significant loss in net revenue. This is largely because, at least in the short term (approximately four years), the anticipated spillover effects are insufficient to offset the losses incurred during restriction periods and, as a result, often cause actual losses to exceed initial expectations. This mirrors community concerns in this study, where MPAs were seen not as future assets but as policies that could deepen poverty unless carefully designed to support economic transition.

A major factor exacerbating this perception was the lack of viable alternative livelihood opportunities within the communities, which made the idea of limiting fishing be perceived as unsustainable. This sentiment aligns with critiques by scholars who argue that MPAs, when poorly integrated into local economic realities, risk becoming instruments of exclusion rather than empowerment (Gurney et al., 2014; Masud, 2019). The drift into informal and illegal activities, including youth involvement in galamsey, illustrates a form of maladaptive resilience in which communities adapt to meet economic needs but undermine environmental and social goals (Coulthard, 2008). This dynamic reflects how unaddressed socio-economic vulnerability can create unintended negative externalities, undermining both conservation and economic security.

Food Security and Nutritional Health

The findings reveal that declining fish stocks and anticipated fishing restrictions from MPAs are perceived by communities not only as threats to livelihoods but as direct risks to food and nutritional security. Across the study communities, participants stressed that fish is not just an economic commodity but also a dietary staple, serving as the primary source of protein for many households. As catches dwindle, participants across communities

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

described rising costs, reduced meal frequency, and a shift from nutrient-rich meals to less nutritious alternatives, which reflects a collapse in household-level resilience. These findings align with broader research on West African fisheries, which shows that coastal communities face heightened risks of hunger and nutritional deficiencies when access to fish is disrupted, particularly where dietary diversity is already limited (Belhabib et al., 2016; Okafor-Yarwood & Belhabib, 2020). The findings are also consistent with studies showing that dietary diversity is often limited in low-income coastal communities, meaning that reductions in fish availability directly translate into food insecurity (Hastuti et al., 2024; Tilley et al., 2022). The perceived link between MPAs and worsening health was particularly strong. Participants strongly indicated that the proposed sites for the network of MPAs are major fishing grounds, citing concerns over protein deficiency and stunted growth. These concerns are supported by nutritional research in coastal food-insecure regions that shows a link between declining fisheries and increased rates of malnutrition, particularly in communities with limited access to alternative protein sources (Béné et al, 2015; Golden et al., 2016; Thilsted et al., 2016). Another point raised by participants was the interconnectedness of fish availability and local agricultural markets. Several noted that declining fish income has reduced their capacity to purchase other food staples such as cassava, maize or palm oil, leading to food waste and depressed local trade. This reflects a broader systems-level interaction, where the decline of one sector (fisheries) has ripple effects on others (farming, trade, markets) (Arnason, 2005; Jacques, 2013). The findings reveal that without supportive policies or nutrition-sensitive design, MPAs risk inadvertently worsening food insecurity in already vulnerable communities.

The study also surfaced the gendered dimension of food insecurity and how women are disproportionately affected by food scarcity. In many coastal fishing households, women are responsible for household food preparation, nutrition, and child care, and often rely on

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

fish processing and trade as key sources of income. Several participants emphasised that when fish catches decline or access to fishing grounds is restricted, women bear the brunt of food shortages, as they must stretch limited resources to feed families. These findings align with gender-focused fisheries research, which underscores that while women's contributions are often undervalued, they occupy invisible yet essential roles in small-scale fisheries and are disproportionately affected by both ecological decline and conservation regulation (Harper et al., 2013, 2020). Additionally, studies from Ghana demonstrate that regulatory measures such as the annual closed fishing season disproportionately affect women, particularly fish processors and traders. According to Ansah & Oduro (2024), during the closed seasons, women often experience heightened food insecurity and greater reliance on coping mechanisms to help the household survive. This is consistent with the experiences documented in this study, where women described using informal coping mechanisms to sustain household nutrition when fishing activities were limited. Consequently, policy interventions that target fishing effort or access tend to indirectly affect women, even though they are not the main targets of regulation (Harper et al., 2020). From the SES perspective, women act as key mediators between ecological change and household-level outcomes. Their roles in fish processing, food distribution, and informal market networks position them as key nodes for influencing compliance and for adaptive responses to resource shocks. This is very important in understanding how MPAs and other fisheries policies may reshape food security outcomes.

Cultural and Ritual Disruptions

The findings reveal that the proposed MPAs have implications beyond economic and environmental factors, extending into cultural and spiritual dimensions. For many coastal communities, the ocean is regarded as a sacred space embedded in local traditions, with rules, taboos and ritual practices that guide fishing activities. These practices often

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

embody traditional ecological knowledge (TEK) that has sustained marine resources for generations. Within the SES framework, these spiritual taboos function as informal institutions that have historically regulated fishing effort, protected sacred groves long before state-led interventions (Foale et al., 2011). Participants from several communities described longstanding traditions to honour sea deities and performing rituals as integral to community identity and belief systems. Some participants expressed concern that MPAs could disrupt the spiritual balance between fishers and marine deities, leaving them to face divine repercussions. This concern mirrors findings from Papua New Guinea, where conservation boundaries unintentionally clashed with sacred sites and eroded community trust. Research demonstrates that conservation policies that ignore cultural dimensions consistently alienate the very communities whose cooperation is essential to success (Mishra et al., 2021). This aligns with literature on the cultural ecosystem services provided by marine environments, reinforcing the need to integrate cultural considerations into conservation planning (Ahtiainen et al., 2019). While others saw MPAs as a threat to ritual practice, arguing that spatial restrictions could disrupt sacred relationships between fishers and marine deities, others interpreted the decline in fish stocks as a spiritual consequence of neglecting traditional rites, which they largely attributed to the rise of Christianity and modernity. These perspectives are not contradictory; rather, they reflect different worldviews coexisting in societies experiencing rapid cultural change. In Ghanaian coastal contexts, where indigenous cosmologies increasingly coexist with Christian doctrines and modern governance systems, this pluralism has been widely documented (Adjei & Sika-Bright, 2019). Studies have shown that when traditional rituals are low due to religious conversion or generational shifts, environmental stressors such as reduced fish catches may be reinterpreted as indicators of spiritual failure rather than just ecological overexploitation (Golo & Yaro, 2013). From a Political Ecology perspective, prioritising scientific models

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

of spatial protection over indigenous sacred protection risks marginalising traditional authorities, who hold the highest local legitimacy. As Darkwa and Acquah (2025) demonstrate, traditional ecological taboos are often more effective at achieving compliance than state laws. Therefore, for the proposed MPA to gain legitimacy, it must move towards a hybrid governance model. Scholars like Gavin et al. (2015) and McCarter et al. (2018) advocate for biocultural approaches to conservation, which explicitly recognise the co-evolution of cultural and ecological systems. Without intentional design features that safeguard these practices, MPAs risk eroding cultural heritage and undermining long-term compliance. However, if they are designed with sensitivity to cultural views, they can become platforms for reviving traditional stewardship, rather than vehicles of disconnection.

Potential Strains on Community Cohesion

The introduction of MPAs risks disrupting social harmony in fishing communities. While some communities expressed confidence in their ability to maintain cohesion due to strong communal bonds, others anticipated that conservation policies could exacerbate existing tensions or create new fractures along socio-economic lines. These findings align with Karakara et al. (2024), who identified resource-related conflicts as a major threat to conservation when policies disproportionately affect livelihoods and existing power structures. In several communities, concerns were raised that unequal enforcement and uneven distribution of benefits could foster internal divisions and potentially lead to conflicts. Such divisions are not new, as historical accounts from the region document periodic disputes over access to fishing grounds, gear use and perceived unequal advantages enjoyed by certain groups (Mensah et al., 2006). However, participants feared that MPA frameworks would make these divisions more pronounced within their communities.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

In several communities, concerns emerged that economic hardship associated with reduced fishing opportunities had already contributed to increased theft and other illegal activities, particularly among unemployed youth. This resonates with Sundar et al. (2018), who found that conservation-induced unemployment can increase illicit activities, further undermining both social order and ecological goals. The study's findings suggest that MPAs, though designed to promote ecological restoration, may have unintended consequences, particularly regarding community cohesion, if associated costs are unevenly borne by already vulnerable groups.

Displacement and Migration Risk

Concerns about displacement were paramount among participants. Many emphasised that MPAs could restrict access to traditional fishing grounds, which have been used for generations. These waters are not only productive zones but also considered ancestral spaces, which are integral to cultural identity and economic survival. From the study, a clear perceived link emerged between fishing restrictions, unemployment, and youth migration into illegal mining (galamsey). In communities like Busua, Achonwa, and Agyan, participants described a well-established pattern that when fishing fails or becomes restricted, young men leave coastal villages for mining sites inland, often engaging in dangerous and environmentally destructive activities. This phenomenon aligns with broader findings that identify migration as an established livelihood coping strategy in Ghanaian coastal communities, particularly given that the majority have low levels of formal education and alternative skills (Eshun et al., 2019). Evidence from other regions reinforces this pattern. For instance, Cinner et al. (2014) found that about 66% of fishers had been displaced from marine reserves in Kenya and the Seychelles, confirming that MPA establishment consistently leads to displacement of fishing effort. This displacement further

Digitized by Sam Jonah Library

triggers both seasonal and permanent relocation of fishers, and intensifies competition over declining stocks in neighbouring areas (Cinner et al., 2010; Mascia & Claus, 2009).

Strategies to minimise the potential negative effects of Marine Protected Areas

Marine Protected Areas (MPAs) are critical for biodiversity conservation but often face resistance due to perceived socio-economic disruptions (Ban et al., 2019). The findings align with global discourse on MPA governance, emphasising the need for context-specific, participatory approaches (Bennett et al., 2021). From an SES perspective, mitigation strategies represent adaptive mechanisms through which resource users attempt to stabilise livelihoods in response to institutional interventions that alter access to marine resources (Barceló et al., 2025). Given the high levels of marine resource dependency observed across the study communities and their generally negative perception of the potential implications of MPAs, measures to mitigate these impacts are necessary to improve social acceptance of MPAs. This is in accordance with studies that emphasise the importance of understanding and mitigating negative impacts to maximise benefits and improve social acceptance of MPAs, which in turn, reduces conflict and is essential for ecological success (Kaplan-Hallam & Bennett, 2018; Ranger et al., 2016).

The study revealed strong community support (60.7%) for improved access to financial services as the most preferred strategy to mitigate the perceived socio-economic impacts of Marine Protected Areas (MPAs). Approval rates were particularly high in Akonu (90%) and Busua (73.3%), highlighting spatial variation in priorities across coastal communities. Within the SES framework, this preference reflects an effort to strengthen financial capital as a buffering mechanism against livelihood instability caused by conservation restrictions. This aligns with global evidence that financial inclusion enhances economic resilience in small-scale fisheries facing conservation-induced disruptions (FAO, 2019; Pomeroy et al., 2020). The prioritisation of financial services can be interpreted

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

through a political ecology lens, which highlights systemic vulnerabilities in Ghana's small-scale fisheries. As documented in previous studies, years of declining fish landings have translated into unstable and often insufficient income for households dependent on fishing (Asiedu et al., 2013; Danquah et al., 2021). This assertion is confirmed by Nazir et al. (2018), who revealed that despite the fishery sector's contribution to the local economy, many fishing communities are characterised by high poverty levels and remain marginalised by formal financial institutions. Challenges such as unreliable financial records, a lack of collateral, and high perceived risks have led to their exclusion from mainstream banking systems, forcing many to rely on informal lenders who charge exorbitant interest rates. Within this context, the prioritisation of access to microfinance, loans, and credit facilities can be understood as both a survival mechanism and a development opportunity. These financial tools can enable livelihood diversification, investment in alternative income-generating activities and cushion households during transitional periods following MPA implementation (Ksoll et al., 2016; Pomeroy et al., 2020). The preference for financial services also complements the Sustainable Livelihoods Framework, which identifies financial capital as a vital asset for achieving sustainable livelihood outcomes. Furthermore, the fact that financial services were prioritised above compensation schemes suggests a shift in mindset from reactive to proactive resilience-building. Rather than relying solely on one-off payments to cover losses, communities are expressing a desire for the means to navigate economic challenges independently. However, the effectiveness of this strategy depends on addressing structural constraints, such as high collateral requirements, limited outreach by financial institutions in remote coastal areas, and low levels of financial literacy (Atkinson & Messy, 2013; Fernandes et al., 2014; Pomeroy et al., 2020). The lower approval rate in Akatekyi (45.3%) suggests that some communities may lack trust in financial institutions

Digitized by Sam Jonah Library

or have limited experience with formal banking systems, suggesting the need for targeted financial literacy programmes to enhance the effectiveness of this strategy.

Compensation support schemes were the second-most-supported strategy (58.1%), with the highest endorsement in Akwidaa (68.4%) and the lowest in Princess Town (32.2%). The relatively high support for this strategy reflects the community's recognition of the economic vulnerability of fishing households in areas near the proposed MPA. As Samonte et al. (2016) emphasised, the establishment of financial compensation and incentive mechanisms for such households is not only appropriate but essential for equitable and effective MPA governance. Compensation is widely recognised in literature as a key strategy to offset losses from fishing restrictions, as it provides economic relief to individuals whose livelihoods are disrupted by MPAs (Clifton, 2013; McCay & Jones, 2011). The schemes can take various forms, including direct cash payments, conditional cash transfers, payment for ecosystem services, or the provision of alternative livelihoods (Mangubhai et al., 2020; Ngoc, 2018; Rakotomahazo et al., 2019). When well-designed, compensation programmes can provide short-term relief and long-term support, making them a vital part of strategies to build local support for conservation initiatives. The preference for compensation in this study suggests that many community members anticipate real, immediate losses due to MPA regulations, particularly in areas where fishing is a primary or sole livelihood. This aligns with studies showing that economic dislocation, if unaddressed, can lead to noncompliance, resentment, and resistance (Gurney, 2015; Harris et al., 2018). Therefore, the success of MPAs is often contingent on the fairness and effectiveness of accompanying compensation schemes. However, the effectiveness of compensation is not guaranteed. Literature underscores that compensation must be transparent, equitable and responsive to community needs to avoid reinforcing social inequalities or sparking conflict (Mangubhai et al., 2020; Rakotomahazo et al., 2019). There

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

is also growing recognition that one-off cash payments may be insufficient to support long-term adaptation, especially in the absence of livelihood programmes or financial planning support. This is why alternative livelihood programmes, often positioned as a form of compensation, are increasingly favoured. They aim to provide fishers with sustainable income streams outside of traditional fishing activities, including aquaculture, eco-tourism, or vocational training and have been used successfully in several global conservation contexts (Ngoc, 2018; Samonte et al., 2016). Despite its popularity, compensation also evokes scepticism, particularly in communities where past development or conservation programmes have fallen short. Perceptions of inadequacy, lack of transparency, or political favouritism in compensation delivery can generate mistrust and threaten MPA legitimacy (Cinner et al., 2018; Mayer et al., 2015). From the lens of political ecology theory, compensation schemes are deeply entangled with power-laden governance processes that determine who qualifies, who benefits, and whose losses are recognised (Horan, 2019). Evidence from the study by Nyavor et al. (2023) demonstrates that the compensation payment approach during the closed fishing period in Ghana was widely perceived as inadequate, unfair and lacked transparency in the selection of beneficiaries, leading many to feel dissatisfied with the implementation of the closed season. This suggests that while compensation is a valued strategy, its impact is closely tied to its design and delivery, and that these factors are key to improving the well-being of coastal communities.

Training and educational programmes were also acknowledged by the respondents, but there existed extreme variation. This preference indicates community recognition of the value of knowledge, skills development, and capacity-building as essential components for adapting to conservation-related changes. While ranked below access to financial services and compensation schemes, education and training were still viewed as important tools for enabling long-term adaptation and self-reliance. Education and training play a critical role

Digitized by Sam Jonah Library

in empowering coastal communities, particularly by enhancing understanding of the objectives, rules, and ecological benefits of MPAs. In addition to fostering awareness and buy-in, such programmes can help improve compliance and participation in resource governance (Bennett & Dearden, 2014). There are instances of effective stakeholder participation in educational and capacity-building initiatives in MPAs that have improved behaviour, attitudes, and knowledge (Leisher et al., 2012; Twichell et al., 2018; Zaldívar-Jiménez et al., 2017). Additionally, training programmes that emphasise livelihood-oriented, practical skills, such as ecotourism, fish processing, value-added seafood products, or entrepreneurship, can help diversify livelihoods and reduce reliance on diminishing fish populations (Lucrezi et al., 2019). The preference for education and training programmes in this study suggests that communities are not solely interested in short-term relief but also value strategies that build human capital and support adaptive capacity. This is consistent with findings from Pomeroy et al. (2020), who argue that investing in education strengthens resilience by providing people with the skills and knowledge to transition toward sustainable livelihoods in the face of conservation or environmental shocks. However, the slightly lower ranking compared to financial and compensation strategies may reflect a perception that educational benefits are less immediate or tangible. In contexts of high economic insecurity, communities may prioritise more direct forms of support. Additionally, limited past exposure to effective training initiatives or a mismatch between training content and local economic opportunities could contribute to mixed perceptions of its usefulness. The success of education and training as a mitigation strategy hinges on contextual relevance, accessibility, and continuity. Programmes should be community-driven and co-designed, ensuring alignment with local needs, interests, and available livelihood options. Training should also be inclusive, targeting youth, women, and

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

marginalised groups, and should ideally be linked with follow-up support mechanisms such as mentorship, seed funding, or market access.

While education, financial support, and compensation emerged as the most preferred strategies, the study also revealed moderate to low support for governance-related strategies, including the enforcement of marine regulations, collaborative decision-making, and strengthening of community-based organisations (CBOs). Although these strategies were less prioritised overall, they remain critical for ensuring the long-term effectiveness and legitimacy of MPAs. Ranking fourth, the enforcement of existing marine regulations reflects a recognition that rules, compliance and monitoring are essential to the success of MPAs. However, its moderate ranking suggests that communities do not see it as a direct remedy for the livelihood losses or socio-economic vulnerabilities they face. From a political ecology view, enforcement without accompanying social safeguards can lead to perceptions of top-down control, especially in contexts marked by a history of conflict and mistrust between state authorities and local fishers (Brueckner-Irwin et al. 2019; Halik et al. 2018). In such cases, enforcement is likely to be more effective when paired with community education, co-management, and mechanisms for local participation in rule-making and surveillance.

Ranked fifth, collaborative decision-making received lower support, which may indicate limited experience with participatory governance or scepticism about the extent of communities' influence in decision-making processes. This points to a persistent power imbalance in marine governance, where communities may feel decisions are made without their input or consideration of their needs. Yet, participatory governance is widely recognised as a cornerstone of successful MPAs. It enhances legitimacy, compliance, and trust, and can help tailor conservation interventions to local realities (Bennett & Dearden, 2014; Di Franco et al., 2020). The low prioritisation of this strategy suggests a need to build

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

trust and demonstrate the tangible benefits of inclusive governance. Capacity-building efforts that support community leadership, negotiation skills, and stakeholder dialogue can help bridge this gap.

The least supported strategy in this study was strengthening community-based organisations. While surprising at first glance, this may reflect the limited visibility, capacity, or effectiveness of existing CBOs in the study areas. In contexts where CBOs are weak, inactive, or perceived as politicised or non-representative, community members may not view them as useful vehicles for change. Nonetheless, both SES and Political Ecology literature emphasise that strong local institutions are vital for resource co-management, conflict resolution, and equitable resource governance (Asare et al., 2013; Francolini et al., 2023; Gutiérrez et al., 2011). Strengthening CBOs could enhance local agency and provide platforms for collective action, especially when integrated into broader governance frameworks that recognise and empower grassroots institutions (Francolini et al., 2023). The findings suggest that institutional strategies must be reframed and revitalised to align with community aspirations and address underlying power relations.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary, conclusions and recommendations of the study. The summary and conclusions are structured around the specific objectives and the research questions of the study. This section also proposes practical recommendations derived from the findings, along with suggestions for future research directions to address gaps or extend the study's contributions.

Summary

The purpose of the study was to assess the potential socio-economic implications of proposed Marine Protected Areas (MPAs) using eight selected communities in the Western Region of Ghana. Specifically, the following objectives were developed to:

1. Assess the level of marine resource dependency of selected coastal communities in the Western region.
2. Examine the perceived economic and social effects of MPAs on selected coastal communities in the Western Region.
3. Identify strategies to minimise the potential negative socio-economic effects associated with establishing MPAs in the Western Region.

The study employed a mixed-methods approach and a convergent parallel design in line with the purpose of the study. Data were gathered from 418 randomly selected respondents in the target population using a structured interview schedule. Nonetheless, 394 of the 418 questionnaires were deemed credible for the study, resulting in a 94.3% response rate. Additionally, focus group discussions were conducted with fisherfolk in the study area to confirm responses from the structured interview and to provide a deeper understanding of the perceived socio-economic implications of the proposed MPAs. The data obtained was

Digitized by Sam Jonah Library

processed using a combination of statistical and qualitative analysis software. IBM Statistical Package for the Social Sciences (SPSS) version 25 was primarily used for descriptive statistical analysis, including frequencies and percentages. STATA software (version 17.0) was employed to summarise Marine Resource Dependency indicators and to conduct inferential statistical tests, including One-way ANOVA, Bonferroni post hoc tests, and Chi-square tests. NVivo was used for qualitative data analysis, specifically to code transcripts from focus group discussions using an inductive thematic analysis strategy, where themes were derived from participants' narratives. The findings were presented in tables, figures, and thematic summaries, which were supported by illustrative direct quotes and discussed. An overview of the key findings of the study is presented in the next section.

Key findings

This study provides a critical analysis of the potential socio-economic implications of proposed Marine Protected Areas (MPAs) in the Western Region of Ghana, contributing to the broader academic discourse on spatial conservation and community-based marine governance. The major findings of the study are presented below based on the structure of the research objectives:

- In addressing the first objective, the study found that most of the communities exhibit a high degree of dependence on marine resources. Among the communities studied, Busua and Akwidaa had the highest dependency, while Akonu had the least, indicating variation in economic diversification across sites. Further analysis explored how different forms of capital, namely natural, human, social and economic capital, interact to shape community-level dependence patterns. The findings indicate that human capital was the strongest predictor of marine dependence, followed closely by economic capital. Overall, among the variables examined, fishing area access, subsidies, economic burden, food dependency,

Digitized by Sam Jonah Library

formal social capital, fishing labour relevance, and work independence emerged as significant contributors to marine resource dependence, while allotment ownership helped reduce it.

- Regarding the second research objective, the study found that while MPAs were acknowledged for their potential ecological benefits, they were widely perceived as threats to the livelihoods and well-being of coastal communities in Ghana's Western Region. Participants expressed deep concern that fishing restrictions could result in reduced income, increased poverty and compromised food security, particularly in highly resource-dependent households. On the social front, communities were concerned that MPAs could lead to cultural disruptions, forced migration, and strains on community cohesion. These perceptions of MPAs were heavily shaped by economic concerns, trust in government, and past experiences with conservation policies. Importantly, support for MPAs was found to be conditional on fair implementation, adequate financial support and meaningful community involvement in the decision-making process.
- Finally, on the third objective, the study found that financial access and compensation schemes were the most preferred strategy among coastal communities. Education and skills training also emerged as a valued strategy, while governance-focused strategies, such as enforcement of marine regulations and collaborative decision-making, received lower support.

Conclusions

This study examined the potential socio-economic implications of establishing a Marine Protected Area (MPA) in Ghana's Western Region. It systematically addresses three interrelated research objectives that collectively contribute to the discourse on sustainable marine governance and coastal livelihoods. The findings reveal both the complexities of

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

marine resource dependency and the nuanced perceptions surrounding MPA implementation. The research offers critical insights for policymakers, conservation practitioners, and coastal communities.

Based on the study's findings, the following conclusions have been made:

The study concludes that coastal communities in the Western Region exhibit moderate to high levels of marine resource dependence, with human and economic capital emerging as significant determinants of this reliance. From a Sustainable Livelihoods Framework perspective, the communities' strong dependence on marine-based skills and income puts them in a structural vulnerability threshold, where restrictions on marine resource access may compromise livelihoods tied to the sea. The findings support the Socio-Ecology Systems theory and demonstrate the close relationship between livelihood structures and ecological dependence, which increases sensitivity to shifts in marine governance.

The study further concludes that although MPAs are acknowledged for their ecological potential, community attitudes are largely influenced by socio-economic risks rather than conservation objectives. A lack of trust in governance institutions and prior experiences with top-down conservation strategies are reflected in worries about income loss, food security, and cultural disruption. These perceptions show that there is a misalignment between governance interventions and local user systems within the SES framework, where low institutional legitimacy and limited participation heighten resistance to conservation measures. The study's findings align with broader empirical evidence from small-scale fisheries contexts, indicating that local perceptions of MPAs tend to be negative in communities where they are perceived as being externally imposed and having a detrimental effect on fishing operations.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

In relation to strategies for minimising the potential socio-economic effects of Marine Protected Area (MPA) establishment, the study concludes that there is a clear hierarchy of preferred strategies among affected communities. Communities expressed the strongest preference for socio-economic strategy options that prioritise direct livelihood support mechanisms such as improved access to financial services and transparent compensation schemes. Human capital development measures, such as education and skills development programmes, were secondary options while governance-focused strategies received relatively less support. From an SLF standpoint, this preference hierarchy for livelihood support reflects immediate pressures on economic and human capital, as households seek short-term stability amid anticipated livelihood threats. The relatively lower support for governance-oriented strategies reflects a lack of confidence in existing institutional arrangements and highlights the need to build trust in current institutional governance frameworks for marine resource management.

Overall, the study shows that the success of MPAs in Ghana, particularly in the Western Region, will depend not only on their ecological design but also on the extent to which conservation planning aligns with livelihood realities and needs of the communities. Without such integration, MPAs risk escalating preexisting vulnerabilities rather than achieving balanced conservation and development outcomes.

Recommendations

The following recommendations were made based on the research findings:

1. The Ministry of Fisheries and Aquaculture Development (MoFAD), in collaboration with the Fisheries Commission and other relevant stakeholders, should develop and implement a targeted communication strategy to raise awareness of the purpose, benefits and potential trade-offs of MPAs, to ensure that the affected communities are well-informed.

Digitized by Sam Jonah Library

2. The MoFAD, through the Fisheries Commission, must integrate socio-economic data, particularly levels of marine resource dependency, into the spatial design and management of MPAs. To prevent the recurrence of social tension and non-compliance observed in previous fisheries management interventions, access restrictions should be context-specific rather than uniform regulations that disproportionately affect highly dependent communities. Additionally, to support adaptive and socially responsive MPA governance, the Fisheries Commission, in collaboration with the Environmental Protection Agency (EPA), Municipal and District Assemblies (MMDAs), and non-state actors such as Hen Mpoano, Friends of the Nation, and research institutions like the University of Cape Coast (UCC), should establish a system for structured, periodic socio-economic assessments in coastal communities adjacent to proposed or existing MPAs. This would ensure that decisions are evidence-based and that the socio-economic realities of highly dependent communities are explicitly considered in MPA management.
3. Since human and economic capital have been identified as contributing most to marine resource dependence, the Government, along with the necessary stakeholders, must channel efforts to reduce their structural vulnerability and further enhance their adaptive capacity.
4. Given the high preference for improved access to financial services as a mitigation strategy, financial literacy must be mainstreamed into coastal community development programmes. MoFAD, in collaboration with the Fisheries Commission and MMDAs in the Western Region, should facilitate community-based financial literacy programmes that target fishers, fish processors, and traders. Additionally, flexible and low-collateral microfinance schemes tailored to fisherfolk should be

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

promoted, alongside government-supported grant or revolving loan programmes for affected households.

5. To address livelihood disruptions, the Government must develop and operationalise equitable compensation frameworks. These can include conditional cash transfers, alternative livelihood packages, and payments for ecosystem services where applicable. Compensation schemes must be co-designed with local stakeholders, guided by clear eligibility criteria, and implemented with third-party oversight to ensure fairness and accountability.

Suggestion for Future Research

Building on the current study, future research may consider conducting longitudinal studies that track the socio-economic and ecological impacts of MPAs over time. This will help assess how community perceptions, resource dependence, and livelihood outcomes evolve after MPA implementation and provide empirical evidence to inform adaptive management.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

REFERENCES

Abesamis, R. A., Alcala, A. C., & Russ, G. R. (2006). How much does the fishery at Apo Island benefit from spillover of adult fish from the adjacent marine reserve? *Fishery Bulletin*, *104*(3).

Ackah-Baidoo, A. (2013). Fishing in troubled waters: Oil production, seaweed and community-level grievances in the Western Region of Ghana. *Community Development Journal*, *48*(3), 406–420.

Adjei, J. K., & Sika-Bright, S. (2019). Traditional Beliefs and Sea Fishing in Selected Coastal Communities in the Western Region of Ghana. *Ghana Journal of Geography*, *11*(1).

Adjei, M. (2024). Gendered spaces and entanglements: analysis of fisher couples' decision-making and practices in Ghana's Western region. *Gender, Place and Culture*, *31*(6). https://doi.org/10.1080/0966369X.2023.2189082

Adjei, M., & Chan, A. H. N. (2023). What Women Do, Believe in, and Financially Contribute—What Matters More in Couples' Decision Making? Gender Inequality in Ghana's Small-Scale Fisheries☆. *Rural Sociology*, *88*(1). https://doi.org/10.1111/ruso.12474

Adjei, M., & Overå, R. (2019). Opposing discourses on the offshore coexistence of the petroleum industry and small-scale fisheries in Ghana. *Extractive Industries and Society*, *6*(1). https://doi.org/10.1016/j.exis.2018.09.006

African Union. (2015). *Agenda 2063: The Africa we want*.

African Union – Inter-African Bureau for Animal Resources (AU-IBAR). (2019). *Africa Blue Economy Strategy*.

Digitized by Sam Jonah Library

Agardy, T., di Sciara, G. N., & Christie, P. (2011). Mind the gap: Addressing the shortcomings of marine protected areas through large scale marine spatial planning. *Marine Policy*, *35*(2). https://doi.org/10.1016/j.marpol.2010.10.006

Agyapong, C. A., Parsa, A. D., Hayhoe, R., Kabir, R., & Cortnage, M. (2024). *Geospatial distribution of tuberculosis incidence and determinants of tuberculosis treatment outcomes in Nzema East Municipality, Ghana*.

Ahanta West Municipal Assembly. (2018). *Ahanta West District Assembly 2010–2013 Medium-term development plan*.

Ahtiainen, H., Liski, E., Pouta, E., Soini, K., Bertram, C., Rehdanz, K., Pakalniete, K., & Meyerhof, J. (2019). Cultural ecosystem services provided by the Baltic Sea marine environment. *Ambio*, *48*(11). https://doi.org/10.1007/s13280-019-01239-1

Albasri, H., & Sammut, J. (2021). A comparison of vulnerability risks and conservation perceptions between mariculture, fishery and ecotourism livelihood groups in a multi-use mpa in Indonesia. *Sustainability (Switzerland)*, *13*(22). https://doi.org/10.3390/su132212897

Alcala, A. C. (2004). Marine reserves as tool for fishery management and biodiversity conservation: natural experiments in the central Philippines, 1974–2000. *... Center for Research and Environmental Management, ...*.

Aldasoro-Said, G., & Ortiz-Lozano, L. (2021). Marine resource dependence in rural coastal communities south of the Reef Corridor of the Southwest Gulf of Mexico. *Ocean and Coastal Management*, *211*. https://doi.org/10.1016/j.ocecoaman.2021.105778

Allison, E. H., & Ellis, F. (2001). The livelihoods approach and management of small-scale fisheries. *Marine Policy*, *25*(5). https://doi.org/10.1016/S0308-597X(01)00023-9

Digitized by Sam Jonah Library

Allison, E. H., & Horemans, B. (2006). Putting the principles of the Sustainable Livelihoods Approach into fisheries development policy and practice. *Marine Policy*, *30*(6). https://doi.org/10.1016/j.marpol.2006.02.001

Amevenku, F. K. Y., Asravor, R. K., & Kuwornu, J. K. M. (2019). Determinants of livelihood strategies of fishing households in the volta Basin, Ghana. *Cogent Economics and Finance*, *7*(1). https://doi.org/10.1080/23322039.2019.1595291

Ameworwor, M. Y., Aggrey-Fynn, J., & Clottey, M. N. K. (2023). Implications of socio-cultural practices on fisheries management: a case of the bottom-set gillnet fishery in the central region of Ghana. *Ghana Journal of Science*, *64*(1), 41–48. https://doi.org/10.4314/gjs.v64i1.5

Ameyaw, A. B., Breckwoldt, A., Reuter, H., & Aheto, D. W. (2020). From fish to cash: Analyzing the role of women in fisheries in the western region of Ghana. *Marine Policy*, *113*. https://doi.org/10.1016/j.marpol.2019.103790

Amoasah, G. (2010). The Potential Impacts of Oil and Gas Exploration and Production on the Coastal Zone of Ghana. *An Ecosystem Services Approach. University …*, (February).

Andradi-Brown, D. A., Veverka, L., Amkieltiela, Crane, N. L., Estradivari, Fox, H. E., Gill, D., Goetze, J., Gough, C., Krueck, N. C., Lester, S. E., Mahajan, S. L., Rulmal, J., Teoh, M., & Ahmadia, G. N. (2023). Diversity in marine protected area regulations: Protection approaches for locally appropriate marine management. *Frontiers in Marine Science*, *10*. https://doi.org/10.3389/fmars.2023.1099579

Anokye, F. A. (2022). *Indigenous Knowledge and Coastal Livelihood Resource Sustainability at Moree and Apam Communities in the Central Region of Ghana* [Doctoral dissertation]. University of Cape Coast.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Ansah, J. W., & Oduro, G. Y. (2024). Gender Dimensions of Vulnerabilities, Adaptations and Alternative Livelihoods of the Closed Season in Elmina–Ghana: A Qualitative Study. *Coastal Management*, *52*(4–5). https://doi.org/10.1080/08920753.2024.2409055

Ansah, J. W., & Oduro, G. Y. (2025). Blue economy risks and challenges in Ghana: a systematic literature review. *Frontiers in Marine Science*, *12*, 1604330.

Ansah, J. W., Oduro, G. Y., & Wilson, D. (2022). Narratives of Non-Compliance in "Tuesday Non-Fishing Day" in Ghana. In *The Palgrave Handbook of Blue Heritage*. https://doi.org/10.1007/978-3-030-99347-4_19

Arnason, R. (2005). *Aquaculture and fisheries interactions: implications for the global supply of fish.* (K. J. Thomson & L. Venzi, Eds.; pp. 29–56). Research in Agricultural and Applied Economics.

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, *35*(4), 216–224.

Arponen, A., & Salomaa, A. (2023). Transformative potential of conservation actions. *Biodiversity and Conservation*, *32*(11). https://doi.org/10.1007/s10531-023-02600-3

Arthur, J. L., & Nsiah, M. K. (2011). Contemporary approaches to sustainable development: Exploring critical innovations in traditional leadership in Ghana. *African Journal of Political Science and International Relations*, *5*(5).

Asante-Yeboah, E., Ashiagbor, G., Asubonteng, K., Sieber, S., Mensah, J. C., & Fürst, C. (2022). Analyzing Variations in Size and Intensities in Land Use Dynamics for Sustainable Land Use Management: A Case of the Coastal Landscapes of South-Western Ghana. *Land*, *11*(6). https://doi.org/10.3390/land11060815

Digitized by Sam Jonah Library

Asare, C., Laryea, J., Ameyaw, G. A., & Mutimukuru-Maravanyika, T. (2013). *Community leadership training workshop report: Strengthening community leadership capacity for sustainable resource management*.

Asiedu, B., Nunoo, F. K. E., Ofori-Danson, P. K., Sarpong, D. B., & Sumaila, U. R. (2013). Poverty Measurements in Small-scale Fisheries of Ghana: A Step towards Poverty Eradication. *Current Research Journal of Social Sciences*, *5*(3). https://doi.org/10.19026/crjss.5.5542

Ateweberhan, M., Gough, C., Fennelly, L., & Frejaville, Y. (2012). *Nearshore rocky reefs of western Ghana, West Africa: Baseline ecological research surveys*.

Atkinson, A., & Messy, F.-A. (2013). Promoting Financial Inclusion Through Financial Education: OECD/INFE Evidence, Policies and Practice. In *OECD Working Papers on Finance* (Number 34).

Ayilu, R. K., Fabinyi, M., Barclay, K., & Bawa, M. A. (2023). Industrial and small-scale fisheries relations in Ghana: A political ecology perspective on blue economy exclusion. *Journal of Rural Studies*, *102*. https://doi.org/10.1016/j.jrurstud.2023.103085

Bailey, C., & Pomeroy, C. (1996). Resource dependency and development options in coastal Southeast Asia. *Society and Natural Resources*, *9*(2). https://doi.org/10.1080/08941929609380964

Baker, D., Murray, G., Kaijage, J., Levine, A., Gill, D., & Makupa, E. (2021). Relationships Matter: Assessing the Impacts of a Marine Protected Area on Human Wellbeing and Relational Values in Southern Tanzania. *Frontiers in Marine Science*, *8*. https://doi.org/10.3389/fmars.2021.673045

Ban, N. C., Adams, V. M., Almany, G. R., Ban, S., Cinner, J. E., McCook, L. J., Mills, M., Pressey, R. L., & White, A. (2011). Designing, implementing and managing marine

Digitized by Sam Jonah Library

protected areas: Emerging trends and opportunities for coral reef nations. In *Journal of Experimental Marine Biology and Ecology* (Vol. 408, Numbers 1–2). https://doi.org/10.1016/j.jembe.2011.07.023

Ban, N. C., Gurney, G. G., Marshall, N. A., Whitney, C. K., Mills, M., Gelcich, S., Bennett, N. J., Meehan, M. C., Butler, C., Ban, S., Tran, T. C., Cox, M. E., & Breslow, S. J. (2019). Well-being outcomes of marine protected areas. In *Nature Sustainability* (Vol. 2, Number 6). https://doi.org/10.1038/s41893-019-0306-2

Barceló, M., Woodhead, A. J., & Gelcich, S. (2025). Exploring adaptive capacity at the land-sea interface: insights from coastal rural communities in Chile. *Ecology and Society*, *30*(2). https://doi.org/10.5751/ES-15893-300204

Bartlett, C. Y., Pakoa, K., & Manua, C. (2009). Marine reserve phenomenon in the Pacific islands. *Marine Policy*, *33*(4). https://doi.org/10.1016/j.marpol.2009.01.004

Beard, R. (2015). *The implications of an evolving Labour Force Survey on key economic variables*.

Beare, D., Rijnsdorp, A. D., Blaesberg, M., Damm, U., Egekvist, J., Fock, H., Kloppmann, M., Röckmann, C., Schroeder, A., Schulze, T., Tulp, I., Ulrich, C., Van Hal, R., Van Kooten, T., & Verweij, M. (2013). Evaluating the effect of fishery closures: Lessons learnt from the Plaice Box. In *Journal of Sea Research* (Vol. 84). https://doi.org/10.1016/j.seares.2013.04.002

Belhabib, D., Lam, V. W. Y., & Cheung, W. W. L. (2016). Overview of West African fisheries under climate change: Impacts, vulnerabilities and adaptive responses of the artisanal and industrial sectors. *Marine Policy*, *71*. https://doi.org/10.1016/j.marpol.2016.05.009

Digitized by Sam Jonah Library

Béné, C.; Barange, M.; Subasinghe, R.; Pinstrup-Andersen, P.; Merino, G.; Hemre, G. I.; Williams, M. (2015). Feeding 9 billion by 2050–Putting fish back on the menu. *Food Security*, *7*(2), 261–274.

Béné, C., Hersoug, B., & Allison, E. H. (2010). Not by rent alone: Analysing the pro-poor functions of small-scale fisheries in developing countries. *Development Policy Review*, *28*(3). https://doi.org/10.1111/j.1467-7679.2010.00486.x

Bennett, N., & Dearden, P. (2012). *From outcomes to inputs: What is required to achieve the ecological and socio-economic potential of marine protected areas*.

Bennett, N. J. (2016). Using perceptions as evidence to improve conservation and environmental management. In *Conservation Biology* (Vol. 30, Number 3). https://doi.org/10.1111/cobi.12681

Bennett, N. J., Blythe, J., White, C. S., & Campero, C. (2021). Blue growth and blue justice: Ten risks and solutions for the ocean economy. *Marine Policy*, *125*. https://doi.org/10.1016/j.marpol.2020.104387

Bennett, N. J., & Dearden, P. (2014). Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand. *Marine Policy*, *44*. https://doi.org/10.1016/j.marpol.2013.08.017

Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., Cullman, G., Curran, D., Durbin, T. J., Epstein, G., Greenberg, A., Nelson, M. P., Sandlos, J., Stedman, R., Teel, T. L., Thomas, R., Veríssimo, D., & Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. In *Biological Conservation* (Vol. 205). https://doi.org/10.1016/j.biocon.2016.10.006

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Berkes, F. (2017). Sacred ecology: Fourth edition. In *Sacred Ecology: Fourth Edition*. https://doi.org/10.4324/9781315114644

Berkes, F., Colding, J., & Folke, C. (2009). Navigating Social-Ecological Systems. Building Resilience for Complexity and Change. Introduction. In *Navigating Social-Ecological Systems*.

Berkes, F., & Folke, C. (1998). Linking social and ecological systems: management practices and social mechanisms for building resilience. Cambridge University Press, 1998. *Cambridge University Press*.

Bertelli, C. M., & Unsworth, R. K. F. (2014). Protecting the hand that feeds us: Seagrass (Zostera marina) serves as commercial juvenile fish habitat. *Marine Pollution Bulletin*, *83*(2). https://doi.org/10.1016/j.marpolbul.2013.08.011

Bhandari, P. (2021). *Ethical considerations in research: Types & examples*. Scribbr.

Biggs, R., Schlüter, M., & Schoon, M. L. (2015). Principles for building resilience: Sustaining ecosystem services in social-ecological systems. In *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems*. https://doi.org/10.1017/CBO9781316014240

Bixler, P. R., Dell'Angelo, J., Mfune, O., & Roba, H. (2015). The political ecology of participatory conservation: Institutions and discourse. *Journal of Political Ecology*, *22*(1). https://doi.org/10.2458/v22i1.21083

Blampied, S. R., Sheehan, E. V., Attrill, M. J., Binney, F. C. T., & Rees, S. E. (2023). The socio-economic impact of Marine Protected Areas in Jersey: A fishers' perspective. *Fisheries Research*, *259*. https://doi.org/10.1016/j.fishres.2022.106555

Boye, C. B., Appeaning Addo, K., Wiafe, G., & Dzigbodi-Adjimah, K. (2018). Spatio-temporal analyses of shoreline change in the Western Region of Ghana. *Journal of Coastal Conservation*, *22*(4). https://doi.org/10.1007/s11852-018-0607-z

Digitized by Sam Jonah Library

Braun, V., & Clarke, V. (2006). (Braun & Clarke, 2006). *Qualitative Research in Psychology*, *3*(2).

Brueckner-Irwin, I., Armitage, D., & Courtenay, S. (2019). Applying a social-ecological well-being approach to enhance opportunities for marine protected area governance. *Ecology and Society*, *24*(3). https://doi.org/10.5751/ES-10995-240307

Burbano, D. V., & Meredith, T. C. (2020). Conservation Strategies Through the Lens of Small-Scale Fishers in the Galapagos Islands, Ecuador: Perceptions Underlying Local Resistance to Marine Planning. *Society and Natural Resources*, *33*(10). https://doi.org/10.1080/08941920.2020.1765058

Burbano, D. V., Meredith, T. C., & Mulrennan, M. E. (2020). Exclusionary decision-making processes in marine governance: The rezoning plan for the protected areas of the 'iconic' Galapagos Islands, Ecuador. *Ocean and Coastal Management*, *185*. https://doi.org/10.1016/j.ocecoaman.2019.105066

Büscher, B., & Dressler, W. (2007). Linking neoprotectionism and environmental governance: On the rapidly increasing tensions between actors in the environment-development Nexus. *Conservation and Society*, *5*(4).

Bushell, R., Staiff, R., & Eagles, P. F. J. (2007). Tourism and protected areas: benefits beyond boundaries. In *Tourism and protected areas: benefits beyond boundaries. The Vth IUCN World Parks Congress*. https://doi.org/10.1079/9780851990224.0001

Byers, B. A. (1996). *Understanding and influencing behaviors in conservation and natural resources management* (Vol. 4). Biodiversity Support Program.

Cabral, R. B., Bradley, D., Mayorga, J., Goodell, W., Friedlander, A. M., Sala, E., Costello, C., & Gaines, S. D. (2020). A global network of marine protected areas for food. *Proceedings of the National Academy of Sciences of the United States of America*, *117*(45). https://doi.org/10.1073/pnas.2000174117

Digitized by Sam Jonah Library

Campbell, S. J., Edgar, G. J., Stuart-Smith, R. D., Soler, G., & Bates, A. E. (2018). Fishing-gear restrictions and biomass gains for coral reef fishes in marine protected areas. *Conservation Biology*, *32*(2). https://doi.org/10.1111/cobi.12996

Castrejón, M., & Charles, A. (2013). Improving fisheries co-management through ecosystem-based spatial management: The Galapagos Marine Reserve. *Marine Policy*, *38*. https://doi.org/10.1016/j.marpol.2012.05.040

Castrejón, M., Moity, N., & Charles, A. (2024). The bumpy road to conservation: Challenges and opportunities in updating the Galapagos zoning system. *Marine Policy*, *163*. https://doi.org/10.1016/j.marpol.2024.106146

Chaigneau, T., & Brown, K. (2016). Challenging the win-win discourse on conservation and development: Analyzing support for marine protected areas. *Ecology and Society*, *21*(1). https://doi.org/10.5751/ES-08204-210136

Charles, A., & Wilson, L. (2009). Human dimensions of marine protected areas. *ICES Journal of Marine Science*, *66*(1). https://doi.org/10.1093/icesjms/fsn182

Cho, L. (2005). Marine protected areas: A tool for integrated coastal management in Belize. *Ocean and Coastal Management*, *48*(11–12). https://doi.org/10.1016/j.ocecoaman.2005.03.007

Choy, L. T. (2014). The Strengths and Weaknesses of Research Methodology: Comparison and Complimentary between Qualitative and Quantitative Approaches. *IOSR Journal of Humanities and Social Science*, *19*(4). https://doi.org/10.9790/0837-194399104

Christie, P. (2004). Marine protected areas as biological successes and social failures in Southeast Asia. In *American Fisheries Society Symposium* (Vol. 2004, Number 42).

Christie, P., & Pollnac, R. (2011). Socio-economy - Social dynamics of scaling-up marine protected area declarations and management. In *Marine Protected Areas: A Multidisciplinary Approach*. https://doi.org/10.1017/CBO9781139049382.008

Digitized by Sam Jonah Library

Chuenpagdee, R., & Jentoft, S. (2025). Blue Justice principles for small-scale fisheries in marine protected areas. In *Navigating Our Way to Solutions in Marine Conservation*. https://doi.org/10.11647/obp.0395.17

Chumbe Island Coral Park [CHICOP]. (2017). *3rd ten-year management plan for Chumbe Island Coral Park.*

Cinner, J. E., Adger, W. N., Allison, E. H., Barnes, M. L., Brown, K., Cohen, P. J., Gelcich, S., Hicks, C. C., Hughes, T. P., Lau, J., Marshall, N. A., & Morrison, T. H. (2018). Building adaptive capacity to climate change in tropical coastal communities. In *Nature Climate Change* (Vol. 8, Number 2). https://doi.org/10.1038/s41558-017-0065-x

Cinner, J. E., & Barnes, M. L. (2019). Social Dimensions of Resilience in Social-Ecological Systems. In *One Earth* (Vol. 1, Number 1, pp. 51–56). https://doi.org/10.1016/j.oneear.2019.08.003

Cinner, J. E., Daw, T., Huchery, C., Thoya, P., Wamukota, A., Cedras, M., & Abunge, C. (2014). Winners and Losers in Marine Conservation: Fishers' Displacement and Livelihood Benefits from Marine Reserves. *Society and Natural Resources*, *27*(9). https://doi.org/10.1080/08941920.2014.918229

Cinner, J. E., Daw, T., & McClanahan, T. R. (2009). Socioeconomic factors that affect artisanal fishers' readiness to exit a declining fishery. *Conservation Biology*, *23*(1), 124–130. https://doi.org/10.1111/j.1523-1739.2008.01041.x

Cinner, J. E., & McClanahan, T. R. (2006). Socioeconomic factors that lead to overfishing in small-scale coral reef fisheries of Papua New Guinea. *Environmental Conservation*, *33*(1). https://doi.org/10.1017/S0376892906002748

Digitized by Sam Jonah Library

Cinner, J. E., McClanahan, T. R., Daw, T. M., Graham, N. A. J., Maina, J., Wilson, S. K., & Hughes, T. P. (2009). Linking Social and Ecological Systems to Sustain Coral Reef Fisheries. *Current Biology*, *19*(3), 206–212. https://doi.org/10.1016/j.cub.2008.11.055

Cinner, J. E., McClanahan, T. R., MacNeil, M. A., Graham, N. A. J., Daw, T. M., Mukminin, A., Feary, D. A., Rabearisoa, A. L., Wamukota, A., Jiddawi, N., Campbell, S. J., Baird, A. H., Januchowski-Hartley, F. A., Hamed, S., Lahari, R., Morove, T., & Kuange, J. (2012). Comanagement of coral reef social-ecological systems. *Proceedings of the National Academy of Sciences of the United States of America*, *109*(14). https://doi.org/10.1073/pnas.1121215109

Cinner, J. E., McClanahan, T. R., & Wamukota, A. (2010). Differences in livelihoods, socioeconomic characteristics, and knowledge about the sea between fishers and non-fishers living near and far from marine parks on the Kenyan coast. *Marine Policy*, *34*(1). https://doi.org/10.1016/j.marpol.2009.04.003

Cinner, J. E., & Pomeroy, R. S. (2012). People and the sea: A festschrift dedicated to the career of Richard Pollnac. *Coastal Management*, *40*(3), 235–238. https://doi.org/10.1080/08920753.2012.677625

Claudet, J., & Guidetti, P. (2010). Improving assessments of marine protected areas. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *20*(2), 239–242.

Clifton, J. (2013). Compensation, conservation and communities: An analysis of direct payments initiatives within an Indonesian marine protected area. *Environmental Conservation*, *40*(3). https://doi.org/10.1017/S0376892913000076

Coastal Resources Center. (2013a). *Managing our coastal wetlands: Lessons from the Western Region of Ghana (Hen Mpoano Policy Brief No. 2)*.

Coastal Resources Center. (2013b). *Solving the fisheries crisis in Ghana: A fresh approach to collaborative fisheries management*.

Digitized by Sam Jonah Library

Coastal Resources Center, & Friends of the Nation. (2010). *Report on characterization of coastal communities and shoreline environments in the Western Region of Ghana. Integrated Coastal and Fisheries Governance Initiative for the Western Region of Ghana*.

Coastal Resources Center, & Friends of the Nation. (2011). *Assessment of critical coastal habitats of the Western Region, Ghana*.

Cohen, L., Manion, L., & Morrison, K. (2017). Research Methods in Education. In *Research Methods in Education*. https://doi.org/10.4324/9781315456539

Cohen, P. J. (2013). *The contribution of locally managed marine areas to small-scale fisheries and food security: A Solomon Islands case study*. James Cook University.

Convention on Biological Diversity. (2010). The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. In *C* (Number 10th). https://www.cbd.int/kb/record/decision/12268

Convention on Biological Diversity (CBD). (2004). *Technical advice on the establishment and management of a national system of marine and coastal protected areas (CBD Technical Series No. 13)*.

Convention on Biological Diversity (CBD). (2022). *Kunming-Montreal global biodiversity framework. Fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity (Part Two), Decision 15/4*.

Cortes-Vazquez, J. A. (2014). Protected areas, conservation stakeholders and the naturalisation of southern Europe. *Forum for Development Studies*, *41*(2). https://doi.org/10.1080/08039410.2014.901238

Costello, C., Ovando, D., Clavelle, T., Kent Strauss, C., Hilborn, R., Melnychuk, M. C., Branch, T. A., Gaines, S. D., Szuwalski, C. S., Cabral, R. B., Rader, D. N., & Leland, A. (2016). Global fishery prospects under contrasting management regimes.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Proceedings of the National Academy of Sciences of the United States of America, *113*(18). https://doi.org/10.1073/pnas.1520420113

Cote, M., & Nightingale, A. J. (2012). Resilience thinking meets social theory: Situating social change in socio-ecological systems (SES) research. *Progress in Human Geography*, *36*(4). https://doi.org/10.1177/0309132511425708

Coulthard, S. (2008). Adapting to environmental change in artisanal fisheries-Insights from a South Indian Lagoon. *Global Environmental Change*, *18*(3). https://doi.org/10.1016/j.gloenvcha.2008.04.003

Crawford, B., L. Gonzales, D. Amin, B. Nyari-Hardi, & Y.A. Sarpong. (2016). Report on the Baseline Survey of Small Pelagic Fishing Households along the Ghana Coast. *The USAID/Ghana Sustainable Fisheries Management Project (SFMP)* , *GH2014*(PGM187).

Creighton, C., Waterhouse, J., Day, J. C., & Brodie, J. (2021). Criteria for effective regional scale catchment to reef management: A case study of Australia's Great Barrier Reef. *Marine Pollution Bulletin*, *173*. https://doi.org/10.1016/j.marpolbul.2021.112882

Creswell, J. W., & Creswell, D. J. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*.

Cullen, L. C. (2007). Marine resource dependence, resource use patterns and identification of economic performance criteria within a small island community: Kaledupa, Indonesia. In *Sciences-New York*.

Danquah, J. A., Roberts, C. O., & Appiah, M. (2021). Effects of Decline in Fish Landings on the Livelihoods of Coastal Communities in Central Region of Ghana. *Coastal Management*, *49*(6). https://doi.org/10.1080/08920753.2021.1967562

Digitized by Sam Jonah Library

Darkwa, E., & Acquah, B. (2025). Whispered Waters: Traditional Taboos and the Dance of Sea Turtle Survival on Ghana's Sacred Shores. *Inverge Journal of Social Sciences*, *4*(1). https://doi.org/10.63544/ijss.v4i1.107

Davis, T. R., & Harasti, D. (2020). Predictive modelling of illegal fishing in no-take marine protected areas. *Fisheries Management and Ecology*, *27*(3). https://doi.org/10.1111/fme.12412

Day, J. C., Kenchington, R. A., Tanzer, J. M., & Cameron, D. S. (2019). Marine zoning revisited: How decades of zoning the Great Barrier Reef has evolved as an effective spatial planning approach for marine ecosystem-based management. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *29*(S2), 9–32. https://doi.org/10.1002/aqc.3115

Day, J., Dudley, N., Hockings, M., Holmes, G., Laffoley, D. D. A., Stolton, S., & Wells, S. M. (2012). *Guidelines for applying the IUCN protected area management categories to marine protected areas*.

De Santo, E. M. (2013). Missing marine protected area (MPA) targets: How the push for quantity over quality undermines sustainability and social justice. In *Journal of Environmental Management* (Vol. 124). https://doi.org/10.1016/j.jenvman.2013.01.033

deGraft-Johnson, K. A. A., Blay, J., Nunoo, F. K. E., & Amankwah, C. C. (2010). *Biodiversity threats assessment of the Western Region of Ghana*.

Deloitte Access Economics. (2013). *Economic Contribution of the Great Barrier Reef*.

Department for International Development [DFID]. (1999). Sustainable Livelihoods Guidance Sheets Framework Introduction Vulnerability Transforming. *Context*.

Department of Environmental Affairs. (2019). *Environmental affairs declares 20 marine protected areas*. South African Government.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Di Cintio, A., Niccolini, F., Scipioni, S., & Bulleri, F. (2023). Avoiding "Paper Parks": A Global Literature Review on Socioeconomic Factors Underpinning the Effectiveness of Marine Protected Areas. In *Sustainability (Switzerland)* (Vol. 15, Number 5). https://doi.org/10.3390/su15054464

Di Franco, A., Hogg, K. E., Calò, A., Bennett, N. J., Sévin-Allouet, M. A., Esparza Alaminos, O., Lang, M., Koutsoubas, D., Prvan, M., Santarossa, L., Niccolini, F., Milazzo, M., & Guidetti, P. (2020). Improving marine protected area governance through collaboration and co-production. *Journal of Environmental Management*, *269*. https://doi.org/10.1016/j.jenvman.2020.110757

Doku, B. N. A., Chen, S., Alhassan, E. H., Abdullateef, Y., Bortey, N. A. D., Abdullateef, Y., & Rahman, M. M. (2018). Fisheries resources of Ghana: present status and future direction. In *International Journal of Fisheries and Aquatic Research* (Vol. 3).

Dorofeeva, V., Klippenstein, E., & Kuznetsov, D. (2021). Global subsiding as a way to sustainable fishery. *E3S Web of Conferences*, *291*. https://doi.org/10.1051/e3sconf/202129105036

Douvere, F. (2015). *World Heritage marine sites: Managing effectively the world's most iconic marine protected areas*.

Duan, W., & Shen, L. (2024). The role of environmental impact assessments in the establishment and management of marine protected areas under the UNCLOS and the BBNJ Agreement. *Review of European, Comparative & International Environmental Law*, *33*(2), 303–311.

Dudley, N. (2008). *Guidelines for applying protected area management categories*. IUCN.

Dunne, R. P., Polunin, N. V. C., Sand, P. H., & Johnson, M. L. (2014). The Creation of the Chagos Marine Protected Area. A Fisheries Perspective. In *Advances in Marine Biology* (Vol. 69). https://doi.org/10.1016/B978-0-12-800214-8.00003-7

Digitized by Sam Jonah Library

Dylewska, A. B. (2009). *The Impact of tourism on socio-economic development in Busua in the Western region of Ghana* [Master's thesis]. The University of Bergen.

Edgar, G. J., Stuart-Smith, R. D., Willis, T. J., Kininmonth, S., Baker, S. C., Banks, S., Barrett, N. S., Becerro, M. A., Bernard, A. T. F., Berkhout, J., Buxton, C. D., Campbell, S. J., Cooper, A. T., Davey, M., Edgar, S. C., Försterra, G., Galván, D. E., Irigoyen, A. J., Kushner, D. J., … Thomson, R. J. (2014). Global conservation outcomes depend on marine protected areas with five key features. *Nature*, *506*(7487). https://doi.org/10.1038/nature13022

Effah, E. (2014). *Assessment of vulnerability of assets and livelihoods to climate variability for adaptation planning in a coastal community in Ghana* [Doctoral dissertation]. University of Cape Coast.

Effah, E. (2022). *Indigenous Knowledge And Ocean Management Practices In Axim, Ghana* [Doctoral dissertation]. University of Cape Coast.

Eliska, E., Nurhayati, N., & Fatimah, P. S. (2020). Coastal Nutrition Status of the Country Reviewed from Social Culture and Islamic Perspective. *J-Kesmas: Jurnal Fakultas Kesehatan Masyarakat (The Indonesian Journal of Public Health)*, *7*(2), 79–82. https://doi.org/10.35308/j-kesmas.v7i2.1732

El País. (2024). *260,000 signatures, 4,000 objections, and a protest: Citizens mobilize against the hotel in Cabo de Gata*. El País.

Enema, M. F. A., & Quezon, M. S. (2024). Fisherfolk at the Crossroads: A Socio-Economic Analysis of Small-Scale Coastal Communities. *Journal of Interdisciplinary Perspectives*, *2*(11), 1–1.

Environmental Protection Agency. (2021). *State of the marine environment report for Ahanta West, Ellembelle, Jomoro and Nzema East districts in the Western Region of Ghana*.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Environmental Protection Agency Act. (1994). *Environmental Protection Agency Act, 1994 (Act 490)*.

Eriksson, B., Johansson, F., & Blicharska, M. (2019). Socio-economic impacts of marine conservation efforts in three Indonesian fishing communities. *Marine Policy*, *103*. https://doi.org/10.1016/j.marpol.2019.02.007

Eshun, I., Golo, H. K., & Dankwa, S. (2019). Livelihood Strategies and Outcomes of Fisher Folks in Selected Rural Coastal Communities of Ghana. *Journal of Culture, Society and Development*, 35–46. https://doi.org/10.7176/jcsd/48-05

Evers, S., & Kooy, M. (2011). *Eviction from the Chagos Islands: Displacement and struggle for identity against two world powers* (Vol. 1). Brill.

Fabinyi, M. (2020). The role of land tenure in livelihood transitions from fishing to tourism. *Maritime Studies*, *19*(1), 29–39. https://doi.org/10.1007/s40152-019-00145-2

Fabinyi, M., Evans, L., & Foale, S. J. (2014). Social-ecological systems, social diversity, and power: Insights from anthropology and political ecology. *Ecology and Society*, *19*(4). https://doi.org/10.5751/ES-07029-190428

Feed the Future Ghana Fisheries Recovery Activity. (2023). *Marine protected area site selection report*.

Fernandes, D., Lynch, J. G., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science*, *60*(8). https://doi.org/10.1287/mnsc.2013.1849

Finegold, C., Gordon, A., Mills, D., Curtis, L., Pulis, A., & Crawford, B. (2010). Western Region Fisheries Sector Review. In *Coastal Resources Center's* (Number December).

Fisher, B., Naidoo, R., Guernier, J., Johnson, K., Mullins, D., Robinson, D., & Allison, E. H. (2017). Integrating fisheries and agricultural programs for food security. *Agriculture & Food Security*, *6*, 1–7.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Fisheries Scientific Survey Division [FSSD]. (2022). *Report on the 2022 Ghana marine canoe frame survey*.

Fitzsimons, J. A., & Wescott, G. (2018). Large-scale expansion of marine protected area networks: Lessons from Australia. *Parks*, *24*(2). https://doi.org/10.2305/IUCN.CH.2018.PARKS-24-2JAF.en

Foale, S., Cohen, P., Januchowski-Hartley, S., Wenger, A., & Macintyre, M. (2011). Tenure and taboos: Origins and implications for fisheries in the Pacific. *Fish and Fisheries*, *12*(4). https://doi.org/10.1111/j.1467-2979.2010.00395.x

Folke, C., Biggs, R., Norström, A. V., Reyers, B., & Rockström, J. (2016). Social-ecological resilience and biosphere-based sustainability science. *Ecology and Society*, *21*(3). https://doi.org/10.5751/ES-08748-210341

Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive governance of social-ecological systems. In *Annual Review of Environment and Resources* (Vol. 30). https://doi.org/10.1146/annurev.energy.30.050504.144511

Food and Agriculture Organization (FAO). (2018a). The state of world fisheries and aquaculture 2018: meeting the sustainable development goals. Food and agriculture organization of the United Nations, Rome. In *fao.org*. http://www.fao.org/3/i9540en/I9540EN.pdf

Food and Agriculture Organization (FAO). (2018b). *The State of World Fisheries and Aquaculture (SOFIA)*.

Food and Agriculture Organization [FAO]. (2019). *Microfinance guidelines support sustainability, resilience, and economic inclusion*.

Francolini, E. M., Mann-Lang, J. B., McKinley, E., & Mann, B. Q. (2023). Stakeholder perspectives on socio-economic challenges and recommendations for better

Digitized by Sam Jonah Library

management of the Aliwal Shoal Marine Protected Area in South Africa. *Marine Policy*, *148*, 105470. https://doi.org/10.1016/j.marpol.2022.105470

Gaines, S. D., White, C., Carr, M. H., & Palumbi, S. R. (2010). Designing marine reserve networks for both conservation and fisheries management. In *Proceedings of the National Academy of Sciences of the United States of America* (Vol. 107, Number 43, pp. 18286–18293). https://doi.org/10.1073/pnas.0906473107

Galapagos National Park Service. (2014). Plan de Manejo de las Áreas Protegidas de Galápagos para el Buen Vivir. In *Puerto Ayora, Galápagos, Ecuador*.

Gall, S. C., & Rodwell, L. D. (2016). Evaluating the social acceptability of Marine Protected Areas. *Marine Policy*, *65*. https://doi.org/10.1016/j.marpol.2015.12.004

Garaway, C., & Esteban, N. (2002). *The impact of marine protected areas on poorer communities living in and around them: Institutional opportunities and constraints: Appendix 4—Case study of Glover's Reef Marine Reserve, Belize (DFID NRSP Project No. 7976)*.

Gavin, M. C., McCarter, J., Mead, A., Berkes, F., Stepp, J. R., Peterson, D., & Tang, R. (2015). Defining biocultural approaches to conservation. In *Trends in Ecology and Evolution* (Vol. 30, Number 3). https://doi.org/10.1016/j.tree.2014.12.005

Ghana Statistical Service. (2021). *2021 Population and Housing Census: General Report Volume 3B - Age and Sex Profile*.

Ghana Statistical Service (GSS). (2014a). *2010 Population and housing census: District analytical report: Ahanta West Municipality*.

Ghana Statistical Service (GSS). (2014b). *2010 population and housing census: District analytical report: Nzema East Municipality*.

Ghana Statistical Service [GSS]. (2016). *Ghana FactSheet*.

Digitized by Sam Jonah Library

Ghana Statistical Service [GSS]. (2021). *2021 population and housing census: Ahanta West Municipal District analytical report*.

Giakoumi, S., McGowan, J., Mills, M., Beger, M., Bustamante, R. H., Charles, A., Christie, P., Fox, M., Garcia-Borboroglu, P., Gelcich, S., Guidetti, P., Mackelworth, P., Maina, J. M., McCook, L., Micheli, F., Morgan, L. E., Mumby, P. J., Reyes, L. M., White, A., … Possingham, H. P. (2018). Revisiting "success" and "failure" of marine protected areas: A conservation scientist perspective. *Frontiers in Marine Science*, *5*(JUN). https://doi.org/10.3389/fmars.2018.00223

Gifford, R., & Dunne, R. P. (2014). A dispossessed people: The depopulation of the chagos archipelago 1965-1973. *Population, Space and Place*, *20*(1). https://doi.org/10.1002/psp.1754

Gimton, T., Rutherford, M., & Dickinson, M. (2010). Stakeholder analysis in marine planning. *Environments*, *37*(3).

Ginting, B. (2018). *Poverty of Traditional Fisherman Percut Village Percut Sei Tuan District Deli Serdang District*.

Glaser, M., Krause, G., Ratter, B. M. W., & Welp, M. (2012). Human-Nature Interactions in the Anthropocene: Potentials of Social-Ecological Systems Analysis. In *Human-Nature Interactions in the Anthropocene: Potentials of Social-Ecological Systems Analysis*. https://doi.org/10.4324/9780203123195

Golden, C. D., Allison, E. H., Cheung, W. W. L., Dey, M. M., Halpern, B. S., McCauley, D. J., Smith, M., Vaitla, B., Zeller, D., & Myers, S. S. (2016). Nutrition: Fall in fish catch threatens human health. In *Nature* (Vol. 534, Number 7607). https://doi.org/10.1038/534317a

Digitized by Sam Jonah Library

Gollan, N., & Barclay, K. (2020). 'It's not just about fish': Assessing the social impacts of marine protected areas on the wellbeing of coastal communities in New South Wales. *PLoS ONE*, *15*(12 December). https://doi.org/10.1371/journal.pone.0244605

Golo, B. W. K., & Yaro, J. A. (2013). Reclaiming stewardship in Ghana religion and climate change. *Nature and Culture*, *8*(3). https://doi.org/10.3167/nc.2013.080304

Gómez-Andújar, N. X., Gerkey, D., Conway, F., & Watson, J. R. (2022). Social cohesion and self-governance arrangements among small-scale fisheries in Puerto Rico. *Frontiers in Marine Science*, *9*. https://doi.org/10.3389/fmars.2022.966309

Goñi, R., Hilborn, R., Díaz, D., Mallol, S., & Adlerstein, S. (2010). Net contribution of spillover from a marine reserve to fishery catches. *Marine Ecology Progress Series*, *400*, 233–243. https://doi.org/10.3354/meps08419

Gorris, P., & Koch, L. (2024). Building trust in environmental co-management: Social embeddedness in a contested German biodiversity conservation governance process. *Environmental Science and Policy*, *154*. https://doi.org/10.1016/j.envsci.2024.103695

Government of Ghana. (1992). *The Constitution of the Republic of Ghana, 1992*.

Government of Ghana. (2002). *Fisheries Act, 2002 (Act 625): Arrangement of sections*.

Government of Ghana. (2023). *Wildlife Resources Management Act, 2023 (Act 1115)*.

Government of Ghana. (2025). *Ghana Sustainable Ocean Plan (2025–2030)*.

Grorud-Colvert, K., Sullivan-Stack, J., Roberts, C., Constant, V., Horta E Costa, B., Pike, E. P., Kingston, N., Laffoley, D., Sala, E., Claudet, J., Friedlander, A. M., Gill, D. A., Lester, S. E., Day, J. C., Gonçalves, E. J., Ahmadia, G. N., Rand, M., Villagomez, A., Ban, N. C., … Lubchenco, J. (2021). The MPA guide: A framework to achieve global goals for the ocean. In *Science* (Vol. 373, Number 6560). https://doi.org/10.1126/science.abf0861

Digitized by Sam Jonah Library

Grüss, A., Robinson, J., Heppell, S. S., Heppell, S. A., & Semmens, B. X. (2014). Conservation and fisheries effects of spawning aggregation marine protected areas: What we know, where we should go, and what we need to get there. In *ICES Journal of Marine Science* (Vol. 71, Number 7). https://doi.org/10.1093/icesjms/fsu038

Gurney, G. G. (2015). Understanding and integrating socioeconomic factors into the design and management of marine protected areas. In *PhD thesis, James Cook University*.

Gurney, G. G., Cinner, J., Ban, N. C., Pressey, R. L., Pollnac, R., Campbell, S. J., Tasidjawa, S., & Setiawan, F. (2014). Poverty and protected areas: An evaluation of a marine integrated conservation and development project in Indonesia. *Global Environmental Change*, *26*(1). https://doi.org/10.1016/j.gloenvcha.2014.04.003

Gurney, G. G., Pressey, R. L., Cinner, J. E., Pollnac, R., & Campbell, S. J. (2015). Integrated conservation and development: Evaluating a community-based marine protected area project for equality of socioeconomic impacts. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *370*(1681), 1681. https://doi.org/10.1098/rstb.2014.0277

Gutiérrez, N. L., Hilborn, R., & Defeo, O. (2011). Leadership, social capital and incentives promote successful fisheries. *Nature*, *470*(7334). https://doi.org/10.1038/nature09689

Guzide, A. (2022). *The cooperative management of SGang Gwaay between the Haida Nation and the Government of Canada*. Sustainable Heritage Case Studies.

Halik, A., Verweij, M., & Schlüter, A. (2018). How marine protected areas are governed: A cultural theory perspective. *Sustainability (Switzerland)*, *10*(1). https://doi.org/10.3390/su10010252

Hall, C. M. (2001). Trends in ocean and coastal tourism: The end of the last frontier? *Ocean and Coastal Management*, *44*(9–10). https://doi.org/10.1016/S0964-5691(01)00071-0

Digitized by Sam Jonah Library

Halpern, B. S. (2003). The impact of marine reserves: Do reserves work and does reserve size matter? *Ecological Applications*, *13*(1 SUPPL.). https://doi.org/10.1890/1051-0761(2003)013[0117:tiomrd]2.0.co;2

Hampton, J., Lehodey, P., Senina, I., Nicol, S., Scutt Phillips, J., & Tiamere, K. (2023). Limited conservation efficacy of large-scale marine protected areas for Pacific skipjack and bigeye tunas. *Frontiers in Marine Science*, *9*. https://doi.org/10.3389/fmars.2022.1060943

Harper, S., Adshade, M., Lam, V. W. Y., Pauly, D., & Sumaila, U. R. (2020). Valuing invisible catches: Estimating the global contribution by women to small-scale marine capture fisheries production. *PLoS ONE*, *15*(3). https://doi.org/10.1371/journal.pone.0228912

Harper, S., Zeller, D., Hauzer, M., Pauly, D., & Sumaila, U. R. (2013). Women and fisheries: Contribution to food security and local economies. *Marine Policy*, *39*(1). https://doi.org/10.1016/j.marpol.2012.10.018

Harris, J. L., & Stevens, G. M. (2024). The illegal exploitation of threatened manta and devil rays in the Chagos Archipelago, one of the world's largest no-take MPAs. *Marine Policy*, *163*, 106110.

Harris, L. R., Nel, R., Oosthuizen, H., Meÿer, M., Kotze, D., Anders, D., McCue, S., & Bachoo, S. (2018). Managing conflicts between economic activities and threatened migratory marine species toward creating a multiobjective blue economy. *Conservation Biology*, *32*(2). https://doi.org/10.1111/cobi.12992

Harrison, H. B., Williamson, D. H., Evans, R. D., Almany, G. R., Thorrold, S. R., Russ, G. R., Feldheim, K. A., Van Herwerden, L., Planes, S., Srinivasan, M., Berumen, M. L., & Jones, G. P. (2012). Larval export from marine reserves and the recruitment benefit

Digitized by Sam Jonah Library

for fish and fisheries. *Current Biology*, *22*(11). https://doi.org/10.1016/j.cub.2012.04.008

Hasselberg, A. E., Aakre, I., Scholtens, J., Overå, R., Kolding, J., Bank, M. S., Atter, A., & Kjellevold, M. (2020). Fish for food and nutrition security in Ghana: Challenges and opportunities. In *Global Food Security* (Vol. 26). Elsevier B.V. https://doi.org/10.1016/j.gfs.2020.100380

Hastuti, V. N., Afifah, D. N., Sugianto, D. N., Anjani, G., & Noer, E. R. (2024). Socio-demographics, dietary diversity score, and nutritional status of children aged 2–5 years: A cross-sectional study of Indonesian coastal areas. *Clinical Epidemiology and Global Health*, *27*, 101599.

Hicks, C. C., Cinner, J. E., Stoeckl, N., & Mcclanahan, T. R. (2015). Linking ecosystem services and human-values theory. *Conservation Biology*, *29*(5). https://doi.org/10.1111/cobi.12550

Holmes, G. (2010). The rich, the powerful and the endangered: Conservation elites, networks and the dominican republic. *Antipode*, *42*(3). https://doi.org/10.1111/j.1467-8330.2010.00766.x

Horta e Costa, B., Guimarães, M. H., Rangel, M., Ressurreição, A., Monteiro, P., Oliveira, F., Bentes, L., Sales Henriques, N., Sousa, I., Alexandre, S., Pontes, J., Afonso, C. M. L., Belackova, A., Marçalo, A., Cardoso-Andrade, M., Correia, A. J., Lobo, V., Gonçalves, E. J., Pitta e Cunha, T., & Gonçalves, J. M. S. (2022). Co-design of a marine protected area zoning and the lessons learned from it. *Frontiers in Marine Science*, *9*. https://doi.org/10.3389/fmars.2022.969234

Hoyt, E. (2018). *Marine protected areas. In Encyclopedia of marine mammals* (pp. 569-580). Academic Press.

Digitized by Sam Jonah Library

Huang, S. C., Chang, Y., & Chang, S. K. (2024). From regional effectiveness evaluation and community engagement toward effective marine protected areas. *Ocean and Coastal Management*, *251*. https://doi.org/10.1016/j.ocecoaman.2024.107075

Humphreys, J., & Clark, R. W. E. (2019a). A critical history of marine protected areas. In *Marine Protected Areas: Science, Policy and Management*. https://doi.org/10.1016/B978-0-08-102698-4.00001-0

Humphreys, J., & Clark, R. W. E. (2019b). Marine protected areas: Quo Vadis? In *Marine Protected Areas: Science, Policy and Management*. https://doi.org/10.1016/B978-0-08-102698-4.00039-3

Ibbett, H., Dorward, L., Jones, J. P., Kohi, E. M., Dwiyahreni, A. A., Sankeni, S., & St John, F. A. V. (2025). Improving compliance around protected areas through fair administration of rules. *Conservation Biology*, *39*(1), e14332.

International Union for Conservation of Nature [IUCN]. (1994). *Guidelines for protected area management categories*.

International Union for Conservation of Nature [IUCN]. (2019). *Protected area categories*. IUCN.

Issah, R. (2024). Gender Mainstreaming Strategies: Exploring the Successes and Failures of Gender Mainstreaming in the Fisheries Sector in Ghana. *Grogest (Gender Equality & Training Programe*.

IUCN. (2023). *A guide to inclusive, equitable and effective implementation of Target 3 of the Kunming-Montreal Global Biodiversity Framework*.

IUCN ESARO. (2020). *The state of protected and conserved areas in Eastern and Southern Africa (State of Protected and Conserved Areas Report Series No. 1)*. https://doi.org/10.2305/IUCN.CH.2020.15.en

Digitized by Sam Jonah Library

Ivankova, N., & Wingo, N. (2018). Applying Mixed Methods in Action Research: Methodological Potentials and Advantages. *American Behavioral Scientist*, *62*(7). https://doi.org/10.1177/0002764218772673

Izah, S. C., Sylva, L., & Hait, M. (2024). Cronbach's Alpha: A Cornerstone in Ensuring Reliability and Validity in Environmental Health Assessment. In *ES Energy and Environment* (Vol. 23). https://doi.org/10.30919/esee1057

Jacobs, N. D. (2019). *Hol Chan Marine Reserve: 2019–2024 management plan*.

Jacques, P. (2013). *Fish and Food Security: Potential for Global Fishery Collapse*. https://doi.org/10.3390/wsf3-i004

Jeffery, L. (2013). Chagos islanders in Mauritius and the UK: Forced displacement and onward migration. In *Chagos islanders in Mauritius and the UK: Forced displacement and onward migration*.

Johannes, R. E. (2002). The renaissance of community-based marine resource management in Oceania. In *Annual Review of Ecology and Systematics* (Vol. 33). https://doi.org/10.1146/annurev.ecolsys.33.010802.150524

Joint Nature Conservation Committee. (2025). *Review and evaluation of the Marine Protected Area networks in England and Northern Ireland*.

Jonah, A. (2020). *Assessment of coastal ecosystems in the greater cape three points area towards its designation as marine protected area in Ghana* [Doctoral dissertation]. University of Cape Coast.

Jones, B., & Andrey, J. (2007). Vulnerability index construction: Methodological choices and their influence on identifying vulnerable neighbourhoods. *International Journal of Emergency Management*, *4*(2). https://doi.org/10.1504/IJEM.2007.013994

Jones, N., McGinlay, J., & Dimitrakopoulos, P. G. (2017). Improving social impact assessment of protected areas: A review of the literature and directions for future

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

research. In *Environmental Impact Assessment Review* (Vol. 64). https://doi.org/10.1016/j.eiar.2016.12.007

Jones, P. J. S., Qiu, W., & De Santo, E. M. (2013). Governing marine protected areas: Social-ecological resilience through institutional diversity. *Marine Policy*, *41*. https://doi.org/10.1016/j.marpol.2012.12.026

Kaplan-Hallam, M., & Bennett, N. J. (2018). Adaptive social impact management for conservation and environmental management. *Conservation Biology*, *32*(2). https://doi.org/10.1111/cobi.12985

Karakara, A. A. W., Peprah, J. A., & Dasmani, I. (2024). Marine biodiversity conservation: The cultural aspect of marine protected areas in Ghana. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *34*(4), e4138.

Karakara, A. A. W., Peprah, J. A., & Dasmani, I. (2025). Social resilience and the blue economy: A study on fishermen in coastal communities in Ghana. *World Development Sustainability*, *7*. https://doi.org/10.1016/j.wds.2025.100257

Karr, K. A., Pina-Amargós, F., Figueredo-Martín, T., & Olivera-Espinosa, Y. (2024). Fishery management enforcement gradients to achieve fishery goals. *Fishes*, *9*(9), 492.

Katikiro, R., Macusi, E. D., & Deepananda, K. H. M. A. (2014). Changes in Fisheries and Social Dynamics in Tanzanian Coastal Fishing Communities. *Western Indian Ocean J. Mar. Sci.*, *12*(2).

Kelleher, G. (1999). *Guidelines for marine protected areas*.

Kraus, G., & Diekmann, R. (2018). Impact of fishing activities on marine life. In *Handbook on Marine Environment Protection: Science, Impacts and Sustainable Management* (pp. 79–96). Springer.

Kruijssen, F., Asare, C., Ameyaw, A. B., Quartson, E., Nii, E., Godfred, A., Asiedu, A., Okyere, I., Donkor, J., Inkoom, N., Papa, N. O., Amankwah, Y., Tachie, P., Dotse, S.,

Digitized by Sam Jonah Library

Kankam, S., Appiah, V. O., & Crawford, B. (2013). *Livelihoods and poverty reduction in coastal communities in the Western Region of Ghana*. http://www.crc.uri.eduandtheWorldFishCenter'swebsiteathttp://worldfishcenter.org.

Ksoll, C., Lilleør, H. B., Lønborg, J. H., & Rasmussen, O. D. (2016). Impact of Village Savings and Loan Associations: Evidence from a cluster randomized trial. *Journal of Development Economics*, *120*. https://doi.org/10.1016/j.jdeveco.2015.12.003

Kusumawati, I., & Huang, H. W. (2015). Key factors for successful management of marine protected areas: A comparison of stakeholders' perception of two MPAs in Weh island, Sabang, Aceh, Indonesia. *Marine Policy*, *51*. https://doi.org/10.1016/j.marpol.2014.09.029

Laffoley, D., Baxter, J. M., Day, J. C., Wenzel, L., Bueno, P., & Zischka, K. (2019). *Marine protected areas. In C. Sheppard (Ed.), World seas: An environmental evaluation* (C. Sheppard, Ed.). Academic Press.

Laffoley, D., White, a, Kilarski, S., Gleason, M., Smith, S., Llewellyn, G., Day, J., Hillary, a, Wedell, V., & Pee, D. (2008). Establishing Resilient Marine Protected Area Networks — Making It Happen. In *Governance An International Journal Of Policy And Administration*.

Lam, V. W. Y., Cheung, W. W. L., Swartz, W., & Sumaila, U. R. (2012). Climate Change Impacts on Fisheries in West Africa: Implications for Economic, Food and Nutritional Security. *African Journal of Marine Science*, *34*(1). https://doi.org/10.2989/1814232X.2012.673294

Laryeafio, M. N., & Ogbewe, O. C. (2023). Ethical consideration dilemma: systematic review of ethics in qualitative data collection through interviews. *Journal of Ethics in Entrepreneurship and Technology*, *3*(2), 94–110. https://doi.org/10.1108/jeet-09-2022-0014

Digitized by Sam Jonah Library

Latorre, J. G., García-Latorre, J., & Sanchez-Picón, A. (2001). Dealing with aridity: Socio-economic structures and environmental changes in an arid Mediterranean region. *Land Use Policy*, *18*(1), 53–64. https://doi.org/10.1016/S0264-8377(00)00045-4

Lavoie, A., & Himes-Cornell, A. (2019). Social Networks of Alaska Fishing Communities. *Coastal Management*, *47*(1), 1–22. https://doi.org/10.1080/08920753.2019.1525259

Lazar, N., Yankson, K., Blay, J., Ofori-Danson, P., Markwei, P., Agbogah, K., & Bilisini, W. B. (2018). *Status of the small pelagic stocks in Ghana and recommendations to achieve sustainable fishing 2017*.

Lazar, N., Yankson, K., Blay, J., Ofori-Danson, P., Markwei, P., Agbogah, K., & Bilisini, W. B. (2020). *Status of the small pelagic stocks in Ghana in 2019*.

Leisher, C., Mangubhai, S., Hess, S., Widodo, H., Soekirman, T., Tjoe, S., Wawiyai, S., Neil Larsen, S., Rumetna, L., Halim, A., & Sanjayan, M. (2012). Measuring the benefits and costs of community education and outreach in marine protected areas. *Marine Policy*, *36*(5). https://doi.org/10.1016/j.marpol.2012.02.022

Lester, S. E., Halpern, B. S., Grorud-Colvert, K., Lubchenco, J., Ruttenberg, B. I., Gaines, S. D., Airamé, S., & Warner, R. R. (2009). Biological effects within no-take marine reserves: A global synthesis. *Marine Ecology Progress Series*, *384*, 33–46. https://doi.org/10.3354/meps08029

Levine, A. S., Richmond, L., & Lopez-Carr, D. (2015). Marine resource management: Culture, livelihoods, and governance. *Applied Geography*, *59*. https://doi.org/10.1016/j.apgeog.2015.01.016

Lewis, N., Day, J., Wilhelm, 'Aulani, Wagner, D., Gaymer, C., Parks, J., Friedlander, A., White, S., Sheppard, C., Spalding, M., San Martin, G., Skeat, A., Taei, S., Teroroko, T., & Evans, J. (2017). Large-Scale Marine Protected Areas: guidelines for design and

Digitized by Sam Jonah Library

management. In *Large-Scale Marine Protected Areas: guidelines for design and management*. https://doi.org/10.2305/iucn.ch.2017.pag.26.en

López-Angarita, J., Moreno-Sánchez, R., Maldonado, J. H., & Sánchez, J. A. (2014). Evaluating linked social-ecological systems in marine protected areas. *Conservation Letters*, *7*(3). https://doi.org/10.1111/conl.12063

Lucas, A. (2016). Elite Capture and Corruption in two Villages in Bengkulu Province, Sumatra. *Human Ecology*, *44*(3). https://doi.org/10.1007/s10745-016-9837-6

Lucrezi, S., Esfehani, M. H., Ferretti, E., & Cerrano, C. (2019). The effects of stakeholder education and capacity building in marine protected areas: A case study from southern Mozambique. *Marine Policy*, *108*. https://doi.org/10.1016/j.marpol.2019.103645

Lundquist, C. J., Bulmer, R. H., Clark, M. R., Hillman, J. R., Nelson, W. A., Norrie, C. R., Rowden, A. A., Tracey, D. M., & Hewitt, J. E. (2017). Challenges for the conservation of marine small natural features. *Biological Conservation*, *211*. https://doi.org/10.1016/j.biocon.2016.12.027

Mangora, M. M., Shalli, M. S., & Msangameno, D. J. (2014). Livelihoods of coastal communities in mnazi bay-ruvuma estuary marine park, Tanzania. In *Vulnerability of Agriculture, Water and Fisheries to Climate Change: Toward Sustainable Adaptation Strategies*. https://doi.org/10.1007/978-94-017-8962-2_17

Mangubhai, S., Sykes, H., Manley, M., Vukikomoala, K., & Beattie, M. (2020). Contributions of tourism-based Marine Conservation Agreements to natural resource management in Fiji. *Ecological Economics*, *171*. https://doi.org/10.1016/j.ecolecon.2020.106607

Mann-Lang, J. B., Branch, G. M., Mann, B. Q., Sink, K. J., Kirkman, S. P., & Adams, R. (2021). Social and economic effects of marine protected areas in South Africa, with

Digitized by Sam Jonah Library

recommendations for future assessments. In *African Journal of Marine Science* (Vol. 43, Number 3). https://doi.org/10.2989/1814232X.2021.1961166

Marcos, C., Díaz, D., Fietz, K., Forcada, A., Ford, A., García-Charton, J. A., Goñi, R., Lenfant, P., Mallol, S., Mouillot, D., Pérez-Marcos, M., Puebla, O., Manel, S., & Pérez-Ruzafa, A. (2021). Reviewing the Ecosystem Services, Societal Goods, and Benefits of Marine Protected Areas. In *Frontiers in Marine Science* (Vol. 8). https://doi.org/10.3389/fmars.2021.613819

Marshall, N. A. (2011). Assessing resource dependency on marine ecosystems. *Environmental Science & Policy*, *14*(6), 682–693.

Marshall, N. A., Curnock, M. I., Goldberg, J., Gooch, M., Marshall, P. A., Pert, P. L., & Tobin, R. C. (2017). The Dependency of People on the Great Barrier Reef, Australia. *Coastal Management*, *45*(6). https://doi.org/10.1080/08920753.2017.1373454

Marshall, N. A., Marshall, P. A., Abdulla, A., & Rouphael, T. (2010). The links between resource dependency and attitude of commercial fishers to coral reef conservation in the red sea. *Ambio*, *39*(4). https://doi.org/10.1007/s13280-010-0065-9

Marshall, N. A., Marshall, P. A., Tamelander, J., Obura, D., Malleret-King, D., & Cinner, J. E. (2009). The social and cultural dimensions of marine resource dependency. *Marine Policy*, *33*(5), 732–741.

Marshall, N., Marshall, P., & Abdulla, A. (2009). Using social resilience and resource dependency to increase the effectiveness of marine conservation initiatives in Salum, Egypt. *Journal of Environmental Planning and Management*, *52*(7), 901–918. https://doi.org/10.1080/09640560903180982

Mascia, M. B. (2003). The human dimension of coral reef marine protected areas: Recent social science research and its policy implications. In *Conservation Biology* (Vol. 17, Number 2). https://doi.org/10.1046/j.1523-1739.2003.01454.x

Digitized by Sam Jonah Library

Mascia, M. B., & Claus, C. A. (2009). A property rights approach to understanding human displacement from protected areas: The case of marine protected areas. In *Conservation Biology* (Vol. 23, Number 1). https://doi.org/10.1111/j.1523-1739.2008.01050.x

Mascia, M. B., Claus, C. A., & Naidoo, R. (2010). Impacts of marine protected areas on fishing communities. *Conservation Biology*, *24*(5). https://doi.org/10.1111/j.1523-1739.2010.01523.x

Mascia, M. B., Pailler, S., Thieme, M. L., Rowe, A., Bottrill, M. C., Danielsen, F., Geldmann, J., Naidoo, R., Pullin, A. S., & Burgess, N. D. (2014). Commonalities and complementarities among approaches to conservation monitoring and evaluation. In *Biological Conservation* (Vol. 169). https://doi.org/10.1016/j.biocon.2013.11.017

Masud, M. M. (2019). An Integrated Management Policy Framework for Sustainable Community Development and Conservation of Marine Resources. In *Conservation of Marine Resources and Sustainable Coastal Community Development in Malaysia* (pp. 117–134). https://doi.org/10.1007/978-981-13-9730-1_8

Mayer, B., Running, K., & Bergstrand, K. (2015). Compensation and Community Corrosion: Perceived Inequalities, Social Comparisons, and Competition Following the Deepwater Horizon Oil Spill. *Sociological Forum*, *30*(2). https://doi.org/10.1111/socf.12167

McCarter, J., Sterling, E. J., Jupiter, S. D., Cullman, G. D., Albert, S., Basi, M., Betley, E., Boseto, D., Bulehite, E. S., Harron, R., Holland, P. S., Horning, N., Hughes, A., Jino, N., Malone, C., Mauli, S., Pae, B., Papae, R., Rence, F., … Filardi, C. E. (2018). Biocultural approaches to developing well-being indicators in Solomon Islands. *Ecology and Society*, *23*(1). https://doi.org/10.5751/ES-09867-230132

Digitized by Sam Jonah Library

Mccay, B. J., & Jones, P. J. S. (2011). Marine Protected Areas and the Governance of Marine Ecosystems and Fisheries. In *Conservation Biology* (Vol. 25, Number 6). https://doi.org/10.1111/j.1523-1739.2011.01771.x

Mcclanahan, T., Allison, E. H., & Cinner, J. E. (2015). Managing fisheries for human and food security. *Fish and Fisheries*, *16*(1). https://doi.org/10.1111/faf.12045

McNeill, A., Clifton, J., & Harvey, E. S. (2018). Attitudes to a marine protected area are associated with perceived social impacts. *Marine Policy*, *94*. https://doi.org/10.1016/j.marpol.2018.04.020

MEA. (2005). Ecosystems and Human Well-Being. Synthesis. In *World Health*.

Mecha, N. J. M., Vicente, J. A., Cayabo, G. D., Omar, S., Ducado, J., Cleto, J., & Creencia, L. (2022). Success indicators of marine protected areas in the Philippines: A systematic review. *Ecocycles*, *8*(1), 73–85.

Mehrad, A., & Tahriri Zangeneh, M. H. (2019). Comparison between Qualitative and Quantitative Research Approaches Social Sciences. *International Journal For Research In Educational Studies* , *5*(7).

Mensah, J., Amoah, J. O., Amenumey, E. B., Mattah, P. A. D., & Mattah, M. M. (2025). The closed fishing season policy in Ghana: Lessons from the coastal fisherfolk. *Marine Policy*, *171*. https://doi.org/10.1016/j.marpol.2024.106472

Mensah, M. A., Koranteng, K. A., Bortey, A., & Yeboah, D. A. (2006). The State of World Fisheries from a Fishworker Perspective : The Ghanaian Situation. *ICSF. International Collective in Support of Fishworkers*.

Middleton, F. (2020). Reliability vs Validity: what’s the difference? *Scribbr*.

Ministry of Fisheries and Aquaculture Development [MOFAD]. (2015). *National fisheries management plan*.

Digitized by Sam Jonah Library

Ministry of Fisheries and Aquaculture Development [MoFAD]. (2022). *Fisheries management plan of Ghana: A national policy for the management of the marine fisheries sector 2022–2026*. Government of Ghana.

Ministry of Fisheries and Aquaculture Development [MOFAD]. (2022). *National fisheries management plan*.

Mishra, K. (2022). Viability of community participation in coastal conservation: A critical analysis. *IOP Conference Series: Earth and Environmental Science*, *1095*(1). https://doi.org/10.1088/1755-1315/1095/1/012009

Mishra, M., Sudarsan, D., Santos, C. A. G., Mishra, S. K., Kar, D., Baral, K., & Pattnaik, N. (2021). An overview of research on natural resources and indigenous communities: a bibliometric analysis based on Scopus database (1979–2020). In *Environmental Monitoring and Assessment* (Vol. 193, Number 2). https://doi.org/10.1007/s10661-020-08793-2

Mizrahi, M., Duce, S., Khine, Z. L., MacKeracher, T., Maung, K. M. C., Phyu, E. T., Pressey, R. L., Simpfendorfer, C., & Diedrich, A. (2020). Mitigating negative livelihood impacts of no-take MPAs on small-scale fishers. *Biological Conservation*, *245*. https://doi.org/10.1016/j.biocon.2020.108554

Mohajan, H. K. (2017). Two criteria for good measurements in research: Validity and reliability. *Annals of Spiru Haret University. Economic Series*, *17*(4), 59–82.

Mohammed, A. S., Tuokuu, F. X. D., & Adda, E. B. (2023). Livelihood access and challenges of coastal communities: insights from Ghana. *Journal of Global Responsibility*, *14*(4), 452–475. https://doi.org/10.1108/JGR-02-2022-0017

Monterey Bay National Marine Sanctuary Foundation. (2022). *Education: Cultivating ocean stewards (Monterey Bay National Marine Sanctuary Foundation Impact Report 2022)*.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Monterey Bay National Marine Sanctuary [MBNMS]. (2021). *NOAA's Monterey Bay National Marine Sanctuary contributions and recommendations to California's MPA decadal management review*. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=203482

Morgan, D. L. (2014). Pragmatism as a Paradigm for Social Research. *Qualitative Inquiry*, *20*(8). https://doi.org/10.1177/1077800413513733

Moscardo, G., Konovalov, E., Murphy, L., McGehee, N. G., & Schurmann, A. (2017). Linking tourism to social capital in destination communities. *Journal of Destination Marketing and Management*, *6*(4), 286–295. https://doi.org/10.1016/j.jdmm.2017.10.001

Mumford, M. D., Higgs, C., & Gujar, Y. (2021). Ethics in coercive environments: Ensuring voluntary participation in research. In B. Stanley & S. Panicker (Eds.), *Handbook of research ethics in psychological science.* (pp. 113–123). https://doi.org/10.1037/0000258-008

National Oceanic and Atmospheric Administration. (2023). *What MPAs provide the nation*.

Nayak, P. K. (2017). Fisher communities in transition: understanding change from a livelihood perspective in Chilika Lagoon, India. *Maritime Studies*, *16*(1). https://doi.org/10.1186/s40152-017-0067-3

Nazir, I., Chauhan, R. S., Khati, A., & Arya, P. (2018). Role of credit for the upliftment of the fisheries sector. *International Journal of Fisheries and Aquatic Studies*, *6*(2), 1–4.

Ngoc, Q. T. K. (2018). Impacts on the ecosystem and human well-being of the marine protected area in Cu Lao Cham, Vietnam. *Marine Policy*, *90*. https://doi.org/10.1016/j.marpol.2017.12.015

Nolan, C. (2019). Power and access issues in Ghana's coastal fisheries: a political ecology of a closing commodity frontier. *Marine Policy*, 103621.

Digitized by Sam Jonah Library

Nunoo, F. K. (2018). *Marine protected areas in Ghana: Strategies, action plan and implementation framework*.

Nunoo, F. K. E. ., Asiedu, B., Kombat, E. O., & Samey, B. (2015). *Sardinella and other small pelagic value and supply chain of the fishery sector, Ghana*.

Nuttle, W. K., & Bergh, C. (2013). Marine-dependent people. *Integrated Conceptual*.

Nyarko, E. A. (2013). *Archaeology of Prince's Town (Ghana)* [Doctoral dissertation]. University of Ghana.

Nyavor, S., Amposah, S., Owusu, V., & Boateng, K. J. (2023). Compensation payment for fisherfolk during closed-season fishing: Lessons from small-scale fisherfolk in Ghana. *Cogent Social Sciences*, *9*(2). https://doi.org/10.1080/23311886.2023.2282502

Ofori-Danson, P. K., Asiedu, B., Amponsah, S. K. K., & Crawford, B. (2019). *Assessment of the socio-economic, food security and nutrition impacts of the 2019 canoe fishery closed fishing season in Ghana*.

Ojea, E., Pascual, M., March, D., Bitetto, I., Melià, P., Breil, M., Claudet, J., & Markandya, A. (2017). Socioeconomic Impacts of Networks of Marine Protected Areas. In *Management of Marine Protected Areas: A Network Perspective*. https://doi.org/10.1002/9781119075806.ch6

Okafor-Yarwood, I., & Belhabib, D. (2020). The duplicity of the European Union Common Fisheries Policy in third countries: Evidence from the Gulf of Guinea. In *Ocean and Coastal Management* (Vol. 184). https://doi.org/10.1016/j.ocecoaman.2019.104953

Okafor-Yarwood, I., Kadagi, N. I., Belhabib, D., & Allison, E. H. (2022). Survival of the Richest, not the Fittest: How attempts to improve governance impact African small-scale marine fisheries. *Marine Policy*, *135*. https://doi.org/10.1016/j.marpol.2021.104847

Digitized by Sam Jonah Library

Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. In *Science* (Vol. 325, Number 5939). https://doi.org/10.1126/science.1172133

Owusu, V. (2019). Impacts of the petroleum industry on the livelihoods of fisherfolk in Ghana: A case study of the Western Region. *Extractive Industries and Society*, *6*(4), 1256–1264. https://doi.org/10.1016/j.exis.2019.11.002

Owusu, V., & Adjei, M. (2021). Politics, power and unequal access to fisheries subsidies among small-scale coastal fisherfolk in Ghana. *Ocean and Coastal Management*, *214*. https://doi.org/10.1016/j.ocecoaman.2021.105920

Owusu, V., Adu-Boahen, K., Kyeremeh, S., Demalie, I., & Eshun, P. (2023). Factors influencing compliance of closed fishing season: lessons from small-scale coastal fisheries in the Central Region of Ghana. *Humanities and Social Sciences Communications*, *10*(1). https://doi.org/10.1057/s41599-023-01513-4

Oyanedel, R., Humberstone, J. M., Shattenkirk, K., Van-Dyck, S. R., Moyer, K. J., Poon, S., McDonald, G., Ravelo-Salazar, C., Mancao, R., Clemence, M., & Costello, C. (2017). A decision support tool for designing TURF-reserves. *Bulletin of Marine Science*, *93*(1). https://doi.org/10.5343/bms.2015.1095

Oyanedel, R., Marín, A., Castilla, J. C., & Gelcich, S. (2016). Establishing marine protected areas through bottom-up processes: Insights from two contrasting initiatives in Chile. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *26*(1). https://doi.org/10.1002/aqc.2546

Pascual, M., Rossetto, M., Ojea, E., Milchakova, N., Giakoumi, S., Kark, S., Korolesova, D., & Melià, P. (2016). Socioeconomic impacts of marine protected areas in the Mediterranean and Black Seas. *Ocean and Coastal Management*, *133*. https://doi.org/10.1016/j.ocecoaman.2016.09.001

Digitized by Sam Jonah Library

Pauly, D., Christensen, V., Guénette, S., Pitcher, T. J., Sumaila, U. R., Walters, C. J., Watson, R., & Zeller, D. (2002). Towards sustainability in world fisheries. In *Nature* (Vol. 418, Number 6898). https://doi.org/10.1038/nature01017

Pauly, D., Watson, R., & Alder, J. (2005). Global trends in world fisheries: Impacts on marine ecosystems and food security. In *Philosophical Transactions of the Royal Society B: Biological Sciences* (Vol. 360, Number 1453). https://doi.org/10.1098/rstb.2004.1574

Pellowe, K. E., & Leslie, H. M. (2020). The interplay between formal and informal institutions and the potential for co-management in a Mexican small-scale fishery. *Marine Policy*, *121*. https://doi.org/10.1016/j.marpol.2020.104179

Petit, I. J., Campoy, A. N., Hevia, M. J., Gaymer, C. F., & Squeo, F. A. (2018). Protected areas in Chile: Are we managing them? *Revista Chilena de Historia Natural*, *91*(1). https://doi.org/10.1186/s40693-018-0071-z

Petrosillo, I., Aretano, R., & Zurlini, G. (2015). Socioecological systems. *Encyclopedia of Ecology*, *4*, 419–425.

Plunkett, R. (2025). *A Sanctuary At Last - NOAA Announces Papahānaumokuākea National Marine Sanctuary*.

Pomeroy, R., Arango, C., Lomboy, C. G., & Box, S. (2020). Financial inclusion to build economic resilience in small-scale fisheries. *Marine Policy*, *118*. https://doi.org/10.1016/j.marpol.2020.103982

Price, R. (2022). *Socio-economic Factors Impacting Marine Protected Areas in the Eastern Tropical Pacific Marine Corridor (CMAR) Region*. https://doi.org/10.19088/K4D.2022.107

Rakotomahazo, C., Ravaoarinorotsihoarana, L. A., Randrianandrasaziky, D., Glass, L., Gough, C., Boleslas Todinanahary, G. G., & Gardner, C. J. (2019). Participatory

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

planning of a community-based payments for ecosystem services initiative in Madagascar's mangroves. *Ocean and Coastal Management*, *175*. https://doi.org/10.1016/j.ocecoaman.2019.03.014

Ramírez, K. (2024). Ethical principles in dental research of behavioral and social factors. *Odovtos–International Journal of Dental Sciences*, *26*(3), 20–25.

Ramsar Convention Secretariat. (1971). *Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, Iran, 2 February 1971) as amended by the 1982 Protocol and 1987 Amendments*.

Ramsar Convention Secretariat. (2013). *The Ramsar Convention Manual: A guide to the Convention on Wetlands (Ramsar, Iran, 1971)*.

Ramsubeik, C., Oxenford, H. A., & McConney, P. (2006). A Livelihoods Analysis of Two Marine Protected Areas in Belize TT - Un Analisis del Sustento de Dos Areas Protegidas Marinas en Belice. *Proceedings of the Gulf and Caribbean Fisheries Institute*, (57).

Ranger, S., Kenter, J. O., Bryce, R., Cumming, G., Dapling, T., Lawes, E., & Richardson, P. B. (2016). Forming shared values in conservation management: An interpretive-deliberative-democratic approach to including community voices. *Ecosystem Services*, *21*. https://doi.org/10.1016/j.ecoser.2016.09.016

Raymundo, L. J. (2003). *Reef check in Apo Island Marine Reserve: A six-year report*.

Reed, M. S. (2008). Stakeholder participation for environmental management: A literature review. In *Biological Conservation* (Vol. 141, Number 10). https://doi.org/10.1016/j.biocon.2008.07.014

Rees, S. E., Fletcher, S., Gall, S. C., Friedrich, L. A., Jackson, E. L., & Rodwell, L. D. (2014). Securing the benefits: Linking ecology with marine planning policy to examine

Digitized by Sam Jonah Library

the potential of a network of Marine Protected Areas to support human wellbeing. *Marine Policy*, *44*. https://doi.org/10.1016/j.marpol.2013.09.027

Rees, S. E., Pittman, S. J., Foster, N., Langmead, O., Griffiths, C., Fletcher, S., Johnson, D. E., & Attrill, M. (2018). Bridging the divide: Social–ecological coherence in Marine Protected Area network design. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *28*(3). https://doi.org/10.1002/aqc.2885

Relano, V., & Pauly, D. (2023). The ‘Paper Park Index’: Evaluating Marine Protected Area effectiveness through a global study of stakeholder perceptions. *Marine Policy*, *151*. https://doi.org/10.1016/j.marpol.2023.105571

Republic of Palau. (2015). *Palau National Marine Sanctuary Act*.

Robbins, P. (2012). Political Ecology: A Critical Introduction, - Paul Robbins. *John Wiley & Sons Ltd*.

Robbins, P. (2020). Political Ecology: A Critical Introduction. Wiley-Blackwell. *Political Ecology: A Critical Introduction. Wiley-Blackwell.*

Rodríguez-Rodríguez, D., & López, I. (2020). Socioeconomic effects of protected areas in Spain across spatial scales and protection levels. *Ambio*, *49*(1). https://doi.org/10.1007/s13280-019-01160-7

Russ, G. R., & Alcala, A. C. (2011). Enhanced biodiversity beyond marine reserve boundaries: The cup spillith over. *Ecological Applications*, *21*(1). https://doi.org/10.1890/09-1197.1

Russi, D. (2020). Governance strategies for a successful marine protected area – The case of Torre Guaceto. *Marine Policy*, *115*. https://doi.org/10.1016/j.marpol.2020.103849

Sagoe, A. A., Aheto, D. W., Okyere, I., Adade, R., & Odoi, J. (2021). Community participation in assessment of fisheries related ecosystem services towards the

Digitized by Sam Jonah Library

establishment of marine protected area in the Greater Cape Three Points area in Ghana. *Marine Policy*, *124*, 104336. https://doi.org/10.1016/j.marpol.2020.104336

Saksono, H., Nissa', Z. N. A., & Suadi, S. (2023). Small-Scale Fisher's Livelihood Strategies: Findings from Case Studies in Several Indonesian Coastal Areas. *Jurnal Perikanan Universitas Gadjah Mada*, *25*(1). https://doi.org/10.22146/jfs.82815

Salm, R. V., Clark, J. R., & Siirila, E. (2000). Marine and Coastal Protected Areas: A Guide for Planners and Managers. In *Marine and Coastal Protected Areas: A Guide for Planners and Managers*. https://doi.org/10.2305/iucn.ch.2000.13.en

Samonte, G. PB., Ramenzoni, V. C., Dacles, T. U., & Fortenbacher, D. (2016). The Effect of Marine Protected Areas on Fishers' Income in the Philippines. *Journal of Ocean and Coastal Economics*, *3*(1). https://doi.org/10.15351/2373-8456.1032

Sánchez-Picón, A., Aznar-Sánchez, J. A., & García-Latorre, J. (2011). Economic cycles and environmental crisis in arid southeastern Spain. A historical perspective. *Journal of Arid Environments*, *75*(12). https://doi.org/10.1016/j.jaridenv.2010.12.014

Sand, P. H. (2015). The Chagos Archipelago Cases: Nature Conservation Between Human Rights and Power Politics. In *The Global Community Yearbook of International Law and Jurisprudence 2013, Volume I*. https://doi.org/10.1093/acprof:oso/9780199388660.003.0007

Saunders, B., Kitzinger, J., & Kitzinger, C. (2015). Anonymising interview data: challenges and compromise in practice. *Qualitative Research*, *15*(5). https://doi.org/10.1177/1468794114550439

Sazzad, S. A. ; B. K. ; S. S. K. ; F. A. M. (2024). Socioeconomic vulnerabilities and adaptive strategies of small-scale fishers in developing country. *Applied Agriculture Sciences*, *2*(1), 1–7.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Schaumlöffel, D. (2015). *Vulnerability and marine resource-dependence in coastal and marine social-ecological systems* [Doctoral dissertation]. University of Bremen.

Schratzberger, M., Neville, S., Painting, S., Weston, K., & Paltriguera, L. (2019). Ecological and Socio-Economic Effects of Highly Protected Marine Areas (HPMAs) in Temperate Waters. In *Frontiers in Marine Science* (Vol. 6). https://doi.org/10.3389/fmars.2019.00749

Schreckenberg, K., Franks, P., Martin, A., & Lang, B. (2016). Unpacking equity for protected area conservation. *Parks*, *22*(2). https://doi.org/10.2305/IUCN.CH.2016.PARKS-22-2KS.en

Secretariat of the Convention on Biological Diversity. (2011). *Convention on Biological Diversity*.

Selig, E. R., & Bruno, J. F. (2010). A global analysis of the effectiveness of marine protected areas in preventing coral loss. *PLoS ONE*, *5*(2). https://doi.org/10.1371/journal.pone.0009278

Selig, E. R., Hole, D. G., Allison, E. H., Arkema, K. K., McKinnon, M. C., Chu, J., de Sherbinin, A., Fisher, B., Glew, L., Holland, M. B., Ingram, J. C., Rao, N. S., Russell, R. B., Srebotnjak, T., Teh, L. C. L., Troëng, S., Turner, W. R., & Zvoleff, A. (2019). Mapping global human dependence on marine ecosystems. In *Conservation Letters* (Vol. 12, Number 2, p. e12617). https://doi.org/10.1111/conl.12617

Sen, V., & Nagwanshee, R. (2016). Ethical issues in social research. *Journal of Management*, *5*(10), 37–41.

Sène-Harper, A. L., Camara, S. M., & Matarrita-Cascante, D. (2019). Does Diversification Lead to Livelihood Security in Fishing-Farming Communities? Insight from the Senegal River Delta. *Human Ecology*, *47*(6), 797–809. https://doi.org/10.1007/s10745-019-00121-8

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Seychelles Marine Spatial Plan Initiative (SMSP). (2020). *Seychelles Marine Spatial Plan Policy (Final Version)*.

Shah, J. M., Uddin, M. S., Hussin, R., Mohd Hamdan, D. D. B., Ibrahim, D., & Ag Ijuwan, N. N. B. (2022). Sustainable Livelihood Strategies of Fishing Communities in Marine Protected Area (MPA), Sabah, Malaysia. *International Journal of Human Resource Studies*, *12*(2). https://doi.org/10.5296/ijhrs.v12i2.19669

Shannon-Baker, P. (2016). Making Paradigms Meaningful in Mixed Methods Research. *Journal of Mixed Methods Research*, *10*(4). https://doi.org/10.1177/1558689815575861

Shields, E. (2020). *Conservation, co-management, and power-balancing in Haida Gwaii*. UCLA Law Review.

Smith, J. G., Lopazanski, C., Free, C. M., Brun, J., Anderson, C., Carr, M. H., & Caselle, J. E. (2025). Conservation benefits of a large marine protected area network that spans multiple ecosystems. *Conservation Biology*, *39*(2), e14435.

Somoebwana, M. I., Ayuya, O. I., & Mironga, J. M. (2021a). Drivers of marine fishery dependence: Micro-level evidence from the coastal lowlands of Kenya. *Cogent Economics and Finance*, *9*(1). https://doi.org/10.1080/23322039.2021.1944967

Somoebwana, M. I., Ayuya, O. I., & Mironga, J. M. (2021b). Marine fishery dependence, poverty and inequality nexus along the coastal lowlands of kenya. In *National Accounting Review* (Vol. 3, Number 2, pp. 152–178). https://doi.org/10.3934/NAR.2021008

Sowińska-Świerkosz, B., & García, J. (2022). What are Nature-based solutions (NBS)? Setting core ideas for concept clarification. *Nature-Based Solutions*, *2*. https://doi.org/10.1016/j.nbsj.2022.100009

Digitized by Sam Jonah Library

Sowman, M., & Sunde, J. (2018). Social impacts of marine protected areas in South Africa on coastal fishing communities. *Ocean and Coastal Management*, *157*. https://doi.org/10.1016/j.ocecoaman.2018.02.013

Speranza, C. I., Wiesmann, U., & Rist, S. (2014). An indicator framework for assessing livelihood resilience in the context of social–ecological dynamics. *Global Environmental Change*, *28*, 109-119.

Stoeckl, N., Farr, M., Jarvis, D., Larson, S., Esparon, M., Sakata, H., & Costanza, B. (2014). *The Great Barrier Reef World Heritage Area: Its value to residents and tourists, and the effect of world prices on it*.

Strain, E. M. A., Edgar, G. J., Ceccarelli, D., Stuart-Smith, R. D., Hosack, G. R., & Thomson, R. J. (2019). A global assessment of the direct and indirect benefits of marine protected areas for coral reef conservation. *Diversity and Distributions*, *25*(1). https://doi.org/10.1111/ddi.12838

Sumaila, U. R., Ebrahim, N., Schuhbauer, A., Skerritt, D., Li, Y., Kim, H. S., Mallory, T. G., Lam, V. W. L., & Pauly, D. (2019). Updated estimates and analysis of global fisheries subsidies. *Marine Policy*, *109*. https://doi.org/10.1016/j.marpol.2019.103695

Sumaila, U. R., Khan, A. S., Dyck, A. J., Watson, R., Munro, G., Tydemers, P., & Pauly, D. (2010). A bottom-up re-estimation of global fisheries subsidies. *Journal of Bioeconomics*, *12*(3). https://doi.org/10.1007/s10818-010-9091-8

Sumberg, J., Jatoe, J., Kleih, U., & Flynn, J. (2016). Ghana's evolving protein economy. *Food Security*, *8*(5), 909–920.

Sundar, S., Tripathi, A., & Naresh, R. (2018). Does Unemployment Induce Crime in Society? A Mathematical Study. *American Journal of Applied Mathematics and Statistics*, *6*(2).

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Tacon, A. G. J., & Metian, M. (2015). Feed matters: Satisfying the feed demand of aquaculture. *Reviews in Fisheries Science and Aquaculture, 23*(1). https://doi.org/10.1080/23308249.2014.987209

Taherdoost, H. (2018). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3205040

Taimur, F. M. (2015). *Marine protected areas in Bangladesh: A perspective on governance and management*. United Nations – The Nippon Foundation Fellowship Programme.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, *2*, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Thanh, T. V., Dinh, H. T., Le, Q. T., & Garschagen, M. (2020). Marine resource dependency and coastal community resilience in Vietnam. *Ocean & Coastal Management*, *193*, 105236.

Thebaud, O., Macher, C., Charrier, G., Alban, F., & Philippe, M. (2023). *Marine protected areas as living labs: Lessons learned and future perspectives*.

Thilsted, S. H., Thorne-Lyman, A., Webb, P., Bogard, J. R., Subasinghe, R., Phillips, M. J., & Allison, E. H. (2016). Sustaining healthy diets: The role of capture fisheries and aquaculture for improving nutrition in the post-2015 era. *Food Policy*, *61*. https://doi.org/10.1016/j.foodpol.2016.02.005

Tidball, K., & Stedman, R. (2013). Positive dependency and virtuous cycles: From resource dependence to resilience in urban social-ecological systems. *Ecological Economics*, *86*. https://doi.org/10.1016/j.ecolecon.2012.10.004

Tilley, A., Byrd, K. A., Pincus, L., Klumpyan, K., Dobson, K., dos Reis Lopes, J., & Shikuku, K. M. (2022). illey, A., Byrd, K. A., Pincus, L., Klumpyan, K., Dobson, K., dos Reis Lopes, J., & Shikuku, K. M. (2022). A randomised controlled trial to test the

Digitized by Sam Jonah Library

effects of fish aggregating devices (FADs) and SBC activities promoting fish consumption in Timor-Leste: A study protocol. Plos one, 17(7), e0269221. *PLOS ONE*, *17*(7), e0269221.

Torell, E., McNally, C., Crawford, B., & Majubwa, G. (2017). Coastal Livelihood Diversification as a Pathway Out of Poverty and Vulnerability: Experiences from Tanzania. *Coastal Management*, *45*(3). https://doi.org/10.1080/08920753.2017.1303718

Toropova, C., Kenchington, R., Vierros, M., & Meliane, I. (2010). Benefits and challenges of MPA strategies. In *Global ocean protection: Present status and future possibilities*.

Tumiran, M. A. (2024). How to deal with insufficient sample size due to non-response in surveys? *Quantum Journal of Social Sciences and Humanities*, *5*(2), 70–86.

Twichell, J., Pollnac, R., & Christie, P. (2018). Lessons from Philippines MPA Management: Social Ecological Interactions, Participation, and MPA Performance. *Environmental Management*, *61*(6). https://doi.org/10.1007/s00267-018-1020-y

United Nations. (1982). *United Nations Convention on the Law of the Sea*. https://www.un.org/depts/los/convention_agreements/text/unclos/unclos_e.pdf

United Nations Development Programme [UNDP]. (2007). *Ahanta West District human development reports: Vulnerability and attainment of MDGs at local level*.

United Nations Educational Scientific and Cultural Organization [UNESCO. (1972). *Convention concerning the protection of world cultural and natural heritage*.

United Nations Educational Scientific and Cultural Organization [UNESCO]. (2017). *A new roadmap for the Man and the Biosphere (MAB) Programme and its World Network of Biosphere Reserves – MAB Strategy 2015–2025*.

Digitized by Sam Jonah Library

United Nations Environment Programme – Nairobi Convention Secretariat, & W. I. O. M. S. A. (2021). *Western Indian Ocean marine protected areas outlook: Towards achievement of the global biodiversity targets*.

United Nations Environment Programme [UNEP]. (2014). *Convention for cooperation in the protection, management and development of the marine and coastal environment of the Atlantic coast of the West, Central and Southern Africa Region*.

United Nations Environment Programme (UNEP). (2019). *Global environment outlook 6: Healthy planet, healthy people*.

United Nations General Assembly. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development (A/RES/70/1)*.

United Nations [UN]. (1979). *Convention on the conservation of migratory species of wild animals (Bonn Convention or CMS)*. University of Oslo – Jus.Uio.No.

United States Agency for International Development [USAID]-University of Rhode Island [URI]. (2013). *Solving the Fisheries Crisis in Ghana: A Fresh Approach to Collaborative Fisheries Management. USAID-URI Integrated Coastal and Fisheries Governance (ICFG) Initiative.*

University of British Columbia. (2017). *Gwaii Haanas National Park Preserve*.

Vallury, S., Shin, H. C., Janssen, M. A., Meinzen-Dick, R., Kandikuppa, S., Rao, K. R., & Chaturvedi, R. (2022). Assessing the institutional foundations of adaptive water governance in South India. *Ecology and Society*, *27*(1). https://doi.org/10.5751/ES-12957-270118

Vanclay, F. (2003). International principles for social impact assessment. *Impact Assessment and Project Appraisal*, *21*(1). https://doi.org/10.3152/147154603781766491

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Vilas, D., Coll, M., Corrales, X., Steenbeek, J., Piroddi, C., Calò, A., Di Franco, A., Font, T., Guidetti, P., Ligas, A., Lloret, J., Prato, G., Sahyoun, R., Sartor, P., & Claudet, J. (2020). The effects of marine protected areas on ecosystem recovery and fisheries using a comparative modelling approach. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *30*(10). https://doi.org/10.1002/aqc.3368

Voyer, M., Gladstone, W., & Goodall, H. (2012). Methods of social assessment in Marine Protected Area planning: Is public participation enough? *Marine Policy*, *36*(2). https://doi.org/10.1016/j.marpol.2011.08.002

Voyer, M., Gladstone, W., & Goodall, H. (2015). Obtaining a social licence for MPAs– influences on social acceptability. *Marine Policy*, *51*, 206–266.

Waibel, M. (2015). *Mauritius v. UK: Chagos Marine Protected Area unlawful*. EJIL: Talk!

Walmsley, S. F., & White, A. T. (2003). Influence of social, management and enforcement factors on the long-term ecological effects of marine sanctuaries. *Environmental Conservation*, *30*(4). https://doi.org/10.1017/S0376892903000407

Wells, S., Ray, G. C., Gjerde, K. M., White, A. T., Muthiga, N., Bezaury Creel, J. E., Causey, B. D., McCormick-Ray, J., Salm, R., Gubbay, S., Kelleher, G., & Reti, J. (2016). Building the future of MPAs – lessons from history. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *26*. https://doi.org/10.1002/aqc.2680

Wilson, K., Pressey, R. L., Newton, A., Burgman, M., Possingham, H., & Weston, C. (2005). Measuring and incorporating vulnerability into conservation planning. In *Environmental Management* (Vol. 35, Number 5). https://doi.org/10.1007/s00267-004-0095-9

Wood, A. (2017). *Strength in numbers: Building community investment in Monterey Bay National Marine Sanctuary*.

World Bank Group. (2020). *Ghana country environmental analysis*.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Xue, S., & Wang, Z. (2013). Protection and exploitation of marine resources based on sustainable development. *Chinese Fisheries Economics*, *31*(6), 152–156.

Yamane, Y. (1967). *Mathematical formulae for sample size determination.*

Yanda, P. Z., Mwajombe, A. R., & Gwambene, B. (2023). Coastal communities' livelihoods conditioned by resource use dynamics and changing environments in Lindi Region, South-Eastern Tanzania. *Marine Policy*, *150*. https://doi.org/10.1016/j.marpol.2023.105532

Young, E. R., & Bilgre, B. (2002). *Hol Chan Marine Reserve management plan*.

Young, T. R. (2007). Background paper 5: The legal framework for MPAs and successes and failures in their incorporation into national legislation. In *Report and documentation of the expert workshop on marine protected areas and fisheries management: Review of issues and considerations, Rome, 12–14 June 2006, FAO Fisheries Report No. 825* (p. 221). Food and Agriculture Organization of the United Nations.

Zaldívar-Jiménez, A., Ladrón de Guevara-Porras, P., Pérez-Ceballos, R., Díaz-Mondragón, S., & Rosado-Solórzano, R. (2017). US-Mexico joint gulf of Mexico large marine ecosystem based assessment and management: Experience in community involvement and mangrove wetland restoration in Términos lagoon, Mexico. In *Environmental Development* (Vol. 22). https://doi.org/10.1016/j.envdev.2017.02.007

Zapata, C. (2005). *Between conflict and collaboration: Participatory management in the Galápagos Marine Reserve. Systematization, evaluation and success factors of the participatory model [Informe entre el conflicto y la colaboración: El manejo participativo en la Reserva Marina de Galápagos. Sistematización, evaluación y factores de éxito del modelo participativo]*. FUNDAR Galápagos.

Digitized by Sam Jonah Library

Zucconi, M. G., Opazo, F., & Navarrete, S. A. (2024). Assessing the efficiency of the marine protected area systems in the southeastern Pacific. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *34*(12), e70032.

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

APPENDICES

APPENDIX A: INTERVIEW PROTOCOL

POTENTIAL SOCIO-ECONOMIC IMPACTS OF ESTABLISHING MARINE PROTECTED AREAS IN THE WESTERN REGION OF GHANA

Date……………………….. **Community…………………………...**

This is an academic research conducted by Vanessa Ofoliorkor Blessyn, an MPhil student from the University of Cape Coast. The study seeks to generate insights into how the establishment of Marine Protected Areas (i.e., designated areas of the ocean where human activities are restricted or managed for the conservation of marine resources) in the Western Region may affect communities socially and economically. The findings of this study will inform decision-making and enhance the well-being of coastal communities while promoting environmental conservation. Simply answer as well as you can, and know that your answers will be kept confidential. Your participation in this study is expected to last approximately 60 minutes.

PART 1: DEMOGRAPHIC CHARACTERISTICS

1. Age of respondent: ……………………………….
2. Sex of the respondent:

   a. Male [ ] b. Female [ ] c. Prefer not to disclose [ ]
3. Educational level Completed:

   a. No formal education [ ] b. Basic level [ ]

   c. Secondary/Vocational [ ] d. Tertiary [ ]

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

4. Marital status of the Respondent:

   a. Single [ ] b. Married [ ] c. Divorced [ ] d.Separated [ ]

   e. Widowed [ ] f. Cohabiting [ ] Other ………..

5. Ethnicity:

   a. Fante [ ] b. Nzema [ ] c. Ahanta [ ]

   d. Ga [ ]. e. Ewe [ ] Other:………………………………………..

6. Do you hail from this community: Yes [ ] No [ ]

   i. If No, specify how long you have lived in this community: ...…………years.

PART 2: Measuring Marine Resources Dependence

7. What is/are your occupation (s)? (Tick all that apply)

   Fishing [ ] Fish processing [ ]

   Fish trading [ ] Farming [ ]

   Aquaculture [ ] Transport business [ ]

   Tourism operation [ ] Carpentry [ ]

   Shop attendant [ ] Other………………………………

   i. Kindly indicate which of your occupations is your main source of income.

   ………………………………………………………………………………………

8. How many years have you been engaged in marine-related activities?..............................

9. How many years of experience do you have in other occupational activities?..

10. What is your estimated monthly income from marine-related activities (GHS)?..

Digitized by Sam Jonah Library

11. What is your estimated monthly income from your other occupational activities (GHS)?..

12. What is your household size?

    a. 1-5 [ ] b. 6-10 [ ] c. 11-15 [ ] d. Above 15 [ ]

    a. How many people depend on you for a living? ………………………………….

13. How many of your household inhabitants contribute economically?...................................

14. On average, how much is your monthly household monetary expenditure (e.g. food, rent, education, healthcare, clothing, etc.)?

    …………………………...

15. How often can you afford to cover all your essential needs?

    Always [ ] Sometimes [ ] Rarely [ ] Never [ ]

16. Are you able to save? Yes [ ] No [ ]

    a. If yes, then how much?...

    b. What is your primary source of financial services for savings and credit?

       Local bank or financial institution [ ] Informal savings group or scheme [ ]

       Family or social network [ ] Village Savings Loan Associations [ ]

       Other:…………………………………………………………………………

17. How often can your household afford 3 square meals a day?

    Always [ ] Sometimes [ ] Rarely [ ] Never [ ]

18. How many days a week does your household consume fish?

    .... days a week

19. How many days a week does your household consume shellfish?

    .... days a week

Digitized by Sam Jonah Library

20. Do you have the following social networks? (Tick all that apply.)

    Extended and nuclear family network [ ] Friendship network [ ]

    None [ ]

21. How would you rate your household's standard of living compared to other households in your community?

    Much lower [ ] Somewhat lower[ ] About the same[ ]

    Somewhat higher [ ] Much higher[ ]

22. Are your community's cultural practices or traditions closely linked to the marine environment?

    Yes [ ] No [ ] Not sure [ ]

    If yes, kindly mention:……………………………………………………………

23. How important are these practices to your community's identity and way of life?

    Not Important [ ] Slightly Important [ ] Moderately Important [ ]

    Very Important [ ] Extremely Important [ ]

24. How many locations are accessible for your marine-related activities (Indicate the number and the name (s) of the specific locations in the space provided)?

    Indicate number of locations………………………………………………………………..

    Mention:…………………………………………………………………………..

25. Have you participated in any community-based activity or engagement to manage or protect marine resources?

    Yes [ ] No [ ]

26. Have you received any support or assistance from these groups for your marine-related work? (Tick all that apply)

    Family [ ] Government Agencies [ ]

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

CSOs/NGOs [ ] Academic institutions [ ]

Community initiatives [ ]

27. Are you a member of any social organisation/association that supports livelihood activities? Yes [ ] No [ ]

    If yes, how many ?..

28. Have you received any subsidies to support your livelihood? Yes [ ] No[ ]

    i. If yes, how many? ……………………………………..

PART 4: Perception of the Proposed Marine Protected Area (MPA) Establishment

29. How important do you think it is to protect marine environments?

    Not Important [ ] Slightly Important [ ] Moderately Important [ ]

    Very Important [ ] Extremely Important [ ]

    a. Kindly explain why you chose that rating.

    ………………………………………………………………………………….

30. How familiar are you with the concept of Marine Protected Areas (MPAs)? MPAs are designated areas of the ocean where certain human activities are restricted to protect marine life and habitats.

    1 - Not familiar at all [ ] 2 - Somewhat familiar [ ]

    3 - Moderately familiar [ ]

    4 - Familiar with the concept and its general purpose [ ]

    5 - Very familiar with MPAs and their specific functions [ ]

31. Are you aware of the proposal to establish an MPA in this area?

    Yes [ ] No [ ]

    i. If yes, how did you hear about it?

    Community Meeting [ ] Information Centre [ ]

    Media [ ] NGOs [ ]

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Traditional Leader/Chief fisherman [ ] Government officials [ ]

Other…………………

32. What do you think is the main purpose of MPAs?

    Increase fish catch [ ] Habitat Protection [ ]

    Promote sustainable fishing practices [ ] Biodiversity Protection [ ]

    Other…………………………………………………

33. Have you been involved in any consultations or discussions related to MPA establishment?

    Yes [ ] No [ ]

34. On a scale of 1 to 5, how willing would you be to support the establishment of a Marine Protected Area (MPA) in your area?

    1- Strongly Opposed [ ] 2 – Somewhat Opposed [ ] 3 – Neutral [ ]

    4 – Somewhat Supportive [ ] 5 - Strongly Supportive [ ]

35. On a scale of 1 to 5, to what extent do you think the MPA establishment would affect your day-to-day activities?

    1- Not affected at all [ ] 2 – Slightly affected [ ]

    3 – Moderately affected [ ] 4 – Significantly affected [ ] 5 – Greatly affected [ ]

Part 4: Strategies to Minimise Potential Negative Impacts

36. What suggestions do you have to minimise any potential negative impacts associated with establishing MPAs?

    Implementing compensation support schemes for affected individuals [ ]

    Enhance skills through training programmes [ ]

    Improve access to financial services [ ]

    Strengthen community-based organisations [ ]

    Engaging in collaborative decision-making processes [ ]

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

Strengthen enforcement of existing marine regulations [ ]

Implement educational programmes to raise awareness about MPA and its benefits [ ]

Other (specify): ……………………………………………………………………

37. What potential livelihood or income-generating opportunities do you see associated with the proposed MPA establishment? (please list)

……………………………………………………………………………………

……………………………………………………………………………………

38. If the proposed MPA limits your current livelihood activities, what income generation activity are you likely to resort to?

……………………………………………………………………………………

……………………………………………………………………………………

39. What support do you think your community would need to effectively adapt to the potential changes brought about by the MPA?

Financial assistance to access more distant fishing grounds [ ]

Technical training and assistance to use different fishing techniques [ ]

Infrastructure development [ ]

Access to alternative/supplementary livelihood opportunities [ ]

Other (specify):……………………………………………………………………

40. How can the local community be actively involved in the planning and management of MPAs to ensure their interests are represented?

Participating in decision-making processes [ ]

Engaging in monitoring and enforcement activities [ ]

Contributing traditional knowledge and practices [ ]

Other:………………………………

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

41. Do you have any more concerns to share about the MPA establishment? Please describe:

…………………………………………………………………………………………

…………………………………………………………………………………………

Thank you for your time!

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

APPENDIX B: FOCUS GROUP DISCUSSION GUIDE

POTENTIAL SOCIO-ECONOMIC IMPACTS OF ESTABLISHING MARINE PROTECTED AREAS IN THE WESTERN REGION OF GHANA.

Date……………………….. **Community………………………...**

FOCUS GROUP DISCUSSION (FGD) GUIDE

Introduction

Welcome the participants and thank them for their participation. Introduce yourself, the purpose of the study and the significance of their participation in the Focus Group Discussion.

Background of participants

Ask participants to briefly introduce themselves (name, occupation, and their connection to the community or marine space).

Discussion Prompts/Questions:

1. **What is the perception regarding efforts to establish nearshore Marine Protected Areas in the Western Region of Ghana**
    - What type of fishing/processing method is often done here?
    - What has been the trend of fishing landings in the past 10 years, 5 years, 2 years, & 1 year (the fish type and the trend: Very low, Low, Moderate, High, Very High)
    - Are you aware of the proposal to establish a nearshore MPA in the Western Region, and what do you understand about the purpose of the MPA?
    - How do you feel about the level of community involvement in the planning of the MPA?
    - What opportunities or benefits do you believe MPAs could bring to your community?

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

- What role do you see MPAs playing in the sustainable management and conservation of marine resources (Impact on the Marine environment, i.e. life and habitat)?
- What concerns/expectations do you have about the MPA?

2. What are the potential social and economic impacts of establishing MPAs?

- What cultural practices and values in your community are closely linked to the marine environment? (How important are they to your identity/way of life?)
- How might the MPA impact these cultural/traditional practices?
- How would you describe the sense of community and social cohesion here? Do you think MPAs could affect community cohesion/relationships (conflicts, migration patterns, distribution of resources)?
- How do you anticipate MPAs might impact social infrastructure and services within the community?
- Which groups (Gender, Age group) are likely to be impacted the most by the MPA?
- How do you think the MPA establishment would impact food security (Fish stocks) in the community (in the short and long term)?
- How do you think MPA could impact household income and economic stability?
- What economic implications do you foresee for local businesses and livelihoods with the establishment of MPAs (e.g., investments, developments, better public services)?
- Do you foresee any opportunities for economic growth or diversification?
- What alternative livelihood options would you consider if access to marine resources is restricted?

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

3. **What measures can be put in place to tackle the identified socioeconomic challenges likely to be posed by the MPA establishment?**

    - How adaptable do you think your community is to changes in resource availability?
    - What training or resources would help your community adapt to the MPA?
    - What strategies or support could help mitigate any potential negative impact?
    - What role do you think the community could play in the planning, management, and governance of MPAs (e.g., co-management, community-managed, state and developing those strategies)?
    - Do you think the community will comply with the rules and regulations of the MPA once it is established?

Closing

Offer participants the opportunity to provide additional comments or suggestions on the topic. Confirm confidentiality and anonymity of response, and then express appreciation for their time and contribution to the discussions.

Contact information for any follow-up questions or further engagement: +233 551759587

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

APPENDIX C: RESOURCE DEPENDENCE INDEX INDICATORS

Definitions, variables comprising each indicator, measurement methods, and calculation procedures.

Indicator	Variable	Measurement	Calculation
Natural capital sub-index			
Allotment ownership	Dwelling ownership	Presence/absence of allotment ownership	Yes =1 No =0
Access to fishing areas	Distinct fishing areas or communities utilized for fishing	Number of fishing areas regularly accessed by the respondent	Access to fishing areas ∑ Fishing areas used
Human Capital sub-index			
Education level	Educational level of the respondent	Completed Educational level	0 = No formal Education 0. 33= Basic Education 0.67= Secondary School 1 = Tertiary
Fishing labour Relevance	Years working in marine resources related activities (a)	Years working in marine resources related activities	Fishing Labor relevance=a/b
	Years working in economic activities (both marine-related and not marine-related) - (b)	Total years of experience in all economic activities carried out	
Social capital sub-index			
Informal social capital	Family network (a)	Presence/absence of support from the family network	Yes =1 No =0 Informal social capital=a + b + c + d
	Friendship network (b)	Presence/absence of support from the friendship network	
	Communal work (c)	Participation in community activities related to the marine resource environment.	
	Support from community actions (d)	Community support actions	
Formal social capital		Membership to formal social organizations/associations	

Digitized by Sam Jonah Library

University of Cape Coast https://uir.ucc.edu.gh

	Memberships to social institutions		Yes =1 No =0
Economic capital sub-index			
Work independency	Number of labor activities unrelated to the resource	Number of labor activities unrelated to the resource	Work independency =∑Marine resource unrelated labor activities
Subsidies	Subsidies received	The presence or absence of subsidies	Yes =1 No =0
Expenditure	Monthly expenditure	Monthly monetary expenditure	Household monthly monetary expenditure
Food dependency	Monthly fish intake	Number of days of fish-shellfish consumption	Food dependency = Number of days of fish − shellfish intake/ 30

Digitized by Sam Jonah Library