SWIOTUNA
South West Indian Ocean Tuna Forum

THE STATUS, ACHIEVEMENTS AND IMPACTS OF COLLABORATIVE FISHERIES MANAGEMENT APPROACHES IN THE SWIO REGION

A report by the South West Indian Ocean Tuna Forum (SWIOTUNA)

FINAL CONSULTANCY REPORT

THE STATUS, ACHIEVEMENTS AND IMPACTS OF COLLABORATIVE FISHERIES MANAGEMENT APPROACHES IN THE SWIO REGION

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Disclaimer

Views and opinions expressed herein in this report are those of the author and do not necessarily reflect the views of SWIOTUNA, reviewers or any other parties.

List of acronyms and abbreviations

BMU:	Beach Management Unit
BV:	Blue Ventures
CCP:	Community Fisheries Councils
CMAs:	Co-management Areas
EAWLS:	East Africa Wildlife Society
EEZ:	Exclusive Economic Zone
FAO:	Food and Agricultural Organization of the United Nations
FFI:	Flora and Fauna International
GDP:	Gross Domestic Product
ICZM:	Integrated Coastal Zone Management
IOC:	Indian Ocean Commission
IOTC:	Indian Ocean Tuna Commission
IUU:	Illegal, Unreported, Unregulated
KCWA:	Kuruwitu Conservation and Welfare Association
KeFS:	Kenya Fisheries Service
KNBS:	Kenya National Bureau of Statistics
LME:	Large Marine Ecosystem
LMMAs:	Locally Managed Marine Areas
MLFD:	Ministry of Livestock and Fisheries Development
NMCI:	Northern Mozambique Channel Initiative
PFC:	Periodic Fisheries Closure
RUMAKI:	Rufiji, Mafia, Kilwa
SWIO:	South West Indian Ocean
SWIOFC:	South West Indian Ocean Fisheries Commission
SWIOFP:	South West Indian Ocean Fisheries Project
SWIOTUNA:	South West Indian Ocean Tuna Forum
TCZCDP:	Tanga Coastal Zone Conservation and Development Programme

TNC:	The Nature Conservancy
UNDP:	United Nations Development Programme
VA:	Velondriake Association
VICOBA:	Village Community Banking Association
WCS:	Wildlife Conservation Society
WWF:	World Wide Fund for Nature

Definition of terms and concepts

Artisanal fishery: This is small-scale fishery whereby fishing operations employ traditional, low-cost technologies and low capital investment both for local consumption and commercial purpose

Beach Management Unit (BMU): This is an organization of fishers, fish traders, boat owners, fish processors and other beach stakeholders who traditionally depend on fisheries activities for their livelihoods

Co-management: This is an arrangement where the management of fisheries resources involve fisherfolk and the government agencies. It is a shared responsibility between the government, other stakeholders and the fisherfolk (community) in sustainable management of fisheries resources. The government entities include national fisheries management authorities, fisheries research institutions while the fisherfolk and other stakeholders on the other hand include the boat owners, fishers, fish traders, beach operators, tourist enterprises (Grilo, 2015; Baticados and Agbayani, 2000; Pomeroy, 2001). For the purpose of this report, collaborative fisheries management and co-management will be used collectively and interchangeably to mean the same thing though we appreciate the difference in their daily usage.

Community Fisheries Council (CCPs): A local co-management structure established under the Marine Fisheries Regulations, 2003 (in Mozambique) with responsibility of supporting the sustainable management of the artisanal fisheries resources and with the right to establish the boundaries of the fishing area of the community, develop use and access rights (Swennenhuis, 2011).

Exclusive Economic Zone (EEZ): This is provided for in Article 55 of the United Nations Convention Law on the Sea (UNCLOS) defines EEZ as area adjacent and beyond territorial sea to a distance 200 nautical miles.

Fisher: An individual who takes part in fishing.

Fisheries Governance: This is the sum of the legal, social, economic and political arrangements used to manage fisheries. It has international, national and local

dimensions. It includes legally binding rules, such as national legislation or international treaties as well as customary social arrangements (http://www.fao.org/fishery/topic/12271/en

Illegal, Unreported, Unregulated (IUU) Fishing: This refers to fishing activities in the areas under the jurisdiction of a state regulation without the permission of that state, or in contravention of its law and regulation, fishing in waters managed by Regional Fisheries Management Organizations (RFMOs) in contravention of conservation and management adopted by that RFMO by vessels flying the flag of members and cooperating non-members, non-members, vessels without nationality, and fishing entities; mis-reporting, under-reporting and none-reporting of catch in national waters and in RFMO areas; and fishing in areas where and for fisheries in which there are no applicable regulations (IPOA-IUU, 2001).

Joint Co-Management Area: This is an area co-managed by more than one Beach Management Unit (BMU).

Locally Managed Marine Areas: This is an area coastal waters with resources therein that is largely or wholly managed at a local level by the coastal communities, land-owning groups, partner organizations, and/or collaborative government representatives who reside or are based in the immediate area, with some form of protection and regulation (Odote *et al*., 2015; Govan *et al*., 2008).

Small-scale fisheries: Labour-intensive fisheries using relatively small crafts (if any) and little capital and equipment per person-on-board. Most often family-owned (FAO, 2005).

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THE STATUS, ACHIEVEMENTS AND IMPACTS OF COLLABORATIVE FISHERIES MANAGEMENT APPROACHES IN THE SWIO REGION

1.0 INTRODUCTION

The main aim of this report is to establish the status and achievement of co-management, contribute to the development of successful fisheries co-management in the SWIO region and share lessons learned from previous and existing interventions. The information generated in this report will be of invaluable contribution to the own going fisheries co-management interventions and future work on this topic. There are various fisheries co-management initiatives in the SWIO region supported by both government and non-governmental entities.

The report draws on consultations with a range of stakeholders involved in fisheries co-management initiatives include e.g., the fisherfolk, government agencies, civil society organizations, the private sector and development partners. The report is further informed by extensive literature sourced from secondary sources. The main target audience for this report include but not limited to the following, government policy makers, fisheries managers, technicians, fisherfolk, development partners and conservationists.

The report is divided into 10 main sections. Section 1 of this report gives the background and context of collaborative fisheries management in the SWIO region. Section 2 defines the purpose and objectives of this assignment including the major tasks. Section 3 describes the methodology and implementation of the project. Section 4 presents the findings of this study. Case studies from Kenya, Mozambique, Tanzania and Madagascar are described in Section 5. The achievements and impacts of collaborative fisheries management interventions are presented in Section 6. Some of the development partners that are supporting collaborative fisheries management in Kenya, Tanzania, Mozambique and Madagascar are highlighted in Section 7. Constraints to collaborative fisheries management are discussed in Section 8. Lessons learnt and success factors are presented in Section 9. Section 10 details the recommendations to improve collaborative fisheries management in the SWIO region.

1.1. Background and Context

The South West Indian Ocean (SWIO) region is one of the most biologically diverse and productive systems, including fisheries. Over 60 million people live within the 100 km of the coast, where they are engaged in different socio-economic activities, namely fishing, maritime trade and use of marine based assets. The economic value of the Western Indian Ocean assets is estimated at USD 20.8 billion, though this figure is conservative.

Small scale fisheries play an important role in providing food and nutritional security, source of income and revenue, employment opportunities among others. Small scale fisheries contribute over 50% of the total fisheries production while accounting for only 13% of the total fisheries value. Nevertheless, small-scale fishing communities are characterized with high poverty levels, unsustainable fishing practices and poor fisheries governance.

There are various initiatives that have been put in place to promote sustainable use, development and management of small-scale fisheries. These efforts have been promoted by national fisheries management authorities in the respective SWIO range states, regional fisheries management bodies (namely the South West Indian Ocean Fisheries Commission-SWIOFC and the Indian Ocean Tuna Commission-IOTC), regional projects namely the Smartfish and SWIOFISH (Indian Ocean Commission-IOC); WWF (SWIO regional fisheries programme, Northern Mozambique Channel Initiative-NMCI, The Coastal East Africa Initiative) South West Indian Ocean Fisheries Project(SWIOFP) and the Large Marine Initiatives(LMEs) as well as development partners and local communities.

Improving small- scale fisheries and active involvement of local communities in managing marine resources has been the key focus for national and regional fisheries management authorities. National fisheries policies, legislative and institutional frameworks and increasingly recognizing the role of local communities in the management of fisheries through collaborative management (co-management). The concept of collaborative fisheries management entails local communities working together with the relevant fisheries management entities to deliver on effective fisheries management for improved governance of coastal and marine resources to ensure stock sustainability for increased socio-economic benefits to the people and the country. Collaborative management therefore is a shared responsibility between the government agencies and the fishery stakeholders.

Collaborative fisheries management or resemblance of the same bears distinctive features in the respective SWIO range states. In Kenya and Tanzania for instance, Beach Management Units (BMUs) are the grass-root community-based institutions with clear roles and mandates as provided in the National fisheries legislation. The BMU (Beach Management Fisheries) Regulations 2007 (now under review) provides for the establishment of BMUs and fisheries co-management areas (CMAs) in Kenya. Co-management areas (CMAs) are distinctive areas in which BMUs undertake fisheries management jointly with the government agencies. In Madagascar, the concept of co-management is enshrined in Locally Managed Marine Areas (LMMAs) whereas in Mozambique it practiced through fishing resource management committees.

Although collaborative fisheries management has yielded positive results with impact on scale, there remains some challenges to be addressed in order to make this model effective. It is understood that SWIOTUNA is seeking the services of a consultant to assess the impact and effectiveness of co-management in the SWIO region. The study will identify the remaining challenges, lessons learnt and recommendations for addressing the gaps.

1.2 Geographical Scope

The geographical scope of this consultancy was limited to the South West Indian Ocean (SWIO) range states. It is not clear from the TOR the coverage of the countries in the SWIO region. The SWIO region is broad and may be defined within the context of the Nairobi Convention and the South West Indian

Ocean Commission (SWIOFC). The Nairobi Convention has 10 member states who include Somalia, Kenya, Tanzania, Mozambique, South Africa, Seychelles, Comoros, Mauritius, France and Madagascar. The SWIOFC on the other hand has 12 member states who include Comoros, France, Kenya, Madagascar, Maldives, Mauritius, Mozambique, Seychelles, Somalia, South Africa, United Republic of Tanzania and Yemen. For the purpose of this assessment, the geographical scope will consider the Nairobi Convention Member states as the SWIO region. However, the assessment laid more focus on four countries, namely Kenya, Tanzania, Mozambique and Madagascar (See Figure 1) as provided for in the TOR "Work to be conducted by the consultant, No. 3". These are the countries that WWF has local presence and with strong collaborative fisheries management initiatives on the ground supported by WWF, Blue Ventures and other partners. This approach was more cost effective since the objectives, roles and functions of co-management system regardless of the countries and regions involved are more less the same. The only difference could be the policy, legislative and institutional frameworks of their parent government national entities under which they operate.

The outcome of this study will certainly inform adaptive and effective fisheries co-management strategies not only in the case study countries but the entire SWIO region and beyond.

1.3 Project Administration and Execution Arrangements

The consultant had the overall responsibility in managing and implementing the project. The Client appointed SWIOTUNA Coordinator to oversee and facilitate the day-to-day administration and management of the consultancy. This work was coordinated across the all the countries to ensure the delivery of the desired results as obligated by the contractual agreement. The SWIOTUNA Coordinator provided support to the consultancy including writing a letter of introduction to the relevant agencies/ authorities whenever required, facilitating access to relevant information and documents from the different individuals, experts and institutions.

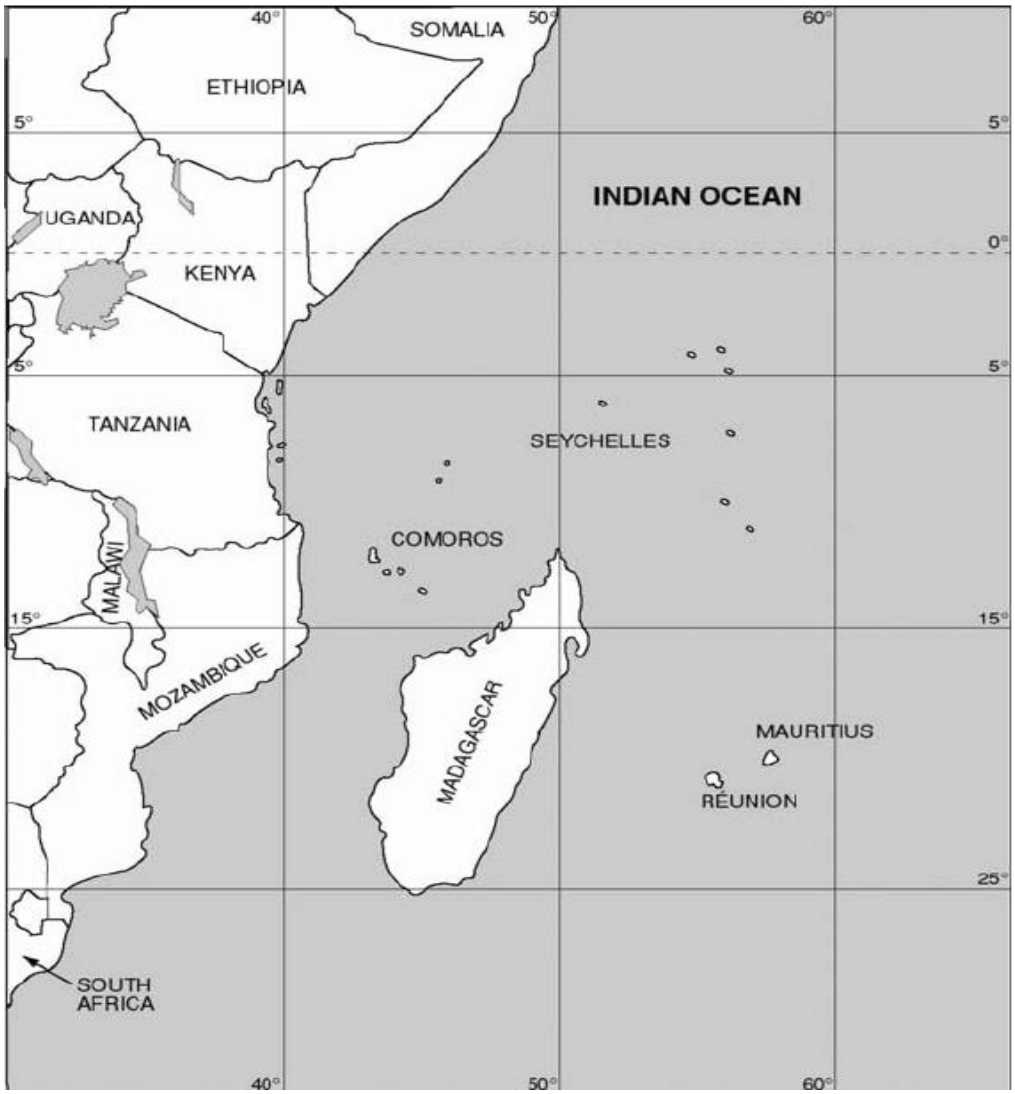

Figure 1: The South West Indian Ocean range states (source: Kiszka *et al.*, 2009).

2.0 PURPOSE, OBJECTIVES AND SCOPE OF WORK

2.1 Purpose

The purpose of this assignment was to establish the status, achievements and impacts of collaborative fisheries management approaches in the SWIO region. The study was to help identify the constraints to effective co-management and as well as identify best practices for scaling out successful prototypes. The information generated from this assessment will certainly provide further insights in designing and adapting to new and innovative ways and tools for effective and sustainable co-management initiatives in the SWIO region. It is widely acknowledged that effective and efficient fisheries management tools and practices yield much dividends, including healthy fish stocks and net socio-economic returns to the respective local communities and countries.

2.2 Specific objectives

Specific objectives for this consultancy were to;

1. Identify impactful sustainable collaborative fisheries management interventions or its resemblance that are being implemented by the national fisheries management agencies, coastal communities and other non-state actors in the SWIO region.
2. Identify the barriers, challenges and constraints to effective and efficient collaborative fisheries management.
3. Define a set of strategies and recommendations that WWF, the relevant SWIO governments and development partners could implement to ensure effective and efficient all-inclusive sustainable collaborative fisheries management in the respective SWIO range states.

2.3 Scope of work and specific tasks

More specific tasks were assigned to this consultancy: - to assess the status, achievement and impacts of collaborative fisheries management in the SWIO region with a case study on four the states, namely Kenya, Tanzania, Mozambique and Madagascar. COVID 19 pandemic notwithstanding, the consultant was expected to undertake the following specific tasks;

1. Review existing information, reports, documents and data with regard to collaborative fisheries management in the SWIO region.
2. Conduct interviews with relevant CSOs and coastal communities, and visit some of the community based collaborative fisheries management initiatives in the select countries and sites in the SWIO region.
3. Capture photographs that will accompany the case studies on collaborative fisheries management in Kenya, Tanzania, Madagascar and Mozambique and have them appropriately presented in the report.
4. Identify and document best practices, experiences and/or interventions carried out by coastal communities in a collaborative fisheries management approach.
5. Collate, synthesize and package the information in the most appropriate way to produce the report that highlights the best practices and interventions implemented in a collaborative arrangement, main barriers and how these can be addressed.
6. Present to SWIOTUNA Secretariat the draft consultancy report for review and any feedback.

3.0 METHODOLOGY

The study employed a range of methodological approaches that included sourcing of both primary and secondary data/ information including desktop reviews, informal consultations, interviews and field visits to some of the select co-management areas.

3.1 Sourcing of Secondary data

This entailed desktop study and literature review on the topic of study whereby the websites of the key organizations and entities involved in fisheries and collaborative fisheries management in the respective countries and the entire SWIO region.

Literature review of relevant reports, research papers, technical reports, policy and strategic documents on fisheries and collaborative fisheries management were reviewed. This involved searching for the relevant records using key words such as fisheries co-management, collaborative fisheries management, community-based fisheries management, co-management in Kenya, Tanzania, Mozambique, Madagascar, Seychelles etc., collaborative fisheries management in the South West Indian Ocean region, lessons and impacts of collaborative fisheries management, importance of collaborative fisheries management. What is collaborative fisheries management.

The information in the documents was examined and screened for relevance before being downloaded and saved as softcopies in the laptop. Hard copies of the relevant documents including reports, research publications were also collected from relevant institutions websites namely Fisheries Departments in the respective SWIO range states, WWF, CORDIO-East Africa, COMRED, SWIOTUNA, Blue Ventures, East African Wildlife Society, Western Indian Ocean Marine Science Association, Wildlife Conservation Society, UNDP-Small Grants Programme. These organizations have pioneered work on collaborative fisheries management in the respective SWIO range states and as well as at the regional level. The documents were rated and assessed based on their relevancy, with a special focus collaborative fisheries management in the South West Indian Ocean.

3.2 Sourcing for primary data/ information

Two sets of questionnaire guide were used in the interviews and informal consultations with the relevant respondents. The questionnaire guides were pre-tested and fine-tuned before they were used in the consultations. The first questionnaire guide (Appendix 1) was administered to the groups and local communities (practitioners) that were implementing collaborative fisheries management initiatives on the ground. The second questionnaire (Appendix 2) was administered to the Civil Society Organizations (CSOs/ NGOs) supporting practitioners that were implementing collaborative fisheries management interventions in the countries where they had local presence. The questions were designed to capture important and specific aspects related to collaborative fisheries management in the respective countries and region (SWIO). The respondents were asked a series of questions (see appendices 1 & 2) designed to assess the extent of collaborative fisheries management initiatives in the SWIO region, impacts and important lessons that we can learn from them to inform improved management, scalability and future work.

Some limited field visits to some of the select co-management sites were conducted to ascertain and confirm various approaches and fisheries co-management interventions on the ground. Some limited consultative field visits were conducted to the BMU offices and areas of jurisdiction (landing sites), fish markets, fishing boats and relevant government offices for consultations and interactions with different fisheries related activities including fishing operations, law enforcement, licensing and fish trade where

local fishing communities were involved in one way or another. During this assessment, COVID 19 containment measures were observed.

The data gathered was used to respond to the following key questions relating to collaborative fisheries management.

3.3 Key questions and issues that guided the assessment.

Relevancy

- The extent to which the objectives of co-management interventions are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies.
- Evaluate the relevance of the co-management schemes, approaches and practices to the needs and priorities of the local communities.
- How the project design was developed? (Whether it was all inclusive and participatory and informed by some assessment or feasibility study, risk assessment, exit and sustainability aspects factored in the project design)
- Analysis of the implementation structures including enabling environment and active involvement of the main beneficiaries /local communities

Efficiency

- Analysis of how collaborative fisheries management has improved and enhanced sustainable fishing practices as well as fisheries management and governance on the ground.
- Evaluate the efficiency of collaborative fisheries management approaches and practices with regards to utilization of such as finances, equipment and human resources to achieve the intended objectives. This is from design and implementation phase to the present.
- How the co-management structures / institutions complied with donor/ funding agreements/ arrangements?
- Existing institutional arrangements and structures for collaborative fisheries management.
- The external and internal factors that may have influenced implementation of collaborative fisheries management (success and impediment factors).
- How the key actors/ partners respond to new developments and emerging issues?

Effectiveness

- The extent co-management has achieved the desired objectives and results that can be verified. Also highlights unexpected/ positive and negative results.
- Evaluate effectiveness of the organizational, administrative and governance arrangements for collaborative fisheries management.
- How effective is the data collection and monitoring systems through participatory and collaborative approaches? Including knowledge management and sharing.
- How is the data collected used to inform policy and sustainable management and development of the co-management areas?

Impact

- How impactful co-management has been to bring about the desired change on the long-term, including reduction of overfishing, unsustainable fishing practices and sustainable socio-economic returns to the local fishing communities.

- Evaluate the impact on of co-management on community livelihoods, including increased availability of fish, increased value of fish and income resulting from improved conservation and management of marine/fisheries resources (co-management areas).
- What are the positive and negative, expected and unexpected impacts of co-management on the target and beneficiary communities (intended and un-intended)? socio-economic and ecological/ecosystem.
- Analyze sustainability of innovative approaches and adoption of appropriate technology by the community with a view to strengthening effective and efficient co-management.
- Evaluate the positive achievements as well as negative aspects, challenges or issues that need to be addressed through adaptive management to strengthen and build effective and impactful co-management schemes for small-scale fisheries.

Sustainability

- The continuation of benefits from a development intervention after major development assistance has been completed, the probability of continued long-term benefits and the resilience to risk of the net benefit flows over time. What measures that have been put in place to ensure continued of the co-management interventions?
- Evaluate the extent of buy-in and degree of ownership and support from the local communities and other stakeholders, including the government agencies and development agencies. Behavioral change among the communities?
- Analyze the capacity of local institutions and beneficiary communities supported to continue with co-management interventions when external support come to an end. Whether the local communities have been adequately trained.
- Existence of exit strategy and sustainability plan in the event that external support comes to an end. Whether BMUs/ fisher associations have comprehensive business plan that are under implementation.
- Existence of partnerships and synergies to leverage technical and technological as well as financial resources to ensure sustainability of interventions and impacts.
- What are the risks and mitigation measures to sustainability?

Adaptability

- co-management adaptive measures over the past years and how effective they are.
- Response to new developments and emerging issues such as Covid19 pandemic, sustainable blue economy, circular economy, nature-based solutions, resilient agricultural food systems.

Lessons Learned

- what lessons can be drawn from the current co-management practices and taken onboard to improve and sustain effectiveness for future work in this space.
- What were the killer and success factors? Both internal and external.
- What worked well and why?
- What didn't work well and why?

The information and data collected was collated and synthesized to pick four (4) case studies that demonstrated good practices and experiences on collaborative fisheries management, namely;

1. Kuruwitu Conservation and Welfare Association (KCWA) in Kenya.
2. Rufiji – Mafia – Kilwa (RUMAKI) Seascape in the United Republic of Tanzania.
3. Velondriake Locally Managed Marine Area (LMM) in Madagascar.

4. Kwirikwidge fishing community in Angoche District in Mozambique.

The results from this study will certainly contribute to improved and effective fisheries co-management of the current and future interventions as well as scaling out.

4.0 FINDINGS

This report presents findings of the study on collaborative fisheries management in the SWIO region with specific case studies from Kenya, Tanzania, Mozambique and Madagascar. The four case studies demonstrate good practices and experiences on collaborative fisheries management although they vary in terms of geographical scope, area and years since their establishment. These are Kuruwitu Conservation and Welfare Association (KCWA) in Kenya; Rufiji – Mafia – Kilwa (RUMAKI) Seascape in the United Republic of Tanzania; Velondriake Locally Managed Marine Area (LMM) in Madagascar and Kwirikwidge fishing community in Angoche District in Mozambique. The details of each case study are described in the section below.

The study findings demonstrate some successful on the ground collaborative fisheries management practices safeguarding community livelihoods as well as providing innovative solutions to myriad challenges affecting coastal communities, ecosystems and resources therein. They illustrate co-creation and co-designing of innovative solutions to many challenges facing small scale fisheries management in the respective countries and the entire SWIO region.

Further the findings underscored the importance of the enabling success factors and enabling framework that promotes effective co-management in promoting sustainable fisheries within the broader context of blue growth pathways. Whereas there is some level of effort in strengthening effective collaborative fisheries management, more work needs to be done to empower local communities in owning and using coastal and marine resources under their areas of jurisdiction (co-management areas, locally managed marine areas, "tengefu").

Each case study presented in this report show some highly contextual good practice based on the local situation and include specific experiences, achievements and impacts. Challenges and barriers related to effective fisheries co-management as well as innovative solutions are highlighted.

In order for us to appreciate collaborative fisheries management, it is important to understand the role and contribution of small-scale fisheries in the economies of SWIO range states. The issues of small-scale fisheries seem to be similar across the SWIO region.

4.1 TOO BIG TO BE IGNORED: SMALL SCALE FISHERIES IN THE SOUTHWEST INDIAN OCEAN (SWIO) REGION

The SWIO region is an important biodiversity hotspot supporting diverse marine life and ecosystem services including food and livelihood security (ref). The SWIO coastal and marine ecosystems underpins the economies of many countries in the region. The economic value of coastal and marine assets in the SWIO region is estimated at US$333 billion with an annual gross marine product of above US$ 20.8 (WWF, 2017).

There are over 65 million people who inhabit/ live within the 100 km coastline across the SWIO region and derive their livelihood from the coastal and marine resources including fisheries (SWIOFC, 2018). Small scale fisheries contribute about 13% of the value of the fisheries sector in the economy of the region (SWIOFC 2018). In Kenya, small scale fisheries contributed about 0.5% of the Gross Domestic Product (GDP) (KNBS, 2020; Fisheries Department, 2019). It is largely artisanal and employ about 2 million people. In Seychelles and Mauritius, fisheries significantly contribute to the national economy accounting for 20% and 1.5% of their GDPs, respectively. The sector employs about 17%of the population in Seychelles. In Mauritius about 22,000 people are employed by the fisheries sector (Ref). In Tanzania small scale fisheries contribute about 1.4% of the GDP, offering employment opportunities

to 4 million people (Ref). The fisheries sector contributes about 7% of the GDP in Mozambique. Small scale fisheries accounted for 8% GDP in 2018 (World Bank, 2019).

Small scale fishers along the SWIO region rely heavily on fisheries for food, nutritional security, local trade and foreign exchange earnings. In the SWIO region, small scale fisheries contributed to over 80% of the fisheries production. Small scale fisheries in Africa employs over 95% of the fishers and provides over 90% of the fish consumed across the continent. In 2013 the fisheries sector in Africa employed over 12.3 million people of which 50% are fishers, 42% processors and 8% are fish farmers (FAO & NPCA, 2013).

Trading, small scale value addition and distribution of fish at the local regional and for export markets are some of the most important economic activities along the fisheries value chain. Women are also involved in the small-scale value addition of fish processing mainly in salting, drying, roasting and selling of fish and fisheries products. They are increasingly venturing in fishing activities. Some of the women own fishing boats and sometime hire crew to fish for them. They also wade and catch fish on foot in the shallow intertidal waters during the low tide.

4.2 CHALLENGES FACING THE SMALL-SCALE FISHERIES SECTOR IN THE SWIO REGION

Despite the contribution of mall scale fisheries in the national economies of the respective SWIO countries, the sector is faced with a number of challenges. These challenges among others include, open access, overharvesting; Illegal, Unreported and Unregulated (IUU) fishing, poor governance, marginalization of the sector, market based conditionalities and climate change.

Open access presents a great challenge to small scale fisheries stocks sustainability. The number of fishers, the type of fishing methods and the quantity of fish harvested is not controlled. This greatly contributes to the over exploitation of the small-scale fishery resources in the SWIO region (WIOMSA, 2016 regional state of the coast report). Considering that most small-scale marine fisheries resources are multi-species and multi-gear, noting that most communities rely on fish for food security, putting a cap on the quantity of fish to be harvested presents a socio- economic and political challenge. Nevertheless, personal alternative livelihood and innovative fisheries management approaches including rights-based system could be viable options. This is consistent with the FAO guidelines on small scale fisheries (AU-IBAR/NEPAD, 2014)

Overharvesting of small-scale fisheries is being experienced across the SWIO range states due to increasing fishing effort, illegal fishing and weak law enforcement. This is occasioned by inefficient human and technical capacity for Monitoring, Control and Surveillance (MCS) as well as weak institutional frame work, more specifically the national fisheries management organizations in the respective SWIO range states.

Illegal, Unreported and Unregulated (IUU) fishing entail fishing without permission, not reporting catches, ignoring catch limits, closed seasons and closed areas among others (WIOMSA, 2016; FAO, 2017; WWF, 2018). Most countries within the SWIO region have limited capacity to enforce national and international laws. IUU fishing has caused considerable loss to the SWIO countries amounting to some US$400 Million annually (WWF, 2015. In Africa, IUU fishing has resulted to economic loss of some US$ 1.5billion annually (AU-IBAR/ NEPAD, 2014; MRAG, 2005).

Poor governance is another key challenge facing small scale fisheries in the SWIO region. It is estimated that US$ 2b-US$ 5billion is lost annually in Africa due to mismanagement (AU-IBAR/NEPAD, 2014)

Small scale fisheries have been marginalized in many African countries. Semi-industrial and industrial fisheries are usually given high priority in many African countries including those in the SWIO region (Ref). Small scale fisheries usually experience budgetary limitations and attract low investment from

both internal and external development partners. National fisheries management agencies and communities have to be strategic and innovative in order to sustainably manage small scale fisheries within their limited resources hence collaborative fisheries management approach.

Market based conditionality including eco-labelling and certification schemes potentially presents non trade barriers to the fish trade. Most small-scale fisheries in the SWIO region are data poor and not sustainably managed. Markets especially from the developed economies especially the USA and Europe are increasingly demanding environmental credentials from where the sea food is sourced. There are a number of fisheries certification schemes namely, Marine Stewardship Council (MSC), Friends of the Sea and Naturland Association.

Climate change and its effects are already being felt in African fisheries. There is evidence of increased water temperatures, rising sea level and extreme weather events. Climate change may lead to difference in species distribution, structure and composition. There is need to build the adaptive capacity and resilience for coastal communities and ecosystems.

These challenges are some of the premise that have led to paradigm shift in the management of small-scale fisheries to embrace collaborative fisheries management. The concept and practice of collaborative fisheries management is discussed in the following chapters.

4.3 COMMON UNDERSTANDING OF THE CONCEPT COLLABORATIVE FISHERIES MANAGEMENT

Co-management is "an arrangement where resource users and the government share responsibility in the management of fishery resources or " a partnership arrangementin which government, the community/local resource users (fishers), externa agents (non-governmental organizations, academic and research institutions), and other fisheries and coastal resource stakeholders (boat owners, fish traders, money lenders, tourism establishments, among others) share the responsibility and authority for decision making over the management of a fishery resources (Pomeroy *et al.*, 1999)". The term ''co-management'' has been used for over a decade to refer to transitioning from a government or centralized natural resource management to that which involves resource users in decision-making and management. The term covers a variety of partnership arrangements between government, resource users and other stakeholders in which responsibilities and decision-making powers are shared in order to manage a resource. Co-management is a management tool which depends on the participation of the local communities in the management of the fishery resources. It is a solution to the problems of resource use conflicts as well as over exploitation since communities enhance a feeling of "ownership" among the communitymembers and motivate them to implement management and conservation measures.

It is an alternative management strategy that merges the interests of government to achieve efficiency and sustainability with local community concerns for self-governance and active participation. Although co-management arrangements have been implemented all over the world, and have been studied for a number of years, no single model of co-management has emerged. This is because of the different conditions, historical circumstances, needs and demands that exist within communities. Consequently, a diversity of partnership arrangements exist which are characterized by various degrees of responsibility and power sharing between the stakeholders. These range ''from those in which the fishers (or other resource users) are consulted by the government before regulations are introduced to those in which the fishers (or other resource users) design, implement and enforce rules with advice from the government''. The main objective of co-management is to develop a strategy of collaborative decision-making that leads to agreement on management roles and responsibilities.

Rationale for co-management in line with international trends, coastal and fisheries co-management arrangements in SWIO have largely been initiated in response to a crisis situation. Over-exploitation of resources, an increase in illegal use as well as other critical issues such as forced removals from

traditional fishing grounds and growing tensions between conservation authorities and local communities, resulted in alternative management strategies being explored. Furthermore, given the vastness of the oceans and extensive coastlines, the government departments realized that they had limited capacity to implement and enforce fisheries management measures, especially in remote coastal areas.

In addition, the benefits of user involvement in resource management are increasingly being appreciated. Thus, with the transition to decentralization and calls for increased user participation in resource management, community-based co-management initiatives have become viable options and continue to be replicated and scaled out.

5.0 CASE STUDIES ON COLLABORATIVE FISHERIES MANAGEMENT IN THE SWIO REGION

Collaborative fisheries management over the past decade has emerged as an innovative approach to sustainable development and management of fisheries resources (Reference) in the SWIO region. In the SWIO range states, collaborative fisheries management has taken different forms and shapes backed up with respective national legislative frameworks. For instance, in Kenya, the Beach Management Regulations 2007 (revised 2021) provide the legislative framework for establishing Beach Management Units (BMUs) and Fisheries Co-Management Areas (CMAs) in Kenya.

Collaborative fisheries management or resemblance of the same bears distinctive features in the respective SWIO range states. In Kenya and Tanzania for instance, Beach Management Units (BMUs) are the grass-root community-based institutions with clear roles and mandates as provided in the National fisheries legislation. The BMU (Beach Management Fisheries) Regulations 2007 (revised 2021) provides for the establishment of BMUs and fisheries co-management areas (CMAs) in Kenya. Co-management areas (CMAs) are distinctive areas in which BMUs undertake fisheries management jointly with the government agencies. In Madagascar, the concept of co-management is enshrined in Locally Managed Marine Areas (LMMAs) whereas in Mozambique it practiced through fishing resource management committees.

As mentioned in the previous section, the following case studies demonstrate some successful on the ground collaborative fisheries management practices that are safeguarding community livelihoods as well as providing innovative solutions to myriad challenges affecting coastal communities, ecosystems and fisheries resources. They illustrate co-creation and co-designing of innovative solutions to address fisheries stock sustainability and enhanced socio-economic benefits.

5.1 KENYA

5.1.1 The contribution of small-scale fisheries in national economy

Kenya's marine fisheries are of strategic value given the role of the sector in supporting livelihoods and contributing to food security. Kenya has a coastline of 640km on the Western Indian Ocean, in addition to a further 200 nautical miles Exclusive Economic Zone (EEZ) under Kenyan jurisdiction. For rural coastal communities, small-scale fishing is essential to overall household well-being, providing both income and nutrient-rich food. In 2015, the marine fisheries sector employed about 60,000 fisherfolk including some 13,000 fishers (Fisheries Department, 2016). The number of people supported indirectly by the sector as traders, processors, input suppliers, merchants of fishing accessories, or providers of related services, is considered much higher, over 1.2 million people. However, fishing-related activities, especially at the community level, are largely informal and dynamic, hence accurate figures are difficult to obtain. In addition, fish is a critical source of affordable animal protein for consumption, particularly

for coastal communities, and the sector is important for the preservation of culture and national heritage, including related industries such as tourism, and for recreational purposes.

Fisheries management in Kenya is the mandate of the Kenya Fisheries Service working closely with the State Department of Fisheries, Aquaculture and Blue Economy and the Kenya Marine Fisheries Research Institute.

5.1.2 Fisheries co-management framework in Kenya

Fisheries co-management in Kenya is provided for in the fisheries act 2016 and fisheries regulations 2007(revised in 2021). Until 2005, fisheries management in Kenya was centralized. Collaborative fisheries management was introduced in 2007 with the gazette of million the Fisheries (Beach Management Units - BMUs) Regulations, 2007. This approach was more collaborative, community-centered and bottom-up. The previous approach was more government centered, less effective with low compliance levels hence not effective in promoting sustainable use and development of fisheries resources in Kenya. Locally managed marine areas including the fisheries co-management areas in Kenya are shown in Figure 2 below.

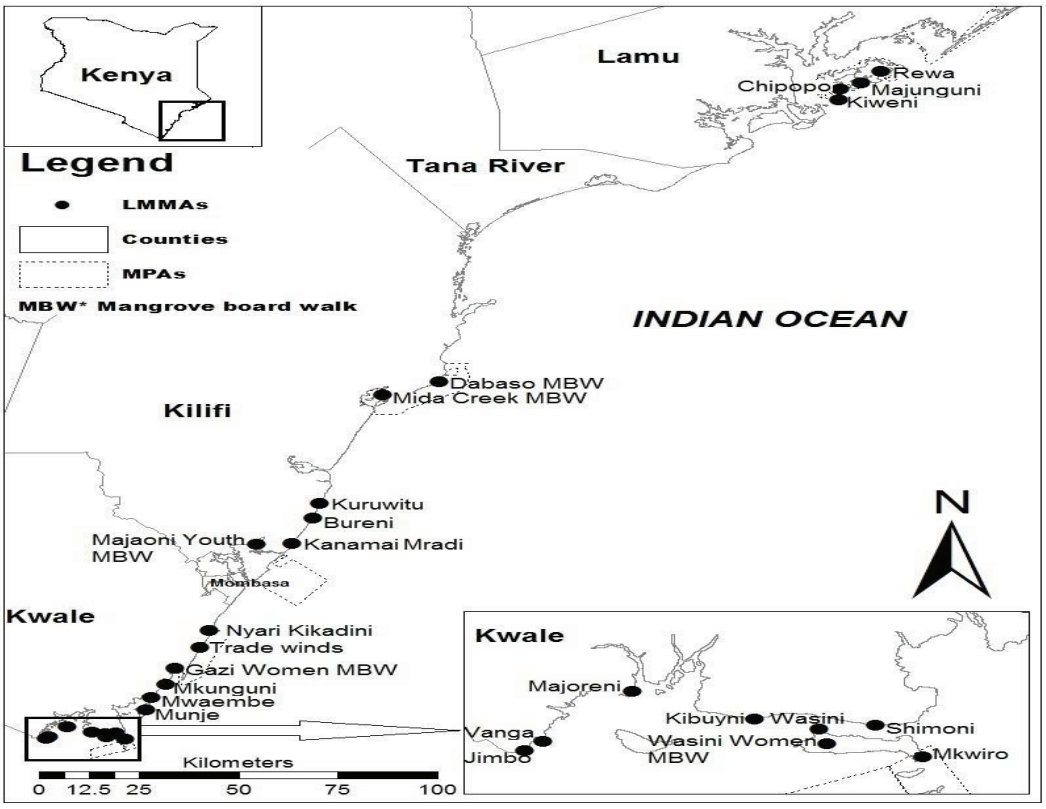

Fig 2: Locally Managed Marine Areas in Kenya (Source: Kawaka *et al*., 2015)

BMUs promote structured community participation in fisheries management, and consist of fishers, fish traders, boat owners and other beach stakeholders who traditionally depend on fisheries activities for their livelihood. BMUs co-manage nearshore fisheries resources under provisions of the Fisheries Management and Development Act, 2016 and the Fisheries (BMU) regulations, 2007 (as revised in 2021) also taking into account BMU bylaws.

In 2010, the Kenya Government devolved some fisheries responsibilities to the County Governments when the new constitution was enacted. This resulted to sharing co-management responsibilities between the relevant Fisheries management agencies at the county level and BMUs. The Kenya Fisheries Service and the State Department of Fisheries, Aquaculture and Blue Economy provide policy guidance and oversight roles, capacity building and setting of standards. The National Environment Management Authority (NEMA), Kenya Forest Service, Kenya Wildlife Service (KWS), Kenya Marine and Fisheries Research Institute (KMFRI), NOGs, the private sector and Civil Society Organizations are also involved in fisheries co-management in Kenya.

As outlined in the BMU Regulations 2007 (revised in 2021), a BMU undertakes fisheries management activities within a designated co-management area (CMA). The main objective of BMUs is to promote sustainable and effective fisheries management.

1) Law enforcement through patrol and surveillance of fishing grounds, the patrol of the fishing grounds is to ensure compliance to regulation and management measures. This is to curb illegal fishing activities to avoid overfishing. Enforcement of the law also entails restricting fishing in closed areas and seasons, use of illegal gears and landing in undesignated sites. However, most of the BMUs have limited capacity to undertake patrol surveys, instead they do beach surveillance and patrols. They do not have patrol boats.
2) Revenue collection. BMUs are involved in collecting some levy on every kg of fish landed, usually Ksh. 2/kg to help in the running and management of landing sites.
3) Formulating by laws: BMUs promote harmony and minimize conflict through the formulation and implementation of by laws. The bylaws are in compatible with existing national and county fisheries legislation
4) BMUs also assist in the fisheries data collection. The fisheries catch data is submitted to the Kenya Fisheries Service (KeFS) where it is analyzed and used to prepare fisheries statistical bulletins and inform policy and decision making for improve fisheries governance.

A joint co-management area (JCMA) is established where members of adjacent BMUs routinely share common fishing ground. Fisheries management activities are undertaken jointly by more than one BMU. Fisheries management activities within a CMA are guided by a co-management plan (CMAP) or a joint co-management plan (JCMAP) which specifies fisheries management measures that are to be undertaken to ensure the sustainable utilization of fisheries in that area. Under the Kenya Coastal Development Project (KCDP) 2011-17, JCMAs were established in Malindi-Ungwana Bay (covering 3200 km2, involving 14 BMUs) and Shimoni-Vanga (covering 838 km2, involving 7 BMUs). JCMA management plans (JCMAPs) were prepared for both during 2016-17 though only the plan for Malindi-Ungwana Bay was approved to-date. NGO partners have subsequently mobilised partial implementation of the draft JCMA management plan in Shimoni-Vanga but the JCMAP in Malindi-Ungwana Bay remains largely unimplemented to-date due to limited resources.

CMAs and JCMAs have also been developed in the northern part of Lamu County (covering approx. 1,000 km2, involving 10 BMUs on Pate Island) over the past 5-6 years, with the support of NGOs including WWF, the Nature Conservancy (TNC), Northern Rangeland Trust (NRT)

Several locally-managed marine areas (LMMAs) have been established through various NGO-supported initiatives along the entire Kenya coast including the Kuruwitu Conservation and Welfare Association (KCWA) in Kilifi County and along the northern coast of Kwale County. The Kiwen Joint co-management area lies in the path of the proposed Lamu Port South Sudan Ethiopia Transport Corridor Project (LAPPSET) and will be dredged to give way for the upcoming port (Maina *et al*., 2011b).

There are 18 Locally Managed Marine Areas (LMMAs), 3 Joint co-management areas and 85 Beach Management Units (BMUs) at the Kenya Coast (World Bank, 2020; Kawaka et al., 2015).

In the section below we illustrate the case study of Kuruwitu Conservation and Welfare Association (KCWA), the pioneer Locally Managed Marine Area (LMMA) in Kenya.

5.1.3 The Case Study of Kuruwitu Conservation and Welfare Association (KCWA), Kenya

Background

Kuruwitu Conservation and Welfare Association (KCWA) is a community-based conservation group that was created in 2003. In 2006, KCWA became the first Locally Managed Marine Area (LMMA) in Kenya. The area covers six landing sites and three villages with an approximate population of 30,000 people. The KCWA area extends about 40 Km coastline to Mombasa and Kilifi with unique biodiversity including the endangered and threatened marine turtles, reef-based fisheries, coral reefs, sea grass beds and mangrove forests.

The establishment of KCWA was motivated by the desire of local communities to conserve and secure the source of livelihood which was otherwise under immense threat form natural and anthropogenic activities. The fisheries resources were on the declining trajectory while the coastal and marine habitats were getting degraded and depleted at a fast rate. Unsustainable fishing practices such as overfishing, unregulated harvesting of reef-based fisheries and depletion of marine life for aquarium trade were some of the main drivers to biodiversity loss in the Kuruwitu area. The establishment of KCWA was as a result of exchange tour to Tanga by the Kuruwitu community to learn more about sustainable fishing practices. Tanga community was managing their coastal and marine resources through a collaborative arrangement supported by the Tanga Coastal Zone Conservation and Development Program (TCZCDP).

KCWA conservation efforts have continued to bear fruits and in 2017, the group was awarded the Equator Prize for their outstanding innovative local community based sustainable development solutions.

Why KCWA was established?

KCWA was established by the local communities with the following objectives;

1) Improve the living standards of the local communities.
2) Enhance and diversify income streams and sources of livelihoods for the local communities.
3) Conserve marine and coastal resources by establishing a community based marine conservation area.
4) Promote responsible and sustainable fishing practices.
5) Provide education and learning opportunities for the youth amongst the Kuruwitu community.
6) Serve as a model for best practices in collaborative community-based marine conservation initiative in coastal Kenya.

Key interventions, achievements and impacts

Since its establishment in 2003, KCWA has implemented sustainable marine resources conservation interventions with impactful results. Figure 3 shows the healthy and diverse marine life in KCWA.

Figure 3: Kuruwitu conservation area is rich with diverse marine life and attract several visitors (Source: KCWA Photo Gallery)

Effective management of Locally Managed Marine Area (LMMA).

In 2006, Kuruwitu Conservation and Welfare Association (KCWA) was established as a Locally Managed Marine Area (LMMA). The establishment of KCWA was through a consultative participatory and scientific approach. The local communities decided to close a 30-hectare area from fishing and other related activities in 2006 to create the LMMA. In, 2013 additional 20 ha were declared as '' no take zones''. The LMMA is an important breeding and spawning ground for marine life. Fishers have reported increased fish catches. The sizes of fish harvested are larger. There is increased evidence of fish spilling over outside the LMMA. The spill-over effects have enhanced fish catches outside the LMMA. Fishers have also reported increased biomass of fish by 400% against 2016 baseline (Equator Initiative, 2019).

The LMMA harbors diverse species of marine life. There are seven marine turtle species which according to the IUCN listing are endangered. The turtles are green sea turtle (*Chelonia mydas*), the olive ridley turtle (*Lepidochelys olivacea*), the loggerhead turtle (*Caretta caretta*) and the Hawksbill turtle (*Eretmochelys imbricata*). Some 180 turtle nests were secured and protected in 2018 (Equator Initiative, 2019)

The coastal habitats such as the mangroves and swamps are important habitats for birds, reptiles, primates and other species such as bush babies and dik dik. There are diverse fish species including catfish, parrot fish emperor fish and groupers. The corals have beautiful ornamental species.

The management of fisheries outside the LMMA is by the Kuruwitu Beach Management Unit (BMU). There are six fish landing sites within the KCWA management area.

Improved livelihoods and diversification of income

Improving the welfare and creating opportunities for more income for the local communities is one of the objectives of KCWA. KCWA has co-created and co-designed various environmentally friendly social enterprises, including fishing and eco-tourism ventures. KCWA own some boats which are used by the group for fishing. The glass bottomed boat is used to ferry tourists/ visitors within the KCWA locally managed marine area to view and enjoy diverse marine life. The visitors pay a fee to access the sites and also for using the boat. In 2016, KWCA received over 1300 tourists from all over the world (Equator Initiative, 2019). KWCA rent out fishing boats to its members at a modest fee. They use the boats to go fishing outside the LMMA, especially in the deep sea for tuna and tuna-like species. The group is engaged in some small-scale value addition of fish and fisheries products. They have some tenders where they deliver fish and fisheries products to Nairobi. They have entered into some social and corporate responsibility with a local airline which delivers their fish to Nairobi. Women groups are involved in vegetable growing and selling, they also run some shops.

Gender and inclusivity

The KCWA management area is inhabited by about 30,000 people who depend on the Kuruwitu coastal and marine resources for their livelihood. Women as well as men are actively involved and engaged in Kuruwitu conservation initiatives. Men usually go for fishing whereas women are involved in small scale fish value addition and trade. Women are also incorporated in the beach management unit (BMU)Executive committee for all the six fish landing sites within the Kuruwitu conservation area. In addition, women groups are involved in other income generating activities such as operating shops and vegetable gardens. As part of financial literacy and socio-economic empowerment, KCWA established a village saving and loan association (VSLA). Over 300 members of the VSLA source and borrow money from the VSLA to improve their businesses.

Scientific research and outreach programmes

The LMMA offer educational, training and research opportunities.

Figure 4: School children on an education tour to Kuruwitu Conservation area

Replication and scaling out

Since its inception, over 20 other LMMA have been established. The KCWA model has been very influential and inspirational. There are ongoing efforts of establishing Takaungu Co-management area in the neighborhood of KCWA. This is being spearheaded by the local communities, Kilifi county government, WWF-Kenya and other stakeholders.

Challenges and solutions

Despite the impressive achievements and the impacts achieved by the KCWA, there exists a number of challenges; Unsustainable fishing practices, urban development (Real-estate in the Vipingo area) and aquarium fish trade. Limited technical capacity and funding. In order to address these challenges, KCWA put in place a strong Monitoring, Control and Surveillance (MCS) team to curb illegal fishing. This has shown successful results. Fundraising efforts have been made to raise financial and technical resources from different partners including WWF, East African Wildlife Society, Wildlife Conservation Society, Ocean Alive, UNDP, KMFRI.

5.2 MOZAMBIQUE

5.2.1 Contribution of small-scale fisheries to the national economy

The fisheries sector in Mozambique plays an important role in the national economy. The sector contributes about 2% to the Gross Domestic Product (GDP), 20% of Mozambican population rely on fisheries for income, 27% of the protein intake is from fish. The sector offers opportunities for employment and wealth creation for the local communities (World Bank, 2019).

5.2.2 Collaborative fisheries management in Mozambique

Fisheries co-management seem to be a recent development in Mozambique although community participation in the management of fisheries resources in the country was conceived way back in the 1990s. In 1994, the Fisheries Master Plan was prepared and approved by the Government. The Master Plan set priorities for subsequent years and laid emphasis on the active involvement of fishers in the management of fisheries resources. Some pilot work was undertaken in some parts of the country including Kwirikwidge village in Angoche District in Nampula. The pilot project was implemented by the Institute for Development of Small-scale Fisheries (IDPPE) Angoche delegation

Fisheries co-management in Mozambique is provided for in the national marine fisheries regulation 2003 (Samoilys, 2017). This legislation enabled the establishment of co-management as one of the tools for sustainable management and development of fisheries resources in Mozambique (Grilo, 2015). Before this legislation was enacted, fisheries management in Mozambique was kind of command and control. The government would collect data, undertake research, ensure law enforcement and management of the small-scale fisheries. The government got concerned about co-management in 2003. This move came out of the generalized perception that the government was not able to ensure adequate fisheries management in Mozambique because of the extensive coastline of about 3000Km and the expansive EEZ coupled with limited resources (Grilo, 2017). The government realized that involving the local communities / stakeholders in fisheries management will be cost effective and efficient especially for coastal fisheries.

The management and development of fisheries resources under the Ministry of Sea, Inland Water and Fisheries which was created in 2015 adopted various forms of fisheries management and development measures including collaborative fisheries management. In Mozambique, there exist two structures of collaborative fisheries management involving Community Council for Fisheries

(CCP) and the Committee for Co-management (CCG). There are various stakeholders that form a CCG including local fishers, fish traders and the private sector.

Through the new legislation, Mozambican authorities have to assist groups of small-scale fishers in setting-up their fisheries co-management institutions – Community Fisheries Councils, or CCPs. CCPs are co-management institutions that aim at promoting the involvement of local communities in the management of marine and coastal resources, both inside and outside of existing MPAs. CCPs are created with direct support from IDPPE and from Provincial Fisheries Services, though other organizations (such as development NGOs) can also take a lead role in the process. These institutions identify and facilitate the organization of a small number of fishers into a CCP. Fishers that belong to a CCP are allocated a small marine area for them to control (decide how fishing can be done there, by who, with what gears, etc.) This means that rule setting and enforcement are now ensured by fishers themselves (within their CCP allocated area). This relieves the State from the burden of these tasks, but it also has advantages for fishers. First, giving them some power to determine fisheries rules within limited spatial areas empowers fisheries and their communities to address their marine-related problems. Second, by involving fishers in problem resolution, fisheries management gains automatically a focus on sustainable use, an important aspect in a context where the availability of marine protein is limited. Third, with additional power come additional responsibilities for fishers. In other words, if something goes wrong with the management of the area allocated to a CCP, there is no one else to blame but themselves. Inevitably, fishers will concentrate on the sustainable use of their area than on conservation.

5.2.3 Community fishing councils (CCPs)

In Mozambique the community fishing councils (CCPs) are some of the collaborative approaches in which the local communities are involved in the management of small-scale fisheries, this is provided for in the fisheries regulations of 2008. The minister responsible for fisheries has the power to authorize the formation of a CCP

The fundamental function of the CCP is provided in the 2006 statutes as follows.

The main objective of the CCP is to contribute to the conservation of the marine and coastal ecosystems. More specifically the CCPs have the following functions

1) Provide sustainable fisheries measures that entail vetting and making of recommendations for fisheries licensing. Monitoring and reporting. Monitoring and reporting to the relevant institutions any changes to the fisheries resource and environment in their areas of jurisdiction
2) Complimenting government efforts in enforcing fisheries management measures and participate in the surveillance and policing fisheries management control or restrict fishing activities and collaborate with the other agencies to control the pollution of the marine environment
3) Promoting public education and extension services creating public awareness of the importance of conserving coastal and Marine environment
4) Advancing the interests of the local fish communities and minimizing conflicts, this entails the setting up of some conflict resolution mechanisms to promote mutual interests including the semi-industrial and industrial fisheries, ensuring that gears for the different fishers are marked accordingly.
5) In addition to the specific the powers and functions of the CCPs, the CCP statutes of 2006 proposed that the designation of the CCP areas of jurisdiction extending 3k shoreward from the shoreline. The government agencies received CCPs as an extension of the grass root in implementing centralized fisheries legislation. A renewal of governance intervention in Mozambique by the National fisheries administration (ADNAP) in 2011 formed the institutional capacity CCPs weak. It was proposed that CCPs should be registered as independent entities with clear legal mandate including self-management of financial resources

5.2.4 Case Study of Kwirikwidge Community fisheries in Angoche

The District of Angoche is situated between 15.58°s and 17.01°s latitude (Anon, 1986) (Anon ,1945) and covers an area of about 3500km2. With a fishing population of over 12000 people. Kwirikwidge community is located in the Morua village some 25 km away from Angoche Capital City. Kwirkwidge community has over 1000 fishers of which 100 are owners. The fishery here is artisanal and include small pelagic sardine, anchovy, horse mackerel silver fish deep sea crustaceans and cephalopods, deep water pelagic.

Kwirikidge has a fisheries resources management community committee. The committee is headed by the chair. The objective of the committee is to contribute towards the efficient management of the fisheries resources in their areas of jurisdiction. These include amongst others;

1) Community sensitization on the use of environmentally friendly and sustainable fishing practices and technologies.
2) Promoting harmony and conflict resolution
3) Making referrals to the relevant national agencies any cases that may not be resolved at their level

Effective fisheries conservation and management measures

The community has put in place some fisheries conservation and management measures which among others include:

1. Restriction of fishing operations in the afternoon.
2. Ban on the use of undersize / mosquito nets for fishing.
3. Demarcation of fishing grounds and general areas under their jurisdiction.
4. Fishers have to obtain fishing permits from the local committee
5. All migrating fishers must secure migration permits for local fishers wishing to migrate to other fishing grounds.
6. Total ban of under water fishing.

These fisheries management practices are aligned to national fisheries management framework. Sanctions are imposed by the local committee for noncompliance by the fishers.

Achievement and impact of co-management.

The imposition of co-management measures in Kwirikwidge fishing community has yielded some achievement and impactful outcomes as highlighted below:

1) Sustainable marine resource utilization

In 2000, the government banned the use of mosquito nets for fishing. The ban on the use of undersize mosquito net and the introduction of penalties for noncompliance has resulted in increased revenue and improved management of fisheries resources. Fish stocks have improved. The CCP has enforced this regulation. They also observe close season. The fishing community also embrace indigenous and traditional approaches to fisheries management. They observe certain myths and traditions in the management of fisheries resources. They also collect fisheries catch data and the information is submitted to the national fisheries management administration (ADNAP) as well as the Institute for Small-Scale Fisheries and the National Fisheries Research Institute.

Fig 5: Fishermen hauling their catch in one of the coastal communities in Mozambique (Source: World Bank)

2) Efficiency

Incidences of conflict among the fishers have greatly reduced. Some improvement in fishing technologies and practices has been reported. Most of the fishers used traditional dug-out canoes, however, they are now changing and many of them are using larger wooden boats. The boats have sails and some of them have motorized engines to propel the boats, which are helping them to go fish in the deeper waters. They are also transitioning from using beach seines to larger gill nets in the deeper waters targeting larger individuals of fish. This adaptation to improved fishing gears and technologies is in response to the declining fish stocks.

3) Equity

Co-management has been instrumental in strengthening the participation of all stake holders in the interaction and management of fisheries resources. Men as well as women are involved in fishing operations within the fisheries value chain. In many cases women are involved in value addition albeit in small way. Men usually go fishing.

4) Financial sustainability

Financing the CCPs seem to be challenge. However, the CCP are being supported establish saving and loaning facility. They have established saving and lending groups locally referred to as Poupanca e credito ratativo or PCR). The local fishing communities are able to access credit to support their fisheries investments.

5) Community empowerment

Local fishing communities (CCP) have control over how they manage and utilize fisheries resource, including defining the no-take zones. Empowering local fishing communities help accelerate moving fisheries towards stock sustainability.

6) Market access

The local fishing communities have a readily available market for their products. The demand of fish is higher than the supply. The fisherfolk sell their fish in Angoche city which is the main market. They also sell fish in other cities including Nampula, Mogovolas and Meconta. Dried fish is sold to distant markets in the neighbouring provinces.

7) Infrastructure improvement

Good road network, electricity and market are critical to promoting the fisheries value chain. There has been some improvement in the road infrastructure which has helped fisherfolk accesing markets. As part of the Artisanal fishery improvement project in Nampula, the Kwirikwidge – Angoche road was rehabilitated.

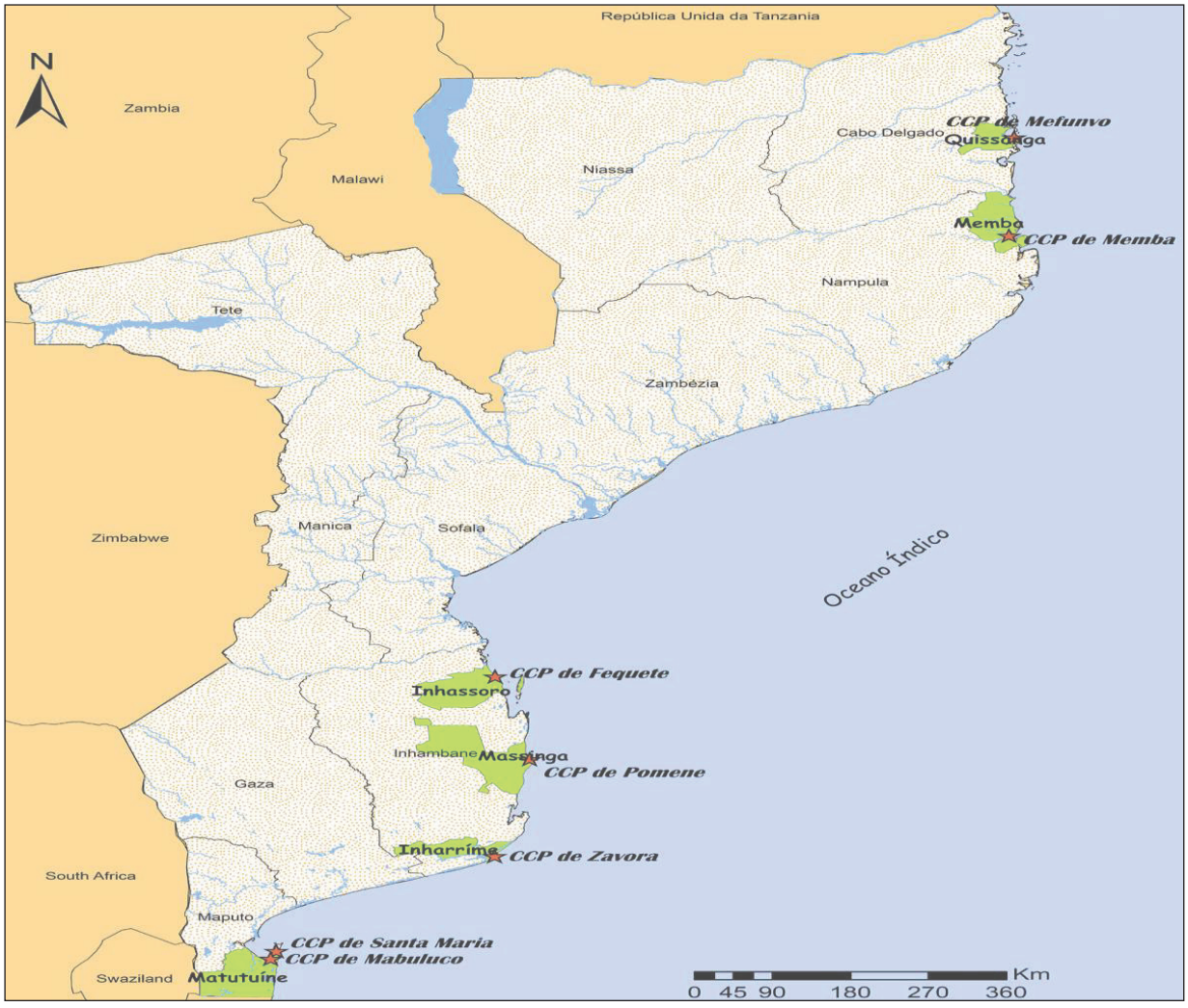

Figure 6: Collaborative fisheries management in Mozambique (Source: World Bank, 2019)

5.3 UNITED REPUBLIC OF TANZANIA

5.3.1 Contribution of small-scale fisheries to the national economy

The fisheries sector plays an important role to the national economy of Tanzania. The county receives foreign earning. The fisheries sector employs more than 170,000 small-scale full-time fishers directly and about 4,000,000 people are engaged in other related fisheries activities such as fish processing, fish marketing, fish trade, boat building and maintenance and fishing gear mending (MLFD, 2011)). From 1998, the sector grows at a rate of 4.3% and estimated to contribute to about 2.7% of the National GDP.

5.3.2 Collaborative fisheries management

Participatory fisheries management was introduced in Tanzania because of increased fishing pressure on the fishery resource and environmental degradation. The government, through the Fisheries Act Number 22 of 2003 (section 18) and its principal Regulations of 2009 (Regulation 133 - 136), provides for establishment of participatory resource management approach by involving local fishing communities, a system commonly known as co-management through Beach Management Units (BMUs). The BMUs are good stewards of the fisheries resources that they depend on for their livelihood.

More efforts have been made by the government of Tanzania to engage community in fisheries management at local level, to enhance effective fisheries resources management and planning, information sharing, monitoring and decision making. In 2009, Fisheries Division in collaboration with WWF and other implementing partners formulated 'Guidelines for Establishing Community-Based Collaborative Fisheries Management in Marine Waters of Tanzania' in 2009. The Guidelines act as a guiding principle document on establishment of BMU national wide to implement Fisheries collaborative management as an alternative to centralized command and control of fisheries management. This was identified as one of the possible solutions to address resource use conflicts and over-exploitations. Since the concept of collaborative management was introduced in Tanzania, a total of 179 BMU's were formed with the support of different partners including WWF, most of the BMUs were established in RUMAKI (See Fig 4 below). The guidelines clearly elaborated the meaning, objectives, principles, formation as well as their roles and responsibilities through which data collection, information gathering are among their responsibilities.

5.3.3 RUMAKI Case Study

WWF Tanzania in collaboration with the Fisheries Development division (Mainland Tanzania) established RUMAKI seascape (Fig 6) where joint collaborative fisheries management was created in Rufiji-Mafia-Kilwa (RUMAKI).

From the RUMAKI model this study established the following success factors and impacts.

1. increased knowledge and importance of marine conservation.

   Local communities, (BMUS) received training on the importance of conserving marine resource.

2. enhanced compliance and enforcement of the law.

Dynamite fishing was very rampant in Mtwara and Kilwa was significantly reduced. Improved catches and biodiversity conservation. Information sourced from literature indicates that fishers' perception of increased fish catches in 2015/2017. Fish catches in Somanga were reported to have increased from 360,000 to700,000kg, respectively, population of sea turtles and sea cucumbers were reported to have increased as well (WWF, 2017).

Rapid field assessments reveal improvement of catch quantity, quality and composition. In Mafia and Kilwa fishers land big fish and Somanga fishers confess to catch tuna during the season, a species which was rarely landed before strengthening collaborative fisheries management. Lobsters have reappeared in Kibiti and Kigamboni following introduction of temporary fishing closing scheme. Octopus catch is on the rise as well. Seasonal closures for Octopus fisheries were introduced, the size and weight of octopus increased. Similar observations were reported for lobsters.

3. Improved trust and cooperation among stakeholders.

Trust and cooperation between BMUs and other stakeholders improved. For instance, a tourist hotel in Mbwa Maji in Kigamboni provided fuel to the Mbwa Maji BMU for boat patrol. The relationship between BMUs and government staff was strengthened. They were also able to resolve conflict

4 Gender inclusivity

The government of Tanzania provided guidelines for involvement of women in the BMUs to ensure gender consideration in all fisheries management. The 30% gender rule (WWF, 2017)

5. Community development

BMUs along the coastline of Tanzania have become the very important mobilizing unit and entry point to communities not only on fisheries matters but also for other sectors e.g. health, education, agriculture and other various campaigns. Various partners and projects use BMUs to implement activities in the localities. There are at least 179 BMUs along Tanzania coastline.

6. Resource ownership and build trust

The CFM process has instilled and strengthened the sense of ownership among community members in coastal Tanzania. In the past management of fisheries resources seemed to be the government responsibility and the communities remained to be users only. Profiling CFM and bringing communities to action for the past 15+ years changed the mentality and now communities understand that they are the primary owner of fisheries resources around them.

7. Sustainability

Although CFM work is mostly donor funded some signals of sustainability are revealed especially in RUMAKI seascape. BMUs collect revenue from different charges and use money to finance patrols, data collection and other BMU operations. There is a plough back scheme for BMUs that collects revenue on behalf of the District Authority. That contributes to the BMU budget. BMUs make plans and take actions on their own on resource management. This includes managing the temporary fishing closing scheme and sharing information to the communities on compliance and resource management.

For sustainability, a cohort of Community Based Trainers/Mentors (CBT/CBM) has been developed especially in RUMAKI seascape to facilitate new BMUs and other community groups e.g., VICOBA with trainings and guidelines on how to operate and comply. This is a cost-effective way of building capacity and sustaining CFM.

Fig 7: Fishers displaying larger sized octopus catch in Songo Songo Island in United Republic of Tanzania (Source: WWF Tanzania)

8. Community based data collection system

Community-based data collection syndicate has contributed to strengthening the national fisheries statistics database. BMUs have a data and information committee where data enumerators are mobilized. An electronic data collection App used by community enumerators feeds instantly to the central online national fisheries database. It is a cost-effective way of obtaining reliable data from the ground. BMUs in Somanga, Songosongo and Kilindoni finance data collection from their internal sources by providing transport costs and data bundle to the enumerators. This signals sustainability of the community-based data collection system and can be scaled up to other BMUs. Some enumerators continue to collect data without any financial support.

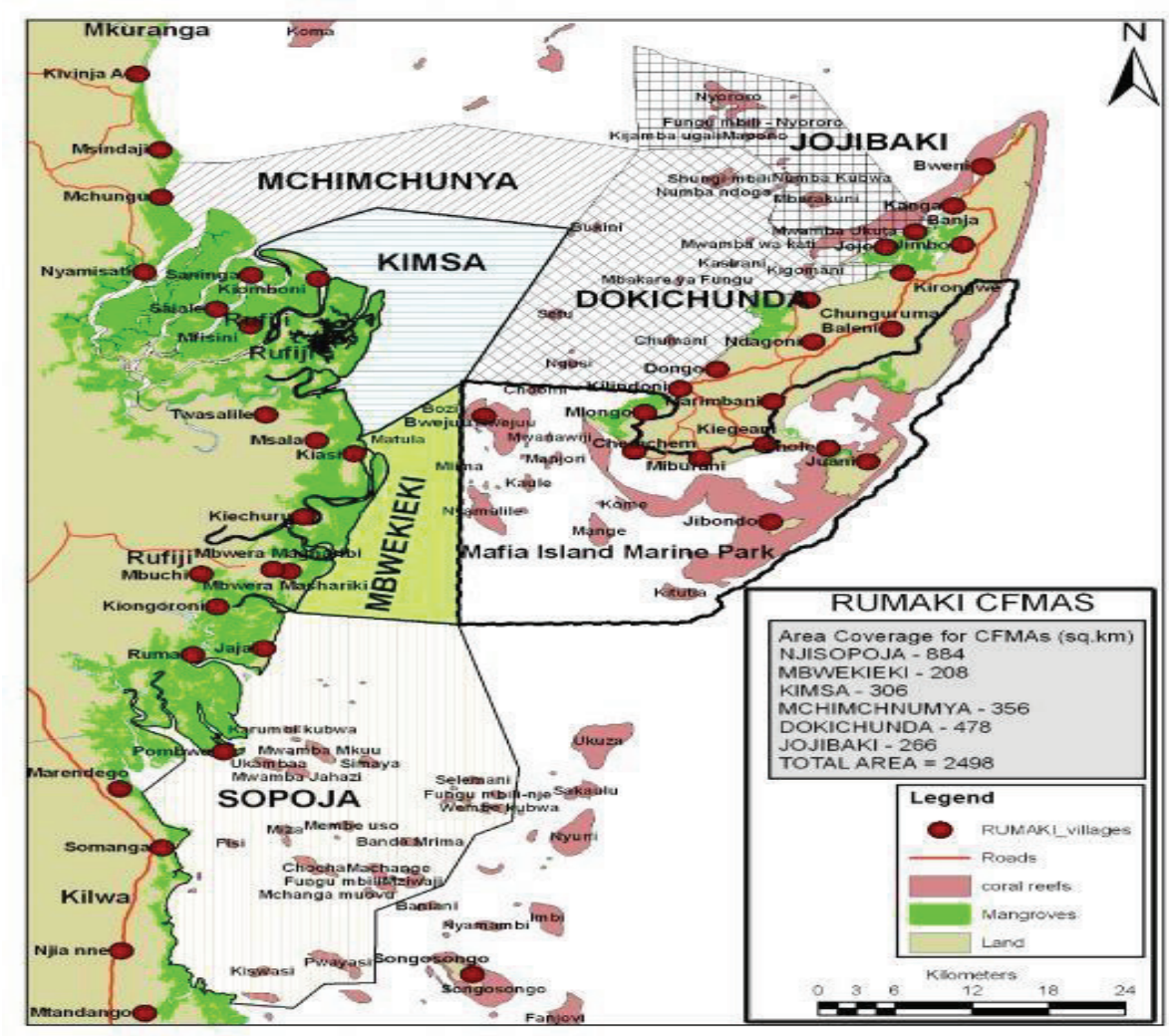

Figure 8: Collaborative Fisheries Management Areas inRUMAKI

5.4 MADAGASCAR

5.4.1 The contribution of small-scale fisheries in the national economy

Madagascar has an extensive coastline of about 5,600 Km and expansive Exclusive Economic Zone (EEZ). In 2018, the fisheries sector accounted for 7% of the Gross Domestic Product (GDP). The sector supports over 1.5 million people, most of whom are coastal communities (World Bank, 2020)

5.4.2 Collaborative fisheries management

Fisheries management in Madagascar has been centralized over the year, with traditional top-down approach. This has resulted to limited capacity of state institutions to effectively manage fisheries along vast and remote coastlines. Fisheries collaborative management was recognized as a priority strategy to restore fisheries. In Madagascar, over the past decade, tremendous progresses were made in implementing community based marine resource management in many sites around the country, with encouraging support from local communities. Sharing of responsibility of natural resource management between government and Malagasy resource users was legally recognized in 1996 through establishment of Gestion Locale Se´curise´e (GELOSE). The law permits communities to come up with their own goals and develop rules for resource use and management. The developed rules (i.e.,

by-laws) should be consistent with national policy. Co-management has been instrumental in strengthening the participation of all stake holders in the interaction and management of fisheries resources through establishment of Locally Managed Marine Areas (LMMAs).

5.4.3 The case study of Volandraike LMMA, Madagascar

Participatory fisheries management in Madagascar began in 2004 when the NGOs Blue Ventures (BV) and Wildlife Conservation Society supported the village of Andavadoaka in Madagascar to implement a trial periodic fisheries closure (PFC) for octopus (Benbow et al. 2014). Neighboring villages replicated the model and in 2006, fishing communities in Southwest Madagascar came together to create the Velondriake (meaning "to live with the sea") Locally Managed Marine Area (LMMA), which was then designated as a Category V marine protected area in 2015. The LMMA is governed by the Velondriake Association (VA), which comprises three regional sub-committees representing northern, central and southern villages. Management responsibility for the MPA has been delegated to the non-governmental organization (NGO) Blue Ventures (BV) and the Velondriake Association by the Government of Madagascar, with the VA carrying out all management activities and BV providing technical and financial support.

While the participatory management of small-scale fisheries has been widely promoted, we have limited understanding of the factors influencing its effectiveness. This case shall highlight lessons from the implementation of Madagascar's first locally managed marine area (LMMA), drawing insights and experiences of staff of nongovernmental organization (NGO) co-managing the LMMA. It describes the LMMA's context and history, and highlight aspects of the approach that underpin its outcomes.

Velondriake (Fig. 7) is one of the fishing villages in South West Madagascar whose economy is based on fishing. Octopus is the primary export fishery for the region and is the most important source of income and livelihood for the local communities. (Benbow et al., 2014). Andavadoaka's early experiences of periodic fisheries closures proved successful, resulting in dramatic increases in landings, which prompted Andavadoaka's fishers to continue with subsequent closures, and neighbouring communities to replicate the approach (Benbow et al., 2014). The establishment of the Octopus industry presented a great threat to the fishery. The concern by the local communities about the sustainability and feasibility of the Octopus fishery. In 2004, the local communities established a temporal closure of the Octopus fishery in Velondriake after realizing that their source of livelihood was at risk. They created a "No take zone" to replenish the Octopus stocks (Lovasoa, 2018).

The Velondriake is one of the first collaborative Locally Managed Marine Area (LMMA) that was established in 2006 (WWF, 2019; Harris, 2007). There are 25 coastal villages in the Velondriake area and they are involved in the co-management of the fishery here (Harris, 2011; Westermann and Gardner, 2013). Velondriake is a home to over 10,000 people. It spans 678 Km2 with diverse marine life and ecosystems including mangroves, lagoons, coral reefs and sea grass beds (Lovasoa, 2018).

Achievements and impacts

Healthy fish stocks

The Octopus closures have resulted to significant fishery benefits, including increases in production and fisher income. The amount, size and weight of Octopus caught have increased over the years during closures (Benbow et al., 2014). It was also reported that biodiversity including marine turtles, dugongs, coral reefs and sea grasses had increased.

Improved fisheries management

Compliance with relevant fisheries management and conservation measures increased over time. The community has managed to develop, implement and enforce local by-laws. Use of destructive fishing gears and practices such as beach seining and poison fishing are outlawed. Temporary and permanent closures are effectively coordinated (Andriamalala et al., 2013). The local communities are also legally empowered (by dina) to impose fines and sanctions to improve compliance with fisheries laws and regulations.

Community buy-in

The initiative is largely guided and managed by local communities, with technical and financial support provided by Blue Ventures. The approach also benefits from broad support from fisheries stakeholders and authorities throughout the supply chain, with fishers and buyers in certain villages making direct financial contributions to the costs of establishing fishery closures. Velondriake was borne out of an effort to coordinate these expanding fisheries closures between adjacent communities along 45km of coastline. Each village had to elect a representative to the sub-regional committee.

Scaling out

Velondriake since its establishment in 2006 has gone beyond fisheries closures. The community has managed to take on other fisheries conservation and management efforts including establishment of 6 permanent no-take zones and fish farming. The no-take zone total over 7 Km2 (Harris, 2011). The model has also been replicated in the southwestern Atsimo Andrefana and Menabe regions. The model has also attracted interest in other fisheries. For instance, this approach has now been applied to mangrove crab (*Scylla serrata*) and spiny lobster (Palinurus) fisheries in western and southeastern Madagascar respectively. Other countries including Mauritius, Kenya, Tanzania and Mozambique have adopted this model for Octopus closures though they are at varying stages of implementation. As a result of the NGO-community partnerships underlying fisheries management efforts in Madagascar, in a majority of cases these village-scale community-led fisheries closures have evolved into the establishment of larger multi-village LMMAs. This has helped improve fisheries productivity, while also building community support for conservation. Since the establishment of Velondriake in 2006, over 70 LMMA have been established along Madagascar's coastline. These initiatives cover about 11.8% of Madagascar's continental shelf, 11,377 km2, with more than 148,920 beneficiaries (MIHARI unpublished data).

Strengthened partnership and networks for sustainable fisheries management

The model has succeeded because of the support from the central government, the local fisheries administration, NGO involvement (Blue Ventures) and working closely with the local communities. There have also lesson learning and exchange programmes which have provided an opportunity to the local communities to learn something new. The MIHARI has since been established to provide a framework for community exchange and lesson learning with desirable results. MIHARI' comprises of about 124 discrete marine environmental management associations.

Catalyzed the improvement of fisheries legislation

The Government of Madagascar enacted a new law in 2005 which required national wide closure *O. cyanea* fishery for 6 weeks from mid-December annually. This is to compliment localized efforts on Octopus closures.

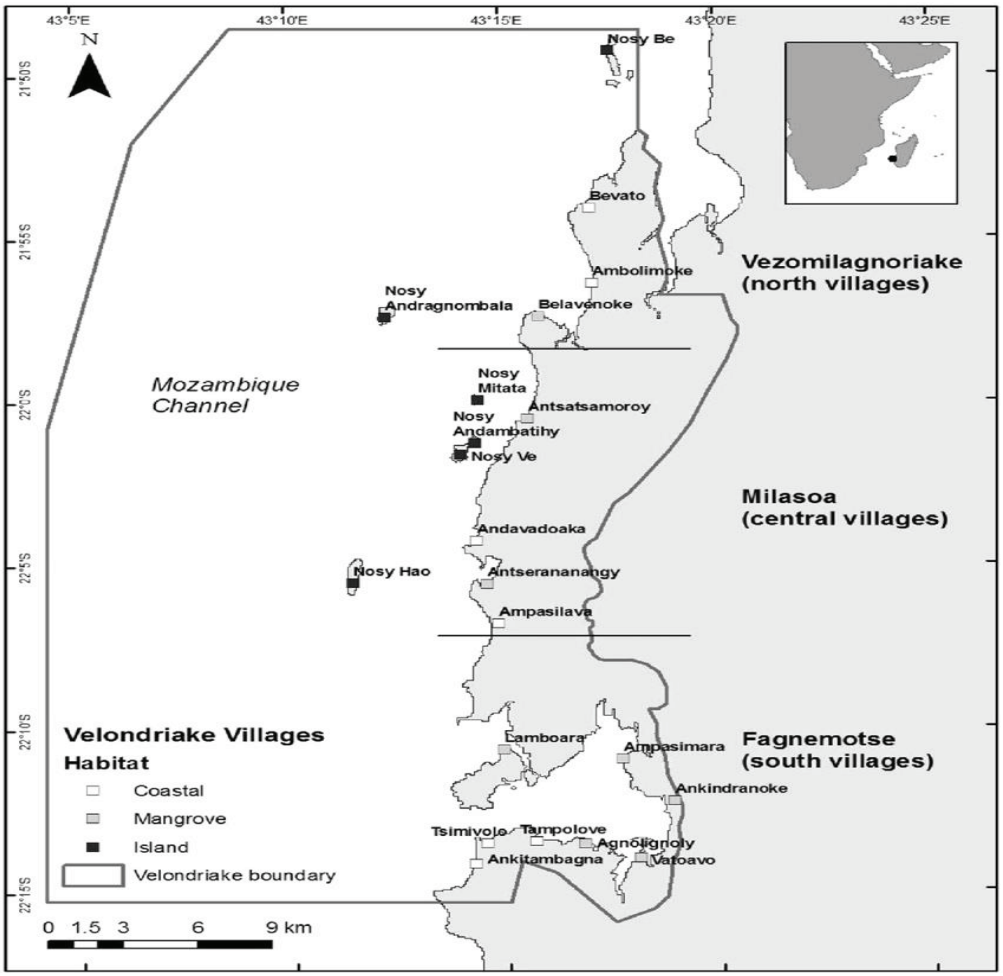

Figure 9. Velondriake community in Madagascar (Source: Barnes – Mauthe et al., 2015)

6.0 ACHIEVEMENTS AND IMPACTS OF COLLABORATIVE FISHERIES MANAGEMENT

This study revealed that the application of the concept of collaborative fisheries management is at various stages of implementation within and across different countries with varied results.

1) A workable model for fisheries co-management

Some independent studies have been commissioned in some countries to evaluate the impact of co-management with desirable results (FFI & EAWLS, 2017; World Bank, 2019; WWF, 2010). They all acknowledge that collaborative fisheries management had demonstrated a workable model of involving local fishing communities and other key stakeholders to promote stock sustainability and enhanced socio-economic benefits. Those management systems at the early stages of implementation many not be obvious to appreciation how collaborative fisheries management could be beneficial in terms of sustainable use of resources. Collaborative fisheries management has enhanced conservation of the areas under jurisdiction by the different community groups by facilitating the closure of some reefs and effective enforcement of laws, rules and regulations. This approach has been successful in bringing agreement between government and users as to what should happen and who should do it.

2) Improved fisheries management

Some good progress has been reported by local communities on improved fisheries management. Local communities have recognized that improved fisheries management has the potential to deliver sustainable fish stocks, improved food security and better livelihoods. Illegal fishing practices such as use of outlawed fishing gears, dynamite fishing have reduced. Dynamite fishing has been rampant in Tanzania coastal waters from Mtwara to Tanga since the 1960s (Slade & Kalangahe, 2015). Over 300 blasts could be counted within a period of 31 days (Braulik *et al*., 2015). Destructive fishing practices using dynamite has been reduced through concerted effort by the government of Tanzania in collaboration with local communities (Ref). Beach seining is an illegal fishing method according to the Kenya fisheries law. In the last decade, beach seining has been used commonly by small-scale fishers in the Kenya waters. There has been however progress made in stopping illegal techniques with the incidences of illegal fishing having dropped to about 2% of former levels.

3) Enhanced stock sustainability and ecosystem health

Surveys conducted in the community conservation areas have generated information which indicated that "No take Zones" had higher coral cover and diversity than those areas open to fishing (FFI & EAWLS, 2017; Osore, 2021). A recent study by the Wildlife Conservation Society (WCS) reports that fishers perceive an increase in fish populations, particularly those fishing around the boundaries of a no-take-zone in the Kibuyuni BMU (EAWLS, 2017; Sobo, 2012). Similar observations have been reported in Wasini. In Madagascar, it was reported that the number, size and weight of octopus increased in the Velondriake Locally Managed Marine Area (LMMA) (Benbow, et al., 2014). Blue Ventures have reported similar observations of increased Octopus catches and sizes in closed areas in Madagascar and Tanzania (Blue Ventures, 2020?). The size of octopus increased from 2.4Kg to 4.4 Kg (Blue Ventures, 2020?). This improvement is attributed to a reduction of illegal fishing as a result of enhanced patrols, combined with habitat-enhancing effects leading to a spill-over of fish into surrounding fishing grounds.

Case Study of Octopus Fisheries Management: Impact of closures

- Successful demonstration of local management capability
- Successful demonstration of a successful management regime for octopus
- Increased quantity and average size of octopus over the project period (early 2015 to today)
- Improved understanding of local governance and MCU (Marine Conservation Unit) regulations both by Village Fisher Committee (VFC) and by Pemba Channel Conservation Area (PECCA) managers
- Understanding of the mechanism of establishing local by-laws
- By-laws in place
- Steps in building collaborative management understood and documented in a manual
- Ability to collect, log and analyze basic catch data locally
- Ability to document experiences and observations using participatory video so that lessons can be shared more widely
- Community willingness to both repeat the closure for octopus but also to begin exploring targeted management regimes for other species such as sea cucumbers, cowries and key fish species
- A close relationship has developed between marine conservation unit authorities and the local village fisheries committee (VFC)

Replication and scaling collaborative fisheries management

The first coral reef based LMMA in Kenya, Kuruwitu, was created in 2006. In 2007, the BMU regulations came into force. Since then, over 100 BMUs have been established along the Kenya coast. 3 Large scale joint co-management areas have been created namely the Pate Island (Lamu), Malindi – Ungwana Bay (Kilifi) and Shimoni-Vanga (Kwale). Plans are underway to create the Takaungu joint-co-management area in Kiliifi County. In Tanzania, BMUs which started in Rufiji, Mafia and Kilwa (RUMAKI) have now been established in most parts of the country, and joint-collaborative fisheries management areas have been established. In Mozambique, there are policy and legal reforms to strengthen and empower community-based fisheries management structures (CCPs).

1. Networks of BMUs/LMMAs have been established

Several networks of BMUs, CCA, LMMAs, CCPs etc. have been established across the respective countries. In Kenya for instance there is the Indian Ocean Water Body (IOCWB) an umbrella body for all the BMUs working on coastal and marine fisheries related aspects in Kenya. These networks enable communities to share information on common challenges faced in delivering site management plans. The networks have also facilitated discussion on collaborative management of fishery resources at a broader scale, beyond BMU site boundaries. These networks are now seen as representing the voice of the local communities. WWF has also helped establish a network and or alliances of Civil Society Organizations which include BMU/CCA/CCPs representatives at national and regional level (SWIOTUNA). This has helped empower local fishing communities on lobbying, advocacy and sharing information on fisheries.

2. Source of income and livelihood

In Kenya, there are over 13,000 small-scale fishers besides fish traders. Small-scale marine fisheries are Increasingly contributing to sustainable blue economy growth by promoting small- scale value addition, minimizing post-harvest losses & enhancing market access for value added seafood products. In 2019 for instance the contribution of the small-scale marine fisheries was 2,5670 Mt valued at US$ 4,477,577. It is estimated that 20% of Mozambican population depend on the fisheries sector for income.

In Tanzania, the fisheries sector employs over 170,000 small-scale fishers directly and 4 million people indirectly.

3. Social equity and gender balance

Local communities organized in form of collaborative fisheries management institutions have been on the forefront in championing and advancing the rights of fisherfolk, including women and vulnerable groups. This is contributing to equitable development of fishing communities by strengthening the voice of the fisherfolk, women and youth in key fisheries management including integrating them in decision making structures. Women as well as youth have been elected in leadership roles of the BMUs, CCPS and other coastal community structures on the ground. The groups are involved in some interventions that improve value addition and marketing of seafood products.

4. Financial literacy and credit access

The BMUs have initiated community-based Village Community Banking Associations (VICOBA). Fisherfolk can now easily access credit to improve their fisheries business. The concept is VICOBA is widespread in Kenya and Tanzania.

5. Policy engagement and advocacy

The voice of fisherfolk has increased. They have been involved in different fisheries policy and reform process where their views are heard. For instance, they contributed to development of the national tuna strategy. They have also influenced the development of fisheries programmes in the region and also actively involved in the implementation, namely Kenya Coastal Development Project (KCDP) and Kenya Marine Fisheries and Socio-economic Development Project (KMFESD), SWIOFISH in Mozambique, Tanzania and Madagascar, Blue Action Fund in Tanzania and Mozambique, MACEMP in Tanzania.

6. Accountability of government staff

Another significant outcome of this type of management strategy is the increased accountability of government officers. Consultations with the local communities revealed that their perceptions towards government staff, especially departments responsible for fisheries has improved. The local communities appreciated the support and usefulness of the government fisheries officers. From the experience gained to date, it is clear that the strengths of this type of management stem from improved communication and transparency between parties and that problems arise when it breaks down.

7.0 CONSTRAINTS TO COLLABORATIVE FISHERIES MANAGEMENT

Although collaborative fisheries management has reported significant contribution to sustainable fisheries management, conservation of coastal and marine ecosystems, there still remain some challenges. These challenges are highlighted below.

1. Weak governance

Effective, transparent and democratic operations of collaborative fisheries management units (BMUs, CCPs, LMMAs etc.) is a perquisite of effective and efficient management of small-scale fisheries. Interactions and interviews with some of the respondents and also information gathered from literature indicates that some of these co-management structures have not embraced democracy and transparency in their daily operations. Some members of the BMUs complained that only the Executive Committee members enjoy the privilege of travels and meeting where they receive some payments in

form of allowances. Other quarters complained of Executive Committee misusing funds for the BMU. In certain instances, BMU Executive Committee members refused to hand over power after elections. Therefore, it has been perceived that only a smaller fraction of the BMU constituency derive more benefits from the BMU/CCP/LMMA system.

BMUs are the only governance structures on the ground. They participate in other numerous activities besides fisheries management, namely, waste collection and coastal tourism related aspects which benefit the communities. This tends to dilute and draw the focus away from fisheries management.

2. Overlap with semi-industrial and industrial fisheries

Local fishers, semi-industrial and industrial fishers tend to have overlapping fishing grounds. Semi-industrial and industrial fishers have been reported to illegally fish in areas under the jurisdiction of the BMUs. They have been accused to damage the fishing gears and nets belonging to artisanal fishers. Ornamental fishers have also come into conflicts with small-scale fishers. Clear national level legislation, enforcement, and monitoring are needed to address these issues. It is perceived that commercial fishing activities may undermine BMU/CCPs/ LMMA entities motivation to participate in active management measures, to trust government partners, and to comply with regulations themselves.

3. Poorly developed infrastructure

There is inadequate infrastructure in the landing sites. Most landing sites lack running and potable water, sanitary facilities, electricity and waste management infrastructure. There are limited cold storage facilities including ice making plants. This contributes to post-harvest losses, especially when fish production is high and cold storage is inadequate. There is a need to improve the infrastructure of fish landing site for quality fish that fetch a better price.

4. Overlapping institutional mandates and poor linkages

There seem to be some overlaps in terms of the national agencies responsible for fisheries management where the BMUs/CCPs/LMMAs are anchored. For instance, in Kenya, the management of fisheries is by both the national and county governments. The national government is responsible for licensing of small-scale fishers and yet the county government is responsible for the management of coastal fisheries. In Tanzania, the Fisheries Development Division is responsible for the management of fisheries, and yet the fisheries officers at the district level are employed by the Local Government. The officers at the district level don't report to the Director of Fisheries. There is need to streamline and harmonize the institutional operations for small-scale fisheries management.

5. Policy, legislative and institutional limitations

Over the past decade or so there has been a shift from centralized to decentralized small-scale fisheries management. Although the BMUs/CCPs/LMMAs have been given legal frameworks to support their operations, concerns have been raised that they don't have adequate legal back to effectively perform their functions. For instance, they don't have ownership rights of the areas under their jurisdiction. They have insufficient support from the government. There is need to review the relevant legislation to give BMUs/CCPs/LMMAs more powers so that they can be better stewards for the sustainable development and management of small-scale fisheries resources.

6. Limited resources

Collaborative fisheries management structures have limited human and financial resources as well as equipment. They rely on external funding. They have limited capacity on technical, financial and administrative aspects. They also have inadequate patrol and surveillance tools. Further, they lack

access to information necessary for responsible fishing practices. As a result, key functions are not delivered, such as auditing of BMU finances, raising awareness of management plans, supporting BMU electoral processes, and providing enforcement support.

7. Cross cutting issues

The key stakeholders and the fisheries sector, including BMUs, CCPs and LMMAs have been impacted with COVID 19 pandemic. Most of them lost their sources of livelihood and income due to the restriction and measures put in place to curb Covid. HIV/AIDs is also prevalent in the fishing communities due to poor medical facilities in the fishing villages. Climate change and its impact is also increasingly becoming an issue. There is need to put in place comprehensive post-Covid recovery plans, implement climate change adaption and mitigation strategies as well as lobby other sectors to improve health facilities in the fishing villages.

Limitations of co-management

- May not be suitable or appropriate for every fishing community.
- Some fisheries resources like tuna are highly migratory and therefore not possible to manage under the local fisheries management framework
- Individual investment may be costlier than the expected returns.
- Require some structures to be on the ground which may not be forthcoming.
- Political interference and elite capture

8.0 LESSONS LEARNT AND SUCCESS FACTORS

The assessment revealed the following lessons, experiences and success factors which cut across all the countries in the SWIO region. All these initiatives have a similar conceptual approach regardless where they are being practiced.

1. collaborative fisheries management existed both during the precolonial and post-colonial periods

An interview and interaction with the local communities as well as reference to the literature indicate that co management existed in different forms during the pre-colonial and post-colonial periods. In precolonial times, coastal fisheries were managed under some form of customary and traditional fisheries management systems (Aswani et al., 2012; Rockotson &Tennery, 2007). This pre-colonial fisheries management included customs traditions and taboos. The traditional management systems were based on communal rights that were vested in a certain community clans or leaders. Such taboos and traditional practices included not use of poison to catch fish, not to fish for juveniles, fishing in coastal waters for subsistence only. However, with the advent of independence these traditional fisheries management practices were replaced by western systems. The traditional rules and regulations for small scale fisheries were abandoned.

During the post-colonial period, some new form of co management was introduced. This was occasioned by the structural adjustment programs (SAPs) that were introduced in line with the World Bank and the international monetary fund (IMF) in the1980s and 1990s in Kenya and the entire SWIO states. Though the saps were meant to improve the socio-economic states for the developing countries, this wasn't the case. They destabilized the economies, led to layoffs which led to increased unemployment and political tension (Rono, 2002). Most staff working in the fisheries' related sectors were laid off hence the capacity for government fisheries resources was weakened. In order to fill this

gap, the SWIO governments re introduced some formal and structural framework for involving local communities in fisheries management. Legal and policy frame works relevant for co-management were put in place and capacity building programs with the support of development partners.

2. Buy-in from local communities is crucial for effective and efficient co-management

The local communities are key beneficiaries to the sustainable fisheries management practices and improved governance involving local communities in co-creating and co-designing collaborative fisheries management solutions enhances the positive outcomes of natural resources conservation efforts. The local communities are incentivized to be better stewards of the natural resource conservation and initiatives if they are part and parcel of the management approaches by offering the local community ownership, access and user rights provided in the relevant policy and legal frameworks. The local coastal community management structures should also benefit from developing their own by-laws that are anchored within the national frameworks.

The FAO voluntary guidelines for securing sustainable small-scale fisheries recognize the role of small-scale fishing communities and underscores people in restoring, protecting and co-managing of aquatic and coastal ecosystems (FAO, 2015) in the implantation and co-management interventions. This brings the question of sustainability and co-management initiatives.

3. Providing enabling policy and legal frameworks is a catalyst to co-management

There exist a number of sectoral policies, legislations and regulations relevant to collaborative fisheries management, including the fisheries, wildlife, maritime, forestry, shipping and Integrated Coastal Zone Management (ICZM). Local communities for instance Beach Management Units have set out their own by-laws.

The FAO guidelines for securing small scale fisheries lays emphasis on providing the necessary policy and legal framework for supporting co-management (FAO, 2015). The level of compliance increases with the input of the local communities in developing the necessary policy and legal framework for collaborative fisheries management. However, in many instances sectoral policy and legislation tend to conflict and overlap with regard to co-management. For instance, there are policies and legal frameworks for establishing local institutions under the fisheries, forest, wildlife, and marine environment

4. Building a case for collaborative fisheries management

Local communities depend on coastal and small-scale fisheries resources for food and nutritional security as well as a source of livelihood. Efforts to establish collaborative and fisheries management units in the SWIO range states must demonstrate socio economic value to the communities, nature and business. The level of compliance and resistance to establishing co-management areas has been linked to the low level of understanding about the ecosystem service to the local communities including food and nutritional security, source of income and foreign exchange earnings. This information can easily be generated through an effective low-cost data collection and monitoring system.

5. Providing the local communities with necessary tools and resources

Capacity building and training programmes are essential. Community ownership of a project and or on-ground interventions also goes hand-in-hand with giving primary stakeholders the tools and resources necessary to achieve the desired objectives and goals. Most of the coastal communities that we interacted with have limited resources, both technical and financial for effective co-management to work. Transitioning to an effective, long-term and more sustainable coastal fisheries require investment in terms of finances, technical and capital resources. Building financial literacy and linking local communities to financing institutions and credit service providers is essential.

6. Building strategic partnership and effective stakeholder engagement

Partnerships involving the civil society, the government, the private sector and other key stakeholders are fundamental to successful implementation and scaling up of collaborative fisheries management.

7. Development Partner Support

There is clear evidence that the co-management approach would not have been adopted on such a scale and in such a time scale had it not been for support from projects funded largely by development partners (WWF, 2010., WWF, 2020). Development partners such as the Nature Conservancy (TNC), WWF, UNDP, Blue Ventures, Wildlife Conservation Society (WCS) and World Bank are investing in collaborative community-based initiative to offer solutions involving local communities in the SWIO region. Alignment and developing synergies is an important element to ensure resources are used optimally and duplication of efforts avoided. The preferred approach to providing developmental assistance now involves centralized budget support, often involving donor basket funding aligned to the sector wide approach to reduce administration costs and theoretically improve capacity building.

8. Showcasing best practices and innovations

Developing communication products and enhancing visibility of best practices and innovative solutions is essential. In all the case studies some form of visibility for instance website, Facebook, brochures and documentaries (print and digital) have been developed though with varying quality. The various interventions by the local communities on co-management have been showcased in different workshops, conferences and other fora.

9. The role of science and research

Science, research and technology play an important role in co-creating and co-designing as well as implementing co-management on the ground as well as informing policy and decision making. Finding new solutions and better ways of harnessing coastal and marine resources requires scientific input. For instance, the design and establishment of the co-management areas were based on science (Osore, 2021). Similarly monitoring of project implementation and impacts involves science.

10. Social capital, consistency and trust

Trust was a prominent enabling factor and related to social capital. The issue appeared at all levels (local and international) and between most of the stakeholders (including government, NGOs and resource users and management groups). Trust facilitated good communication and strengthened relationships between the different and diverse stakeholder groups. Dedicated extension support and constant engagement on the ground are critical to gaining community trust and willingness to be involved in collaborative fisheries management. A grass-root approach facilitates consensus building and resolving conflicts that may bound to arise (Ostrom, 1990; WWF, 2020).

11. Sustainable Financing

The sustainable financing of fisheries management institutions is a rather obvious lesson but nevertheless a very important one. It is also one that is sometimes ignored during the initial process of developing new institutions or modifying existing ones. It can be a process that often takes longer than expected, especially when legislative amendments are needed, so it is wise to start considering options at the earliest opportunity. Nearly all the collaborative fisheries management structures and unit entirely depend on funding from external sources, mostly development partners and to some extent government driven programmes. This presents sustainability issue for collaborative fisheries management interventions.

6) Human Capital

Enabling human capital factors were awareness of the rules and regulations as well as knowledge of conservation threats and ecological systems. Stakeholder consultations reported that this awareness and knowledge helped to foster A Common Understanding among communities and resource management groups, such as beach management units (BMUs) - an important precondition to collective action (Ostrom, 1990).

9.0. DEVELOPMENT PARTNERS SUPPORTING COLLABORATIVE FISHERIES MANAGEMENT IN SWIO

Small scale fisheries are sustainable resources supporting livelihoods for over 60 million people that inhabit the 100km coastal strip in the SWIO region. There are several donors and development partners who are keen to see that small scale fisheries are managed in a more sustainable manner to benefit local communities, providing food and nutritional security. The following development partners and NGOs have played a catalytic role to transition small scale fisheries in promoting centralized collaborative fisheries management. The list may not be exhaustive though (Table xyz below)

Table xyz shows some of the development partners and NGOs that have invested fisheries co-management in the Coastal East Africa

NGO	Country	Location	Intervention
WWF	Kenya	Lamu, Kilifi, Kwale (Shimoni –Vanga)	• Capacity building to BMUs • Establishment of co-management • Establishment of No Take Zones
The Nature Conservancy (TNC)	Kenya	Lamu	• Capacity building to BMUs • Establishment of co-management • Establishment of No Take Zones. • Establishment of Octopus closures.
Northern Rangeland Trust (NRT)	Kenya	Lamu	• Capacity building to BMUs • Establishment of co-management • Establishment of No Take Zones. • Establishment of Octopus closures
Wildlife Conservation Society (WCS)	Kenya	Kilifi, Kwale (Shimoni – Vanga)	• Capacity building to BMUs • Establishment of co-management • Establishment of No Take Zones.
East Africa Wildlife Society (EAWLS)	Kenya	Kwale, Shimoni - Vanga	• Gear restriction • Establish
Fauna and Flora International (FFI)	Kenya	Kwale (Wasini,	• Establishment of No Take Zones

CORDIO – East Africa	Kenya	Kwale (Mukuyuni, Wasini, Vanga and Jimbo)	• Establishment of No Take Zone.
LaMCOT	Kenya	Lamu (Iweni)	• Establishment of co-management. • Establishment of No Take Zones.
Bureni Turtle Watch	Kenya	Kwale - Bureni	• Establishment of No Take Zones,
COMRED Kenya	Kenya	Kwale (Munje)	• Establishment No Cost
UNDP-Small Grants Programme	Kenya	Kwale (Shimoni-Vanga Seascape including Vanga, Jimbo, Wasini, Shimoni, Mkwiro and Kibuyuni etc)	• Capacity building to BMUs • Strengthening co-management • Establishing No take zones.
Blue Ventures	Kenya		• Establishing closures • Capacity building of BMUs
Reefulution	Kenya	Kwale (Shimoni Vanga)	• Establishing No take zones • Capacity building of BMUs
IUCN	Kenya		•
Africa parks	Mozambique	Bazaruto	• Capacity building of fishing communities
Ocean Revolution	Mozambique	Inhambane Bay	• Capacity building • Establishing of No take zones
Wildlife conservation society (WCS)	Mozambique	Tofo Barra Rocha Inhambane Bay Primeirs & Segundas Nempula Zambezia	• Capacity building ccps • Establishing No take zones and co management areas
Zoological Society of London	Mozambique	Cabo Delgado	• Capacity building of CCPs • Developing community conservation areas
RARE	Mozambique	Sofala Cabo Delgado Nampula Maputo Inhambane	• Establish co management areas • Capacity building of CCPs
Marine Megafauna Foundation (MMF)	Mozambique	Tofo Bara Rocha Inhambane	• Establish co management areas • Capacity building of CCPs
Oikos	Mozambique	Quirimbas	• Strengthening CCPs
WWF	Mozambique	Quirimbas, Primeiras & Segundas, Nampula and Zambezia	• Capacity building • Establishment of No take zones • Establishing community management areas

World Bank (SWIOFISH)	Mozambique	Sofala, Zambezia, Nampula	• Establish co-management areas • Capacity building
Blue Ventures	Tanzania	Zanzibar (Unguja and Pemba)	• Building capacity for BMUs • Establishing No take zones • Closures
WWF	Tanzania	Rufiji, Mafia, Kilwa, Mtwara, Tanga, Dar Es salaam, Lindi	• Establishing BMUs • Establishing co-management areas • Establishing no take zones
Mwambao	Tanzania	Bagamoyo, Mafia, Pemba, Unguja	• Building capacity for BMUs • Establishing community networks
Western Indian Ocean Marine Science Association	Tanzania	Tanzania/ SWIO region	• Capacity building for local fishing communities • Generating scientific data to inform fisheries policy and management
Sea Sense	Tanzania	Kilwa, Lindi	• Establishing of collaborative fisheries management areas • Building capacity of BMUs
WWF	Madagascar	Southern Madagascar -Toliara	• Establishing of collaborative fisheries management areas • Building capacity of BMUs
Blue Ventures	Madagascar	Toliara, Ambaja, Antananarivo	• Building capacity for Locally Managed Marine Areas (LMMAs) • Support establishment of LMMAs
WCS	Madagascar	MaMa Bay, Southwest Madagascar,	• Support Locally Managed Marine Areas
Conservation International	Madagascar		• Conservation of Marine Protected Areas

10.0 RECOMMENDATIONS

These sets of recommendations have been developed based on the information that was gathered in the field and desktop study. The relevant national agencies and the respective countries that have the cardinal responsible to drive collaborative fisheries management are supposed to take leadership and rally other partners to support improvements in collaborative fisheries management as outlined in the recommendations below. Nevertheless, all the stakeholders that support inclusivity, socio-economic empowerment and sustainable natural resources management will find these recommendations worth consideration for implementation.

1) Performance review of local community fisheries management frameworks and institutions

Collaborative fisheries management structures and systems have been around of over a decade or two in all the SWIO range states. Whereas local communities under collaborative arrangement have been very instrumental in sustainable development and management of fisheries resources, concerns have been raised with regard to their performance effectiveness. A comprehensive evaluation of the performance of community-based fisheries management system would be necessary to understand how they have been effective in meeting the objectives and mandates that they were established for and demonstrate shared benefits to their members, community and nature.

2) Strengthen policy and legal frameworks for empowering local communities in fisheries management

Across the SWIO region, the local communities (BMUs, CCPs, LMMAs etc.) were established within the relevant legal framework. Most of them were established under the fisheries policies and laws in their respective parent national agencies responsible for fisheries management and development. Without legal identity and power, these collaborative fisheries management units are very vulnerable to local and political leadership who may not wish to see improvements in local governance and management. Legal identity is also crucial to demonstrating clearly the mandate of these local community-based entities within local government and national systems. Concerns were raised that the local communities through this collaborative arrangement have some limitations in effectively discharging their roles and responsibilities. The law doesn't explicitly allow them ownership, access and use rights in their respective co-management areas. The government agencies usually are responsible for the overall management including surveillance and licensing fishers and all other enterprises within the vicinity of the co-management arranges. There is need to review the legal framework for BMUs, CCPs, LMMA to enable them have realistic fishing rights including access and ownership rights of the areas of their jurisdiction.

3) Sustainable financing and resource mobilization

Whereas continued donor support is crucially important as new collaborative fisheries management units are established as part of the transitioning from centralized to participatory fisheries management, sustainability should be a priority. Most of the collaborative fisheries management initiatives are externally supported, including financial and technical resources. Efforts should be made by all the key stakeholders, and most importantly government agencies to integrate funding needs for the BMUs in their national budgets. Developing innovative funding mechanisms such as a fisheries levy managed by the local fishing communities to support co-management development, capacity building programs and implementation of fisheries management and conservation measures on the ground would assure continuity.

4) Strengthen internal governance and democracy for the local communities

The local communities' groups and entities in collaborative management have their own by-laws that guide and govern their functions including sustainable development and management of their fisheries resources. Good governance provides the general conditions within which economic growth, well-being and poverty reduction take place in BMUs, CCPs, LMMAs etc. Interactions with local communities on the ground revealed subtle governance issues, namely corruption and malpractices, manipulation by the political leadership and failure to conduct fair and transparent elections. In some cases, old officials deliberately fail to hand over to the incoming officials. This study confirmed that governance needs to be improved, and can only be improved by gradual, determined and concerted local effort, and by making decision-making systems and processes as transparent and accountable as possible.

5) Improving Infrastructure and Services at Landing Sites

There are few support services available for fisheries communities living at landing sites and associated villages. As a result, education levels are generally low and there is very poor health, water, sanitation services and feeder roads. There is also inadequate fisheries infrastructure for fish handling processing and storage. Efforts should be directed to improving working and living conditions of fisheries communities through improved infrastructures.

6) Securing fisheries resources and related ecosystem functions

The numerous institutional, social and legislative achievements made as part of developing a co-management approach in the SWIO range states were expected to secure or improve the fish resource base. However, it is not very clear if this is being achieved in many of the fisheries co-management areas. What is more clear is that many of the institutional, social and legislative processes are fitting into place to induce improvements in the fish resource. There is need to put in place a comprehensive participatory fisheries data collection system and ecological monitoring.

7) Strengthen participatory community-based law enforcement

There is evidence of increasing fishing effort which has resulted to decline in fish catches and mushrooming of illegal fishing activities. Increasing fishing efforts result to less catch per fisher hence some of them resort to illegal methods and gears to maintain their catches and incomes, inevitably catching smaller, often immature and less valuable fish. There is need to strength community-based Monitoring, Control and Surveillance (MCS). Most importantly is to provide fisheries monitoring equipment such as patrol and surveillance boats.

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APPENDICES

Annex 1: A questionnaire to establish the status, achievements and impacts of collaborative fisheries management approaches in the South West Indian Ocean (SWIO) region (Targeting local communities and practitioners (BMUs, CCPs, LMMA and Co-Management Areas entities)

Preamble

The South West Indian Ocean Tuna Forum (SWIOTUNA) is undertaking a study to establish the status, achievements and impacts of collaborative fisheries management approaches in the SWIO region. This study would help identify the constraints to effective co-management and as well as identify best practices for scaling out successful prototypes. The information generated from this assessment will certainly provide further insights in designing and adapting to new and innovative ways and tools for effective and sustainable co-management initiatives in the SWIO region. It is acknowledged that effective and efficient fisheries management tools and practices yield much dividends, including healthy fish stocks and net socio-economic returns to the respective local communities and countries.

We understand your actively involved in promoting collaborative fisheries management in this country and or SWIO region. This is to kindly request that you provide us with the following information by filling in the details in the template below. You can also provide additional information such as reports, pictures and video clips as an email attachment or the medium that is appropriate.

The information collected from this assessment will be purely for the purpose of this study and no other use whatsoever.

Thank you very much for your support and invaluable information

Name of the Locally Managed/ community fisheries management entity (e.g., BMU, CCP, LMMA, Co-management Area)	
Country	
District/ County	
Year established	
Number of Members	Male:
	Female:
Objectives of establishment	
Activities / interventions	
Achievements/ Impacts	
List the success factors (What reasons/factors contributed to the success)	
List at least five (5) Challenges/ Constraints that affect your performance towards meeting the desired goals and objectives	
List some suggestions to address the challenges / constraints identified above	
List sources of your financial support to implement your interventions/ activities (List the organization/ institutions)	
List sources for your technical support (List the organizations/ institutions and the kind of support they offer)	

Annex 2: A questionnaire to establish the status, achievements and impacts of collaborative fisheries management approaches in the South West Indian Ocean (SWIO) region ((Targeting NGOs and development partners)

Background Information

1. Name of the respondent and position in the organization/ Group
2. Name of the Organization/ Group
3. Country where the Organization/Group is based
4. Type of organization: Please select one: a) Regional NGO with programmes in other countries, b) national NGO with programmes in counties across the country; c) community-based organization with programmes within one part of the country, other (please specify)
5. When were you registered?
6. Number of founding members? (At the time of registration) ....
   How many are females?.....How many are male?.....Others (Specify)…….
7. What is the current status of membership?
   How many are female?.....How many are male?.....Others (Specify)…….
8. Location of the Organization
   County..... .... Area..... ....

9. Geographical scope of the programmes (Tick one):
   County/District/Local level, entire of Coast, National, Other..... ..... (Please specify)
10. Member of national CSO alliance? Please tick one:
    Yes, No, other (specific)
11. If yes, give the name of the CSO Alliance in your country.

Objectives of the Organization

12. What are the objectives of your organization? List a maximum of five.

Collaborative fisheries management

13. Are you currently implementing programmes that promote inclusivity and conservation of coastal and marine resources under collaborative fisheries management approach?
    Yes/ No. (Please tick one), others..... ..... (specify)

14. If your answer above is yes, please list the programmes/ projects/ interventions and where located.

15. Who are the main targets/ beneficiaries of your collaborative fisheries management interventions? List them.

16. Were the local communities involved in the design and development of the co-management programmes including establishment of the co-management areas? Explain how?

17. What have been the achievements and impacts of these interventions? List them.

18. Where did you get resources/ funds to support your programmes/ activities? List the sources.

19. Have you been trained to undertake effective and efficient collaborative fisheries management?

20. Do you have an exit strategy in the event of an end of your external financial support?

Constraints, challenges and strategies in collaborative fisheries management

21. What are the main 5 challenges or constraints you have experienced in carrying your organizations' objectives to support collaborative fisheries management?

22. What should be done to address these challenges and constraints?

Adaptive management and response to COVID 19 pandemic

23. What impacts did COVID 19 have to you're a) organization, b) local communities.

How did the you and the local community respond to these impacts

Annex 3: WORKPLAN AND IMPLEMENTATION SCHEDULE

Activity	Approach	Deliverables (Milestones)	Weeks								
			1(8th – 10th Sept)	2 (13 -17 Sept)	3 (20-24 Sept)	4 (27 sept – 1st Oct)	5 (4-8 Oct)	6 (11 -15 Oct)	7 (18 -22 Oct)	8 (25 – 29th Oct)	No of Days
Prepare inception report	Email submission	Inception report									0.5
Receive comments from SWIOTUNA Coordinator on the inception report	Feedback via email/call	Inception report									0.5
Development and refining of data collection tools	Online/Zoom meeting with the consultancy team	Data collection tools									2
Data collection: Review of existing documents and data	Desktop work	Data/information on the subject matter									5
Interviews with key stakeholders	Virtual interviews	Data / information on the subject matter									15
Key informant interviews	Virtual interviews	Data / information on the subject matter									5
Questionnaire surveys and focus group discussions on role, importance and benefits as well as challenge of co-management approaches	Limited site visits to some of the areas under co-management	Data / information on the subject matter									3

Data analysis and report write up	Internal workshop (consultant and team)	Draft report									11
Submit initial draft report	Virtual meeting	Presentation on initial findings									3
Submit final report	Virtual meeting	Final report									5
Total Days											50

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