MENAI BAY CONSERVATION AREA
GENERAL MANAGEMENT PLAN 2022-2032

MBCA GMP

Prepared for
MINISTRY OF BLUE ECONOMY UNDER SWIOFISH WORLD BANK PROJECT
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Menai Bay Marine Conservation Area
General Management Plan, 2022-2032

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Name	Title	Signature	Date
Max Goulden	Managing Director		19th May 2020
Kerry Lewis	Project Manager		10th November 2021
Heidi Guille	Director		17th June 2022

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The Department of Marine Conservation has approved the implementation of this General Management Plan for the Menai Bay Marine Conservation Area of the year, 2022-2032

On behalf of the Department of Marine Conservation

EXECUTIVE SUMMARY

The Menai Bay Conservation Area (MBCA) is located to the southern part of Unguja Island. MBCA was declared a marine conservation area in 1997under the Fisheries Act no.7 2010 The MBCA boundaries fall within the three administrative districts of West, Central and South and in two regions (Urban-West and South). Several small islands and sand banks encompass the MBCA, many with fringing coral reefs. Islets in the bay include Punume, Kwale, Miwi, Nyememb e, Komonda, Vundwe, Sume, Tele, Nguruwe, and Ukanga, covered mostly by coral rag bush and surrounded by coral reefs and seagrass beds. Most of the islets are not habitable; however, some are used by fishers as camping sites to reach offshore fishing grounds.

The MBCA and adjacent areas have exceptional resource values in terms of biodiversity, such as mangrove ecosystems, extensive seagrass areas and coral reefs. Such areas support populations of sea turtles, whales, dolphins, dugongs, coconut crabs and a diverse array of rich fish stocks. Scenic values of the MBCA include sandy beaches and numerous small and unique islands like Kwale, Pungume Uzi and Chumbe and other smaller sandbanks. Here, social values include tourism, fishing and cultural values such as historical ruins, archaeological sites, caves and sink holes. However, these are just some examples of the exceptional resource values described more comprehensively in the General Management Plan (GMP).

MBCA is administered and managed by the newly created Department of Marine Conservation (DMC) within the Ministry of Blue Economy and Fisheries (MBEF). Of fundamental importance to MBCA and the other four marine conservation areas (MCAs) of Zanzibar is the new administrative and management structure and new legislation that is soon to be rolled out under the MBEF.

The West B, Central and South Districts which fall within the current MBCA have 27 principle coastal wards and a total resident population of around 88,000. In terms of population, the principal wards are Fuoni Kibondeni and Chukwani, together comprising over 23,000 inhabitants. Rapid population growth within the districts and associated human impacts are anticipated to have a strong influence on the coastal and marine ecosystem.

Resource-use in the conservation area includes fishing, the collection of sea cucumber and molluscs, aquaculture (seaweed farming), agriculture, harvesting of mangrove and forest products, lime making, beekeeping, small businesses and tourism operations. Most communities are heavily dependent on coastal and marine resources for their livelihoods and the coastal population exploit living marine resources including fish and molluscs, as well as mangrove stands. These resources are not only used by the west coast population but also by fishers from the east, where deep waters often restrict local vessel access. Fishers from Unguja and as far as mainland Tanzania also come to fish in the Menai Bay and adjacent waters .

The need for a revised management plan: Unfortunately, the insufficient control of fishers and fishing methods have led to impacts on marine resources and thus signs of destruction and overexploitation are common. Enforcement of fishing prohibitions in the non-extractive zone of Chumbe Island coral park (CHICOP)has been successful after many years or effort, but such a small conservation area is insufficient to contribute significantly to the wider area of reefs and fish stocks of ther MBCA. However, Chumbe Island has served to increase fishers' awareness of the importance to preserve the high diversity of fish and coral reef habitat in the MBCA area as a whole. Nevertheless, considerably more management and enforcement is required to safeguard marine biodiversity, the many endangered, threatened or protected (ETP) species, and the condition and productivity of this natural resource base (especially coral reef). There is an urgent need for a revised GMP to address the degradation of the natural marine environment, biodiversity and resources.

This GMP represents the first step in the formal process used by the MBCA management in planning, developing and managing its marine and coastal resources. After reviewing different styles and structures of similar management plans from Tanzania and other parts of the region, the structure that has been adopted here is modelled on the Kisite-Mpunguti Marine Protected Area Management Plan (2015-2025), produced in Kenya. Recent changes in the environment and natural resources

management have highlighted the need for a strategic document to guide management decision making and to better define the vision statement, goal and objectives of the MBCA. Management planning and a clear strategy for management is a prerequisite if MBCA aims to begin monitoring its own effectiveness. Therefore, the MBCA GMP is accompanied by a Monitoring Control and Surveillance (MCS) Strategy, a Demarcation Plan, and a Management Information System (MIS).

This GMP and the MCS Strategy have been prepared in close consultation with the management of MBCA and a considerable number of stakeholders and stakeholder group representatives. The plan specifies management goals and strategies for the MBCA, related to the conservation area's mission and goal. Moreover, the GMP identifies major existing and potential threats and issues facing the conservation area from an ecological, social and cultural perspective. As such, the plan is designed to provide a framework for interactive management that relies on strong collaboration with the fisheries and tourism sectors and is supported by research, conservation and development partners.

The MBCA GMP has been formulated to provide a long-term vision and guidance required for the conservation and utilization of resource values found in the area. The plan has five key components:

- GMP Foundations
- Zonation Scheme
- Management Programmes (with six-year activity plans: from 2022 to 2027)
- Monitoring, Control and Surveillance (MCS)
- Implementation approach and principles (with Immediate priorities for the MCA Manager)

GMP Foundations: The plan foundations set out the purpose of the MBCA GMP that MCA Managers will aim to achieve. It describes the exceptional resource values that management will conserve and describes the planning process, plan structure and participation in planning.

One key feature of the GMP is that it is designed as a 'roadmap' on reaching the desired objectives within ten years, following a series of steps and procedures to be implemented over time. The GMP follows the Nature Conservancy's Conservation Action Planning (CAP) framework, recognized as one of the most widely used conservation planning tools in the world, and is designed to show the link between various variables and their impact on project completion. The CAP framework is based on a four-step project cycle and designed to be adapted to meet the needs of local planning teams while maintaining the integrity of the guiding principles. The start of this action planning cycle is defining the project people, scope and focal conservation targets. This has been well-covered in this GMP, resulting in the development of a set of strategies, measures and objectives, typically between 3 – 5 for each of the management programmes. Thereafter, the GMP describes how the implementation of strategies and measures might be approached through the actual implementation of the proposed actions, usually 4 – 8 for each of the management objectives identified. Actual implementation requires the participation of numerous stakeholders, ranging from local communities to international NGOs, under the leadership of the MBCA Manager. Emphasis will be on local community participation, including of fishers and other resource usures. From there, the fourth and critical step in the CAP framework is to analyse the results of the actions, share findings and adapt going forward.

Zonation Scheme: The Zonation Scheme is a management tool that allows managers to set different goals to be achieved in different parts of the MPA. In this edition of the GMP, there are only two types of zoning proposed for the MBCA: two Not Take Zones (RZs) and two Restricted Fishing and Recreational Zones (RFRZs). The RZs are designed to protect and conserve biologically significant habitats that have or are being restored to their near pristine conditions (locally referred to as *tengefu*) and offer sites to be undisturbed for scientific research. They also promote different types of visitor activities.

The proposed RZs of the MBCA encompass Kwale Island and sandbank and Dongwe

Mlango. All activities prohibited under the existing national legislation (namely the Fisheries

Act, 2010 and subsequent amendments and regulations) shall be prohibited in the entire MBCA boundaries, in addition to specific fishing practices, shore-based and seabedextractive activities, other activities and fishing and tourism operations regulations, as defined in this GMP.

Management programmes: The management plan is divided into five programmes that address conservation and administration issues in the MBCA and adjacent areas:

Ecological Management Programme

The purpose of the Ecological Management Programme is to restore and maintain MBCA ecological integrity through integrated strategic adaptive management. The MBCA ecological management programme (EMP) aims to enhance the biodiversity conservation and the ecological integrity of key ecosystems in the protected area. These ecosystems include mangrove forests, coral reefs, seagrass beds, sandy beaches, islands and their associated resources. The ecosystems serve as vital habitats for diverse flora and fauna that are important means of livelihoods for local communities and constitute an essential element for sustainable development. The following three management objectives are matched by 20 proposed actions under this programme:

- Populations of rare, endemic, endangered, threatened or protected (ETP) species restored and protected
- Marine ecosystems are restored and maintained in a healthy functioning state
- Marine biodiversity information is shared, understood and appreciated

Tourism Development and Management Programme

The purpose of this programme is to develop a unique tourism product, based on the special marine biodiversity, scenery and local culture at MBCA, that offers a memorable visitor experience. The following four management objectives are matched by 20 proposed actions.

- Adequate tourism support infrastructure and equipment provided
- Tourism activities and attractions diversified and managed
- MBCA's tourism marketing improved
- Visitor management systems improved and updated

Fisheries Resource Management Programme

The purpose of the programme is to ensure that MBCA's fisheries resources are restored and sustainably managed in collaboration with all stakeholders. The following five management objectives are matched by 14 proposed actions:

- Enforcement and surveillance of fishing activities strengthened
- Improved research on fishery management
- Effective community participation in fishery management
- Fishing pressure within MCAs at sustainable levels
- Impacts on emerging issues in fisheries resources assessed and addressed

Mariculture Development Programme

The purpose of programme is to empower and encourage local community to develop and benefit from sustainable forms of mariculture. The following two management principles are matched by six proposed actions.

- Seaweed farming production maintained or expanded sustainably
- Alternative mariculture options developed and implemented

Community Support Programme

The purpose of the programme is to empower and encourage local communities within MBCA to actively participate in sustainable conservation and management of marine resources. The following two management principles are matched by six proposed actions:

- Awareness of importance to conserve marine resources improved
- Communities actively involved in resource management enhanced

Monitoring, Control and Surveillance Strategy

As well as pro-active enforcement, this MCS Strategy considers measures to improve voluntary compliance though education and outreach and incentives to fishers. Where available, best practice guidelines and case studies in enforcement and surveillance of MPAs have been utilised to suggest the most practical and impactful interventions. The application of alternative modern technologies for both surveillance and monitoring have also been included. This MCS Strategy has 10 objectives and 36 proposed actions.

Implementation Approaches and Principles: The final chapter of the GMP states that once the objectives and actions (and activities, or measures) have been reviewed, these need to be prioritized and the implementation timeframes then reviewed. This should be done by the MCA Manager working with the Stakeholder Management Committee (SMC), community level organisations and research, conservation and development partners. The prioritised actions need to be costed and form the basis of the budget request. Only then will it be possible to decide which action should begin in the first year and those which can be developed in the subsequent years. The precise work plans needed to implement these actions should then be developed by the MCA Manager and management team.

Developed work plans need to be clear on the activities that are to be undertaken, including the identification of those individuals and entities responsible for each activity/task, and the associated budget. The plans also need to include measures defined to monitor progress. Progress monitoring is a key part of activity implementation and produces the information required to evaluate the efficacy of those activities. As per the guidance of the CAP approach, the evaluation sequence for monitoring should be based on analysis, learning, adaptation and sharing. These are the last steps in the CAP approach, requiring that the MCA Manager and management team systematically take the time to evaluate the actions they have implemented, to update and refine their knowledge of the MCA objectives, and to review the results available from the monitoring data collected. This reflection provides insight on how the GMP actions are working, what may need to change, and what to emphasize in the following phases. This step then asks the MCA Manager to document what has been learned and to share it with other stakeholders so they can benefit from the successes and failures. Three critical elements are needed to carry out the implementation of the GMP: adequate funding, stakeholder involvement and their roles and responsibilities, and fisheries co-management systems.

Immediate priorities for the MCA Manager

Once the GMPs have been formally approved by Government, the work of the MCA Manager will begin. In addition to the many internal tasks related to staffing, infrastructure and administration, the

following three sets of tasks are important and relate specifically to GMP implementation:

Involvement of research, conservation and development partners

- Identify and meet with representatives of stakeholder groups that are relevant to the implementation of the GMP (at a minimum, these will include local fisheries (SFCs), local seaweed farmers, Fisheries Dept, Marine Conservation Dept, NGO-SFC Collaboration representatives, local hoteliers, local SCUBA operators, local sandbank or fishing trip operators, local tour operators, other investors, school and social or community groups, port authorities, etc)

- Keep stakeholders, partners and the new oversight committee (the SMC) informed on details of the final management framework as it become legally binding.

- Identify potential development and conservation partners for some of this work in the GMPs. Most of the narrative of the proposed actions indicate where partners have a role.

- Regularly remind stakeholders that the GMP and MCS Strategy are guiding documents and that their implementation is based on adaptive management; learning from doing, adapting and progressing. This recognises that periodic reviews of action implementation are needed.

Finalize the Replenishement zones

- Revise all Replenishment Zone proposed in the GMPs, with the SMC and agree on the boundaries and regulations for each site. Site visits will be required. Zoning has to be defined only through collective agreement among all stakeholder groups, led by the MCA Manager.

- Once RZs are agreed, convene a meeting with the MCS, Co-Management and Conservation and Marine Resources units within the DMC to define the markers and zoning tools and markers and beacons that will be installed and the timeframe.

- Work with the relevant entities to re-draw any maps as required to accurately reflect the final decision on the RZ and ensure that RZ maps are distributed in appropriate languages and format for the understanding of those entities and stakeholders whom the RZ will affect.

Revise and prioritize proposed actions for the five GMP programmes and the MCS Strategy

- There are 66 proposed actions under the five thematic areas (ecology, tourism, fisheries, mariculture and community development), plus 36 actions related to MCS. The MCA Manager and SMC need to review each action and prioritize them with respect to the available budget, research, development and conservation partners, government priorities and other driving factors.

- Once prioritized, the timeframes for each proposed actions needs to be set and agreed with the person responsible and participating entities.

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ACRONYMS

CAP	Conservation Action Planning **CBD** Convention on Biological Diversity
CBO	Community-Based Organisation
CHABAMCA	Changuu-Bawe Marine Conservation Area **CHICOP** Chumbe Island Coral Park
CMG	Collaborative Management Group
CORDIO	Coral Reef Degradation in the Indian Ocean
CPUE	Catch per unit effort
DAMA	Department of Archives, Museums and Antiquities
DFD	Department of Fisheries Development
DFAD	Department for Fisheries and Aquaculture Development
DFDMR	Department of Fisheries Development and Marine Resources
DFO	District Fisheries Officer
DMC	Department of Marine Conservation
DoE	Department of Environment
DSFA	Deep Sea Fishing Authority
EAME	Eastern African Marine Ecoregion

EBSA	Ecologically or Biologically Significant Marine Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMP	Ecological Management Programme
ESIA	Environmental and Social Impact Assessment
ETP	Endangered, Threatened or Protected (Species)
FAD	Fish Aggregation Device
FAO	Food and Agriculture Organisation
FEC	Fisher Executive Committees
FMCAC	Fisheries and Marine Conservation Advisory Council
FMP	Fisheries Management Plan
GEF	Global Environment Facility
GMP	General Management Plan
GPS	Geographic Positioning System
GSM	Global System for Mobile communication
IBA	Important Bird Area
ICZM	Integrated Coastal Zone Management
IGA	Income generating activity
IMS	Institute of Marine Sciences
IUCN	International Union for Conservation of Nature
KIDOTOA	Kizimkazi Dolphin Tourism Operators Association
KMKM	Kikosi Maalum cha Kuzuia Magendo
KMPA	Kwanini Marine Protected Area
MACEMP	Marine and Coastal Environment Management Project
MANRLF	Ministry of Agriculture, Natural Resources, Livestock and Fisheries
MBCA	Menai Bay Conservation Area
MBEF	Ministry of Blue Economy and Fisheries
MCA	Marine Conservation Area
MCS	Monitoring, Control and Surveillance

MCTAG	Marine Conservation Technical Advisory Group
MCU	Marine Conservation Unit
MEP	MacAlister Elliott and Partners Limited
MICA	Misali Island Conservation Area
MIMCA	Mnemba Island Marine Conservation Area
MIS	Monitoring Information System
MKUZA II	Zanzibar Strategy for Growth and Poverty Reduction
MLF	Ministry of Livestock & Fisheries
MO	Management objective
MPA	Marine Protected Area
NGO	Non-Governmental Organisation
OBM	Outboard Motor
PECCA	Pemba Channel Conservation Area
PMSD	Participatory market system development
PRA	Participatory Rural Appraisal
RGZ	Revolutionary Government of Zanzibar
RZ	Replenishment Zone
SFC	Shehia Fishermen Committees
SMC	Stakeholder Management Committee
SUCCESS	Sustainable Coastal Communities and Ecosystems
SUZA	State University of Zanzibar
SWIO	South West Indian Ocean
SWIOFish	South West Indian Ocean Fisheries
SWOT	Strengths, Weaknesses, Opportunities and Threats
TNC	The Nature Conservancy
ToR	Terms of Reference
TSH	Tanzania Shilling
TUMCA	Tumbatu Marine Conservation Area

UDSM	University of Dar es Salaam
UNEP	United Nations Environment Programme
URT	United Republic of Tanzania
USD	United States Dollar
VPO	Vice President's Office
WCS	World Conservation Society (New York)
WHS	World Heritage Site
WIO	World Western Indian Ocean
WIOMSA	Western Indian Ocean Science Association
WWF	World Wildlife Fund
ZAFIRI	Zanzibar Fisheries Research Institute
ZATI	Zanzibar Association of Tourism Investors
ZATO	Zanzibar Association of Tourist Operators
ZCT	Zanzibar Commission for Tourism
ZEMA	Zanzibar Environmental Management Authority
ZFFS	Zanzibar Fisheries Frame Survey
ZIPA	Zanzibar Investment Promotion Authority
ZMA	Zanzibar Maritime Agency
ZPC	Zanzibar Ports Corporation
ZPEP	Zanzibar Poverty Eradication Plan
ZTC	Zanzibar Tourism Corporation

DEFINITIONS

The following definitions are provided from the Zanzibar Fisheries Frame Survey (2016):

Beach-seine: Refers to an encircling fishing net made of a piece of netting mounted between two ropes, one on either side; and whose method of operation involves pulling of such net towards the beach, sandbank, shallow waters area.

Cast net: Refers to a circular net that is thrown over a shoal of fish and allowed to sink to the bottom, trapping fish inside it.

Gill-net: Refers to a fishing net that catches fish by entangle them (commonly, but not always around their gills). These nets vary in lengths, mesh sizes and twine sizes. Usually, a sheet of netting is held vertically with help of floats and sinkers and set in a straight line in the water column. Gillnets are classified in terms of their mode of operation as shark nets (6" to 12" mesh, bottom set for sharks and rays), drifting gill nets (6" nets for tuna and other large pelagic fishes), shallow water gill nets (2" to 4" gill nets for shallow water reef fishes. Hand line: Refers to a line managed chiefly by direct contact with the hands on which baited hook(s) is/are attached

Long line: Refers to a long fishing line with a number of baited hooks, more or less evenly spaced, usually set close to the sea bottom in deep-sea fishing.

Octopus stick: refers to a stick with a pointed end used for capturing of octopus from the reef. It is locally known as "uchokoo". There are some variants of this, where a thin iron rod (bar) is used in its place.

Purse seine: Refers to a surrounding net drawn around a school of fish and then closed at the bottom by means of a line passing through rings attached along the lower edge of the net

Ring-net: Refers to a surrounding net like a purse seine with bridles to help pull in the lead line. It is similar to a purse seine but without the running purse line. The bag is a separate net.

Shark net: Refer to a fishing net for catching sharks (see gill net)

Trap: Refers to a device for catching fish that has a mesh or other structure which diverts the fish into an enclosure so arranged that egress is more difficult than ingress

Boat: Refers to a fibre-glass boats or wooden planked vessel with pointed bow and a square or rounded stern which is usually propelled by engine.

Dhow: Refers to a wooden planked vessel with pointed bow and rounded stern, usually propelled by sailing only.

Dugout canoe: Refers to a vessel constructed from a single log or a few pieces of a tree. The bottom is usually flattened for stability and usually propelled by oar, long pole or rudimentary sail

Mashua: refers wooden planked boat with bow and transform stern usually propelled by sailing but can also fitted with an engine

Outrigger canoe: Refers to a type of a dugout canoe with outriggers which provide stability to the vessel, specially, as its main means of propulsion is by sail.

Fisher/Fisherman: Refers to an individual who participates in any part fishing activity and is earning whole part of their livelihood through fishing operations.

Fish Shelter/Banda/shade: is any permanent or temporally structure used for handling fresh fish. Fish Banda provides a suitable handling place for artisanal fish operators to process or assemble their products before sale.

Landing site: Refers to an area adjacent to the beach of a village where local fishers usually land their catches and park their fishing vessels upon return from their fishing activities.

Sheha: Refer to a leader of the lowest level of formal administrative unit (locally known as *shehia*), appointed by the District Commissioner

Shehia: Refer to a smallest government administrative unit.

1. GENERAL MANAGEMENT PLAN FOUNDATIONS

1.1 The General Management Plan

When designed well and effectively implemented, marine conservation areas (MCAs) can restore fisheries and ecosystems both within and beyond MCA boundaries, as well as alleviate poverty among coastal communities. The Menai Bay Conservation Area (MBCA) General Management Plan (GMP) for the period 2022 to 2032, is the overarching management document for this protected area. The plan contains guiding principles, management objectives and actions aimed at achieving the purposes for which the MCA is established under the Fisheries Act No. 7 of 2010 Marine Conservation Unit Regulations. Furthermore, as stated in the MCU Regulations Part III 8. C. "In collaboration with the Managers, the coordinator shall prepare long-term management plans for controlled areas including management measures, annual implementation plans and their budgets."

This GMP represents the first step in the formal process used by the MBCA management in planning, developing and managing its marine and coastal resources. The style and structure of this GMP is similar to those from Tanzania and other parts of the WIO region, in particular, the GMP model for the Kisite-Mpunguti Marine Protected Area Management Plan (2015-2025), produced in Kenya (KWS, 2015) which addresses very similar marine conservation challenges to those experienced by the MCAs of Zanzibar. The MBCA GMP developed to fulfil the stated goals and objectives of the MBCA. More specifically to:

- Identify the key elements of the MBCA that make it a site of national and international significance.
- Articulate threats to the marine resources and other issues relating to management.
- Outline strategies to minimize threats.
- Provide framework for working in partnership with local communities to develop sustainable resource use and to diversify income-generating activities to support the livelihoods of local residents.
- Provide framework to work with local government authorities, economic enterprises including tourism developments, to ensure that environmental guidelines are observed in order to minimize negative environmental impacts.
- Provide a basis for the development of subsidiary legislations, subsidiary planning documents, operational plans and day-to-day management decisions.

The MBCA stakeholders completed the review of this GMP (2022-2032) in March 2022, through a process that involved key resource use stakeholders. The review was an opportunity to consider existing management approaches and actions, the roles, responsibilities and priority scheduling of the various activities. It also allowed for consideration of future direction of management in the MCA, and provided an opportunity to evaluate the challenges and successes in implementing the previous GMP. Following the review, the MBCA GMP (2022-2032) was endorsed by MBCA stakeholders on 15th March 2022 at a GMP validation meeting held at the Ministry of Blue Economy and Fisheries, Stone Town.

The Planning Process

The preparation of this GMP comprised the seven tasks described below, of which the last four are aimed at directly contributing to improved management of the MBCA:

Task 1) Conduct preliminary consultations: Consultation with the Department of Fisheries Development (DFD), now the Department of Fisheries and Aquaculture Development (DFDMR), including

staff of the DFAD's Marine Conservation Unit (MCU), now the Department of Marine Conservation (DMC) and MCA field staff; the Technical Adviser for the Co-management component and the World Bank SWIOFish Task Team Leader; as well as other consultants responsible for preparation of priority fisheries management plans (FMPs) for Zanzibar, selected other MCA stakeholders including FEC members and representatives from the tourism sector.

Task 2) Conduct a review of literature: From the start of the assignment, literature relevant to this assignment including (but not limited to) legislation and regulations, sectoral policies, existing rapid assessments (2005) and GMPs (2010) for MBCA and other MCAs on Zanzibar; available routine reporting from DFAD, MCA and MCS relevant to the target areas; relevant research outputs on fisheries, coral reef status, other environmental or socio-economic issues, and relevant SWIOFish preparation studies including Meyers (2014) and Shalli & Anderson (2013), among others.

Task 3) Prepare an Inception Report: An Inception Report that outlined in detail the strategic approach, methodology, implementation plan, staff roles, timeframe etc., drawing on the above consultations and literature review as well as guidance provided in sections items 4 to 7 (below).

Task 4) Draft the GMP: This task included maintaining a fully oriented MANLRF (now the Ministry of Blue Economy and Fisheries – MBEF) core team on the proposed planning approach with roles clearly identified. Stakeholders were closely consulted early in the planning process and had opportunities to provide input to draft versions of relevant sections of the GMPs, to build consensus, particularly on any proposed management regulations or zonation, with consultations properly documented with signed agreement of key stakeholder representatives.

Task 5) Prepare a Monitoring, Control and Surveillance (MCS) Strategy for each MCA: Preparing the MCS strategy for each MCA included a review of existing/proposed legal and management frameworks, notably existing fisheries and MCU regulations, proposed management actions in the MBCA GMPs (Task 4 above), relevant Fisheries Management Plans (FMPs), consultation with stakeholders (DFAD and SFCs among others), evaluation of the success of current and past approaches to MCS and identification of options for alternative approaches to MCS, including positive incentivization of compliance.

From a practical perspective, consideration was given to monitoring and reporting requirements for MCS measures identified and appropriate procedures and formats for monitoring and reporting, building on any already in existence at DFAD. Capacity available within DFAD and MCAs (including SFCs) in relation to MCS needs were evaluated, and equipment resources for implementing MCS in each MCA considered, both from MANRLF (now MBEF) recurrent and SWIOFish project funding.

Task 6) Prepare an over-arching MCA Demarcation Plan: With the goal being to support effective MCA management and related compliance and enforcement, the MCA

Demarcation Plan includes identification of priority boundaries in the official gazettement, review of the zoning plans in the revised GMP, and through consultation with DFAD personnel (including MCA managers), other relevant authorities and selected community and private sector stakeholders prioritised outer and/or internal zone boundaries for demarcation.

Task 7) Design an MCA Monitoring Information System (MIS) and train relevant users: Based on a literature review of current best practice on MPA management effectiveness monitoring, and consultations MANRLF and SWIOFish consultants, standardized monitoring indicators for assessing management effectiveness of MCAs with detailed protocols for monitoring each MCA was developed.

One of the key features of the development of this GMP is stakeholder participation. It is widely recognized that comprehensive stakeholder participation in the development of a GMP leads to greater success in the subsequent implementation.

To ensure the preparation of the draft GMP followed best practice, actions and procedures were developed that are viable, pragmatic and acceptable to all the entities affected by the MCA. In doing so, the following principles (as outlined in IUCN, 2004) guided the process:

- A review of existing information (e.g. physical, biological, social, economic, policies, legislation) and description of the context of each MCA.
- Analysis of copies of GMPs for other protected areas, both from within Zanzibar (e.g. CHICOP) from mainland Tanzania (e.g. Mafia Island) and within the region.
- Identification of stakeholders and establishment of a transparent consultation process, which involved meetings with individual interest groups and for all stakeholders together.
- Analysis of constraints, opportunities, threats, issues, problems and needs, and identification of solutions.
- Formulation of a vision, objectives and (where appropriate) targets.
- Design of management actions and interventions, including boundaries and zonation schemes and acceptable mechanisms for enforcement and compliance.
- Ensuring that the GMP is objective-oriented.
- Determining financing mechanisms, mindful of the need for benefit and revenue sharing with stakeholders. This is particularly important where certain stakeholders are required to surrender part(s) of their resource base to other stakeholders where compatibility of the two is not possible.
- Establishing monitoring and evaluation protocols, including a process for periodic review and revision.
- Preparation of the revised GMP to be shared with all stakeholders, and for public review.
- Incorporation of comments and submission the final GMPs for formal approval.
- Publishing the final GMP (both as hard copies and electronically).

Furthermore, the development of this GMP follows the Nature Conservancy's Conservation Action Planning (CAP) framework, recognized as one of the most widely used conservation planning tools in the world. The CAP is designed to be adapted to meet the needs of local planning teams while maintaining the integrity of the guiding principles (Annex 1. Conservation Action Planning outline). It is based on a four-step project cycle summarised in Figure 1.

Once the project or protected area scope, has been defined, the CAP framework is based on the following three important but different features:

- **conservation assessment**, which includes target viability, threat analysis and situation analysis;
- **strategies** that guide conservation action, based on agreed conservation targets, and viability, threat and situation analyses; and
- **best practice** in conservation, e.g. participation, implementing work plans and using the results.

Figure 1. Conservation area planning (CAP) cycle.

The Roadmap Approach to Implementing the GMP for the MBCA

One key feature of the present GMP is that it is designed as a 'roadmap' on reaching the desired objectives within ten years, by following a series of steps and procedures to be implemented over time. It is designed to show the link between various variables and their impact on project completion. The start of this action planning cycle is defining the project people, scope and focal conservation targets (see Figure 1). This has been well-covered in this GMP leading to the development of a set of strategies, measures and objectives, usually between three and five for each of the five management programmes. Thereafter, the GMP describes how implementation of strategies and measures might be approached, through the actual implementation of the proposed actions, usually between 4 and 8 for each of the management objectives identified. Actual implementation requires the participation of numerous and different stakeholders, from local communities to international NGOs, under the leadership of the MBCA Manager. Emphasis will be on local community participation, including of fishers and other resource usures. From there, the fourth and critical step in the CAP framework, is to analyse the results of the actions, share findings and adapt going forward.

Current Status of the MBCA

The current status of MCAs of Zanzibar is one where virtually nothing is actually taking place with respect to marine resource management or ecological conservation, and resource user confidence in management authorities is at an all-time low. Although quantitative evidence on the status of fisheries and ecosystems is fragmented and incomplete, there is a lot of anecdotal evidence as well as stakeholder recognition that the demersal shallow water fisheries (octopus and coral reef fish) within the MCAs of Zanzibar are overfished and that there are increased numbers of fishers and decreased fish stocks. One exception to this is the presence of several functioning and active collaborative man-

agement initiatives involving seasonal closures of certain octopus and fishing grounds in the south of MBCA, supported by local and international NGOs. Similar examples exist in TUMCA and PECCA.

The marine ecosystems are also under increasing pressure from population growth and the impacts of climate change. This was also the case when the MCAs were created. The Inadequate of implementation of management measures from the first GMPs (where they exist) has resulted in an increased gap between the status of the resources and ecosystems and the ability of management to address the issues. The status of the marine environment in MBCA matches this overview of Zanzibar's MCAs.

The no-take and other zones, the community participation initiatives in managing selected areas and other actions that are proposed in this GMP can be seen as piloting interventions, that need to be tested and assessed, adapted and modified or abandoned, as the case may be, as part of the 'roadmap' approach toward reaching the desired objectives within ten years.

GMP Structure and Function

The GMP structure is simple and aimed at promoting understanding and implementation of the GMP by the MCA Managers, resource users, development, research and conservation partners and other stakeholders. **Error! Not a valid bookmark self-reference.** presents the key components of the GMP and their functions.

Table 1. GMP structure, functions and contents.

Category	Function and contents
Plan Foundations	Introduce the plan, describe the plan's geographic scope, present the plan structure and the framework used to develop it. Present the Plan Purpose Statement and Exceptional Resource Values (ERVs). Outline management issues of specific concern for the MBCA.
Zonation Scheme	The zonation scheme proposed is meant to reconcile different types and intensities of use in different parts of the MBCA, and to help reconcile the sometimes competing and conflicting conservation and resource use needs. Identifies and proposes areas of the MBCA where different types of visitor use and tourism developments are permitted. It is also noted that the proposed zonation scheme needs to be finalized through a collective and participatory process involving all relevant stakeholders under the leadership of the MCA Manager.

Management Programmes	The bulk of the GMP is addressed here, with a framework to guide management activities that contribute to achieving the future desired state for specific aspects of the MBCA. The MBCA GMP has the following five thematic programmes: Ecological Management • Tourism Development and Management • Fisheries Resource Management • Mariculture Development • Community Support Each of the five management programmes has a purpose, followed by a set of three to five guiding principles that form the basis of the development and implementation of management actions. A set of three to five management objectives set out the specific goals of MBCA management, and for each objective a series specific management actions are described. The management actions will be implemented by the MCA management, often in collaboration with research, development and conservation partners.
Monitoring, Control and Surveillance	For MBCA, the sixth management programme component of the GMP is the Monitoring, Control and Surveillance (or MCS) Strategy, designed to ensure and support the implementation of the above programmes. As well as pro-active enforcement, this MCS Strategy considers measures to improve voluntary compliance though education and outreach and by generating incentives through management that benefits the general community.
Category	**Function and contents**
Monitoring Framework	A monitoring framework for each of the five management programmes was designed to provide guidance for the assessment of the potential positive and negative impacts resulting from programme implementation. It includes easily quantifiable indicators for assessing impacts and potential sources of the information required. The more detailed Management Information System (MIS) is presented as a separate document to accompany the GMP.
6-Year Implementation Schedules	Each programme is accompanied by an implementation schedule, that provides the link between the ten-year management actions and the annual work planning and budgeting of MBCA management. The schedules break down the programme's management actions into a series of tangible and explicit activities proposed for the first six years of implementation. For each proposed action responsible persons will need to be identified through a process led by the MCA Manager and supporting SMC, MCTAG and partners. The schedules include a proposed timeframe for activity implementation, and "milestones" for monitoring plan delivery. The final four-year schedule will be defined after a comprehensive analysis and review of each programme towards the end of year five, halfway through the overall implementation period of this GMP.

1.2 Menai Bay Conservation Area

The MBCA is located to the southern part of Unguja Island. It was declared a marine conservation under section (10) 1 of the Fisheried Act No 7 of 2010.The area was officially gazetted by an order published in the legal Supplement (Part II) of the Zanzibar Government Gazette vol. CVI No. 5755 of 9th August 1997.

The MBCA is an IUCN Category VI MPA which encloses an area of about 717.5 km^2, from the eastern side of Unguja Island at Bwejuu, proceeding south round Kizimkazi and to the western side extending past the peninsula, round Fumba village, then northwards to Mazizini near Zanzibar Town (MCU Regulations 2014). Its boundaries fall in three administrative districts of West, Central and South and in two regions (Urban-West and South).

The approximate coastline length in the MBCA is 140 km, excluding that of the small islands. Chumbe Island, while lying within the extended borders of the MBCA, is considered a separate and inde-

pendent (although essentially nested) marine protected area (MPA). The MBCA is administered and managed by the Department of Marine Conservation, within the MBEF.

Area Description

The current boundary starts from Chukwani in the West B district (close to the southern border of Zanzibar Town) to Bwejuu, on the southeast coast (Figure 2). The MBCA encompasses several small islands and sand banks, many with fringing coral reefs. The islets in the bay include Pungume, Kwale, Miwi, Nyememberbe, Komonda, Vundwe, Sume, Tele, Nguruwe, and Ukanga, which are covered mostly by coral rag bush and surrounded by coral reefs and seagrass beds. It covers an extensive marine area which includes the seabed and substrata extending into Menai Bay and beyond the east coast fringing reef to the 10 m contour depth at spring low tide.

Most of the islets are not habitable; however, some are used by fishers as camping sites to reach offshore fishing grounds. The islands of Pungume and Kwale, for example, that are strategically located close to Zanzibar town and easily accessible from Dar es Salaam, have been favourite camping sites for visiting *dago* fishers.

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Figure 2. Boundaries and main administrative and infrastructure features of the MBCA.

Vision Statement

The vision for the MBCA needs to be a forward-looking statement that is inspiring and describes the area as it could be in ten years from now, based on the result of the proposed management actions carried out. It provides the over-arching frame for determining the expected results, while describing the most outstanding features of the MBCA and how these might appear in future. The proposed MBCA's vision statement is presented below.

Vision Statement

In 10 years from now, the MBCA will be home to a rich diversity of marine plants and animals some of which are threatened and endemic (e.g. Indian Ocean Humpback dolphin) to this area.

A dynamic environment, the MBCA is rich in seabirds, which enables it to retain its international recognition as an Important Bird Area (IBA). The coral reefs are restored and protected so that reef fisheries not only survive but also thrive. Cognizant of the effects of climate change e.g.

increased erosion, wave action, coral bleaching, the MBCA Management and community are informed and work with specialists and experts to guide mitigation measures.

This unique and inspiration setting is where people gather to reconnect with nature and have mem-

orable experiences. Visitors are drawn to the MBCA by stories of pristine coral reefs,

dolphins, seasonal whales, magical islands, exquisite nature trails and the people who utilize the marine resources in a sustainable fashion. The understanding that the MBCA is fragile

commits them to protect MBCA for all to discover and enjoy. Visitors experience and personally connect with nature through the MBCA's special mosaic of marine and coastal habitats. They

enjoy meaningful time through a rich selection of activities designed to meet their needs and interests, such as dolphin-viewing, snorkelling, SCUBA diving, canoeing, boat safaris, bird watching, and picnicking on sandbanks.

The story of this outstanding heritage is presented to the public through both electronic and

print media, and public outreach education activities increasing local and national support for the MBCA.

The MBCA is a showcase of community participation in conservation. The local communities conserve and utilise fisheries resources sustainably, guided by specifications in the agreed

zoning scheme. A cooperative relationship ensures inclusion of stakeholders in all aspects of

MBCA operations and management creating opportunities for socio-economic benefits that promote diverse income sources and improved livelihoods of the fisher community. The health

and sustainability of the MBCA, its unique habitats and threatened species are maintained by passionate staff and through strong relationships with MBCA's terrestrial and adjacent ecosystems and communities.

MBCA Goal

Based on the current status, the proposed goal to be adopted for the MBCA is:

"To restore and conserve the diversity, abundance and ecological integrity of all physical and biological resources in the MBCA, so that they may be enjoyed and used productively and sustainably by present and future generations".

This aligns well with the definition of the term "conservation" in the Act No. 10 of 1999,

The Establishment of the Zanzibar Nature Conservation Areas Management Unit Act, 1999. The objectives are the specific statements that describe how the goal will be reached. The objectives help the managers with planning, measuring progress, and evaluating success. As per the Fisheries Act No. 7 of 2010 MCU Regulations, the proposed MBCA objectives are as follows:

MBCA Objectives

1. To promote, coordinate and guide public understanding, awareness, appreciation and enjoyment of the natural resources through interpretation/education and the provision of recreational opportunities.

2. To restore and maintain the population of key species, especially the Critically Endangered Indian Ocean Humpback dolphin and Hawksbill turtle, all other species of marine turtles, critical seabed communities, especially coral reefs and other Endangered, Threatened and Protected Species (ETP Species) refers to species which are listed as endangered, threatened or protected under national and international legislation.

3. To undertake the restoration, sustainable development and utilization of the MBCA's natural

resources, particularly fisheries, in a manner which will generate revenue to different stakeholders and therefore provide an economic justification for the setting aside of not-take zones.

4. To petition for internal and external financial grants for management purposes.

5. To promote research for the purpose of supporting MBCA management and education programmes.

6. To improve the management and conservation of the MBCA marine resources through gender sensitive, environmentally and socio-economically balanced approaches, in collaboration with stakeholders (especially fisheries and tourism) to ensure their active participation in the management.

7. To build the capacity of the marine conservation staff, SFC and other collaborating community organisations, to carry out effective management of fishing, tourism and other MBCA related activities.

8. To restore, preserve and maintain a typical representative area of the coral reef communities, migratory marine birds, and threatened and endemic marine wildlife for the benefit of present and future generations.

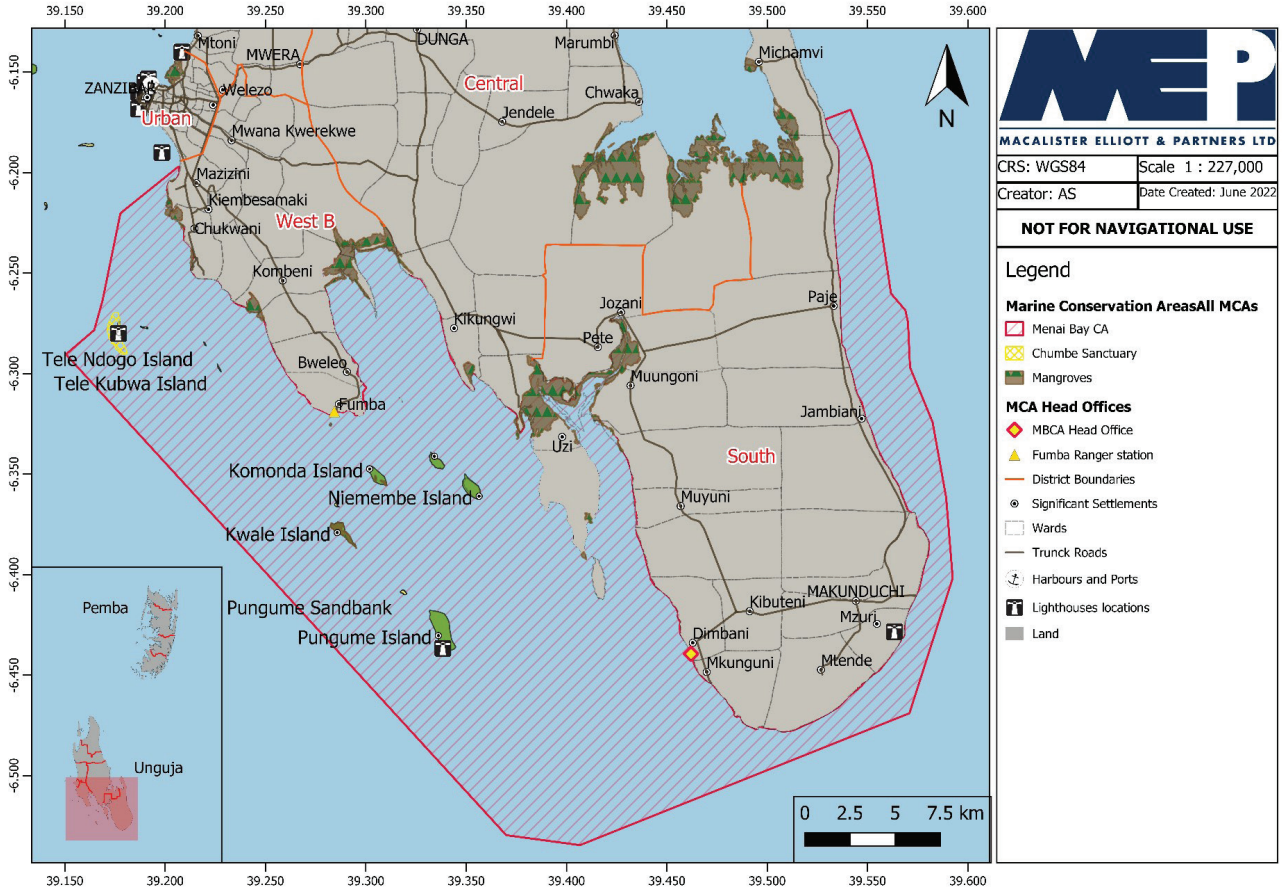
In doing so, the GMP will control the illegal harvest and use of fish, forest and land resources within its borders, by using special patrols with cooperation from citizens and other government agencies. Through its implementation, it will contribute to the three pillars of sustainable marine conservation: environmental, economic and social. It is also essential that the GMP delivers value for money for the tourist as well as the community and the coastal and marine ecology of the site.

Exceptional Resource Values of the MBCA

The Exceptional Resource Values (ERVs) of the MBCA are the area's key natural resources and other ecological and physical features that provide diverse benefits to local communities as well as national and international visitors. The ERVs are critical for MBCA's unique qualities, characteristics and ecology and should be the focus of restoration and conservation efforts. The following sections describe the MBCA ERVs that were identified through reviews of the literature, from personal knowledge of the consultant team and from information shared by stakeholders during the planning process, in particular with respect to their importance to the area. The MBCA ERVs are categorised into four broad categories: Socio-economic, Cultural, Scenic and Biodiversity (Table 2 below).

Table 2. MBCA exceptional resource values.

Category	Exceptional Resource Value
Socio-economic	Tourism Jozani mangrove boardwalk Fishing Trade



Cultural	Caves and sink holes close to Pete, Jambiani and other sites Historical ruins Ancient mosque at Kizimkazi Dimbani
Scenic	Kwale, Pungume Uzi and Chumbe Islands Sandy beaches Chumbe, Kwale, Pungume and other sandbanks Vundwe Island

Biodiversity	Marine mammals (whales, dolphins) Sea turtles Whalesharks and other Elasmobranchs Mangrove forests, Seagrass beds and Coral reefs Fish fauna Island refugia and Important Bird Areas Island coastal forest on Chumbe, Kwale and Pungume islands Endangered, threatened and protected species (ETP) Zanzibar (Unguja) – Saadani Ecologically or Biologically Significant Marine Area (EBSA)

Biodiversity values and Endangered, Threatened and Protected Species

The waters around Zanzibar are home to a number of species that are listed as endangered, threatened or protected under national and international legislation. Because of the rich marine and coastal biodiversity, MBCA is within the area included in the Zanzibar (Unguja) – Saadani Ecologically or Biologically Significant Marine Area (EBSA), and much of estern MBCA is also included in an Important Bird Area (IBA). The following provides a summary of species and natural habitats that contributed to the unique natural features of MBCA.

Marine Megafauna

Marine megafauna that are resident or visit the waters of the MBCA include mammals (dolphins, whales and possibly dugong), sea turtles and elasmobranchs (sharks and rays). Losses of marine megafauna (elasmobranchs, marine mammals and sea turtles) may have implications for the structure, function and productivity of ecosystems (e.g. Heithaus et al., 2008; Kiszka et al., 2015). These implications are especially concerning in small-scale fisheries areas like Zanzibar where coastal communities heavily on near-shore environments for their survival and livelihoods, with limited adaptive capacity to respond to ecosystem change.

Whales

Humpback whales (Megaptera nova*eangliae*) migrate seasonally from temperate waters to warm tropical waters where they breed and calve. The humpback whale migrates along the east coast of Africa and are regularly sighted in MBCA from June-July to November every year. It is possible that the MBCA and other coastal waters of Zanzibar represent a breeding area for humpback whales, based on the high number of calves observed, indicating that the whales give birth to their young in or very close to Zanzibar waters. Boat-based research conducted 2008-2012 off the south coast of Unguja encountered 340 groups of a total of 744 humpback whales of which 3.6% where young of the year calves (Berggren et al. unpublished data). The occurrence of competitive groups and acoustic recordings of singing males in the area also showed that males visit the waters to look for breeding opportunities and that there were more females with calves in the MBCA than in surrounding waters off the south coast of Unguja (Graham and Berggren, 2015).

Humpback whales are regularly encountered entangled in gillnets and lines to fish traps. This is a serious threat to the whales and also to the livelihood of the fishers that lose their gear when whales

get entangled and swim away with nets and lines attached.

Dolphins

The two most common species of dolphins occurring in MBCA are the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) and the Indian Ocean humpback dolphin (*Sousa plumbea*) (Amir et al. 2002, 2005, 2012). Both species are resident in the Menai Bay based on capture-recapture analysis of photographically identified individual dolphins (Stensland et al., 2006). Other species reported in the MBCA include the spinner dolphin (*Stenella longirostris*), Risso's dolphin (*Grampus griseus*) and common bottlenose dolphin (*Tursiops truncatus*).

Indian Ocean humpback dolphin

The Indian Ocean humpback dolphin shows restricted distribution and small populations where they are present. Reports suggest that this species prefers shallow nearshore waters of less than 25 m; and populations are usually found in locations with extensive shallows, such as protected bays and estuaries (Braulik et al., 2015; 2017; 2018).

According to the latest population size estimates based on capture-recapture analyses of identified dolphins, there were 19 (95% 14-25) non-calf individuals in this area (Sharpe and Berggren, 2019), representing a 63% reduction in abundance since 2002 (Stensland et al. 2006). Sharpe and Berggren (2019) also report that the population at this scale is not viable with a possible local extinction in this area within the next 40 years. Braulik at al. (2015) suggests that this species is likely to be the most endangered cetacean in Tanzania and is now listed as Endangered on the IUCN Red List.

Indo-Pacific bottlenose dolphin

The latest population size estimates, based on mark-recapture analyses of photographically identified dolphins, indicate there were 114 (95% CI 89-144) non-calf Indo-Pacific bottlenose dolphins in the Menai Bay in 2015 (Sharpe, 2018) and there was no detectable trend in abundance over the past 16 years (Stensland et al. 2006).

The primary threat to both species relates to incidental mortality and injury in fishing gillnets as the habitat overlaps the area were most artisanal fisheries occur (Amir 2010, Amir et al. 2002, 2005, 2012). The Indian Ocean humpback dolphins are primarily threatened by bottom set gill-nets used very close to shore whereas the Indo-Pacific bottlenose dolphins are mainly caught by drift-nets fishing further offshore. Two bycatch studies conducted in 2003/2004 and 2007/2008 estimated a yearly take of Indian Ocean humpback dolphins of around 6.4% and 4.8% of the population, respectively (Amir, 2010). Since these assessments, no long-term mitigation efforts to reduce bycatch have been attempted and these high levels of mortality have likely been consistent across years. Approximately

10% of the estimated Indo-Pacific bottlenose dolphin population was removed as fisheries bycatch in 2003/2004 and 2007/2008 in the drift gill-net fishery (Amir, 2010). High mortality may be driving a source-sink dynamic in which the MBCA is an ecological sink (Sharpe, 2018). In this scenario, abundance is kept high through immigration from outside the area, and as a result abundance outside this area may be declining without being detected.

The second most significant threat to dolphins in the MBCA is dolphin tourism, although targeting the Indo-Pacific bottlenose dolphins it also affects Indian Ocean humpback dolphins opportunistically. The activity was initiated around 1992 and by 1997 the activity had replaced the hunt for dolphins in the area (Berggren, 2009). The dolphin tourism in the MBCA is currently unregulated and unmanaged in violation of the existing tourism regulation (Berggren et al., 2007, Zanzibar Tourism Act 2009). The effects of tourism activities on the Indo-Pacific bottlenose dolphin population in MBCA have been demonstrated to affect short-term behaviour of nursing females (Stensland and Berggren, 2007) and the daily activity budget, increasing the amount of time traveling and reducing the amount of time foraging, resting and socialising (Christiansen et al., 2010).

Suggested guidelines for the dolphin tourism were introduced in 1998. However, these were perceived as too strict and were rarely followed by the operators. In 2002, revised guidelines were issued by the Department of Fisheries and Marine Products and distributed in the form of a leaflet available in English and Swahili. Unfortunately, few operators to date have followed the guidelines and the activity now engage about 100 boats that take tourists out to watch and swim with dolphins. Humpback whales are also opportunistically targeted when seasonally present in the area.

In an effort to improve the dolphin tourism in the MBCA, the Kizimkazi Dolphin Tourism Operators Association (KIDOTOA) was formed in 2005. This was one of the outputs of the WIOMSA funded Sustainable Dolphin Tourism Project (Berggren et al., 2007). KIDOTOA is/was a non-governmental organisation dedicated to long-term sustainable development of the dolphin tourism in the MBCA. The focus of the Association was to promote sustainable dolphin tourism, dolphin research, education and environmental conservation. KIDOTOA further provided intensive training courses in sustainable dolphin tourism for tour guides and boat operators organised in collaboration with the Institute of Marine Sciences, University of Dar es Salaam. The courses included both theoretical and practical elements where participants were trained in land- and boat-based best practice for whale or dolphin watching. The course was offered at regular intervals and participants were issued a certificate on completion of the course. KIDOTOA also developed and posted information signs for marine mammals at public access areas where tourists, tour operators and local communities easily can access the information. KIDOTOA promoted the dolphin tourism guidelines and provided education and awareness to the community and schools. KIDOTOA was an advocate for the protection of dolphins from destructive and unsustainable fishing practices in the region such as the use of drag nets and dynamite blasting.

Methods to mitigate and release humpback whales entangled in fishing gear was one of the objectives in the three Humpback Whale Bycatch Mitigation and Whale Watching Workshops conducted in 2010, 2011 and 2012. The second aim was to introduce how sustainable and safe whale watching can be conducted. The workshops included both theoretical and practical elements and attracted around 40 participants per year with broad stakeholder group representation. The Workshops were organised by Newcastle University in collaboration with the Ministry of Livestock and Fisheries, Zanzibar, the Institute of Marine Sciences, University of Dar es Salaam and KIDOTOA. Funding for the Workshops and a donation of specialised disentanglement equipment was provided by the International Fund for Animal Welfare, US.

Other threats to the dolphins and whales in the MBCA relate to anthropogenic impacts associated with habitat degradation including underwater sound from blast fishing (Braulik et al., 2017), use of outboard engines on boats and pollution.

Turtles

Five species of turtles occur in Zanzibar waters: Green (*Chelonia mydas*), Hawksbill (*Eretmochelys imbricata*), Loggerhead (*Caretta caretta*), Olive Ridley (*Lepidochelys olivacea*) and Leatherback

(*Dermochelys coriacea*) (Frazier, 1975). Marine turtles spend almost their lives at sea except when the females go ashore to lay eggs in pits dug in sandy beaches. They travel large distances between laying, and often return to the very same beaches that they hatched. Individuals will take around 30 years to reach maturity.

In Zanzibar waters, including those of the MBCA, the Green and Hawksbill as the most common (Khatib et al. 2002). Green turtle nests were seen around Unguja Ukuu and Muungoni, and from the early 1990s, Clark and Khatib (1993) reported that between 10 and 40 nesting per year could be observed at Kizimkazi and between 10 and 20 at Fumba. There was a conservation project at the the Uzi Island Sea Turtle Lagoon project, in the MBCA, though the current status of the project needs to be confirmed. Human disturbance has reduced nesting to only a few isolated locations, and currently there is no certainty as to whether turtles continue to nest in the MBCA. The only Hawksbill turtle nesting in Zanzibar now takes place on the uninhabited Misali Island, within the Pemba Channel Conservation Area (PECCA). Sea turtles that forage in Zanzibar waters may be nesting in other countries in the region, such as Seychelles and even South Africa.

The hawksbill is classified by IUCN as Critically Endangered based on a global population decline of over 80% in the past 50 years, mainly resulting from nesting beach damage, egg poaching and capture for the once-valuable shell. The other species are all categorized as Endangered.

One of the most important achievements in efforts to conserve turtles in Zanzibar was the establishment of the Zanzibar Sea Turtle Conservation Committee in February 2002 as a recommendation of the Sea Turtle recovery plan for Zanzibar. Whether this contributed to their conservation, and the status of this committee and plan are not known and need to be re-visited.

Whale sharks and other Elasmobranchs

The capture of elasmobranchs (sharks and rays) allied species has been a feature of the Zanzibar fishery for hundreds of years, with a long tradition of trade in salted dried shark including shark fins. Recently though, the numbers of species and individuals caught have declined significantly and no licenses for export of fins are being issued (Barrowclift et al., 2017; Jiddawi and Shehe, 1999). Many species continue to be landed around Zanzibar, with the meat for local consumption, the livers for boat wood oil and teeth and jaws for tourist trade. Recent research investigating the catch in small scale-fisheries in East Africa (Kenya, northern Madagascar and Zanzibar) have shown that catch records are massively underreported regarding the number of sharks and rays caught (Temple et al. 2018, 2019).

In Zanzibar, at least 21 species of elasmobranch species are caught (Barrowclift et al.

2017). Mobula spp. are caught in both mainland and Zanzibari small-scale fisheries (Temple et al. 2019). Catches of sharks appear seasonal, being highest during the NE monsoon, particularly between January and May (Barnett 1997; Schaeffer 2004), possibly due to seasonal weather affecting fishing effort. Batoids have a particularly high representation in Zanzibar, with various Dasyatidae species dominating the batoid catch (Barrowclift et al. 2017), which may reflect fishing practices, market demand or the suspected decline and partial collapse of shark stocks (Barrowclift et al., 2017; Jiddawi and Shehe, 1999). The high level of batoid landings, combined with limited understanding of the ecology and life history of many of the species recorded, demonstrate a need to allocate research efforts to document life history parameters for this group of rays.

Shark landings are dominated by ground sharks (Carcharhiniformes), within which requiem (Carcharhinidae), hammerhead (Sphyrnidae) and hound (Triakidae) sharks are most common (Temple et al. 2019). The largest contributors are small and moderately sized species occurring in a range of coastal, oceanic and deep-sea habitats, particularly smoothhounds (*Mustelus* spp.), sliteye (*Loxodon macrorhinus*), spurdog (*Squalus* spp.), hardnose (*Carcharhinus macloti*), grey reef (*C. amblyrhynchos*) and spottail (*C. sorrah*) sharks. Scalloped hammerheads (*Sphyrna lewini*) are also common. Larger species, such as bull (*C. leucas*) and tiger (*Galeocerdo cuvier*) sharks, are caught in limited numbers

including in the MBCA. Further, oceanic and deep-water species, including shortfin mako (*Isurus oxyrinchus*), silky (*C. falciformis*), thresher (*Alopias* spp.) and bigeye sixgill (*Hexanchus nakamurai*) are also recorded in relatively low numbers.

Despite having only been recently described (Last et al., 2016b), Baraka's whipray (*Maculabatis ambigua*) is a common constituent of the elasmobranch catch in Zanzibar primarily caught in bottom-set gillnets (Barrowclift et al., 2017; Temple et al., 2019). Recent research on the biology of Baraka's whipray indicate that the species is a fastgrowing and early maturing species, with a relatively long lifespan. Yet, available data suggest the species is likely overfished and that the species is unlikely to be biologically sustainable in the face of current fisheries pressures (Temple et al. in prep).

Recently a new species of shark has been described from specimens caught by fishers in the MBCA, the sixgill sawshark *Pliotrema annae* (Berggren and Temple, 2020; Weigmann et al. 2020). This is an exciting discovery which also highlights how much is still unknown about the marine biodiversity around Zanzibar and how vulnerable it may be to Insufficiently monitored and managed fisheries. We know very little about sawsharks. Until now, only one sixgill species (*P. warreni*) was scientifically recognised. With the discovery of a new species the need to properly assess the impact of small-scale fisheries on marine life is even more urgent. There may be other unidentified sharks and other species that are commonly caught in these fisheries with a risk of species going extinct before they are discovered.

Due to their slow reproductive rates, populations of sharks and rays are slow to recover from over-fishing, which has led to many species being now considered threatened and endangered. Elasmobranchs typically display life histories of slow growth, being long-lived, with late sexual maturity and low fecundity (Compagno, 1990). These traits indicate limited resilience to anthropogenic disturbances, such as fishing exploitation (Quetglas et al., 2016), due to low population growth rates and slow recovery rates (Hutchings et al., 2012). However, some elasmobranch species have life history traits more capable of recovery following exploitation and with appropriate management could be targeted as part of a sustainable fishery (Simpfendorfer and Dulvy, 2017).

Efforts to monitor and manage fisheries in this region must be expanded to prevent biodiversity loss and to develop sustainable fisheries. There are simple methods available that can work on small boats where monitoring is currently absent, including using cameras to document what is caught. Recent research clearly shows the potential effects from small-scale fisheries to a diverse range of coastal, oceanic, and even deep-water marine megafauna species, reinforcing small scale fisheries' potential to impact across multiple ecosystems (Temple et al. 2019). Thus, there is a clear need for further work in and over longer time periods in order to improve assessments and inform evidence-based management of small-scale fisheries. However, what is clear is that for the future sustainability of marine megafauna resources, further focus must be placed on management of the dominant small-scale fisheries.

The main value of sharks to the MBCA relate to their role in the ecology of the fish community, especially of coral reefs, for the viewing opportunity by visitors of whales harks on boat trips and of the smaller sharks and rays by SCUBA divers and snorkellers.

Mangrove forests

Mangrove forests play an important role in the ecosystem of the MBCA, providing areas of high ecological productivity, breeding and nursery functions, roosting areas, feeding grounds; and providing other services such as trapping sediments and improving water quality, adding nutrients to coastal waters and preventing coastal erosion. They also provide ecosystem services to local communities such as through the provision of materials and habitat for bees (bee-keeping), sources of firewood and charcoal, medicines and building materials for houses and boats. Mangroves are thus an important source of income for many people engaged in selling mangrove forest products.

Mangrove forests cover the sheltered bays and inlets in the northern parts of MBCA, around Nyamanzi, Kisakasaka, north of Uzi Island and at the northern part of Pete Channel Muhando (1995),

extending over an area of 900 ha in total (Makame et al., 2005) and representing the second largest mangrove stand in Unguja Island after Chwaka Bay. Additional smaller areas of mangroves can be found at Muungoni, Ng'ambwa, Fumba, Kiomoni near Kizimkazi Dimbani, and along the shores of Chukwani (Figure 3).

There are 10 species of mangroves found in Zanzibar, all occuring in MBCA. All mangrove forest areas in Zanzibar are protected. Harvesting is managed through a permit and licensing system, issued by the Forestry Department, which has defined a national mangrove management plan. Further to the national programme, as described by Torell et al (2006), mangrove management within the MBCA in the past involved supervision by the village headmen and MBCA staff, with an Environmental Committee established in each of the 16 participating villages. Village representatives participated in overall management of the project, and a number of alternative income generating projects were supported, including bee keeping and tree farming. The program encouraged mangrove protection and replanting, with villagers themselves initiating many of these activities. For example, in Ng'ambwa the villagers initiated a mangrove conservation project and in Nyamanzi, the villagers started a bee-keeping project to earn income at the same time as conserving the mangrove forest.

Seagrass beds

Seagrasses are flowering plants that live submerged in the marine waters. They form dense beds which cover large areas of coastal waters and perform a wide spectrum of biological and physical functions. Twelve species of seagrass have been identified in Zanzibar coastal waters, with the most dominant being *Thalassia hemprichi* in intertidal areas, and *Thalassodendron ciliatum* and *Syringodium isoetifolium* in deeper water.

Seagrasses are a source of food for herbivorous invertebrates, fish and turtles; they trap and bind sediments thereby reducing particulate pollutants over coral reefs; and provide protection to shorelines by dissipating wave energy. Seagrasses serve as breeding, nursery and feeding areas for many invertebrates and vertebrate species. The Endangered Golden Sandfish (*Holothuria lessoni*) and other sea cucumbers of commercial value occurs in seagrass areas; and seagrass beds are also important for the Endangered Napoleon Wrasse (*Cheilinus undulatus*) whose juveniles feed and seek refuge among seagrasses. Seagrass beds also provide important foraging areas for the qualifying critical habitat marine mammal species, notably the Indian Ocean humpback dolphin.

No direct human uses of seagrasses have been recorded so far in MBCA, though seagrass beds also support local livelihoods through shore-based gleaning of shrimp, gastropods and bivalves. As noted in *Social and economic values* section (page 22) the extent of gleaning means that the pressure on intertidal habitats is likely to be significant. The Fisheries Act of 2010 prohibits the use of beach-seine, however, based on local consultations, various stakeholders confirmed that beach seine-nets continues to be widespread in the MBCA. This is considered a key threat to the status of seagrass habitat. Other key threats to seagrass habitats include high fishing pressures across the seascape, and in some locations, seaweed farming.

Coral reefs

Coral reefs support diverse assemblage of fishes and invertebrates are an important biodiversity feature, fishery resource and tourist asset of the MBCA, extending along the entire eastern seaboard, and around many of the smaller islands in the Menai Bay area (Figure 3). Coral reefs are also a foraging habitat for the Indian Ocean Humpback dolphin.

Soft corals are the most numerous in the coral formation of MBCA, especially in the more sheltered areas. Hard corals, typically of genera *Acropora*, *Porites*, *Galaxea* and *Montipora*, are the main reef builders and are widespread throughout the MBCA where suitable conditions prevail.

Baseline data for hard coral cover, expressed as a percentage, conducted in the mid-1990s (by Horrill, 1992, and Muhando and Mohammed, 1996) suggested that average hard coral cover around five

MBCA sites was 33% with the lowest recorded at Paje Kijambani (19%) and the highest being Pungume (48%). However, even though the Paje Kijambani reef had the lowest hard coral cover; it had by far the highest overall coral cover with soft corals covering around 75% of the substrate. While the Pungume reef showed the highest hard coral cover it also exhibited the lowest diversity and generic richness with only 22 recorded genera (out of 53 genera recorded across MBCA), being instead dominated by the genus *Montipora* accounting for over 80%. The most dominant coral reef genera in MBCA are *Acropora*, *Montipora*, *Porites*, *Millepora*, *Lobophyilla*, *Echinopora* and *Favia*. From more recent surveys conducted in 2002, Kwale Island reef had 48% of both hard coral and dead coral, Komonda Island reef had 61% of hard coral and 19% of dead coral, and the protected area of Chumbe had 37% of hard coral and 16% of dead coral (Mbije et al., 2002). While the data are not always directly comparable, there is sufficient historic detail from which to monitor and measure changes in the condition of the coral reefs in MBCA in the future.

One of the principal threats to the coral reefs within the MBCA is destructive fishing practices, the other being the volume and damage caused by unregulated recreational visitors, reportedly already taking place at Kwale Island reef. However, with appropriate interventions to reduce destructive fishing practices, and additional actions implemented to promote natural reef regeneration, such as those proposed in this GMP, it is possible that the coral reef ecosystem in the MBCA can recover. For example, on nearby Chumbe Island, on the west coast of Unguja, where significant natural and un-aided coral regeneration has been demonstrated after 10-15 years of no destructive anchoring or fishing.

Other than anthropogenic threats, a third category of threat to coral reefs related to water quality, including temperature. An increase of water temperature by 2-3 °C, as happened in late 1997 and early 1998 (Muhando, 1999), led to discoloration and whitening or bleaching. Though bleached corals can survive for several months, if high temperatures continue for over five months, many coral colonies die. The rise in water temperature was attributed to a global phenomenon called the El Nino event. In certain parts of Zanzibar, Tanzania Mainland, Kenya and Seychelles over 70% of corals died.

Fish fauna

The fish fauna of the MBCA has not been well documented, though official statistics from the DFD-MR indicate that the economically most important fish species from MBCA include large pelagic varieties such as mackerel and tuna (Scombridae), jacks and trevallys (Carangidae), marlin and sailfish (Istiophoridae), barracudas (Sphyraenidae) and Serranidae (Groupers). Demersal species, including snappers (Lutjanidae), emperors (Lethrinidae), breams (Nemipteridae), rabbitfishes (Siganidae), parrotfishes (Scaridae) and goatfish (Mullidae) are also commonly landed at MBCA landing sites. From the coral reef ecosystem, 514 species of fish from 30 different families have been reported from Chumbe Island's protected reef, thus it is expected that from the wider MBCA, a total species number may exceed 500, taking into account pelagic and deeper water species from the east and southern portions of the area. Numerous other species of sharks and rays occur in MBCA. The fish fauna of the coral reefs of the MBCA are an important asset to the local fishing community as well as the tourism sector in this area. As such the MBCA is possibly a sink for the finfish fishery (as well as the octopus fishery), meaning that the abundance inside the MBCA is kept high through immigration from outside the area, and as a result abundance outside this area may be declining without being detected. This has not been proven though.

Island refugia

There are five uninhabited islands within the Menai Bay area, of various sizes, from the small Miwi Island to the larger Kwale, Nyamembe, Pungume and Vundwe islands. Smaller islets include the three forming the Komonda Islets, the two Tele ndogo and Tele Kubwa, and many others (Figure 3). Chumbe Island supports a small, eco-lodge and the two associated small islets. All these islands and islets are of fossil coral origin and covered in dense coral rag vegetation. This special flora is home to a small but diverse fauna community. Important among the fauna is the Coconut crab *Bigrus latro*, the largest terrestrial arthropod in the world, though it starts life in the sea. The species inhabits the coastal forest regions of many Indo-Pacific islands, although localized extinction has occurred where

the species lives close to humans. They are generally nocturnal and remain hidden during the day, emerging only on some nights to forage.

The Ader's duiker, now very rare in Zanzibar, is thought to still exist on Chumbe Island, where a few specimens were introduced to serve as a free-ranging breeding nucleus. The dry bush habitat of the shores of parts of the MBCA are also a home for the blue duiker as well as wild pigs, galagos, tree hyrax, African civet, Sykes monkey and several mongoose species.

Island coastal forests

There are three large islands within the Menai Bay area that support dense rich coastal forest communities: Chumbe, Kwale and Pungume. Apart from Chumbe, little is known of the species composition and the importance of associated fauna.

Important Bird Areas

About hundred bird species have been identified in MBCA, among which are herons, egrets, African fish eagles, brown noddy, terns, plovers and sandpipers. The islands of Pungume and Kwale are also important habitats for roosting seabirds, while expanses of soft sediment of coral silt attracts large numbers of Palearctic waders and the mangroves are also important roost sites. There are two Important Bird Areas (IBAs) of relevance to MBCA. IBA TZ044, is located on the south coast of Unguja, together with Chumbe Island (Figure 3). The site covers the two adjacent bays of Kiwani and Kombeni in the southwest.

Key species found in the area include the Terek sandpiper (*Xenus cinereus*), the crab plover (*Dromas ardeola*) 712 (1998) and breeding pairs of the Roseate tern (*Sterna dougalii*) 750 (1994) (Bregnballe et al., 1990; Geene, 2001; Iles, 1994).

Birdlife International (2020) reports that between July and October, Chumbe Island supports an assemblage of pelagic-feeding birds. In many but not all years this includes a significant breeding colony of Roseate Tern, that nest on two tiny rocky islets a few hundred metres off the southern tip of Chumbe. Predation by rats and the Indian house crow (*Corvus splendens*) is a serious problem for Roseate terns. Chumbe managed a successful rat eradication programme in 1998.

A second bird area, IBA TZ045 exists on the Chwaka Bay side, extending north from the village of Paje to Chwaka Bay (7,500 ha), which provides shelter from the SE monsoon and prevailing ocean currents (Figure 3). Chwaka Bay has extensive stands of mangroves along its southern shore, and large intertidal expanses that provide feeding grounds for shorebirds. In addition to those listed below, 320 Ruddy turnstones (*Arenaria interpres*) where recorded in 1989. The Cape gannet (*Morus capensis*) is a rare visitor to East African waters, and has been recorded off Paje. Key non-breeding species number are crab plovers 1,633 (1998), Greater sandplover (*Charadrius leschenaultia*) 1,805 (1998) and Saunder's tern (*Sterna saundersi*) 3,050 (1989) (Bregnballe et al., 1990; Geene, 2001; Iles, 1994). Tourism results in some disturbance to feeding birds but is unlikely to cause serious problems Birdlife International (2020).

Figure 3. Principal ecological, scenic and socio-economic values within the MBCA.

Jozani Forest National Park

The nearby forest at Jozani Forest National Park is host to several important mammals, the most famous of which is the Red Colobus monkey *Colobus badius kirkii* (Endangered) with 30% of the total population of 2,400 is centred on Jozani Forest. The near endemic ungulate Ader's duiker *Cephalophus adersi* (Endangered) has its stronghold on Unguja with a population estimated at below 2,000, in five fragmented sub-populations, including one at Jozani.

While the forest is outside of the MBCA boundaries, some of the resident species on animals often move into adjacent mangrove areas that are within the jurisdiction of the MBCA. For example, among the 40 bird species recorded, are included three endemic races: *Tauraco fischeri zanzibaricus*, *Andropadus virens zanzibaricus* and *Nectarinia veroxii zanzibarica*, plus to others, *Nectarinia olivacea granti* and *Cercotrichas quadrivrigata greenwayi*, shared only with Pemba Island and Mafia island, respectively.

A growing environmental awareness within Zanzibar, over the last 10-20 years, has led to improved conservation of Jozani, which has developed into a popular tourist destination, with a mangrove boardwalk. Success of Jozani has benefits for the improvement of management within the MBCA.

Threatened Habitats and Species Summary

Within the MBCA there are the following threatened ecosystems constitute critical habitat:

- Seagrass beds
- Nearshore shallow water coral reef communities
- Mangrove forests

The following threatened marine animals are confirmed or likely to be found within MBCA waters (Critically Endangered CE, Endangered ED, and Vulnerable VU):

- At least five coral species of the eight in the WIO region EN, plus most species VU
- Golden sandfish sea cucumber *Holothuria lesson* EN, plus six species VU
- Golden sandfish sea cucumber *Holothuria nobilis* EN
- BInadequate teatfish sea cucumber *Holothuria scabra* EN
- Golden sandfish sea cucumber *Thelenota ananas* EN
- Longheaded eagle ray *Aetobatus flagellum* EN plus five other ray species VU
- Reticulate eagle ray *Aetomylaeus vespertilio* EN
- Largetooth sawfish *Pristis pristis* CE
- Green/Narrowsnout sawfish *Pristis zijsron* CE
- Scalloped hammerhead *Sphyrna lewini* EN plus another 20 shark species VU
- Great hammerhead *Sphyrna mokarran* EN

- Humphead wrasse *Cheilinus undulatus* EN plus another 7 fish species VU
- Brindled grouper *Epinephalus lanceolatus* EN
- Loggerhead Turtle *Caretta caretta* EN
- Green turtle *Chelonia mydas* EN
- Leatherback turtle (sub-pop) *Dermochelys coriacea* CE
- Hawksbill turtle *Eretmochelys imbricata* CE
- Humpback dolphin *Sousa plumbea* EN

Scenic values

Uzi Island

The largest of the MBCA islands, Uzi is connected by a causeway through dense mangrove forest to the main island of Unguja, located immediately south of the main island's Unguja Ukuu ruins. There is a single main village on the northeastern corner of Uzi, facing the Pete Inlet, with most of the island under agriculture. Fishing, mostly by canoe, is centred on the inlets, mangroves and nearby reefs. At 6 km in length, Uzi Island is the second largest of the smaller islands which surrounds Unguja, after Tumbatu Island in the north.

Kwale Island

Kwale Island has become the most popular day-visiting destination in the MBCA, attracting foreign tourists for picnics and snorkeling. Small shacks, basic toilets and a few trails are present on the island, but there are concerns about environmental damage and that hygiene and waste management are in need of improvement. The island is characterized by pristine dense coastal forest where visitors can walk and enjoy the scenic natural forest as well as the panoramic view of the ocean.

Pungume Island

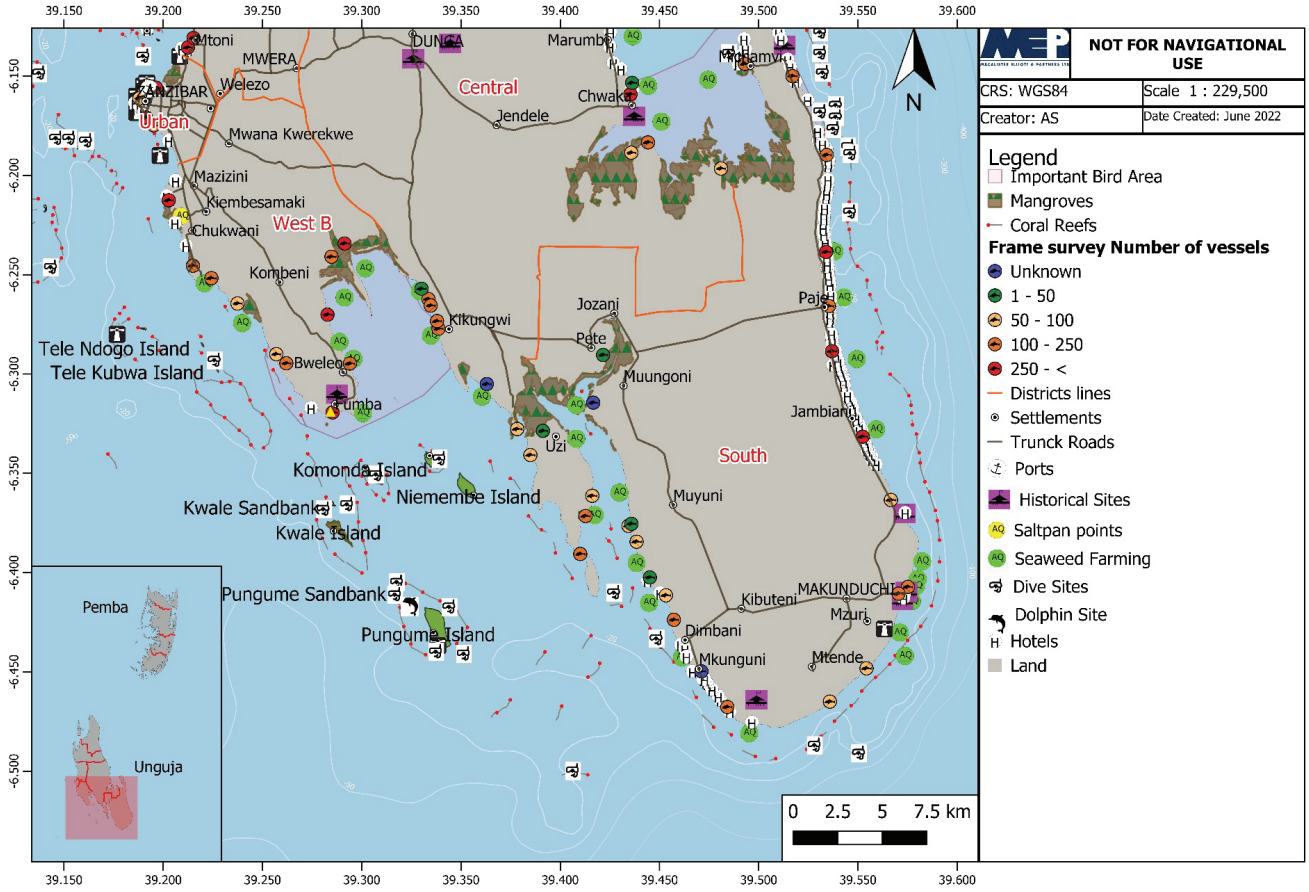
Pungume Island is the southernmost island within MBCA and of Zanzibar. It is densely vegetated and has a squared, horizontally banded bInadequate and white lighthouse on its southern edge, built in 1919, which is 26 m high with two white flashes every 3 seconds. The island has developed into an important centre for migrating *dago* fishers and fish and octopus traders.

Chumbe Island

Chumbe Island is the northernmost island in the MBCA. In 1992 it was leased to a private investor and in 1994 was developed into the Chumbe Island Coral Park, which contains the Chumbe Reef Sanctuary and the Closed Forest Reserve, when the western fringing coral reef was officially closed to fishing, boating, and SCUBA diving. "The park is run by the nonprofit private organization Chumbe Island Coral Park, Ltd. (CHICOP), which conducts marine research, environmental education programmes and high-end eco-tourism on the island. The island has two historic buildings, the most visible being the 20th Century lighthouse, and the accompanying lighthouse-keeper small mosque. The white stone lighthouse on its central western edge, was built in 1904, is 37 m high with a white flash every 11 seconds.

Surveys on Chumbe Island coral reefs have documented, at least 90% of all hard coral species that have been recorded in Eastern Africa, and 514 fish species, from 50 fish families, including rare species such as the Giant Grouper, *Epinephelus lanceolatus*. Roseate Terns, *Sterna dougalli*, successfully bred on a nearby islet and Coconut crabs, are common.

Other smaller islands



Menai Bay also has eight other uninhabited and wooded islands, namely Nyamembe, Vundwe, the three that form the Komonda Islets, plus the two outcrops of Tele ndogo and Tele kubwa. During high tide, these also provide refuge for seabirds to roost as well as nesting sites.

Makunduchi and Pungume Lighthouses

Makunduchi lighthouse is located at South easterns tip of Kusini district of Unguja. It is constructed in 1919 with 44 m high, horizontally banded lighthouse, with white flashes every 15 seconds.

Pungume Lighthouse is located on Pungume Island to the southwestern tip of the Zanzibar Archipalago in Tanzania. It is constructed in 1919 with 26m high, with white flashes every 3 seconds

Chumbe, Kwale, Pungume and other sandbanks

There are three main sandbanks in the MBCA, all, in the Menai Bay area. The northernmost is Chumbe sandbank, part of the Chumbe Island reef, on its eastern edge; the central ones are Kwale sandbank, north of Kwale Island, and Pungume sandbank, northwest of Pungume Island. Other smaller sandbanks exist east of Fumba Peninsuula, in Kiwani Bay, and the following small islands include sandy patches that occossionally form sandbanks at their northern (leeward) shore: Miwi, Nyamembe and Komonda. All the sandbanks in MBCA are important during hightide as roosts for many sea-

birds, while conversely, during low tide, several are important picnicking sites for tourists, particularly those of Kwale and Pungume.

Sand beaches

The current area covered by the MBCA includes at least 30 km of white sand beaches. Most of these are present along the eastern seaboard, from Jambiani to Dongwe, where the beaches extend gradually into a clear lagoon. But there are small stretches of beach also at Kizimkazi Mukunguni, Kizimkazi Dimbani, along sections of the Fumba Peninsula. There are also a few smaller isolated beaches away from villages. The beaches of the MBCA are a very important asset and vital to the local communities and the tourism sector as recreational areas.

In some places, sand has been extracted from the beaches for building material (mixing with lime for mortar) and for spreading on footpaths and around tourist bungalows. Such activities threaten the very existence of the beaches, reduce their role in combating coastal erosion and as a barrier against sea level rise. In some locations, beaches are also used a 'toilet area' by local residents, especially early in the mornings, and a dump site for solid wastes.

Cultural and historical values

Many villages bordering the MBCA host important archaeological and historic remains, some of local and international significance, as well as traditional and cultural events. Those closest to the MBCA shores include the Unguja Ukuu archeological site, the Kizimkazi Dimbani Old Mosque and the Mwaka Kogwa Festival at Makunduchi, as described further below. Others include the Machaga Cave of Pete, the Cave of Kuumbi at Jambiani and the Cave of Mwanampambe of Kajengwa Makunduchi, all of which are protected legally. Numerous sink holes, flooded during high tide, are located in parts of the rocky shore and which are often associated with religious or other ceremonies. As these contribute to the overall value of the area, it is important that these cultural and historic values are appropriately considered in the management of the MBCA.

Unguja Ukuu

Unguja Ukuu is an archaeological site just north of Uzi Island, under the responsibility of the Department of Archives, Museums and Antiquities (DAMA). The site has yielded many artifacts (e.g. pottery from the Far East, Near East, India, and the Southern Mediterranean and rings, glass, coins, iron artifacts, ivory and a variety of animal remains), providing evidence of the site's long history as an important trading port. It has become an important cultural tourist site on Zanzibar.

Kizimkazi Dimbani Mosque

In the southwest village of Kizimkazi Dimbani, the main mosque is one of the few living (still in use) religious heritage sites along the Swahili Coast of Tanzania, believed to be the oldest Islamic building on the East African coast, built in 1107 A.D. (500 AH) by Shiraz settlers from Iran under the order of Sheikh Said bin Abi Amran Mfaume al Hassan bin Muhammad (Chami, 2017). It is famous for its inscription of 1107 AD (500 AH) designed in floriated Kufic script and inserted on the north wall of the mosque, with another inscription informing of a major rebuilding of the mosque in 1772-1773 (Chami, 2017).

As Chami (2017) explains, although the mosque is regarded as a National Monument and is preserved in terms of the Ancient Monuments Preservation Act of 2002, it is the duty of the local community to manage the site; this is despite the heritage legislation failing to recognize the importance of the community's involvement in the site. Also, the commercialization of the Kizimkazi Mosque by the government as a visitor site has led to conflict between the local community and the government regarding the sharing of the profits obtained from the mosque. The DAMA is the government authority responsible for conservation of historic monuments.

Makunduchi Mwaka Kogwa Festival

On the eastern shores of the MBCA, in the village of Makunduchi, each year a four-day festival takes place, mostly in late July. The event celebrates the Shirazi New Year, with the Mwaka Kogwa festival consisting of spirited banana stalk fights, symbolizing the traditional cleansing ritual allowing participants to air past grievances and usher in the new year harmoniously and with a clean slate. The men fight it out on the field as the women sing about love and life, dressed in their finest clothes. After the combatants have tired themselves out, a small, thatched hut is built, set alight then extinguished in another ritual that wards off death should someone's house catch fire in the new year. Celebrations continue on the beach with colorful decorations, a giant banquet and lively dancing.

Social and economic values

Finfish Resources

Fisheries in Menai Bay are a cornerstone of the local economy, as well as a major revenue earner for fishers from other regions using the Bay (EcoAfrica, 2005). Fishing is concentrated in nearshore areas, and most fishers sell their products at auctions directly at the landing sites, though some are sold to visiting fishmongers, transported to the main market in town, or through agreements with tourists' hotels (Torell et al., 2006).

Data from the 2016 Zanzibar fisheries frame survey (ZFFS) indicate that the MBCA has 56 landing sites serving 8,230 fishers, a quarter of which are women (Table 3). The area has 1,910 vessels, outrigger sailing canoes being the most common. With 306 outboard engines, fishers are capable of reaching a range of fishing grounds, using 211 boats, 10 mashua and possibly some of the other smaller vessel. It is likely that some of these motorized vessels are also used for carrying tourist on dolphin viewing excursions.

The most important fishery resource in Menai Bay is for finfish, both pelagic and demersal, other resources including sharks, rays, skates (EcoAfrica, 2005). The fishery for the small pelagic species (collectively known as ***dagaa***) is fairly minor in the MBCA and centred around Kizimkazi Dimbani.

The most popular gear in the MBCA landing sites was found to be longline fishing, with over 6,600 hooks, while traps and handlines fall in second and third, respectively (Table 3). Other notable gears are gill-nets, spears and ***uchokoo*** (wooden hand spears). Of the illegal gears used within the MBCA, there are 320 spearguns and 48 beach-seines. There are currently 27 SFCs in MBCA, and their members have agreed to five pilot fisheries management areas (see Figure 4).

Key stakeholders involved include small-scale fishers, porters from the boat to selling or processing areas, traders, processors (boiling, drying and packaging), wood suppliers, and food vendors. Other actors include restaurant owners, suppliers of inputs such as salt and packaging bags.

Of note is that in the previous management of the MBCA, as described by EcoAfrica (2005), the plan for the MBCA excluded destructive fishing methods, promoted an eight-month closed season to fishing camps for ***dago*** on the islands, and initiated community-based monitoring. Villages initially involved were Fumba, Bweleo, Dimani, Nyamanzi and later Kisakasaka.

Table 3. Fisheries statistics for MBCA (ZFFS, 2016).

Parameter	Number	Parameter	Number
Shehia Fishing Committees	27	Fisher density (no./km2)	12
Fish landing sites	56	Fishers (total)	8,230

West B	11	Fishers (male)	6,200
Central	22	Fishers (women)	2,030
South	23	Fishing gears (total)	16,375
Total fishing vessels	1,910	Cast-net	12
Boat	211	Gill-net	420
Dhow	178	Handline	3,941
Mashua	10	Longline	6,635
Dugout canoe	326	Purse-seine	0
Outrigger (ungalawa)	1,185	Ring-net	15
Vessel outboard engines	306	Spear	320
Vessel inboard engines	15	Uchokoo (hand spear)	527
Vessel fishers (VF)	4,518	Trap	4,457
Foot fishers (total)	3,712	*Speargun*	320
Foot fishers (male)	1,532	*Beach-seine*	48
Foot fishers (female)	2,180	Surface area (km^2)	717.5

Visiting (*dago*) fishers

The main motivations for *dago* fishing are shelter from bad weather, the means to accumulate cash when away from their home villages, and nowadays, to avoid conservation areas. Camping locations are specific and are approved by the DFDMR. Because of strong winds and waves conditions, there are no official dago camps on the east coast. If any, such dago sites are unofficial and short lived.

For all of Zanzibar, most *dago* activities take place in the MBCA, with important *dago* sites being Pungume Island, Kizimkazi, Mtende, Unguja-Ukuu, Fumba, Buyu, Chukwani and Mazizini. *Dago* season in MBCA is during NE monsoon, during which fishers visit from all over Unguja Island and few from mainland Tanzania. Important gears used include gillnets, handlines and dema (busket) traps. There is no attempt to record the numbers of *dago* fishers, fisher do not require a separate license, and camping fees may locally be charged, and are mostly related with compliance with safety and cleanliness rules. Depending on the relative locations, village administration may require some payments for certain services.

Figure 4. Agreed fisheries pilot management areas for MBCA.

Intertidal gleaning

Men, women and children participate in this foot-fishery, usually on days with large tides, to explore the lower reaches of the intertidal zone and to collect a range of molluscs, crabs, eels, octopus, sea cucumbers and fish. The importance of this fishery is often overlooked, but it contributes to household diets and shells may be sold as curios to tourists.

Torell et al (2006) reported that Zanzibari women collect over twenty-one species of bivalves, but out of these species some are more prevalent and favored than others. Women tend to collect mostly cockles (*Anadara antiquata*), giant murexes (*Chicoreus ramosus*), conchs (*Pleuroploca trapezium*), and oysters (*Pinctada margaritifera*). Collection of bivalves takes place every spring tide (i.e. twice per month), with most of what is collected being consumed within the household, and very little sold commercially. The abundance of the target species varies by area and season, which makes the price swing throughout the year.

Some small bivalve species (e.g. money cowrie *Cypraea annulus*, locally known as *simbi*) and a few other small species are collected and stockpiled for later sale. Material is then exported from Zanzibar for the manufacture of buttons and other items, usually in India or China. Collection can be relatively profitable, providing cash for women who have few other income generating options. Torell et al (2006) further suggest that since nearshore stocks have been depleted, and women are forced to collect animals further away, collection of wild bivalves may be dangerously depleting the populations. Thus, these authors argue for some form of management through a conservation or zoning policy, to allow stocks to recover.

Other high-value invertebrates that are caught by specialized fishers in MCA waters, include prawns, lobsters and squid, using a range of gears. The octopus fishery is very important to many households, and usually involves men and women, on foot during low spring tide mornings, searching for them over the reef crest using a metal or wooden stick, or using snorkel and mask in deeper waters using spears.

Holothurian fishing

The holothurian (or sea cucumber) fishery involves foot fishers and divers. Sea cucumbers are collected in shallow waters by hand with snorkel and SCUBA gear or as by-catch in drag nets. They are boiled and dried for export to SE Asian countries. Tanzania is the second largest exporter as of 2000 after Madagascar, according to Food and Agriculture Organisation (FAO) statistics, yet exports have been declining due to over-fishing for the last few years. Holothurians play an important role in sediment cleansing and in reef recycling, and their excessive and uncontrolled removal causes hardening of the sea floor, eliminating habitat for other benthic organisms (EcoAfrica, 2005), with negative consequences on other marine life that are not fully understood. Despite some uncertainty, the trade in three species (*Holothuria fuscogilva, H. nobilis and H. whitmaei*) is now restricted under CITES Appendix II as they are considered Endangered. Appendix II classification applies to species that are "not necessarily now threatened with extinction but that may become so unless trade is closely controlled" and trade in these species may be authorized through an export permit (CITES www.cites.org).

Seaweed farming

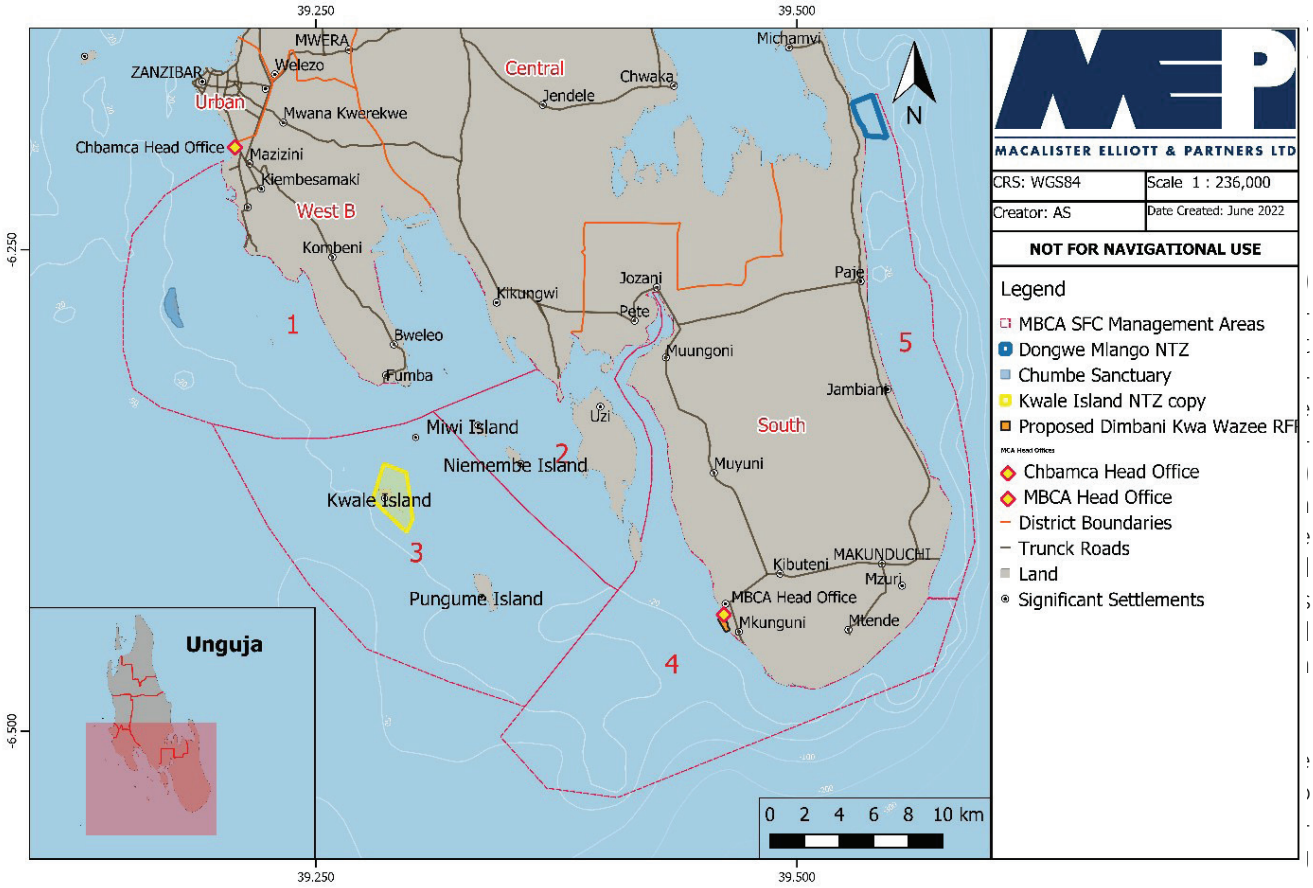
Seaweed farming is a significant livelihood activity undertaken mainly by women within coastal communities. All the five of Zanzibar MCAs include individuals that are involved in seaweed production, which include farming and small-scale processing. Most of the villages started farming seaweed in the early 1990s when the farming started. The data presented here is from 2012 statistics from Department of Marine Resources. Where a more recent datum was available, it is shown. It should be noted there that farming seaweed is currently greatly affected by environmental changes (climate change), causing ice-ice disease and epiphytism that kill the seaweed. Seaweed production in Zanzibar is currently around 11,000 MT, dry weight, while there is no production data for each village or region.

Menai Bay harbours villages farming seaweed in South Region, covering central and south Districts as well as West District in Town West Region. In MBCA, villages farming seaweed include Makunduchi Tasani, Makunduchi Kijini, Makunduchi Mzuri, Paje, Muyuni B, Mtende, Muyuni A, Muungoni, Bwejuu, Jambiani Kibigija, Jambiani Kikadini, Pete, Kizimkazi, Makunduchi Nganani, Makunduchi Kajengwa, and Makunduchi Kiongoni in South District and Charawe, Pongwe, Ukongoroni, Michamvi, Chwaka, Kikungwi, Bungi, Uroa, Uzi, Marumbi, Ng'ambwa and Unguja Ukuu in Central District. In West District villages farming seaweed are Nyamazi, Fumba, Buyu, Kisakasaka, Kibondeni, Bweleo and Dimani. The distribution of farmers is a follows: South 2,858 (2,641 women, 217 men); Central 2,231 (1,916 women, 315 men); West 414 (397 women, 17 men). Total for MBCA is 5,503 (4,954 women and (549 men).

MBCA seaweed farming has also been affected by effects of environmental changes where wild seaweed has fouled and completely smothered the farms in Bweleo village. The effect is now spreading to a nearby village of Dimani Ndambani. The activity is generally considered sustainable, though the form of farming widely adopted relies on using wooden stakes inserted into the seabed and collection by foot. Localised disturbance in intertidal areas where seagrass may be present and the use of mangrove sticks for supporting the growing lines, both of which are a concern.

As explained by Torell et al (2006), two of the three coastal villages Tanzania selected for trials was in Fumba Bay in Zanzibar and Fundo Island in Pemba. The other being on the mainland in Tanga. The areas were selected because seaweed could be grown in sheltered areas, protected from strong wave action which hinders growth. Pilot farming activities focused on *E. spinosum* and *E. striatum* using the off-bottom (fixed bottom) cultivation method and were also intended to act as farming demonstration sites for local communities in the area and provide extension services improving the quality

of dried seaweed. In the Menai Bay area mainly *E. spinosum* and to a smaller extent *E. cottonii* are grown. The trial obvious worked well and the practice continues.



the pearl oyster (*chaza*) farming did yield pearl production and became partly successful, but has since collapsed, for reasons that are no clear at present.

At present, a bath sponge farm is operating at Jambiani, was introduced and supported by a Swiss-based organisation, working with IMS and SUZA. The sponge farms utilise locally occurring species, tested them for cultivability and commercial value, set up a breeding farm in deeper water, and transfer the young sponges to be reared in shallow water farms. A similar form of support from a sea cucumber ranching trial is being attempted on a small scale around Unguja Ukuu and Uzi, with harvested specimens sold through established markets on Zanzibar. Also within the MBCA, a fish farming trial is being conducted at Jozani village where the focus was on milkfish *Chanos chanos*, but has recently shifted to *Tilapia* species.

There are no obvious threats to or impact on the MCAs from these mariculture activities. Most take place in intertidal zones in intertidal sandy areas for sea cucumber and in rock shores for oysters. Hence, tidal currents facilitate cleaning and refreshing the waters around. So far there is no obvious attempt to undertake any monitoring of parameters related to aquaculture.

Tourism

Since the early 1990s, tourism started to provide Zanzibar's largest and most important revenue stream, and by 2019, there were over half a million visitors. Many of these are attracted by the cultural, historic and natural history of Zanzibar, and especially the shorelines and marine life.

Most of the tourism sector growth was restricted to the East Coast of Unguja Island, including the Jambiani and Paje areas now within MBCA, but also other areas further north, now in MIMCA. Tourism development in the Menai Bay has been very slow to develop, primarily because of the absence

of the long white sand beaches and the adjacent lagoon, typical of the east coast. Also, historically Insufficient roads and difficult access to Menai Bay hindered the growth of tourism that has been seen in Stone Town, with the northern part of Unguja benefiting from these improvements earlier.

From 2000, tourist numbers for MBCA have steadily grown, from 8,400 in 2001 to over 35,000 in 2010 (Meyer et al, 2012), and revenues based on entrance fees from approximately USD 43,000 to USD 69,000 for the years 2001 to 2003 (Lindhjem et al, 2003). There are no data for the number of tourist visitors to the MBCA over the recent years, but the figure is likely to be between 40,000 and 60,000.

For the whole of Zanzibar, data for seven years (1997 to 2003), reveal the seasonal nature of international tourism arrivals (see **Figure 5**), showing the marked July to September peak, corresponding to summertime in Europe from where most tourists originate. Low numbers of tourist in April to June reflect the wet season, and a small rise in December corresponds to the Christmas peak. From 2010 onward, the numbers have steadily increased, with less marked seasonal trends, except for the generally lower numbers during the wet season. It is also during these months that any hotels free their local staff for seasonal leave and carry out essential maintenance and repairs to the properties.

Tourists are a vital component of the vision and objectives of the MBCA, providing muchneeded fees that support the implementation of management strategies that will contribute to meeting the objectives and ultimately the vision for the area. The tourism sector also has a responsibility to adhere to the regulations of the MBCA and be an active participant in resolving issues and challenges as the emerge. Left unregulated, the tourism sector can potentially contribute towards degradation of the natural and social structure of the site.

Of relevance to management and revenue, tourist numbers may change with very little or no warning due to local and international events, some beyond the control of the MBCA, or the RGZ. The security, safety and personal experiences of tourists may significantly affect the way they communicate with travel operators and their choice of destination, affecting possible return visits and the travel choice of their families and friends. Civil unrest, political or elections-related manifestations, may contribute negative impressions that affect the choice of destination. These experiences can be influenced by local actions and behaviour of those involved in management of protected areas, the tourism sector and the security agencies.

Figure 5. Monthly international tourist arrivals on Zanzibar1.

1 Source: https://www.tanzaniainvest.com/telecoms/zanzibar-tourism-sector-profile

Global and international events, such as the attack on the World Trade Centre in September 11, 2001, local and regional unrest, such as Al-Shabab attacks in neighbouring Kenya, and the recent Covid-19 pandemic, can result in travel advisories issued against certain destinations. Zanzibar has suffered shocks to its tourist industry in the past, for example following the 1995 and 2000 elections, which set back tourism and harmed the economy[1]. Following the September 11 attacks in New York, a downturn of more than 40% in the annual visitor numbers was experienced from November 2002 to February 2003, with losses estimated of USD 18 million from the tourism industry. The reduced tourism from the two years of the Covid-19 pandemic is unprecedented.

From the perspective of the MBCA management, it is important that operational budgets are realistic and flexible, and stay focused on the highest priorities that can be achieved when budgets are available, meanwhile ensuring that enforcement of rules and regulations against degradation of the environment is maintained.

Within the tourism sector there are a range of activities that interact with and depend on the biodiversity and scenic values of the MBCA. The principal activities are described below: Beach hotels

Currently less than 15 hotels along the shore of the Menai Bay portion of the MBCA, at

Kizimkazi and Fumba areas, but several hundred along the east coast portion, along the Jambiani to Dongwe coast (Figure 3). In Fumba, a new housing development soon to be completed is expected to attract tourists and second homeowners.

Within the MBCA, hotels range from modest ten-bed operations to large multinational 200bed complexes. The hotels provide an extremely valuable employment opportunity for thousands of local residents and are a market for local products including fish. The beach hotels also require large amounts of electricity and freshwater which can at times exert pressure on the natural water supplies and reservoirs, and generate different forms of waste, from sewage to solid and organic wastes that need to be managed.

Using the hotels as a base from which to explore the surrounding areas and other parts of Zanzibar, tourists explore the local beaches and villages and engage with the local communities on many levels. More formal recreational activities that take place inside the MBCA include the following:

Dolphin viewing

This has been one of the most visible tourist activities in the MBCA since the conservation area was first established, having started around 1992, originally operating from Kizimkazi Mukunguni, but now from other sites along the shore, including Kizimkazi Dimbani and

Fumba. Depending on the season, there are now 306 outboard engines operating in the MBCA (see Table 3), with many of these likely to be used to ferry small groups of tourists to see bottlenose dolphins. As described under the section above on dolphins, the unregulated dolphin viewing is known to be threatening dolphin populations.

Kite surfing

This new form of water sport was introduced to Zanzibar in the early 2000s. It requires steady wind, relatively calm water, with shallow depths for training, and the Inadequate of obstacles or hazards. The clear, shallow wates of the lagoon on the east coast of the MBCA, from Jambiani to Dongwe provide ideal conditions for kite surfing, and there are currently 10-15 established kite surf operations that attract a specific clientele and help diversify the tourism. The east coast, almost entirely within the boundaries of the MBCA is now a worldrenown site for kite surfing. Other than minor interaction with seaweed farms, there are not many conflicts or negative impacts associated with kite surfing at present.

Sandbank picnicking and snorkelling

The small islands, sandbanks and associated isolated beaches with the main Menai Bay area have for the last 15 years become the destination for between 5-10 tourism operations that carry tourists for daytrips for picnics and snorkelling. At times there can be over 20 boats at a single sandbank, with over one hundred tourists that enjoy the unique setting, eat seafood lunches and snorkel in clear waters over coral and seagrass beds. The most popular site is Kwale Island and sandbank (Figure 3), which is reached from embarkation points on Fumba Peninsula. Pungume Island is known as a good area for snorkeling yet corals are reported by tourist boat operators to be continuously destroyed by *mtando* (illegal purse seine fishing around coral areas in shallow water) fishery from Town and from Dar es Salaam.

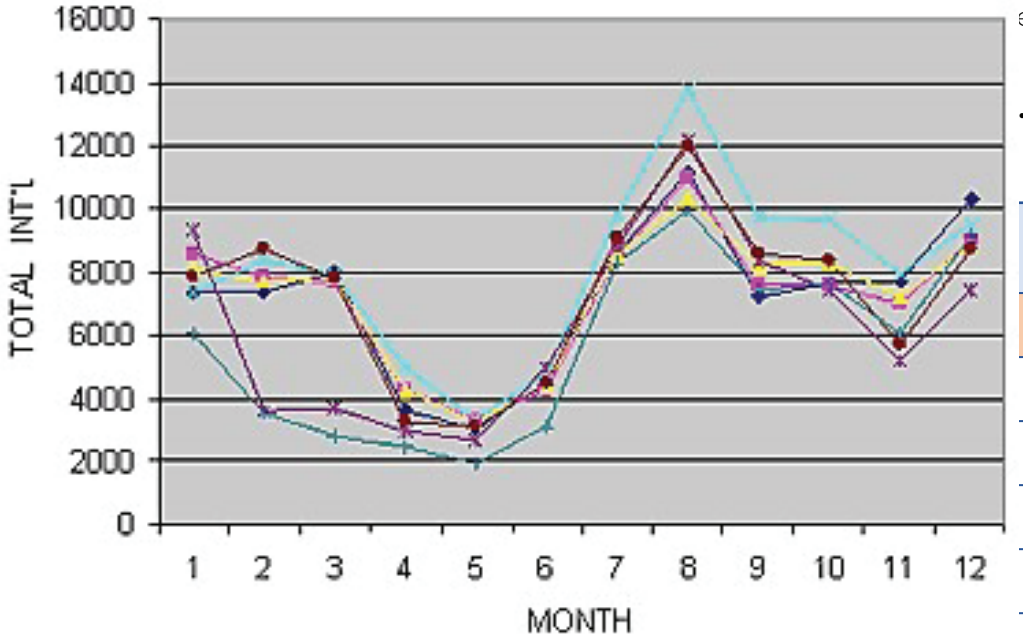
MCA Managers need to be aware of the range of impacts are associated with these trips, the most severe being anchor and tourist damage to corals through careless anchoring and uninformed tourists in the water. Other impacts are littering and various wastes that end up in the water during high tides including plastic water bottles, food packaging and wraps, plastic utensils, bags, food wastes and glass and metal containers. Disturbance to roosting seabirds also occurs when boats and tourists arrive at sandbanks during high tide, especially when roosting sites are few. Feeding of reef fish for the benefit of tourists may be disrupting normal feed behaviour and altering the fish community structure. The prevalence of sea urchins, due to over-fishing of natural predators, is the main complaint of operators and tourists.

Coral reef SCUBA diving

SCUBA diving tourism is an important activity in the MBCA (see Figure 3). On the western, Menai Bay portion of MBCA, mostly operating from hotel bases on the Fumba Peninsula and around Kizimkazi, there are two SCUBA operators. These use 15 main dive sites within 30-minute reach, all being coral reef habitat. On the eastern portion, another five SCUBA operators exist, using 5-10 sites, mostly on the outer fringing reef, or in the passes or deeper portions of the lagoon. Operators are either individual entities or associated with larger hotels. Few negative impacts arise from SCUBA operations, other than anchor damage and diver damage to corals, as with sandbank operations.

1.3 MBCA Local Communities

The West B, Central and South Districts which fall within the current MBCA have 27 principle coastal wards and a total resident population of around 88,000 (see Table 4). The principal villages that are reliant on the marine resources of the MBCA are Chukwani, Kiembe Samaki, Kigaeni, Kajengwa, Fumba, Kis ern shores, and Jambi



Ward			
South Ung			
Bwejuu			
Dongwe			
Jambiani			
Jambiani			
Kajengwa	2,313	Tunguu	3,563

Kibuteni	482	Unguja Ukuu Kae-bona	1,362
Kijini	2,634	Unguja Ukuu Kaep-wani	1,563
Kiongoni	1,106	Uzi	1,801
Kizimkazi Dimbani	1,760	Bungi	2,518
Kizimkazi Mkun-guni	2,617	Zanzibar West	
Mtende	1,330	Bweleo	971
Muungoni	1,629	Chukwani	8,298
Muyuni A	1,028	Dimani	2,052
Muyuni B	934	Fumba	981
Muyuni C	811	Fuoni Kibondeni	15,400
Mzuri	2,120	Kombeni	3,162
Nganani	2,050	Nyamanzi	1,287
Paje	3,245	Shakani	2,760
Pete	1,420		
Tasani	1,519	To-tal	87,978

The population in the villages within the MBCA was 11,324 in 1998, increased to 27,000 in 2002, and stands at almost 88,000 based on the 2012 census (see Table 4). The rapid population growth and the associated human impacts have a strong influence on the coastal and marine ecosystem.

Most of the coastal villages bordering the MBCA are situated on coral rag terrain, characterized by dry and Insufficient soil conditions. The main economic activity for men is fishing supplemented seasonally by agriculture, as well as livestock keeping and petty business. Women are primarily engaged in seaweed farming along the east coast, and more generally in agriculture, firewood collection, weaving of coconut strands for rope making and other related products. There is also a KMKM (navy) camp within MBCA, close to Kizimkazi, and good cooperation between the navy and the local community.

Men and women take part in the tourism sector, working in hotels, as guides, on boat trips for dolphin watching, sandbank picnics and snorkelling or SCUBA diving on the reefs. The proximity to the Stone Town, now by good roads, results in increasing number of day visitors each year.

In most of the rural areas, social and health services and infrastructure are generally Insufficient, though better off than many other parts of the country. A material lifestyle analysis based on a survey of 133 households conducted in 2003, found that Menai Bay residents were better off than many others in Tanzania. For example, 73% of the villagers surveyed bordering Menai Bay have access to piped

water, compared to 28%for rural Tanzania. Also, 68% of the households were reported to have ability of taking three meals per day compared to 42.8% for rural Tanzania. Finally, only 16% of the Menai Bay residents were found to be illiterate compared to a national average of 33% (Tobey and Torell, 2006).

The MBCA is an important local feature for these residents, as it can impose additional planning restrictions on what they can do. Meanwhile, the large number of visitors to the MBCA can be both positive in supporting the local economy but can also have adverse effects, for example, through excessive immigration of, for example, tourist-associated operators, into local settlements.

1.4 Principal Stakeholders

This GMP is intended to be a transparent document that describes the goals, objectives, guiding principles and actions to inform and lead the management and development of the MBCA for the next ten years. For that to be a success, the GMP is designed to be accessible to all stakeholders. The above sections described the principal socio-economic activities that take place in and around the MBCA. Each of these represents a value and important stakeholder group. These groups can be divided into those that are resource users and those that are involve in resource management.

An important step in establishing effective stakeholder relationships is to identify the stakeholders and their roles within the MBCA. Table 5 summarizes the stakeholder groups of MBCA and their expected roles in the development and implementation of the GMP. Those stakeholders met thus far in the preparation of this GMP are listed in '**Annex 2.**

MBCA Stakeholders Contacted'.

Table 5. Summary of stakeholder groups and their expected roles in implementation of the MBCA GMP.

Stakeholder groups	Roles
Resource management	
MBCA Management	Overall responsible for implementing this GMP
Dept of Marine Conservation	Overall responsible for marine conservation
Dept of Fisheries Development	Overall responsible for fisheries related issues
Zanzibar Fisheries and Marine resource Reseach Institute (ZAFIRI)	Overall responsible for Fisheries and marine resources researches releated issues in MBCA
Dept of Environment (including Zanzibar Environmental Management Authority)	Overall responsible biodiversity conservation, protection of endangered species, sharing of relevant environmental and social impact assessment (ESIA) applications with MCA Managers
Commission for Tourism	Overall responsible for issuance of tourism licences, and to ensure operators and enterprises adhere to best practice, especially with respect to pollution, waste management, agreed principles and practices under the GMP
Zanzibar Investment Promotion Authority	Responsible for issuance of business licences to investor and informing them of MCA objectives, principles and practices under the respective site-specific GMPs
Donors	Support socio-economic development programmes, community initiatives, enterprises, and improvement of environmental and natural resource management
NGOs/CBOs /Private sectors	Partner with environmental, cultural, heritage and non-governmental / non-profit groups within MCAs, including related to Fisheries and Mariculture activities
Legislators	Review and update applicable legislation on natural resource use with respect to MCAs, protected species, etc.
Law enforcement (including customs, police, KMKM)	Advise on legal matters, and maintain/enforce legal attributes per the proposed MCS Strategy of the MCA
Government planning and finance authorities	Permitting and maintaining the law. Facilitation and Communication towards user groups. The MBCA Management manages the conservation on behalf of Government

Courts and judiciary	Appraise contraventions to applicable fisheries and conservation laws, and be informed on the significance of contraventions with respect to MCAs
Ministry of Health	Maintain and monitor health and hygiene at sites with the MCA
Ministry of Education	Maintain/manage schools and other training institutions and provide opportunity for and encourage their participation in environmental awareness/education activities
Ministry of Finance	Participate in resolving and be informed on challenges related to funding for MCAs
District Governments	Participate in and oversee village compliance with objectives, principles and practices under the GMP
Village Governments	Participate in and oversee behaviour and compliance of local communities with the objectives, principles and practices under the GMP
Local universities (e.g.SUZA, IMS)	Conducting research on marine resources and related socio-economic aspects
Resource users	
Fishers	When fishing within or adjacent to MCA borders comply with hygiene, health and environmental standards and the objectives, principles and practices under the GMP
Seaweed farmers	When farming within or adjacent to MCA borders comply with hygiene, health and environmental standards and the objectives, principles and practices under the GMP
Fishmongers/traders	When storing or processing seafood within/adjacent to MCA borders, comply with hygiene, health and environmental standards and applicable GMP principles
Tourism sector (hotels, water sports, restaurants, excursions and ZATI and ZATO)	The tourism sector is dependent on the marine environment to a great extent, especially the condition of beaches and coral reefs for diving. Tourists use the MBCA on a daily basis. The CHICOP represents a successful tourism-conservation initiative.
Boat owners and operators	Ensure crews comply with hygiene, health and environmental standards and objectives, principles and practices under the GMP
Industry (including energy, oil and gas storage, construction)	Ensure practives comply with hygiene, health and environmental standards and objectives, principles and practices under the GMP
Community	The local community depends on the well being of the MBCA indirectly for income. Educational establishments use the marine Conservation Area as an education tool.
Local schools	Participate in educational and environmental awareness initiatives and support and promote the agreed goals, objectives, principles and practices under the GMP

Zanzibar Port Corporation	Ensure shipping comply with best practice, especially on pollution and waste
Tourist housing projects	Ensure property owners and occupants comply with objectives, principles and practices under the GMP

1.5 Applicable Legislation, Policies and Management Plans

The setting up of MBCA is provided for under section 10(1) of the Fisheries Act No. 7 of 2010, with the area officially gazetted as a multiple-use marine conservation area by an order published in the legal supplement (Part II) of the Zanzibar Government Gazette vol. CVI No. 5755 of 9th August 1997. The order prohibits the use of certain destructive fishing methods such as beach seines, spear fishing, explosives, poison and drag nets (*kigumi*). and provides for a system of permits and fees for the use of the area by non-residents. It describes controlled areas which may be created by order, pollution prevention, and control on sea life including corals, shells, trade and export.

The current legal tool for managing the MCAs in Zanzibar is the Fisheries Act No. 7 of 2010

MCU Regulations, which provided for the establishment of the Marine Conservation Unit

(MCU), previously under the DFAD, and in 2020 elevated to the Department for Marine Conservation (DMC). A new Fisheries Bill currently under development is envisaged to be presented to the House of Representatives in 2022. This new Act will repeal the Fisheries Act No. 7 of 2010 and its associated MCU Regulations, establishing instead a new legal and institutional management framework for ecosystem-based fisheries management. In keeping with RGZ policy, there is also a requirement for a more inclusive collaborative approach to the development and management of marine resources.

The Fisheries Act of 2010 also provides that any fishing vessel operating in the internal waters, territorial sea and EEZ of Zanzibar, of whatever size or method of propulsion, shall be licensed according to the categories of licenses as established by the Minister responsible for fisheries on Zanzibar. Zanzibar no longer has sole jurisdiction over its EEZ and the management of the shared EEZ with mainland Tanzania is the role of the Deep Sea Fishing Authority (DSFA), which is based on Zanzibar.

Several government departments and agencies have statutory or management responsibilities in the MBCA. As a result of this sectoral management approach, there are different legislation and acts that influence coastal resource management in MCAs. A range of relevant legislation tools exist to support implementation of GMPs, from national legislation to obligations under international treaties and conventions. This GMP will be implemented in the overall context of these national legal frameworks and international obligations.

To ensure sound management of the marine environment, the RGZ has to date created five MCAs, of which the MBCA is the oldest. Furthermore, Chumbe Coral Park was gazetted in 1994 (with the island forest reserve gazetted in 1995), and three additional forest conservation areas, Ngezi Forest Reserve and Jozani-Chwaka Bay National Park and Kiwengwa Controlled Area are gazetted protected mangrove forest conservation areas. The western portion of the Jozani-Chwaka Bay National Park is within the boundaries of the MBCA.

Institutionally, the MBEF oversees marine fisheries, and although the above are the overriding legislation relate to the marine environment, there are several laws, policies and strategies on Zanzibar that are directly relevant to the management of marine resources. MKUZA III (Zanzibar Strategy for Growth and Reduction of Poverty) 2016-2020, recognises the importance of the marine resource and advocates for establishment and operation of a National Protected Areas Board (NPAB) to deal with marine and terrestrial protected areas. Other principal institutions that are directly relevant to different aspects of the coastal environment is the Second Vice President's Office, and its Department of Environment (DoE) that are responsible for environmental law, EIAs and setting of environmental standards under the Environmental Management Act No. 3 of 2015 and following the Environment Policy of 2013. Conservation of key breeding and feeding sites is enacted through the Nature Conservation Areas Management Unit Act, of 1999.

The need for integrated management of natural resources is stated in the Environmental Management Act of 2015 which also provides a legal basis for the establishment of integrated coastal management (ICM) in Zanzibar. It furthers requires that developments in environmentally sensitive areas, including forests, mangroves and small islets and water catchments undertake scoping studies to assess environmental impacts. The Act aims to guarantee uses of renewable resources in the public domain which are indispensable to meet basic daily living needs of individuals, families and communities and are compatible with the Act's principles of sustainable development.

The National Environmental Policy of 2013 focuses on conservation and development of environmental resources with a view to utilising them in a manner that will improve people's welfare. The policy addresses, among other themes, environmental and climate change governance; terrestrial and marine resources and biodiversity; forest conservation; renewable and efficient energy; environmental information systems and awareness, climate change adaptation and mitigation, sustainable tourism and gender. It also states that a number of legislations and regulations related to environmental and natural resource management and conservation in the areas of forestry, fisheries and other sectors are inadequately enforced.

The Zanzibar Tourism Regulations of 2009, made under Section 31 of the Zanzibar Tourism Act No. 6 of 2009, address diverse issues, some of which are directly applicable to the behaviour and conduct of tourism entities within MCAs. One pertinent example is the very detailed items related to dolphin tourism, of which item 41 (Requirement of dolphin and whale watch vessels operator), item 42 (Maximum of vessels Guideline for whale and dolphin and watching), and item 44 (Approaching whales and dolphins), are examples among others.

The Zanzibar Investment Policy requires mobilisation of investments that are socially and economically beneficial as well as environmentally sound in order to protect Zanzibar's natural heritage. The recent Zanzibar National Environmental Plan also highlighted the need for collaboration with the private sector in coral reef protection. Of special relevance are the recent 2019 Tourism for All Policy and the 2020 Blue Economy Policy.

Finally, a number of other management plans exist that relate in part to the MBCA. For example, the Mangrove Management Plan which relates to the management of mangroves close to the MBCA, and the Management Plan for Sustainable Coastal Livelihoods at Jambiani which relates to the management of beach erosion.

On the international landscape, Zanzibar is, either under the United Republic of Tanzania (URT) or as an independent entity, signatory to a number of international treaties and conventions relevant to MBCA. The most important are the Convention of International Trade In Endangered Species (CITES) 1975 [ratified 1979], the Convention on Biological Diversity (CBD) 1992 [ratified 1995], the Conservation of Migratory Species of Wild Animals (CMS/Bonn), the Ramsar Convention on Wetlands of International Importance 1971 [ratified 2000], the MARPOL International Convention for the Prevention of Pollution from Ships, the Nairobi Convention (UNEP Convention for the Protection, Management and Development of the Marine and Coastal environment of Eastern African Region) 1985, the UNCLOS United Nations Law of the Sea Convention 1982 [Ratified 1985], and the UNESCO World Heritage Convention 1975 [Ratified 1977].

It is important that these plans take account of each other as far as practicable and that major policies in all these plans do not act against each other. The GMP programmes are designed to be implemented in compliance with the vision, strategies, programmes and laws of the RGZ and applicable international treaties.

1.6 Management Framework

The institutional framework for management and oversight of the MCAs in Zanzibar is both multi-sectoral and multi-scaled across the central government and local government authorities. In 2020, the

Revolutionary Government of Zanzibar (RGZ) created the Ministry of Blue Economy and Fisheries (MBEF) with the overall aim of sustainable developing and managing marine resources. There are now two departments for the management of fisheries and MCAs, the Department of Fisheries Development and Marine Resources (DFDMR) and the Department of Marine Conservation (DMC). The creation and functions of these departments along with the newly formed Zanzibar Fisheries Research Institute (ZAFIRI) are set out in the new Fisheries Bill (in preparation).

The proposed management framework is predicated on the Ministry structure as determined by RGZ and the Directors of the two Departments and their respective Units (Figure 6). Within this structure there is also the Ministerial level Fisheries and Marine Conservation Advisory Council (FMCAC) which provides a high-level mechanism for intersectoral coordination/integration through provision of advice for the management of fisheries, marine resources and conservation. Its members are Directors from within the Ministry, the Director General of ZAFIRI and equivalent level representatives from other sectors such as Environment, the Maritime Authority (and Tourism) as well as the Chief Executive Officer of KMKM (Navy) and the State Attorney.

Figure 6. Management structure of the MCAs on Zanzibar, based on work undertaken by a team of DMC Unit Managers and MCA managers and staff under the direction of the Director of the DMC in consultation with Unit staff from the DFAD.

Day to day management and operations of the MBCA remain the domain of the MCA Manager, supported by delegated professionals and support staff in the field. The management of the MBCA operates at the levels of the village, district and country. In each of the 27 coastal wards covered by the MCA there is now a Shehia Fisheries Executive Committee (FEC). About ten members are elected from fishing groups at each Shehia, who then either select or elect a Chairman, Secretary and Treasurer from those members. As such the SFCs represent the fishing groups within each Shehia. The MCA staff and the District based Fisheries Officer (DFO) provide support and act as the technical advisers, thus the SFCs provide the link between fishers and the Districts via the DFO. At the time of writing the chair of each SFC sits on the FEC which reports to respective MCA Executive Committee. The FEC will not exist as a formal body in the forthcoming changes to the MCA management framework but may continue as an informal body. Many of the current functions of the FEC will be

undertaken by the Collaborative Management Groups (CMGs) and Stakeholder Management Committees (SMCs). The actual names and functions of these structures may change with the ongoing reorganisation. There are currently 27 SFCs in MBCA representing 27 wards (*shehias*). Each *shehia* may have one or more villages.

Ministry and Departments

Divisions within the Department of Marine Conservation

1. Division of Monitoring, Control and Surveillance (MCS) – enforcement of fisheries and MCA regulations and by-laws.

2. Division of Conservation and Marine Resources Unit – technical aspects of marine resource management

3. Division of Co-Management and community development

The Division will also provide technical support and training to the SMC, CMGs and the SFCs (Figure 6).

Divisions within the Department of Fisheries Development and Marine Resources

1. Artisanal Fisheries – Sustainable artisanal fisheries development

2. Aquaculture – Sustainable aquaculture development

3. Marketing and processing

The Planning Unit and the Finance Unit support both departments (Figure 6).

Division of Co-Management and community development

The MCA Managers report to the Co-Management Division whose functions amongst other will include:

1. Coordination of activities across all MCAs,

2. Development and monitoring of guidelines for the collaborative management of MCAs, including those for management agreements, and fisheries within the MCAs including for implementation plans and progress reporting,

3. Monitoring and managing management agreements with private investors and SFCs and/or CMGs.

4. Working with contact persons in relevant Ministries integrate relevant requirements from other sectoral policies (principally Environment and Tourism) into MCA management guidelines.

5. Act on behalf of the Director as the ultimate arbiter of disputes relating to fisheries or marine resource management within MCAs.

6. Others as defined by the Director of DMC

The Co-Management Division and MCA Managers are provided with technical support and training from other technical units in the DMC and DFDMR specific to their functions.

Marine Conservation Technical Advisory Group (MCTAG)

The proposed MCTAG shall serve as the mechanism to facilitate adaptive management as advocated

in the GMPs for each MCA. Adaptive management has two main components, the first is the monitoring and evaluation of the effectiveness of implemented management measures and the second is the use of research findings to inform management. The MCTAG will provide a mechanism for facilitating both of these components and in particular for facilitating, and integrating the findings of, multi-disciplinary applied research specific to the needs of the MCA. The MCTAG will primarily advise the Conservation and Marine Resource and Co-Management Units within the DMC but also could have a broader role to include the MCS Unit as well as the Artisanal Fisheries and Aquaculture Units of DFDMR.

The role of MCTAG is to complement that of ZAFIRI, through providing a mechanism for the participation of other research institutions. Members of the committee could also be drawn from the Zanzibar State University (SUZA) and the Institute of Marine Science (IMS) of the University of Dar es Salaam as well as regional institutions e.g. KMFRI and CORDIO. Functions of the MCA Managers

Currently the functions of the MCA Managers are:

1. Ensure the development and implementation of the plan for the conservation area.
2. Prepare annual and monthly work plans, budgets and reports for the MCA.

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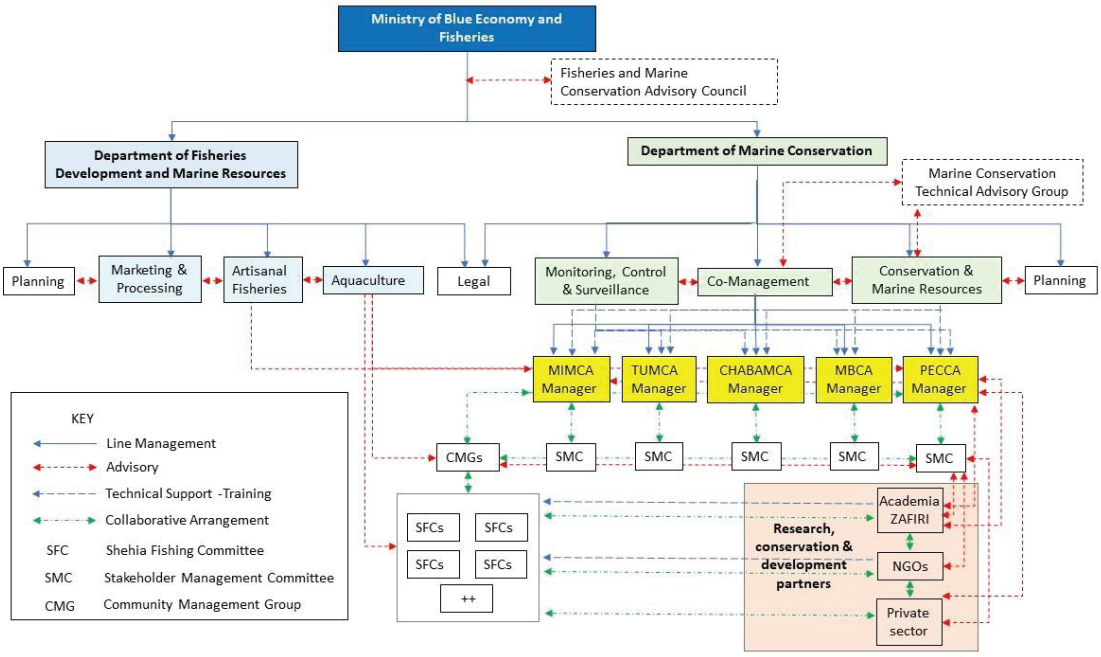


The operation of each of these mechanisms is described in the following sub-sections. Given these mechanisms, much of the work of the MCA Manager will be the facilitation and coordination of activities undertaken by their staff and partners with technical support and training provided from the relevant Units of DMC and DFDMR.

CMG/SFC Management Agreements

For the co-management of the coral reef fish and octopus fisheries, it is proposed that each

MCA be sub-divided into management areas. There are five SFC management areas in MBCA. Each of these management areas contains between 3-10 SFCs that can operate individually or within groups. It is proposed that to optimise management effort, SFCs will be encouraged for form collaborative management groups whose functions and governance along with those for individual SFCs are set out in the SFC Standard Operating Procedures. These are currently being finalised for approval.

Therefore, it is envisaged that MCA Manager will work with up to 5-10 CMGs in MBCA. Under the Pro-

visions of the Fisheries Bill (in preparation), the DMC can enter into management agreements with local communities through their SFCs and it is recommended that this also includes CMGs. Use of CMGs will optimise the number of management units and hence management agreements and retain flexibility and options for implementing fisheries management measures.

In the proposed system the councillors of the individual SFCs are elected by defined fishing groups (by gear or fishery type and including mariculture) and represent that fishing group. As such SFCs will manage their fishers and their CMG that will then provide the collaborative partner for the MCA management. It should also be noted that SFCs may not necessarily choose to form CMGs in which case the MCA management would enter into agreements with individual SFCs.

Management agreements would have an agreed format that would include as minimum management objectives, activities and timeframe for activity implementation. They could also present zoning of the area (including closed areas) and management regulations. The latter could be formalised under the provisions set out in the Fisheries Bill (in preparation).

Stakeholder Management Committee

The SMC provides a mechanism for:

a) Increased transparency as to the management of the MCA.

b) Increased communication between stakeholders and between stakeholders and MCA management.

c) Involvement of stakeholder groups in the planning, implementation and reporting, of activities relevant to the objectives of the MCA.

d) Identifying and implementing opportunities for joint or collaborative working between stakeholders.

e) The better coordination of those activities.

f) Better engagement of the broad range of stakeholders in the sustainable management of the MCA.

g) Linking of local level activities to policy implementation.

h) Empowerment of communities and stakeholders to undertake the sustainable development and management of fisheries and marine resources within MCAs.

All of the above were identified as aspects of management that need improvement during the MCA GMP and MCS Strategy validation workshops.

The proposed functions of the SMC are:

1. Assisting with the development of MCA GMP implementation plans.

2. Identification of collaborative partners to implement or participate in the implementation of agreed activities.

3. Facilitate the production of progress reports.

4. Assist in the development and implementation of management guidelines.

5. Assist in strengthening stakeholder engagement and cooperation particularly for the implementation of agreed activities.

6. Assist the MCA Manager with conflict resolution.

7. Assist in raising stakeholder and/or community awareness concerning all aspects of sustainable fisheries and marine resource use and management.

8. Seek funding and support the cost of implementing agreed activities.

It is proposed that the SMC is made up of representatives of/from:

1. The CMGs

2. NGOs working on conservation, fisheries and marine resource management, aquaculture, sustainable livelihoods and/or local community capacity development.

3. Representatives from the tourism sector e.g. hoteliers, dive centres, local boats (*nahodha*)

4. Representatives from Districts e.g. forestry, community development, environment

5. Representatives from other relevant community-based organisations (CBOs).

6. Private investors managing islands or marine areas within MCAs.

The proposed SMC has both government and non-government members. The primary purpose of this committee is to develop and implement coordinated collaborative activities hence its proposed composition. The presence of sectoral representatives in this committee also allows it to implement activities across sectors. However as these have been proposed to include District level staff, and Districts do not have jurisdiction below the highest highwater mark, the possible multi-sector approach at MCA level for marine activities still needs to be agreed.

MCA staffing structure

The proposed staffing structure (Figure 7) is proposed to enable the MCA Manager to delegate defined work responsibilities to specific officers. The work responsibilities reflect the requirements for enabling effective fisheries co-management with SFCs and groups of SFCs as well as the activity programmes as set out in the MCA GMPs and MCS strategy. As such there are specific officers for SFC Development and Support, Marine Control and Surveillance, Tourism Liaison and Education and Environment.

Figure 7. Proposed MCA staffing.

The **Head Ranger** will work closely with, and under the guidance of, the MCS Unit of the DMC but will be responsible to the MCA Manager. The Head Ranger of the MCA will be responsible for the undertaking of MCA MCS activities with their staff and will provide support to the MCS activities being undertaken by SFCs/CMGs in accordance with their management agreements.

The **SFC Development and Support Officer**(s) will work with partners (from the SMC) to develop the capacity of the SFCs to undertake their role in accordance with the Management Agreements approved by the DMC/DFDMR. This will include ensuring good governance and financial transparency and management by the SFCs and CMGs within the MCA according to the approved SFC Standard Operating Procedures. They will also work closely with the technical officers from the Units of DMC and DFDMR particularly relating to the requirements for effective co-management, conservation and marine resource management, aquaculture development, artisanal fisheries development and marketing and processing initiatives.

The **Tourism Liaison** officer will work with the relevant SMC collaborators and Department of Environment staff to implement the agreed activities from the MCA GMP. This will include but not be limited to the development of guidelines for tourism activities, promotional digital and hardcopy promotional and educational materials.

The **Education and Environment Officers** will deliver educational programmes as developed by the Conservation and Marine Resources Unit and Department of Environment with advice from the MCTAG and collaborative partners. They are also responsible for delivery of selected environmental work as defined in the ecological programme of the GMPs.

The position and role of the **Revenue Collector**(s) will depend on the eventual financing mechanism for the MCS of Zanzibar (see also Section 9.2). Currently, an important contribution to funding relies on visitor fees and fees for specific activities being collected and transferred to MCA accounts. As the funding mechanism is currently under review, the roles of terms of reference for this staff position will not been finalised for some time.

It should also be noted that further work is required to detail the functions of the Units within DMC and DFDMR including job descriptions for staff at Unit and MCA level. However, before that work takes place the management framework as presented needs to be agreed. There are some questions concerning the proposed framework that require further consideration, in particular, in relation to there being a multi-sector integration mechanism at the Unit level to complement the MCTAG, depending on whether it is agreed that the FMCAC is more of a policy making advisory body; consideration should also be given to a 'Forum' for NGOs and private sector entities that have projects or initiatives for the better management/conservation of coastal and marine resources – that could be formal or informal and would assist the DMC and DFDMR in the coordination of their activities, identification and implementation of synergies, avoidance of duplication and developing guidelines (minimum requirements) on a range of matters; and, based on the initial staffing structure for the MCAs proposed, at present it does not include Monitoring Officers whose remit would be the collection of data related to the effectiveness of management, whether that be based on local level monitoring (e.g. SFCs and CMGs) and their members, which would necessitate consideration to staffing to facilitate, undertake and coordinate this work.

MBCA Physical Resources

In 2010, the MBCA has two motor vehicles, 10 motorcycle and three boats. There was also radio communication equipment installed in each village to communicate among themselves and with head office and GPS equipment also available. There are four small offices in Kizimkazi (2), Kikungwi (1) and Fumba (1). The Kzimikazi office was built by MACEMP and functions as a central office of MBCA where

the management is currently based to implement daily activities. Diving equipment, computers, photocopiers and printers were provided by MACEMP.

1.7 Revenue Generation and Expenditure

Revenue streams

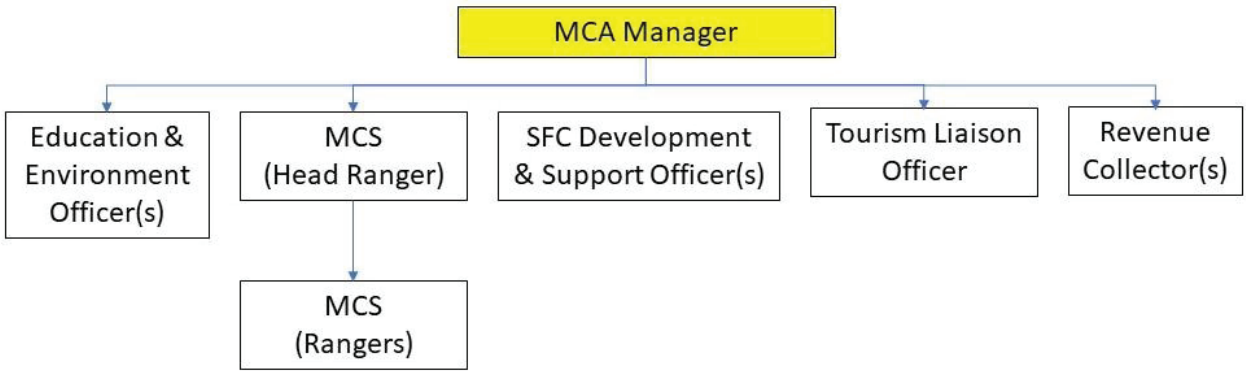
Based on the existing MCU Regulations, the establishment of the Marine Conservation Areas Fund (hereafter referred to as the MCA Fund), provides the source of revenue for all MCAs on Zanzibar, with revenue streams being the government, international donor agencies, and visitor entrance fees. Most revenue at present is generated either through tourists' daily entrance fee (USD 3 per person) for international visitors and TSH 1,000 for residents, as per fee rates described in the Fisheries Act No. 7 of 2010. Visitor's entrance fees are paid by tour operators and hoteliers that bring their visitors to the MCA, by purchasing tickets or vouchers from the MCA office or from respective offices or representatives in the villages. MBCA management (with the participation of the relevant District authorities) may also collect *dago* fees from visiting fishers.

The management and administration of the MCA Fund rests with the Permanent Secretary, with funds being divided into two parts: 70% for management purposes and 30% for community development activities. Eligible recipients potentially include fisher groups, tourism operators and community development projects.

The current situation appears to be all revenues accruing from MCAs held in the conservation area bank account, with the terms and condition for the use of funds being in accordance with the MBCA Order. It is not apparent whether there are any controls or detailed budgeting, clear account procedures or transparent reporting. Government revenue is reported to cover some of the salaries and most office costs.

For the years 2001 to 2003, USD 43,000 to USD 69,000 was generated from tourist entry fees (Lindhjem et al., 2003). As described in the section on Tourism (see page 27), numbers of tourists visiting Zanzibar have increased overall since the 1990s, but are vulnerable to local, national, regional and international influences (as described above), which can significantly affect the number of tourists visiting Zanzibar and most importantly, the tourist revenue in terms of entrance fees. Concerns over fees and operations budgets are a main management issue (see Item 8 in the following section) and approaches to address this are presented in Section 9.2.

As an example, the MBCA GMP (2010) described inadequate financial and management capacity, stating that the financial capacity of the MBCA to fulfil its mandate was not there, and that due to inadequate government budget allocation, the human resources development as well as service delivery to the general public has been insufficient. The inadequacy and uncertainty of funds have impacted negatively on management operations ranging from recruitment of staff, training, research and monitoring activities. By 2019, there was no apparent improvement in the situation. An urgent



appear that operational costs could be met, however, there are no data on how much of tourism fees are actually used for park management, what current operations cost, or how much would remain for the community development portion. The latter is critical for generating trust and commitment by local communities inside MCAs.

It is (widely) acknowledged that additional funds are required to fully manage the MCA. Additional funds, generated through fees or other means are needed for the management of MCS, including costs for SMC meetings, patrols and administration activities, implementing agreed management actions, and for various development activities within the MCA communities. An annual workplan with operating budget will be prepared by the MCA manager in collaboration with the SMC, the agreed annual workplan and budget is then submitted to the Co-management Unit for approval by the Principal Secretary of the Ministry. There is much to be learnt from the other MCAs of Zanzibar when structuring the operational costs and revenue streams for MBCA.

1.8 Key Management Issues of Concern

Management of the marine and coastal environment within the MBCA considers the key management issues of concern and attempts to develop strategies and actions to address each of them. The summary of the most recent study (EcoAfrica, 2005) stated that overall, the MBCA system is showing strong and multiple signs of stress all over the area, it has been degraded, there is still pressure on it, and that without systematic and significant intervention, the system will continue to degrade further with far-reaching effects for tourism and the livelihood of the fisher population. The consultations, research and site visits conducted during the preparation of this GMP have confirmed that the situation has degraded further since that study, over seven years ago, and that urgent measures are needed to rectify the situation.

The 12 management issues described in the sections that follow, were defined based on the views of resource users, evidence from studies and field observations. These management issues form the basis of the recommended actions, presented under the five principal programmes and one strategy that follow, namely:

- Ecological Management Programme
- Tourism Development and Management Programme
- Fisheries Resource Management Programme
- Aquaculture Resource Management Programme
- Community Support Programme
- Monitoring, Control and Surveillance (MCS) Strategy

The MCS Strategy is proposed to support the implementation of the above programmes.

The key management issues identified from the previous GMPs and verified by stakeholders consulted to date, are described in the following sections:

1. **Illegal activities in the MBCA (illegal fishing gear, migrant fishers)**

Illegal and destructive fishing practices were the main justification for the initial recommendation to establish the MBCA in the early 1990s. Since the cessation of WWF support for MBCA (around 2002), enforcement of fisheries patrols has not been fully effective, for several reasons, including shortage of personnel and funding of operations. As a result, illegal fishing activities have been increased, including the usage of undersize mesh size, illegal gears, and of chemicals. Ring-net usage around coral reef areas in daytime is considered the greatest threat with implications for the integrity of coral communities. There is currently a high level of migrant fishers in the MBCA fishery, mostly camped at Pungume Island, from where they operate without restrictions on gears, fishing areas and intensity.

There are concerns that the current fishing effort is unsustainable and is expected to grow in the future under ever-increasing local market demand, including from the tourism sector. Gear can be used to catch undersized fish before they reach the age of maturity and spawn at least once before capture. In addition, certain gears (i.e., spear-guns) may be utilised to overfish mature spawning individuals, thus reducing the likelihood of spawning within the population. Therefore, increased fishing

effort and destructive fishing practices have resulted in decline in the local fish catches which in turn impacts negatively on individual fisher's income and living standards of the coastal communities in the area. In a 1995 study, fish catch was considered by fishers to be declining, especially that of demersal species. Local institutions are unable to or chose not to regulate the resulting fishing pressure. If patrols are conducted regularly, the use of illegal fishing gears and methods in the MBCA would be significantly controlled.

2. Coral reef and small island habitat degradation

As indicated in previous GMPs for MBCA, studies indicate that destructive fishing gears and overfishing at MBCA has altered the coral reef community structure from a community dominated by corals and herbivorous fishes to shallow communities dominated by sea urchins. Use of fishing gear, such as dragging gill nets inshore, is known to substantially impact the structure and health of coral reef communities, through the physical breakage of coral colonies.

The coral reefs are also being threatened by breakage by certain tourism activities, especially boat anchoring caused be sandbank picnic and SCUBA operations, and in some cases by the tourist themselves through physically tramping over coral. Internationally, the carrying capacity of coral reefs has been determined to be about 5,000 divers per site per year (Harriott, 2002). Because tourism is an important activity on the MBCA, it requires careful management by MBCA management. Thus, there is strong motivation to protect and conserve reefs that are the subject of tourism interest. Tourism should be managed by a combination of zoning plans, plans of management of intensively used sites, code of practice and permits.

Coral themselves are also susceptible to bleaching from natural events associated with elevated sea water temperatures, with documented reduction in living coral cover after the 1998 coral bleaching event.

The forested islands that support a unique assemblage of plants and animals have not been surveyed, other than that at Chumbe. Pressure from visiting fisheries (firewood and possible charcoal production), ad hoc tourism facilities (kiosks, toilets, dumpsites) and introduction of pests threaten the integrity and uniqueness of these coastal forest areas.

3. Threat to marine mammals (dolphins and whales) sea turtles and elasmobranchs (sharks and rays)

Threatened and nationally protected marine animals (turtles, dolphins and whales) are killed during fishing operations. For example, Amir et al. (2002, 2005) reported that bycatch of dolphins in gill-net fisheries is the most serious threats in the area. The bycatch of dolphins occurs year-round and all recorded catches of dolphins have been in drift and bottom set gill-nets used in the MBCA and for whales gill-nets and lines for fish traps. The annual by-catch in gill-net fisheries in the MBCA is estimated to 10% and 5-6%, respectively of the estimated populations of Indo-Pacific bottlenose and Indian Ocean humpback dolphins and is not considered sustainable (Amir, 2010). Recent studies have showed that the Indian Ocean humpback dolphin face a possible local extinction in the MBCA within the next 40 years (Sharpe and Berggren 2019).

Every year, several humpback whales swim into fishing gear and get entangled in drift and bottom set gill-nets in MBCA (and other parts of Tanzania), especially from July to September when most abundant in this region. At the first Zanzibar humpback whale bycatch mitigation and disentanglement workshop conducted in 2010, fishers reported that for the year 2009 alone 13 incidents of humpback whale entanglement in fishing gear took place off the MBCA.

As indicated in previous GMPs for MBCA, poaching and destruction of turtle nests has often been reported, and given that the area has very few uninhabited and non-disturbed nesting beaches, the pressure on sea turtles is very high. It has also been reported that turtles are hunted purposely for

meat, with collection of turtle eggs common practice. The threat is particularly acute for turtles and dolphins because of their slow life histories and limited potential rates of increase.

4. Unregulated dolphin tourism

The potential financial benefit of dolphin watching tourism to the local communities of MBCA, especially around Kizimkazi villages and to the conservation of resources through visitor fees is undeniable, as demonstrated by the development of the activity on Zanzibar, especially around Kizimkazi (in the MBCA), since the mid-1990s. Suggested guidelines (Berggren et al., 2007) for appropriate behaviour were developed for MBCA but are currently not followed or enforced, and there are no penalties for violation of the guidelines, although the Zanzibar Tourism Act (2009) states that operators should be licensed. Further the 2009 Act prescribes that there should be a maximum of five vessels at the area where the activity is undertaken, with only one dolphin watching vessel within 50 meters of a group of dolphins and that a vessel shall reside in a watching area no more than one hour to allow other vessels to watch. As described in the 2010 GMP for MBCA, concerns have been raised for many years about the effects on dolphin boat trips on the dolphins, their feeding and foraging activities and social family interactions. It seems that dolphins respond negatively to the presence of marine vessels, by increasing their swimming speed and moving away from the source of noise, such as when boats approach dolphin pods at high speed or move over feeding/resting areas or locations where mothers are present with young calves (Stensland and Berggren, 2007; Christiansen et al., 2010). Such disturbances may have negative effects on the long-term health and residency of the dolphins, with the potential for the dolphins to abandon an area altogether (Corkeron, 1990). The inadequate, absence or non-compliance with proposed guidelines (and Tourism Regulation, 2009) is widely concluded to be impacting negatively on resident dolphin populations, which in turn would impact on the number of visiting tourist and the associated revenue. Local boat operators fail to understand the effects of boat numbers around dolphins reflectibng the need for an effective education and awareness effort.

The inadequate, absence or non-compliance with proposed guidelines (and Tourism Regulation 2009) is widely concluded to be impacting negatively in the resident dolphin populations, which in turn would impact on the number of visiting tourist and the associated revenue.

5. Inadequate MCA administration and management infrastructure

Infrastructure to assist visitors to explore and appreciate the marine resources inside the MBCA, such as mooring buoys, are Inadequate. These facilities, among others (to be defined following a detailed assessment), need to be provided and existing ones maintained to ensure that visitor experience and satisfaction are enhanced. For example, the rapid assessment study by EcoAfrica (2005) reported on the insufficient situation at the Fumba tourist launching point which at the time had no infrastructure or services and reflected badly to tourists and local communities alike. That study suggested that one way of addressing the problem was to convert the current ranger station to an interpretation centre where visitors can get information, visit basic amenities (toilets that are cleaned and serviced regularly, and perhaps even a place to change clothes), have access to an arts and crafts outlet, and where tourists can interact with knowledgeable and friendly rangers.

The current main office block and utilities at Kizimkazi Dimbani are adequate to serve the current and future office space requirements proposed in this GMP, with storage facilities for stores and equipment also adequate. However, along the entire eastern side of the MBCA, from Makunduchi to Dongwe, there is no infrastructure at all. If a ranger station would be deemed necessary, a detailed assessment would need to be conducted to determine the need, type and function of such a facility.

But effective communication both within and outside the MBCA is essential for efficient management, and key to improving MBCA management's response to urgent issues. While the MBCA office staff have personal mobile phones of the basic models, these have a limited range and application for work. VHF radios that were operational during the period supported by WWF are no longer in use, and smart phone on which MCS apps can be operated are not in use. There is need to improve administrative and management infrastructure to ensure effective and efficient management of the MBCA.

6. Insufficient stakeholder participation

Since the end of the period supported by WWF in 2004, there has been very little stakeholder participation in MBCA management. While MBCA management authorities play a primary role in enforcing legislation, compliance is greatly improved when stakeholders actively take part in MBCA management activities. A multi-stakeholder strategy is needed that focuses on the different resource use stakeholders to ensure management and utilization of the fishery resource, dolphin tourism, coral reefs for tourism recreation, shoreline protection, seaweed farming and others is undertaken in a way that permits both derivation of socio-economic benefits and conservation of the same.

7. Inadequate of zonation and clear demarcation of MBCA Boundaries

Stakeholders and MBCA management have indicated that effective enforcement of rules and regulations will benefit from clearly marked MBCA zones for specific activities and overall boundaries. Continued expansion of the fishing pressure over recent years, including the illegal use of destructive gears as well new entrants (being new generations of visiting *dago* fishers and local resident fishers) accessing the MBCA fishery resources, accompanied by increasing tourism activities in overlapping areas, such as sandbank picnics and snorkelling, dolphin viewing and SCUBA operations require clearly marked specific use zones, and overall protected area boundaries.

8. Inadequate financial and management capacity

Financial capacity of the MBCA to fulfil its mandate is not there. Since the end of the WWF supported period, there has been inadequate government budget allocation. In addition, the human resources development as well as service delivery to the general public has been insufficient. The inadequacy and uncertainty of funding have impacted negatively on management operations ranging from recruitment of staff, training, research and monitoring and enforcement activities.

It is important to note that local communities' perceptions of impacts and progress within protected areas are most positive in those programs that have had the longest and greatest investment of time and resources (Tobey and Torell, 2006). This management issues is addressed in more detail in Section 9.2.

9. Low levels of education, awareness and training

Within almost all resource-use stakeholder groups, there are low levels of education, awareness, understanding and appreciation of and value given to many of the natural resources that are important for the overall integrity of the MBCA, and to the tourism sector on which so much of the income of the area and local livelihoods depend. Related specifically to fisheries, the Fisheries Management Plans also documented that there was low understanding of essential fish habitat for reef fishery species, and similarly low level of understanding by fishers that non-targeted taxa can be caught with legal gear types.

On the means to develop alternative livelihoods, again there are low levels of entrepreneurship knowledge and skills among local communities, without which sustainability through relieving pressure on the existing resources cannot be achieved.

Within the portion of the local community engaging directly with the tourism sector a communication gap was identified in the previous GMP, whereby many local tour operators cannot communicate effectively with tourists. This related especially to what is and is not permitted during the tour operations, be it dolphin viewing, coral reef snorkelling or simply beach walks. Consequently, tourists are not always educated before or during the excursions.

Also related to the tourism sector, there is no formal requirement for captains and/or guides to be trained in boat safety, boat operations and manoeuvres around dolphins, on anchoring and use of moorings, vessel and engine maintenance, and first aid.

10. Insufficient and erratic research and monitoring

This GMP has been devised based on current understanding of the functioning of the area and its economic value. There are gaps in this understanding and there will be an ongoing need to improve understanding through research focused on the priority uncertainties. Numerous studies have been conducted, but not all have not been for conservation or management purposes, some more focused on academic purposes. As a result, there is limited information available on livelihoods and resource use trends. Increasing use by visitors, surrounding development and climate and sea level change can impact on the health and ecological functioning of the area, as well as its value at different spatial scale. Such topics are current priority areas for research.

Structured and targeted monitoring is needed of resource use, of human demography and livelihoods, utilization needs and trends, on carrying capacity of the different activities in the MBCA, including fishing grounds, tourist areas. Focal areas for research associated with the MBCA include visitor numbers and behaviour, biodiversity and populations of target species. Findings from such research and monitoring will enable the respective institutions responsible for management of the resources in the area to adapt management plans.

Currently, there is a Inadequate of a framework to guide and use monitoring data. An effective management information system (MIS) requires performance indicators, data and information and capacity to monitor and review with the objective of identifying constraints and the adoption of remedial measures to remove the constraints. The development of a appropriate MIS is a separate output that supports all MCAs on Zanzibar.

11. Impacts of climate change

The widely recognised impacts of climate change and global warming include some unpredictable shifts, for example, in monsoonal winds, rainfall, temperature and sea level rise could all take their toll in fishing and tourism activities in the MBCA area. Some of the mitigating measure against damage to coral (bleaching) weakened by warming waters, are improved reef monitoring, use of MPAs, transplanting healthy coral to degraded reefs and use of coastal and fishing management schemes.

12. Emerging coastal development issues

Both the local population and the tourism volume are increasing on Zanzibar, with many undesirable impacts. Managing land-based wastes (including sewage from tourism sector and the local populations) and especially the rising volume of pollution from plastic, have impacts that directly and indirectly affect the marine environment include the MCAs. Consequences of the introduction of fruit wastes to the marine environment by tourists is not understood. These and others are proposed in the management strategies of this GMP.

2. MBCA ZONATION SCHEME

2.1 Introduction

Most MPAs around the world use a system of zoning to protect the natural resources within a protected area, as well as reduce the user conflicts to ensure that the various user groups can sustainably benefit from the resources. It is the primarily management tool of multipleuse marine protected areas such as MBCA. Specific geographic areas are designated based on their conservation requirements and ability to support certain activities. The GMP provides guidance on what can and cannot occur within the zones. Zoning provides all users with greater clarity and predictability, but zoning schemes can only be implemented through a full public consultative process.

The aims of the zoning scheme proposed for MBCA are to protect sensitive and threatened species and habitats, marine resources and the fishery stocks on which local communities and the tourism sector depend. It also aims to reduce user conflict, while allowing all users to sustainably enjoy the benefits of the MBCA.

Recognizing that there is the need to have eventually, 20 to 25% of the marine habitat areas (especially coral reef habitat) included under a form of 'no touch' conservation zones that are strategically located to help the recovery of the MBCA, this GMP proposes a much smaller proportion, from which to build upon over future reviews and adjustments, so that target can be reached within 10 years. The now well-documented Chumbe Island experience has shown that even damaged and over-fished coral reefs can recover when pressure on them is reduced.

This proposed zoning scheme for MBCA has been developed based on the characteristics and uses of the area and the recommendations of MBCA stakeholders including current user groups, such as the MBCA management, local fishers and tourism facilities and operators. The zoning scheme provides the framework for the management of uses within the MBCA over a 10-year period (2022-2032), during which it should be periodically revised (as described under the 'roadmap' approach) based on recommendations arising from research, monitoring and evaluation activities. It is therefore important that all stakeholders are aware that the initial zonation scheme that is agreed under this GMP represents a minimal first attempt, and that over future reviews, the overall goal will be to increase the number, area, and variety of zones to improve the success at reaching the overall goal and objectives of the MBCA.

Implementation of the proposed zoning scheme requires an effective enforcement framework, as described in the MCS Strategy. It also needs the constructive engagement of all relevant stakeholders, which may in turn require a public education effort to strengthen understanding and encourage compliance among respective resource user groups.

2.2 Prohibited practices and activities within all zones

To restore, conserve and protect the habitat and marine resources of the MBCA, specific activities will be prohibited. Following implementation of this GMP, regulations will be drawn up and legislated by the order under the Fisheries Act, 2010 and its subsequent amendments. All activities prohibited under the existing national legislation shall be prohibited in all zones within the conservation area boundaries.

Specifically, the following activities are PROHIBITED:

Fishing practices

- Any activity involving mechanical damage to, or breakage of, coral and other benthic habitats or organisms, whether by hand, use of poles or other implements
- Killing of turtles, whether accidental or deliberate, including removal of eggs [note 1]
- Killing of dolphin and whales, whether accidental or deliberate [note 1]

- Trawling or and form of dragging of nets on the seabed
- Use of propelled spear-guns and harpoons for commercial fishing
- Use of dynamite or other explosives for fishing
- Use of chemicals and poisons for fishing
- Use of SCUBA gear to collect any marine organism, other than for research purposes and subject to prior authorization
- Use of mesh size for *madema* smaller than 2 inches
- Use of wire traps (madema ya waya)
- Use of metal spears
- Use of beach seine-nets
- Use of monofilament gill-nets
- Use of pull nets with stretched-mesh size of less than 2.5 inches
- Use of mosquito nets, other than by women for catching small shrimps (*uduvi*)
- Use of all large-meshed set gill-nets of mesh size exceeding 4 inches, on bottom mid or surface, including drifting [note 2]
- Other fishing gears may be introduced to this list to reflect new legislation.

Note. 1. The feasibility of enforcing the regulation banning killing of turtles, dolphins or whales caught by accident will be a challenge to enforce. This is addressed in more detail in the MCS Strategy, and a phased or separate zonation approach may be required.

Note 2. The exclusion of all large-mesh (>4 inches) gill-nets used as bottom-set and drifting surface nets, within this relatively large area, is aimed specifically at reducing the mortality of the resident dolphin populations. Seasonal migrating Humpback whales and endangered sea turtles will also benefit from this ban, though their movements extend well beyond the boundaries of this specific zone. Therefore, this net will be permitted outside the MCAs, and its use within the MCAs will need to be agreed with the fishers and the MCA Manager who will be guided by experts, the SMC and other stakeholders. It is noted also that seasonal bans may be appropriate in certain locations, and that the complete ban may need to be achieved over time.

Of relevance to illegal nets, *Mtando* is use of any surrounding purse-seine type net, referring to ring-nets that are used in shallow waters so that the bottom of the net is in contact with the substrate which is disturbed when the net is drawn shut. On mainland Tanzania it also includes beach or boat seines (also called *Juya la Kojani* or *Kigumi* or *Kavogo*) for surrounding net with a float line fitted with floaters and bottom line with sinkers or any other modification, used in shallow water targeting fish living in coral reefs and other shallow water fish and when operated the bottom line touches the sea-bed causing damage to the environment. A key feature of *kigumi* is the use of sticks to drive fish into the net.All other ongoing use of most recreational and artisanal fishing activities that are ecologically sustainable and consistent with the overall objectives of MBCA are permitted. These include basket traps (*madema*), handlines, other nets between 2.5 inches and 4 inches, in specific netting zones (to be defined).

Shore-based and seabed-extractive activities

- Mangrove cutting (unless with permit from the Forestry Division) · Mining of live coral

- Mining of dead coral
- Sand mining from beaches and sandbanks
- Any form of seabed mining
- Production of salt by heating seawater using fuel wood or hydrocarbons
- Sale and buying of marine curios inside the MBCA (with the aim to develop a Zanzibar-wide ban, especially of critical species e.g. Triton, Bulmouth Helmet, shark teeth and jaws)

Other activities

- Anchorage in coral reef areas
- Introduction of alien species of flora and fauna for mariculture (unless specifically permitted by the relevant authorities)
- Jet skis in the Menai Bay area (entire western portion of MBCA, where dolphin and whales regularly occur)
- Port development and/or dredging (marina development and permanent docking facilities – including wood jetties - will require submission of an ESIA and prior approval of the Manager)
- Hydrocarbon exploration and drilling (where exploitation will be subject to comprehensive ESIA and review by the Manager and other relevant authorities)

2.3 Fishing and tourism operational regulations inside MCAs

All fishing and tourism activities will require that operators be licensed, both individuals and vessels, as per fisheries, tourism and maritime regulations. In particular, the following will be required:

- All artisanal fishers in will be issued a fishing license and will provide all required information on the type of vessel/gear they use.
- All tourism dolphin boat operators will be issued a dolphin license and will provide all required information on the type of vessel they use.
- All tourism sandbank, snorkelling and picnic boat operators will be issued a dolphin license and will provide all required information on the type of vessel they use.
- All tourism-related boat operators (dolphins, sandbank and snorkelling and SCUBA) will be required to undertake a training course on boat operations within MBCA, related boat manoeuvres around marine mammals, close to coral, anchoring, basic first aid, and explanations on permitted behaviour within MCAs to passengers (clients). The certificate will last for a year with yearly refresher renewals. If in contravention of the MBCA boat Code of Practice, then the licence can be revoked. Employment for trainers will be one additional benefit of this intervention.
- Sport fishing (including use of spearguns) will be restricted to designated areas within the MBCA, will be subject to prior issuance of sports fishing license and payment of the appropriate fees, may be bound by minimum and maximum size restrictions. Furthermore, the fishing of some species, to be determined by the Manager may be restricted to catch and release only.
- Sport fishers (including use of spearguns) will show permits and provide catch information to

any duly authorized MBCA staff.

MBCA zonation proposed in this initial phase of the implementation of the MBCA GMP is very simple and comprises only two types of user zones, as follows (see Figure 8):

- Replenishment Zone (RZ) or Core Protection Zone
- Restricted Fishing and Recreation Zone

The following sections provide further details on the rationale for each zone.

Figure 8. Proposed zonation map for MBCA.

2.4 Proposed Zones for the MBCA

No-Take Zones

The no-take zones (RZ) are designed to protect and conserve biologically significant habitats that have or are being restored to their near pristine conditions (locally referred to as *tengefu*) and offer sites to be undisturbed for scientific research. Some of the key objectives of this zone are to:

- Protect areas to allow them to be restored
- Protect spawning areas and nursery grounds
- Minimise damage to important habitats
- Provide refuge for protected species, such as dolphins and turtles
- Boost species numbers, which helps the food web as a whole
- Increase the abundance of fish and become an integral part of the resource management (mangroves, coral reef, fisheries); and
- Provide restored undisturbed environments for research and other educational activities.

As such, all types of fishing activities will be prohibited in these zones, but a range of recreational activities, such as boating, SCUBA diving and snorkelling, that have minimal impact on the marine environment will be allowed but regulated and monitored.

In the first phase of implementation, the MBCA RZs are designed to be small and numerous, at locations which are important from an ecological perspective. These include areas of high coral cover, including Kwale Island reef and associate sanfbank reef area and coral gardens, and breeding and feeding sites for important species such as grouper and octopus which will enable them to be true RZs and also have a greater conservation impact. Also relevant are the accessible lagoon area at Dongwe Mlango in the northeast of the MBCA, and the small inshore coral garden area close to Kizimkazi Dimbani. This is the best information that exists at present. Additional surveys will need to be undertaken to identify other areas of high ecological value. It is also important that the RZs are attractive, accessible and known to the tourism/SCUBA sector. By visiting these RZ sites, these stakeholders will be contributing to financing the MBCA as well as participating in the surveillance and sharing of information for management, as described in the MCS Strategy (Chapter 8). Periodic reviews on the RZ are a mandatory feature of the MCA that would require collaboration from conservation and research partners. The proposed RZs of the MBCA encompass the following: Although these recreational activities will be promoted, the primary objective of the RZs remains maintaining ecological integrity. Therefore, this zone will act as a sanctuary for fish and other marine life. The proposed RZs of the MBCA encompass the following:

Kwale Island and sandbank

The island and associated sandbank (Figure 9) to the north are currently the most popular site for day tourists, mostly for picnics, snorkelling, SCUBA and dolphin-viewing. The boats that carry the visitors begin the trips from selected embarkation points on Fumba Peninsula.

Dongwe Mlango

The pass from the lagoon at Dongwe through the fringing reef is a popular SCUBA area, with four main dive sites (Figure 10). This proposed site is only 500 m or so from a proposed lagoon site, the Pingwe-Dongwe RZ, that is in a landscape currently un-assigned to either MBCA or MIMCA. Based on discussions with stakeholder, the area was accidentally omitted from the revised MIMCA boundaries, and it is therefore included in the MIMCA GMP. For practical reasons, the Dongwe Mlango RZ and the Pingwe-Dongwe Lagoon RZ could be combined into one single RZ, thus simplifying management, demarcation and enforcement.

Chumbe Island west reef

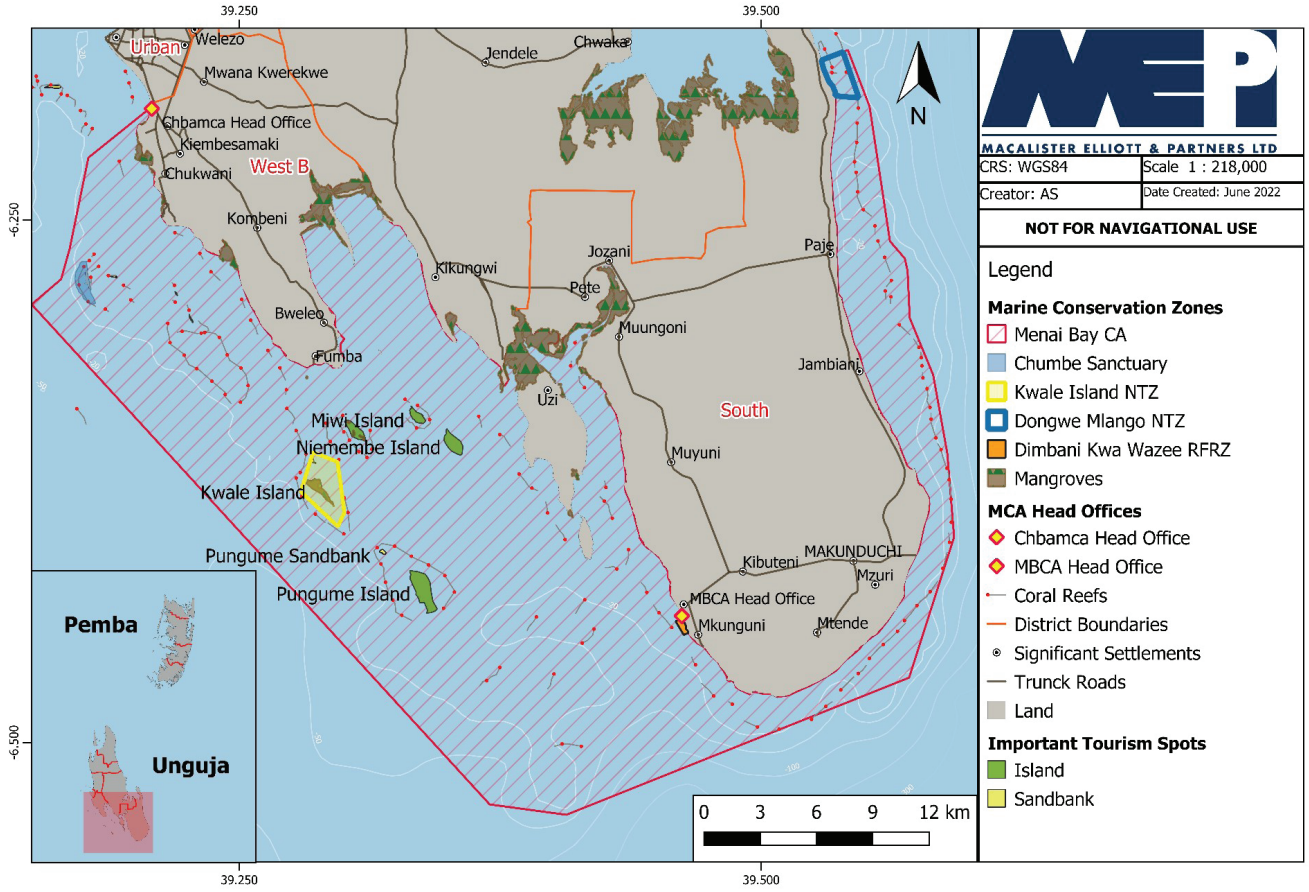
The western area around Chumbe is already under independent management and will continue to remain as such. Access to Chumbe is coordinated by their own visitor management procedure and are not under the auspices of the MBCA management. For further details, the CHICOP website https://chumbeisland.com/. In future, to expand the existing the RZ at Chumbe Island to include the eastern portion of the reef and associated lagoon, should be considered at an appropriate forum of relevant stakeholders.

2.5 Restricted Fishing and Recreation Zone

Kwa Wazee Dimbani Reef

A small fringing coral reef is located just south of Kizimkazi Dimbani and was in the 1990s an area exclusively reserved for hand-line fishing by the older fishers who could no longer canoe to more distant fishing grounds accessed by the bulk of local fishers (Figure 11). This agreement persisted for many years and only recently appears to have collapsed, to the benefit of providing tourists with an easily accessible area of coral with low risk of interaction or conflict with fishers.

The Dimbani reef has some good qualities and is in close proximity of a key tourism area in Kizimkazi. Based on a previous study, on Mnemba Atoll, where the house reef showed remarkable recovery over a few years, the reef opposite Dimbani also has the potential to recover to a reasonable tourism



areas to which they are functionally linked.

Figure Proposed Kwale Islands no-take zone.

Figure Proposed Dongwe Mlango no-take zone

Figure Proposed Dimbani kwa Wazee Restricted Fishing and Recreation Zone.

3. ECOLOGICAL MANAGEMENT PROGRAMME

3.1 Programme Purpose and Strategy

The purpose of the Ecological Management Programme is to:

Restore and maintain MBCA's ecological integrity through integrated strategic adaptive management.

The MBCA ecological management programme (EMP) aims at enhancing biodiversity conservation and ecological integrity of the key ecosystemsthat include mangrove forests, coral reefs, seagrass beds, sandy beaches, islands and their associated resources. These ecosystems serve as vital habitats for diverse flora and fauna that are important for local of livelihoods and constitute an essential element for sustainable development and tourism.

As described in the preceding sections, these ecosystems are exposed to numerous and diverse anthropogenic and natural pressures that have led to degradation, often with loss of biodiversity and reduced productivity. The main pressure from humans is unsustainable exploitation to meet the needs and demands of local communities. This can result in conflict between utilization and conservation objectives. Other local pressures include vessel anchoring, use of illegal and destructive fishing gears, and a range of pollution types (including localized domestic waste/sewage, discharges as well as diverse solid waste, especially plastics). Finally, the impacts of climate change and global warming (sea level rise, rise in temperatures and acidification) are already being felts in the MBCA.

These local and global threats are compounded by high levels of poverty amongst local communities, Inadequate of alternative livelihoods, low education and awareness amongst the local communities, resulting in little appreciation of the true economic values of these ecosystems.

The MBCA's EMP is based on management actions and activities that aim to address and reduce and eliminate the above-mentioned threats, thereby protecting the ecological integrity and values of the ecosystems of MBCA. The five guiding principles explain key factors considered in the development of the MBCA EMP. These will influence the implementation of the EMP, and are described below:

Guiding principles

While implementing the EMP, the MBCA management, with participation of stakeholders, will endeavour to ensure that:

- **Coastal and marine ecosystem resilience is safeguarded through maintaining ecological linkages and connectivity**

Strong ecological linkages and connectivity that maintains exchange of larvae and growth stages and other materials are crucial to the health of the TUMCA coastal and marine ecosystems. Strengthening and maintaining connectivity that maintains exchange of materials. Maintaining and safeguarding the connectivity ensures the structure and function of these ecosystems is safeguarded, promoting resilience and inherent recovery capacity from current and future levels of disturbances.

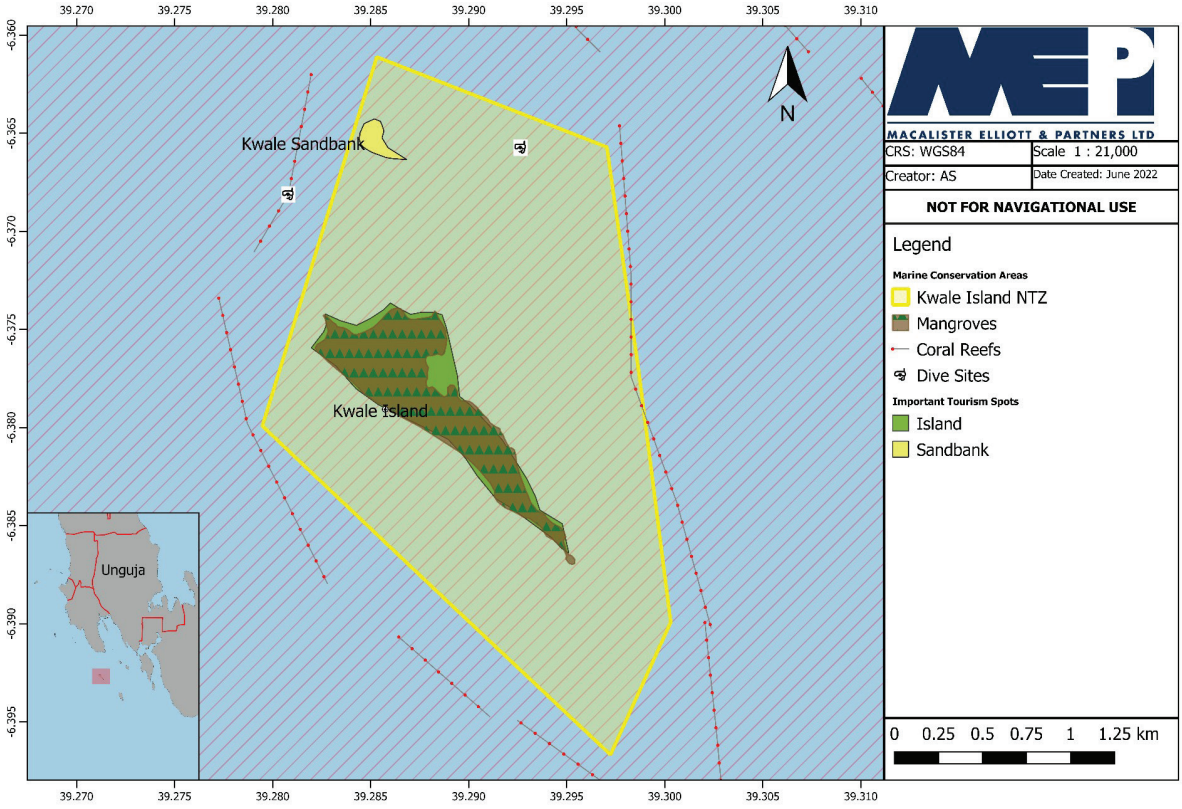
- **Human livelihoods are diversified, and wellbeing is ensured**

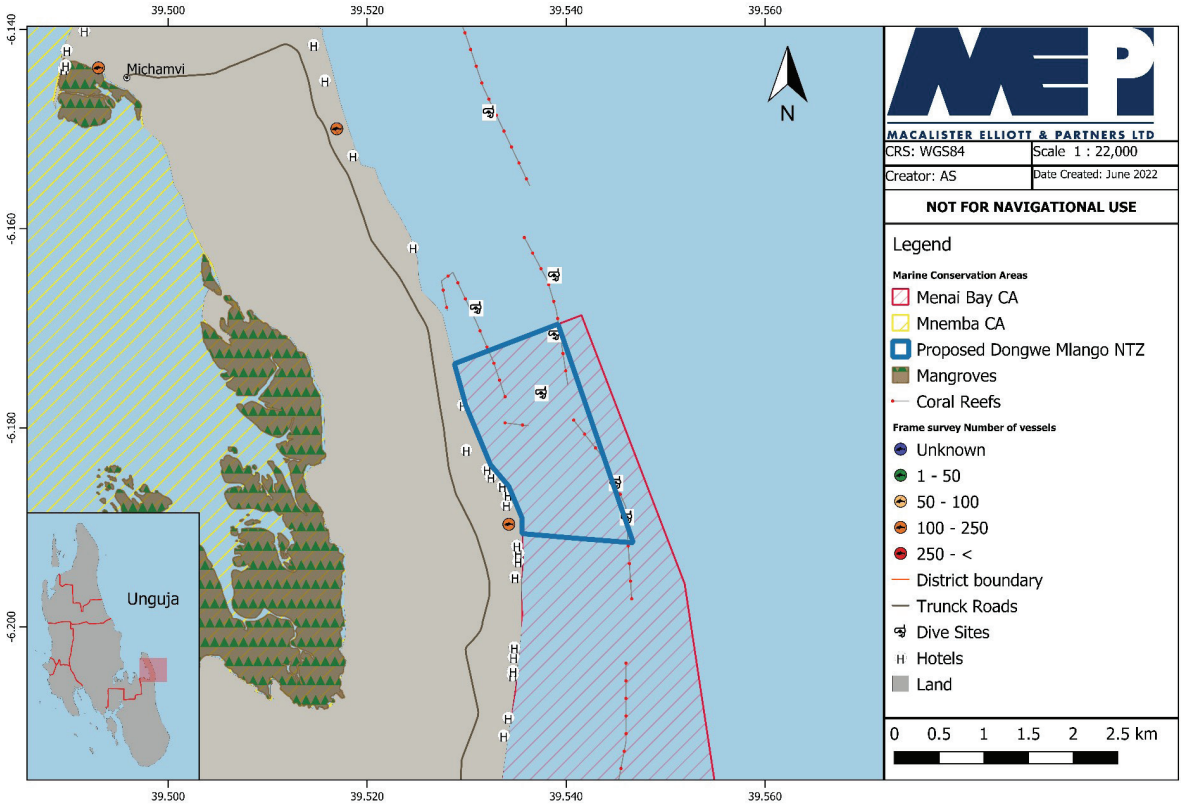
Ecosystem goods and services play a critical role in sustaining livelihoods and the wellbeing of local communities. Managing this human dimension and the interaction with the coastal and marine ecosystems is crucial and represents the core of management and conservation action.

- **Conservation of coastal and marine species is strengthened and enhanced**

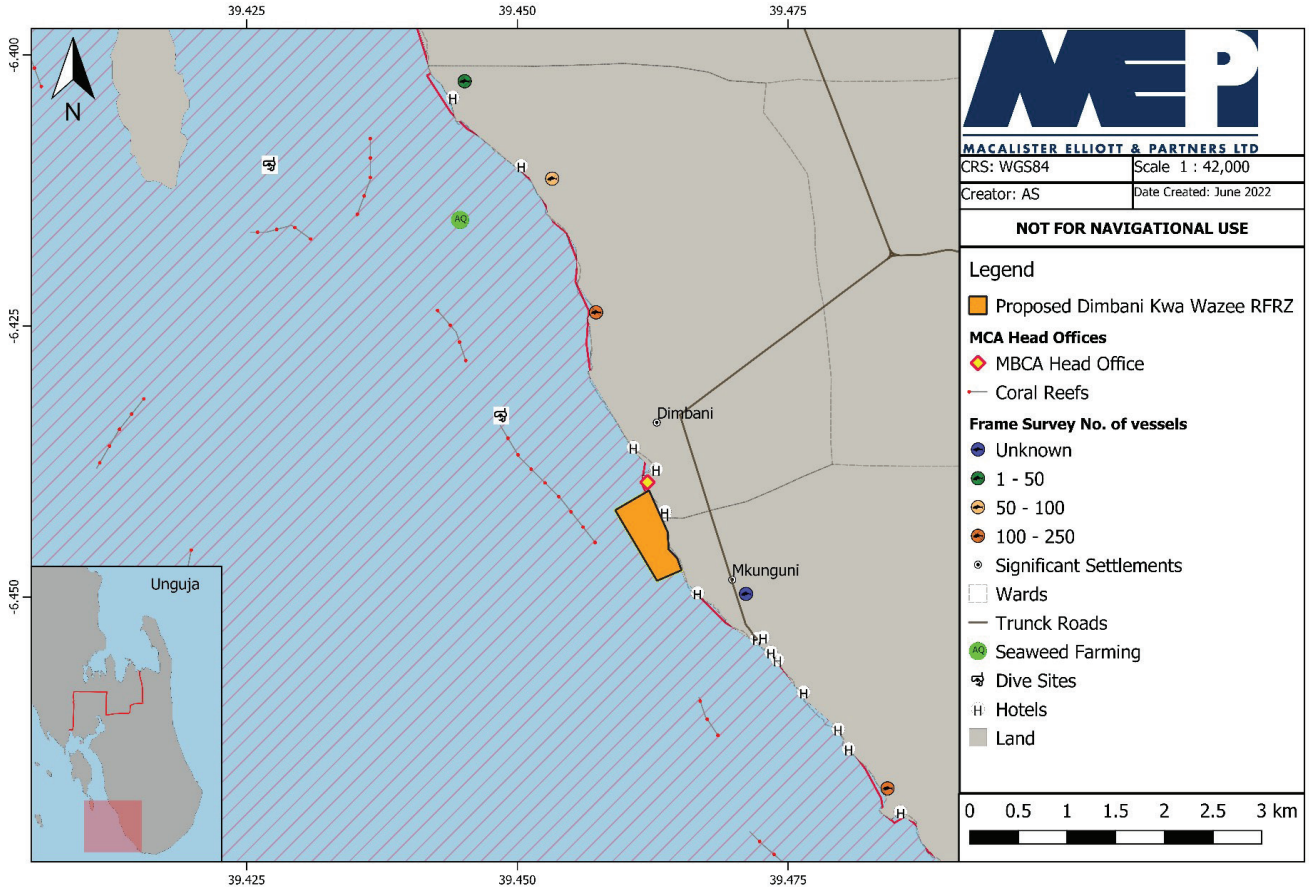
The rich biodiversity of MBCA includes notable species such as sharks and rays, dolphins, sea turtles, and whales that are considered threatened or endangered locally and globally. Through this EMP, efforts will be made to ensure that threats to these special status species are minimized and recovery of their populations enhanced and monitored.

- **Strategic linkages and exchange of information between research and conservation**





Over the past twenty years, different national and regional institutions and research groups have undertaken studies under different disciplines in the MBCA. However, information sharing among these institutions and with local institutions is weak. This principle seeks to avoid duplication of re-



the conservation targets.

These key stages and their application in the MBCA planning process are developed further in the following sections.

Conservation Targets

The first step of the CAP process is the definition of a small number of (usually about eight) Conservation Targets. These Conservation Targets are a limited suite of species, communities, and ecological systems that represent and encompass the biodiversity in the MBCA and its ecosystem. They are the basis for setting goals, carrying out conservation actions, and measuring conservation effectiveness.

In this GMP, ten MBCA Conservation Targets are selected, each based on their own rationale, important subsidiary targets (i.e. other ecosystem components that share Key Ecological Attributes (KEAs) and threats with the Conservation Target concerned), and each of the KEAs for each target are set out in Table 6. These Conservation Targets represent the unique biodiversity and environmental or ecological features that may require specific management actions within the MBCA. These are the ecological and biodiversity features of the MBCA that are the focus of restoration and conservation efforts within the GMP.

Table 6. MBCA Conservation Targets, subsidiary targets, and Key Ecological Attributes (KEAs) (modified from KWS, 2015).

Conservation target	Rationale for selection	Important subsidiary targets	Key Ecological Attributes
Mangrove eco-system	• Fisheries benefit • Nursery grounds • Bird community habitat • Shoreline protection • Buffer to wave energy • Excellent carbon sink • Entrapment of sediment • High productivity value • High subsistence value • Highly degraded • Economic value (potential for alternative livelihoods)	• · Diverse fish species • · Bird species	• Biomass value • Forest cover • Complexity index (measure of stand height, composition, density, etc) • Importance value index (frequency of occurrence of a particular species) • Water quality • Nutrient levels • Sedimentation • Bird community composition
Coral reef	• Shoreline protection • Spawning ground • Turtle habitat • Nursery and breeding ground for coral reef • High biodiversity value • High productivity value • Highly sensitive habitat • High economic value • (livelihood support, tourism)	• Reef fish • Reef invertebrates • Turtles • Dolphins	• Fish and invertebrate density, diversity, and biomass • Bleaching extent and severity • Coral diseases • Sea urchin density • Coral recruitment • Coral diversity and coral cover • Water quality • Predation and herbivory · Benthic composition • (including live coral cover) • Reef rugosity • Seawater temperature • Turbidity (light attenuation) • Sedimentation rates
Seagrass beds	• Turtles and dolphin feeding grounds • Nursery ground for fish and invertebrates • Sediment trap/nutrient recycling • Carbon capture and sink • High biodiversity value • High productivity value • High economic value (livelihood support) • Highly resilient	• Diverse fish species • Turtles • Dolphins • Gleaning livelihoods	• Abundance of fish and invertebrates • Seagrass cover, diversity and shoot density • Herbivorous density • Nutrient levels • Primary productivity • Sedimentation • Water quality • Primary productivity
Intertidal hab-itats	• Biodiversity value • High productivity value • Economic value (livelihood support) • Shoreline protection	• Bird species • Octopus • Sea cucumbers • Gleaning livelihoods	• Biodiversity value • High productivity value • Economic value (livelihood support) • Shoreline protection
Conservation target	**Rationale for selection**	**Important subsidiary targets**	**Key Ecological Attributes**

Coastal forest	• Encroachment • High level of endemism • High cultural value • High subsistence value	• Colobus monkey • Elephant shrew	• Canopy cover • Forest area · Complexity index (measure of stand height)
Islands	• Unique Islands • High cultural value • Nesting grounds of migratory birds • Roosting sites for various bird species	• Fairy tern • Coconut crab • Mangroves • Sandy beaches	• Abundance and diversity of birds • Vegetation cover • Sea level
Sandbanks	• High economic value (tourism) • Roosting sites for various bird species	• · Diverse bird species	• · Abundance and diversity of birds · Sea level
Reef fish stocks	• High biodiversity value • Highly sensitive habitat • High productivity value • High economic value • (livelihood support, tourism)	• · Non-commercial • finfish	• Level of demersal resource exploitation, • Status of fish resources • (abundance, biomass, • diversity), • Trophic levels structure (herbivorous, predatory) • Species aggregations
Threatened marine mammals	• Biodiversity value • Tourist attraction • Indicator of ecosystem health • Humpback dolphin endangered	• Prey species • Seagrass	• Water quality • Population size and structure • Genetic diversity • Habitat quality and utilization • Availability of prey species • Human disturbance
Sea turtles	• Biodiversity value • Endangered species and • Critically endangered • Hawksbill	• Reef invertebrates • Seagrass beds	• Water quality • Population size and structure • Genetic diversity • Habitat quality and utilization

Threats to Conservation Targets

A “threat” is defined as a combination of a stress and the source of the stress(es) that have a negative impact on Conservation Targets. The comprehensive definition of Conservation Targets and their KEAs enables the identification of the “threats” to these targets and attributes and the subsequent prioritisation of these threats according to their significance on Conservation Target during the 10-year lifespan of the MBCA GMP.

Table 7 below details the threats that currently impact or are likely to impact on the MBCA Conservation Targets and their KEAs. The analysis presents the threats with an indicator of whether the threat is stable, increasing or decreasing, and the resulting importance or priority of each threat. The ranking of the threats helps to define the priority management objectives and subsequent actions that define the ecological management programme, as well as the other five management programmes presented in this GMP.

Table 7. Threats to Conservation Targets of MBCA.

3.3 Management Objectives and Actions

The identification of threats to the Conservation Targets and their KEAs (Table 6) and the ranking (Table 7) provided the basis for the development of the EMP's Management Objectives (MOs) and Actions. The following sections describe these MOs and provides an outline of the management actions needed to achieve them. For each of the following three MOs a brief description of the relevant management issues and opportunities is given, which provide the specific context and justification for the actions:

MO 1. Populations of rare, endemic or endangered, threatened or protected MO 2. Marine ecosystems are restored and maintained in a healthy functioning state

MO 3. Marine biodiversity information is shared, understood and appreciated

Objective 1: Populations of rare, endemic, endangered, threatened or protected species restored and protected The Zanzibar coast is endowed with diverse terrestrial and marine habitats that host a wide array of flora and fauna species some of which are of special conservation concern. In the MBCA's wider ecosystem, the adjacent coastal forest ecosystem is home to an array of wildlife, including the Zanzibar Red Colobus monkey (the flagship species for the Jozani forest), the rare and threatened Ader's Duiker, Zanzibar elephant shrew among other mammals and over 100 bird species, some of which are considered endangered. These may all, at times, move into the fringing and creek mangroves of the MBCA.

The strictly marine habitats include coral reefs, seagrass beds, mangroves, sandy beaches and sandbanks and intertidal habitats. These habitats are home to a variety of marine flora and fauna such as the endangered sea turtles, dolphins, whales, and diverse species of fishes and invertebrates. The diverse species cover a range of trophic levels, from top predators to prey, and serve as important indicators of the health of the environment. Extreme pressure from artisanal fishing and recreational tourist activities in the MBCA inevitably impacts on certain species in a variety of ways. This MO has therefore been formulated to better understand the population ecology, key habitat requirements and threats to these species and their habitats. A key element of management is to restore and effectively protect the rich biodiversity of the MBCA and mitigate against any recreational and commercial fisheries-related impacts and other adverse effects of tourism and other uses. Management actions that will be implemented to realize this objective are described in the following sections.

Action 1.1: Conduct surveys on status of turtle nesting beaches and habitat usage

MBCA sea turtles are threatened by direct harvesting/fishing, trapping as by-catch in various fishing gear and by the destruction of foraging and nesting grounds due to Insufficient shoreline management. In the MBCA, poaching and destruction of turtle nests has often been reported. Given that the area has very few nesting beaches, the pressure on sea turtles could be inordinately high. Hence, to address these threats, under this management action, MBCA management will undertake a revision of the mapping and assessment of the turtle habitat including nesting, foraging and migratory habitats to provide information to update the status of the sea turtle populations within MBCA. Surveys will include establishing historic nesting sites and foraging locations as well as current ones. Further, turtle nesting sites will be secured and monitored, and strategies to protect turtles when in important foraging grounds will need to be developed with the fishing community, especially those using nets. The details of the number of sites to be secured and monitored will be informed by the precise baseline surveys conducted.

Where there are already conservation partners working with the authorities and stakeholders on the protection of turtle nesting beaches and of turtles themselves, the MCA Manager and the SMC can focus on other proposed actions.

Action 1.2: Disseminate information and increase public awareness on sea turtle conservation and management

Sea turtles are marine flagship species and were one of the most publicized species within Zanzibar in the 1990s and 2000s. This is attributed to the high number of stakeholders within the WIO region conducting research, education and awareness and lobbying for conservation and protection of sea turtles and dolphins. In Zanzibar, a sea turtle conservation groups are involved in monitoring and conservation efforts, comprising sea turtle conservationists in different capacities, including individuals, hoteliers, local community groups, NGOs and government institutions. While there is no oversight or coordinating entity, information generated by these groups is vital for the conservation of sea turtles. The consumption of turtle meat in Pemba is common and has led to many deaths as a result of chelonitoxism (at least two occasions recorded in last 25 years, most recent November 2021). The reasons for this should be included in any education package. Guidelines for safe extraction of turtles from nets also need to be produced. MBCA will therefore scale up its linkages with these groups and develop programmes for education and awareness. Developing and implementing a sea turtle conservation and education programme in collaboration with national and international education and awareness initiatives like the *International Year of the Turtles* will enhance support for conservation among stakeholders. This action will also be informed by results from Action 1.1.

Chumbe Island Coral Park (CHICOP) has offered to support and collaborate in the design, development and implementation of these public awareness programs, as a component within their on-going Environmental Education Programmes (EEP). Also, as above, where there are already conservation partners working with the authorities and stakeholders on the protection of turtle nesting beaches and of turtles themselves, the MCA Manager and the SMC can focus on other proposed actions.

Action 1.3: Conduct inventories of key species

Many studies have been conducted in the MBCA, though most were focused originally on turtles, then more so on dolphins, whales, coral reefs and mangrove forests, with seagrasses, for example, receiving less attention. Inventories of species of fish, coral, invertebrates (e.g. sea urchins and sea cucumbers, gastropods and marine molluscs), birds, marine mammals, and some vertebrates in the coastal forests can be collated from current publications, but much of this information needs to be updated. This action requires a thorough assessment of biodiversity in the area in collaboration with other research and conservation partners. For example, CHICOP can make all habitat information and data gathered over > 20 years available for habitat and species inventory.

The timing of such work will depend on the funding and priorities determined by the MCA Manager and SMC. A monitoring strategy that takes into consideration the key species, habitats and processes will also be developed to update and monitor habitat status and species movements. Note that species of conservation importance are addressed in Actions

1.1 (turtles) and 1.5 (marine mammals, sharks and rays).

Action 1.4: Lobby for and contribute to the development of a Zanzibar Marine Mammal Conservation Strategy

Several systematic studies on marine mammals have been carried out along Zanzibar's coast, and 34 of the estimated 89 species of cetaceans (dolphins and whales) worldwide are known to occur in the region with 19 species recorded off Zanzibar (Amir et al., 2012; Braulik et al., 2017). To improve conservation and management of these marine mammals a Zanzibar Marine Mammal Conservation Strategy will be developed, in collaboration with other government agencies, stakeholders and conservation partners, to adequately identify and address challenges facing them.

Considering that the marine mammals are trans-boundary species, there will be need for concerted efforts by all the stakeholders to come up with an action plan for the strategy which can be imple-

Threats	Conservation targets										Priority ranking
	Mangrove	**Coral reef**	**Seagrass**	**Intertidal habitat** incl. beaches	**Coastal forest**	**Islands**	**Sandbanks**	**Reef fish stocks**	**Sea turtles**	**Marine mammals** whales, dolphins	
Over exploitation of resources	↑	↑	↑	↑↑	↑	↑	↑	↑↑	↑↑	↑	***
Destructive exploitation (destructive gears & methods)	↑	↑↑	↑	↑	↑	↑	↑	↑↑	↑	↑	***
Invasive species (actual and risk)	≈	≈	≈	≈	↑	↑	≈	↑	≈	≈	*
Habitat conversion e.g. Fumba Housing Project	?	?	↑	↑	↑↑	↑↑	↑	≈		≈	**
Climate change (sea level/temperature rise etc)	↑↑	↑↑	↑	↑		↑	↑	↑	↑	≈	**
Pollution (debris from land and sea sources)	↑↑	↑↑	↑	↑		↑↑	↑↑	↑	↑↑	↑↑	***
Wastewater/Insufficient waste disposal		↑		↑		↑	↑				**
Land erosion/ sedimentation		↑	↑			↑					*
Tourism pressure on marine environment	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑↑	***
Removal of keystone species		↑↑	↑↑			↑		↑↑			**
Insufficient seawater quality		↑	≈				≈	≈			*
Seaweed farms and seabed ecology impact	↑		↑↑	↑↑							*
Boat anchoring damage		↑↑	↑↑					↑↑			**
Charcoal production	↑				↑	?					*
Coastal development				↑	↑	↑↑					**
Overfishing predatory fish that feed on sea urchins		↑↑	↑↑	↑				↑			***
Entanglement in fishing gears									↑↑	↑↑	***
Impact from oil and gas exploration		?						?	↑	↑	*

Threat level	Not applicable	NA	Very high		High		Medium		Low		None	
Trend	Significantly increasing	↑↑	Increasing	↑	Stable	≈	Decreasing	↓	Uncertain	?		

mented by multiple stakeholders. This will elevate the status of the sea mammals to a national level hence provide a link to the regional and international initiatives on marine mammal conservation. Through this management action, MBCA will initiate the process of developing the strategy that will incorporate all stakeholders. MCA Manager will need to work with specialist marine mammal research partners.

Action 1.5: Develop a research and monitoring programme on species of conservation importance

Given the strategic importance of dolphins to the MBCA and Zanzibar as a whole, and potentially of the dugong for MBCA, there is a need to develop a long-term national cetacean (whale and dolphin), elasmobranch and seahorse research programme. Elasmobranchs (sharks and rays) are declining at an alarming rate in around Zanzibar, including MBCA, and this balance needs to be redressed for a healthy ecosystem to restore. Endangered seahorses are harvested in south PECCA for sale, including the Giraffe seahorse (*Hippocampus camelopardalis*) and smooth seahorse *H. kuda*, identified from Makongwe area, and there is avery chance that these species are also being caught in Menai Bay and other MCAs.

The research should address key aspects of the endangered, threatened or protected species within these groups and ecology, such as their life cycle, migration patterns and routes, population structure and distribution are known, to understand potential threats and challenges and develop mechanism to mitigate them. Close collaboration with conservation-minded stakeholders and conservation partners outside the MBCA will be necessary to achieve ultimate conservation goals. Targets will need to be set as to what and when should be developed to address this action. Information generated will contribute to mapping the area to determine the geographic boundaries of the populations of these marine groups of conservation importance, identify hotspots, prime habitat requirements and possible threats to the survival of populations.

This action has the potential to involve a number of highly qualified and interested reaerch and conservation partners, many of whom have deep knowledge of the marine environment and threats to the ETP species in the MBCA (and other MCAs of Zanzibar), and experience in mitigating the threats. The opportunity presents itself now for collaboration and action on addressing the urgency to reduce further declines in the populations of these species of conservation, and economic importance to Zanzibar.

Action 1.6: Raise awareness about current and potential threats through training, education and implement a code of conduct

Dolphin tourism has rapidly expanded in the MBCA area, which potentially increases conflict between conservation and tourism. A code of conduct on whale and dolphin watching introduced by the MCU in 2007, and originally focused primarily on the dolphin tourism activities of the MBCA on Unguja,was expected to address some of the issues. However, there is still need for sensitization and research required to effectively manage this activity, as well as formalization of the code of conduct in a regulation that is enforced. As such, a review of the level of interactions between people and marine mammals and their impacts will generate information for review of the existing code of conduct and develop education and awareness materials. Since many of these interactions are directly related to the boat owners and operators, these industry players will be trained and sensitized on the conservation and wise management of whale-dolphin watching activities, as this is the flagship tourism product for the MBCA area. Many boat operators currently do not believe that number of boats chasing dolphins might have negative impacts on the lives of the dolphins and the dolphin-related tourism itself, stressing the need for an improved and continuous education programme. A further step to encourage compliance with codes of conduct, that needs to be assessed with the stakeholders, would be to include adherence to codes of conduct as conditions for licencing boat operators.

Work will require precise baseline results (see Action 1.5) and targets agreed with the participating institutions, under the guidance of the MCA Manager and SMC. Training targets, including numbers and communities involved need to be established.

Action 1.7: Conduct economic valuation of dolphin and whale watching industry

Tourism-based dolphin and whale watching can become a very powerful tool for dolphin conservation. The economic value of watching dolphins in the MBCA could provide an example of what might be done along the coast where dolphins are commonly harassed or could provide a justification for their conservation among the local community and Zanzibar at large. Hence an updated study on the economics of dolphin and whale watching will be carried out in collaboration with relevant stakeholders. This study will benefit a lot from the data possessed by local research institutions, namely IMS and SUZA, from their previous research on dolphins in MBCA. The study will build on the previous one, by Berggren et al. (2007), which also serves as a baseline against which changes in the last 13 years can be compared. The suggestion at the time was to implement a new fee system where tourists pay per person to go on a dolphin watch tour and require a minimum number of tourists per boat to minimize the number of boats in the bay at any one time. This will result in operators making more money per trip/day while making fewer trips.

Action 1.8: Manage harvesting of endangered sea cucumbers

Endangered sea cucumbers are some of the highest value products harvested from coral reefs. *Holothuria nobilis, H. lesson, H. scabra* and *Thelanota ananas* are now classified as Endangered on the IUCN Red List. In MBCA , this trade is artisanal and concentrated in the Menai Bay area, as well as other sites. All the Endangered species are currently being fished. There is now concern about this fishery due to heavy extraction over recent decades, showing significant reductions in stocks of the most endangered species, and uncertainties over impacts on marine ecology due to removal of these sediment grazers.

Sea cucumbers harvest is a very lucrative business, supporting many livelihoods in MBCA. To be able to make management decisions regarding the fishery, an assessment will be done to gauge the level and extent of the trade, the percentage of fishers involved impacts on the habitat. An assessment of impact on targeted species needs to be conducted, with participation of relevant conservation, fisheries and academic partners, to determine sustainability, building on any previous analysis conducted to date in the area. For example, Mwambao-MCCC has conducted some research on sea cucumbers in Kisiwa Panza area. The assessment should conduct a mapping exercise to identify possible areas for sustainable development of the fishery. The law currently allows sale of farmed sea cucumber but is silent on where juveniles can be sourced. *Holothuria scabra* is the preferred farmed species. The MBCA management will liaise with the fisheries department to revise the law if necessary, to ensure sustainability of the fishery.

Objective 2: Marine ecosystems restored and maintained in a healthy condition

A wide range of species from large marine mammals like the whales and dolphins, to various fish species, sea turtles and seabirds are present in the MBCA, which also provides important livelihood opportunities for communities. The major ecosystems in the MBCA (coral reefs, seagrass, and mangrove) have been altered due to human use and more recently to climate change. A notable climate change related effect on the critical ecosystems for MBCA is coral bleaching. The seagrass ecosystem is threatened by destructive fishing techniques, while coral reefs are also threatened by similar destructive fishing gears and certain fishing practices (that include ring net fishing, spearfishing and fishers anchoring on the reef flat and the huge numbers of footfishers that trample the reef flats on low tides), and to a far lesser extent by tourism activities such boat anchoring and breakage caused by SCUBA divers and snorkelers. The mangroves of MBCA, are in places also threatened by over exploitation.

The following three actions are designed to ensure restoration and protection of critical marine ecosystems for MBCA and their long-term viability ensured. The focus is on addressing the effects of

human activities detrimental to the ecosystems.

Action 2.1: Implement measures to reduce coral reef damage

In Zanzibar, coral reefs play extremely important ecological, economic and cultural roles. They also support high biodiversity, and protect coastal areas from storm surges, thus contributing to prevent coastal erosion.

The health of the MBCA's coral reefs has continued to decline, in part, due to destructive fishing gears and overfishing, with a community structure now dominated by sea urchins and herbivorous fish. Breakage of corals by novice snorkellers is also a major threat to specific and accessible small parts of the ecosystem within the MBCA. The installation of permanent moorings is proposed (See Action 1.3 in the Tourism Development and Management Programme). Similarly, numerous proposed Actions in the Fisheries Resource Management Programme (Section 5) are directly relevant to reducing destruction of coral reefs (e.g. Actions 1.1, 2.3 and 4.1).

To minimize coral damage, an assessment to identify, map and zone coral reef ecosystems and their condition within MBCA should be undertaken. This will necessitate collaboration with conservation partners and academic institutions to support the MCA Manager. Key indicators of coral reef condition and benchmarks against which change will be assessed will be developed, and research and monitoring information will be communicated to the community and other stakeholders to enhance coral reef recovery and conservation awareness and promote wise use of the resource. Involvement of the local community in biodiversity monitoring has been demonstrated by Mwambao-MCCC. Such an approach would also strengthen information sharing with the local communities. An implementation plan and clearly defined objectives to guide implementation need to be established. It should be considered a high priority, but the development of this action will depend on priorities and funding.

Action 2.2: Control access to selected critical habitats (coral reefs, mangroves and seagrass)

Uncontrolled human activities and natural occurring events (overharvesting, El Nino, use of destructive harvesting practices) have led to the partial destruction of coral reefs, seagrass and mangrove ecosystems within the MBCA. Among the efforts required to reduce the level of destruction will be the development of resource extraction plans for coral reefrelated resources, reforestation of degraded mangrove areas and raising awareness about the need for healthy ecosystems in the protected area. Deforestation trends should be identified first, and reforestation should target mainly areas of degradation.

The seagrass bed is threatened by uncontrolled sewage seepage into the sea from villages and tourism establishments as well as from destructive fishing practices using beach-seine nets. Seaweed farming is the most recent threat, especially in the intertidal and shallow lagoonal areas, in MBCA taking place along much of the east coast from Jambiani to Dongwe, Kizimkazi Mukunguni, and around parts of the Fumba Peninsula. Key stakeholders in these critical habitats will be sensitized on the impacts of human activities on these ecosystems and they will be assisted in developing and implementing mitigation measures. Zoning of areas for gear restrictions especially use of nets, needs to be considered along such measures.

Action 2.3: Conduct restoration and rehabilitation of critical habitats

The compromised species and habitats of MBCA require restoration and rehabilitation strategies or implementation of measures that will ensure recovery of the ecosystem's structure and functioning. Hence, in partnership with other research agencies operating in the area, MBCA management will conduct pilot studies on restoration and rehabilitation of critical habitats. Scientists and MBCA managers will identify and make use of available manuals used for restoration or rehabilitation of critical habitats such as mangrove restoration, artificial coral transplantation, sea urchins and crown of thorns control manuals. Pilot studies on restoration and rehabilitation strategies will be conducted where no such manuals exist, with a strong involvement of local community stakeholders. Training of MCA Managers and/or communities should be conducted with the assistance of conservation partners and relevant academic institutions.

Prioritization of this proposed Action needs to be evaluated as cost effective, in light of potential high costs for coral reef restoration (and to a lesser degree seagrasses and mangroves) per unit of surface. A restoration planning exercise should be undertaken and depending on funds and conservation partner support, efforts should be allocated to protect those remaining intact critical habitats, rather than restoration. The overall approach is a candidate for marine spatial planning and zoning exercise to make sure all critical habitat and other zones are taken into consideration.

Objective 3: Marine biodiversity information is shared and understood and appreciated

For effective management of protected areas research and monitoring information is critical. MCA Managers require information to enable them to assess the status of key species and habitats, information related to operations such as the behaviour of visitors and communities living adjacent to the MCA, and information to adapt to changes and hence improve management. Currently, there is very little formally agreed research and monitoring work carried out at the MBCA. However, numerous scientific reports and journal articles do relate to the MBCA, with most on dolphins, and some on coral reef ecology, fisheries and a few are on management related topics such as local communities and resources management. Furthermore, research information is not made readily available to the management authorities and the management structure currently has none or little storage and retrieval systems for this type of information. The purpose of this objective is to streamline research in the MBCA and dissemination of research outputs to relevant stakeholders.

The nine proposed management actions that will be implemented to achieve this objective focus on integrating long-term and short-term surveys of all critical habitats and species; developing and mainstreaming implementation of an environmental awareness programme; liaising with school authorities, wildlife clubs (and other groups) to develop a marketing strategy targeting schools and citizens; reviewing existing information and research on climate change, and raising awareness on climate change impacts, mitigation and adaptation measures; promoting central (DMC) research collaboration and dissemination of information; developing a central (DMC) research data management system; developing an ecological monitoring programme and build capacity to implement the programme; and, reviewing and revising management practices effectiveness with managers.

Action 3.1: Integrate long-term and short-term surveys of all critical habitats and species

MBCA requires short-term and long-term monitoring of critical habitats and species of special concern to detect changes in their status. Species of conservation importance are addressed in Actions 1.1 (turtles), 1.5 (marine mammals, elasmobranchs and seahorses) and 1.7 (sea cucumbers), while critical habitats (coral reefs, mangroves and seagrass are addressed in Action 2.2. Of significant importance is linking these data with a GIS database to visualize changes over temporal and spatial perspectives, and to include investigating connectivity and movement between different areas. Surveys on these species and their habitats will be carried out regularly to determine trends. Local community stakeholders should be trained and heavily involved. The main outputs from this integration of the results of different surveys and monitoring efforts will be used to communicate findings and trends with local stakeholders, feeding into the environmental awareness programme (Action 2.3, below). CHICOP conducts regular monitoring of the Chumbe Reef Sanctuary and can provide data and results to MBCA.

Action 3.2: Develop and mainstream the implementation of an environmental awareness programme

Excessive human pressure coupled with the effects of climate change have diminished both the productivity and species richness and diversity of MBCA's coral reef habitats. Moreover, there is inadequate awareness on the importance of these habitats and insufficient enforcement of relevant regulations to protect these ecosystems. A critical step in developing effective conservation and management strategies for coral reefs in MBCA is the provision of information on the distribution, abundance, composition and health of these ecosystems. However, the existing information on coral reefs in MBCA is not promoted.

Increasing awareness among the local stakeholders, resource users and tourism entities of coral reefs and the role they play in delivering ecosystem services is critical. At the local community level, there is need to engage with stakeholder groups and define the needs for general environmental education as it relates to management of the MBCA's natural resources, from school age to older citizens. From such a survey, priority actions will be developed to guide the development of an environmental awareness programme focused on the resource users and resource managers involved in the MBCA. Experience from previous initiatives (and other relevant proposed Actions) will be garnered to help guide future environmental awareness programmes. Focusing on school level education, emphasis is needed on incorporation of endangered species information into the school curriculum, particularly on elasmobranchs, turtles and marine mammals. Awareness should also include local communities through co-management and participatory process that extend outside the scope of ecological monitoring, and more focused on resource use.

MBCA management will collaborate with other government agencies and NGO and other partners (e.g. CHICOP) in organising and actively participating in conservation events such as annual marine environment day, *Mazingira* competition, species specific awareness activities for example *Year of the Dolphin* and *Year of the Turtle* as well as forming community and school-based wildlife or environmental clubs.

Conducting a broad Knowledge, Attitude and Practice (KAP) survey at the start of this intervention will greatly help to inform the details, content and approach of eventual environmental education, awareness and training programme. One of the main goals of this Action is to develop a change in behaviour among resource users so that impacts on the natural environment are reduced. There are many resources and expertise available that are focused on behavioural change (e.g. RARE's "social marketing" campaign which describes strategies to help change behavior – https://rare.org). MCA Mangers should work with conservation partners, especially those experienced with social sciences and peoplecentered approaches that strives to make environment- and climate-friendly changes in behaviour easier to adopt with more long-lasting impact.

Action 3.3: Liaise with school authorities, wildlife clubs (and other groups) to develop a marketing strategy targeting schools and citizens

Currently, students in large groups are unable to visit the MCA mainly because of the high cost associated with transport and entry fees. In liaison with DMC, affordable packages will be developed and extended to the wildlife clubs (and other groups) to be promoted in schools. Moreover, the local business community will be invited to invest in this initiative. As described for Action 3.2, one of the over-riding the goals is to encourage and develop behavioural change among resource users so that impacts on the natural environment are reduced. Expertise and techniques are available for this, and involvement of local communities is critical for the success of such interventions. For example, the Chumbe Environmental Education programme has taught over 11,000 local students; noting that issues of safety at sea are critical whenever promoting environmental education initiatives, as this is often overlooked and is vital to consider if groups are planning to take students on or in the water.

There is a need to engage with stakeholder groups and define the needs for general environmental education as is relates to management of the MBCA's natural resources, from school age to older citizens. Stakeholder analysis is crucial to identify stakeholders. The Department of Environment should be involved to help the action. The MBCA has unique conservation values which the community is not aware of. Thus, there is a need to raise general awareness on the importance of MBCA. Consequently, MBCA management will collaborate with other government agencies and NGOs in organising conservation events such as annual marine environment day, *Mazingira* Competition, species specific awareness activities like year of the dolphin and year of the turtle as well as forming community and school-based wildlife or environmental clubs.

MBCA ranks among the protected areas highly visited by organised groups. However, it still has potential to accommodate more groups if education events and resources envisaged under this programme are implemented. Currently, the only organisation actively promoting and implementing marine conservation activities for schools is CHICOP. Their experience is valuable, and their model

can be replicated through all of Zanzibar's MCAs, with dedicated tours to relevant parts of the MBCA organised. Other conservation education work in community areas may be underway, possibly involving school groups, and should be encouraged. To further enhance MBCA visitation by local organised groups, MBCA management will boost the conservation education activities targeting local schools, including through offering transportation.

National educational events will be targeted to capture a larger turnout of domestic tourists and visitors, including schools, as well as meetings and conferences such as annual head teachers' meetings, where promotion materials on MBCA will be distributed.

Action 3.4: Conduct a review of existing information and research on climate change

The major ecosystems in the MBCA including coral reefs, mangroves and coastal forests are threatened by impacts of climate change. Available ecological data from various independent research initiatives provides some baseline information for certain features e.g. coral reefs, dolphins, birds. Information on how climate change will impact other habitats and species of the area is scant, and potential mitigation measures not known.

There is a need to review existing information on climate change with targeted research on climate change indicators and potential mitigation and restoration measures (e.g. reforestation, pilot coral growth studies, reefs connectivity studies to identify resilient reefs, pilot carbon capture project). Zanzibar has a Climate Change Strategy (launched in 2014) and climate change is incorporate in the 2050 Zanzibar Development Vision. MBCA management will partner with research institutions in synthesizing information on climate change and developing relevant intervention measures. One avenue of investigation might include using adapted methodologies of Climate Vulnerability Assessments at communitylevel (see Care International, or Conservation International, FFI-Mwambao BAF project), to integrate the socio-economic parameters into the risks and later mitigation strategies to respond to climate change impacts in MBCA.

Action 3.5: Raise awareness on climate change impacts, mitigation and adaptation measures

MBCA stakeholders need to become aware of current global issues affecting ecological systems within the area, and how they are likely to impact their livelihoods might be impacted. MBCA will therefore collaborate with relevant research stakeholders and partners to develop awareness on the results and recommendations of climate change studies in MBCA, building on the findings of Action 3.4 (above). This information needs to be available and disseminated in an easy-to-understand format to various relevant stakeholders.

Following from the research findings from Action 3.4 (above) focus should include building knowledge at SFC level on expected climate change impacts and how to adapt/plan e.g. in selection of RZ. It is also important to assess the vulnerability of different SFCs within MBCA, that will help with prioritization. Outputs could consider also to facilitate the establishment, implementation and dissemination of the Zanzibar Disaster Communication Strategy (2011), particularly the procedures to disseminate timely and accurate warnings to the general public and government officials in the event of an impending emergency situation, to include early warning systems associated with climatic events.

Action 3.6: Promote central (DMC) research collaboration and dissemination of information

the MCAs of Zanzibar, including the MBCA provide study opportunities for research and educational institutions, but this need to be conducted in a coordinated way to encourage formal mechanisms for information exchange and networking. To minimize duplication of studies a coordination mechanism coordinated through the DMC would help inform the development of research proposals. One possible way to achieve that is for research and conservation partners, MCA managers and local communities to gather at a forum where experiences on research and management can be shared. In addition, existing regional mailing lists (e.g. WIOMSA mailing lists) may provide a good starting point for establishing collaboration links. A Zanzibar MCA annual research forum could be initiated, with updates of key stakeholders of MBCA and other MCAs on Zanzibar. During such meetings, research

gaps will be identified, and important research themes prioritized. Note that research specific to fisheries and its dissemination are captured under Actions 2.2 and 2.1, respectively, in Chapter 5 Fisheries Resource Management Programme.

To ensure that priority areas are targeted, and research solutions identified collaborative effort between scientists and resource managers in developing research proposals is importantThis creates ownership regarding the purpose of research and sources of research funding, as well as ensures coordination and implementation of recommendations by MCA managers. Collaboratively identified targets and indicators to evaluate management effectiveness enhances and improves management and planning as well as providing opportunities for participation of local stakeholders.

An important outcome of the Action will be to make MBCA visible in the region and globally. This can be achieved by sharing more information and research findings, case studies and other scientific and social research outputs online and with appropriate data portals (e.g. Protected Planet, WDPA).

Action 3.7: Develop a central (DMC) research data management system

The main purpose for developing a central research data management system is to gather information that can be used to monitoring and assessment of threats and to evaluate and adapt management interventions where necessary. A few research partners have conducted research in the TUMCA, but few of the outputs are centrally archived. An annotated bibliography of Zanzibar's MCAs can easily be compiled and made widely available, but the individual articles or reports are more difficult to obtain. Such findings are also crucial for sharing to promote MBCA (See Action 3.6, above). Thus, a comprehensive information management system will be developed at the DMC Office to ensure all relevant data and information is analysed and disseminated regularly and made available through appropriate media (e.g. reports, pamphlets and scientific papers). Data collection protocols and platforms should be agreed on and training and equipment provided where needed, with easy access and contribution options (including "citizen science" with tourist divers' sightings for instance). The system should be comprehensive, and also include fisheries information, though access rights need not be the same for all users. Such a dissemination system will promote public appreciation of conservation efforts that should translate to increased support for the MCAs of Zanzibar.

Action 3.8: Develop an ecological monitoring programme and build capacity to implement the programme

For effective protected area management research, monitoring and evaluation are essential. MCA managers need information to assess the status of key species and habitats as well as operational related information such as the behaviour of visitors and communities living adjacent to the managed area. In addition, managers need information in order to adopt management actions to changes and improve management strategies. Hence, an ecological monitoring programme will be implemented to establish baseline data, record changes in resources and contribute to evaluate management effectiveness of the MBCA.

MCA Managers should work with conservation and research partners to develop such a programme, and NGOs and other stakeholders currently collecting data in the field, could be asked to share their data in a shared database. The activities should capacitate local talent and educated local stakeholders to participate in data collection and analysis. For example, Mwambao-MCCC has at least six trained octopus catch recorders in place in Tumbatu (with the aim to encourage local level feedback into management practices). Such local experiences are very valuable and, where successful, need replicating.

The principal elements and indicators of the monitoring programme are incorporate in the more comprehensive Management Information System (MIS) that is presented as a standalone document. Local stakeholders will be involved. The ecological monitoring programme is distinct from the survey and monitoring programme of key species (Action 1.1), the monitoring programme of species of conservation importance (Action 1.5) and the surveys of critical habitats and species to determine trends and to visualize using GIS for stakeholder sensitization (Action 3.1). The focus is more on monitoring (and training) to determine whether management interventions are being successful. There are however synergies with the three aforementioned actions and the MCA Manger and research and conservation partners need to ensure that the four activities are not duplicating efforts but com-

plimenting each other.

Action 3.9: Review and revise management practices effectiveness with managers

This is a critical activity that will provide an opportunity for managers to analyzed data (for example from the findings of Action 3.8, above) and determine whether modifications to management practices are necessary. The principal indicators related to management effectiveness are included in the comprehensive Management Information System (MIS) that is presented as a stand-alone document. Relevant elements specific to MBCA will contribute to management effectiveness assessment, to help to find out if the MCA is meeting its objectives in the most efficient and effective way. MCA Managers should seek assistance from experts within appropriate NGOs to undertake the evaluations. For example, at CHICOP theye managers have considerable experience with MCA management effectiveness assessments, evaluations, adaptive management mechanisms and processes (including those recognized in the global conservation community and submissible for global tracking etc.). Co-management approaches and community roles in local management need always to be respected and acknowledged.

Management actions should be designed around the concept of SMART objectives to ensure adaptive management, and once management actions are more firmly in place/effective, the monitoring approach will benefit from standardized surveys like those developed by METT/iMET and/or the Natural Resources Governance Tool (NRGT) developed by WCS. It will determine whether the MCA is designed, planned and managed appropriately, and whether it is having positive results, such as protecting biodiversity, promoting tourism and improving livelihoods of local people. Annual reviews of the METT or other tool tracking management effectiveness should produce results that can be published on global databases (e.g. Protected planet) or WIO networks (e.g. WIOMPAN).

Monitoring Framework

The monitoring framework presented in the Table 8 is designed to provide guidance for the assessment of the potential impacts resulting from the implementation of each of the EMP. The framework sets out the potential positive as well as negative impacts that may possibly occur during the implementation of each programme. The framework also includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information needed. Monitoring the impacts of the plan implementation will ensure that timely changes to management approach are made when the situation demands.

Table 8. Ecological Management Programme Monitoring Framework (modified from KWS, 2015).

Objective	Potential Impacts (positive and negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Populations of rare, endemic, endangered, threatened or protected species restored and protected	Turtle population in MBCA increasing and breeding sites protected	Population size; Turtle nests	Population assessment report Turtle nesting monitoring reports
	Endangered humpback dolphin population increasing	Population size	Population assessment report
	Endangered sea cucumber species increasing	Population size	Population assessment report

Objective 2: Marine ecosystems are restored and maintained in a healthy functioning state	Coral reef damage in MBCA reduced	Population size of coral fishes	Coral reef fisheries monitoring report
	Threats to seagrass ecosystem reduced	Area coverage and shoot density	Seagrass bed monitoring reports
	Pollution reduced and clean up programmes conducted regularly	Water quality	Water quality reports
Objective 3: Marine biodiversity is shared, understood and appreciated	Marine biodiversity is being conserved	Species diversity; Population size	Population assessment report

3.4 Implementation Schedule

The following pages set out the proposed first six-years of the ten-year implementation and schedule for the MBCA GMP (see Table 9). The activity plan details the activities, responsibilities, timeframe and milestones necessary for the delivery of each management action, starting in 2022, which need to be finalized by the MCA Manager and SMC.

Table 9. Ecological Management Programme Implementation Schedule (first six years).

ment Action and Activities	Persons responsible	Timeframe										
		2022		2023		2024		2025		2026		2
		1	2	3	4	1	2	3	4	1	2	3
e 1: Populations of rare, endemic, endangered, threatened or protected species restored and protected												
1: Conduct surveys on status of turtle nesting beaches and habitat usage												
p and assess turtle habitats including nesting, foraging and migratory habitats	TBC											
date the status of the sea turtle populations												
ure and monitor turtle nesting sites												
2: Disseminate information and increase public awareness on sea turtle conservation and management												
le up linkages with the sea turtle conservation groups in Zanzibar and mainland Tanzania	TBC											
velop programmes for education and awareness on sea turtles												
plement a sea turtle conservation and education programme												
nance support for conservation among stakeholders												
3: Conduct inventories of key species												
dertake a thorough assessment of biodiversity in the area in collaboration with other researchers	TBC											
velop a monitoring strategy that takes into consideration the key species, habitats and processes												
date and monitor habitats status and species movements												

4: Lobby for and contribute to the development of a Zanzibar Marine Mammal Conservation Strategy													
d the process of consulting local and international dolphin research experts on the development of a Marine Mammal Conservation Strategy	TBC												
by relevant government agencies formalize the Strategy													
5: Develop a research and monitoring programme on species of conservation importance													
ate close collaborations with conservation minded stakeholders outside the MBCA	TBC												
o the area to determine the geographic boundaries of sharks and rays, dolphin populations													
ntify hotspots, prime habitat requirements and possible threats to survival of populations													
velop mechanisms to mitigate against identified threats													
6: Raise awareness about current and potential threats through training, education and implement a code of conduct													
iew the level of interactions between humans and marine mammals and their impacts	TBC												

Management Action and Activities
1.6.2 Generate information for review of the current code of conduct
1.6.3 Develop education and awareness programmes on human-marine mammal inter
1.6.4 Train and sensitize boat owners and operators on appropriate whale-dolphin wat
1.6.5 Maintain a MBCA dolphin incident recording database and map conflict hot spots
1.6.6 To encourage compliance with codes of conduct, assessed with stakeholders to in codes of conduct as conditions for licensing boat operators
1.6.7 Support development and implementation of community-based action plans to a
Action 1.7: Conduct economic valuation of MBCA and the dolphin and whale watchi
1.7.1 Conduct an economic value of watching dolphins and whales in the MBCA
1.7.2 Conduct an economic valuation study to assist in understanding and quantifying t in the protected area
Action 1.8: Manage harvesting of endangered sea cucumbers
1.8.1 Assess and gauge the level and extent of sea cucumber trading, the percentage o the impacts on the habitat
1.8.2 Conduct an assessment on the impact of harvesting sea cucumber to determine i
1.8.3 Liaise with the fisheries department to review the Fisheries Act and other policies to ensure sustainability of the fishery

Management Action and Activities	Persons responsible
Objective 2: Marine ecosystems are restored and maintained in a healthy state	
Action 2.1: Implement measures to reduce coral reef damage	
2.1.1 Undertake an assessment to identify, map and zone coral reef ecosystems within MBCA	TBC
2.1.2 Develop key indicators of coral reef condition and benchmarks against which change will be assessed	
2.1.3 Communicate research and monitoring information to the community and other resource users to enhance coral reef conservation awareness	
2.1.4 Promote wise use of the resource	
Action 2.2: Control access to selected critical habitats (coral reefs and seagrass)	
2.2.1 Raise awareness on the impacts of human activities on critical habitats to key resource users	TBC
2.2.2 Assist key stakeholders in developing and implementing mitigation measures	
2.2.3 Restrict access to critical habitats which have been zoned as protection zone through implementation of the prescription provided in the zoning scheme	
Action 2.3: Conduct restoration and rehabilitation of critical habitats	
2.3.1 Conduct pilot studies on restoration and rehabilitation of critical habitats	TBC
2.3.2 Use available manuals for restoration or rehabilitation of critical habitats (e.g. mangrove restoration, artificial coral transplantation, sea urchins and crown of thorns control manuals) in the pilot projects	
Objective 3: Marine biodiversity information shared, understood and appreciated	
Action 3.1: Integrating long-term and short-term surveys of all critical habitats and species	
3.1.1 Carry out surveys on critical species and their habitats regularly to determine trends	TBC
3.1.2 Link data from the survey with a GIS database to visualize changes over temporal and spatial perspectives	

Action 3.2: Develop and mainstream the implementation of an environmental awareness programme														
3.2.1 Develop effective conservation and awareness strategies for fragile habitats (especially coral reefs) and endangered species in MBCA and provide information on their distribution, abundance, composition and status	TBC													Environmental awareness programme developed by ……., and implemented by ……., with annual events thereafter
3.2.2 Actively participate in the annual marine environmental day														
3.2.3 Participate in *mazingira* competition														
3.2.4 Organize dolphin and turtle awareness events														
3.2.5 Give talks and disseminate promotion materials during conferences/meetings held														
Action 3.3: Liaise with school authorities, wildlife clubs (and other groups) to develop a marketing strategy targeting schools and citizens														Strategy to reach ore schools developed by …….and implemented by …….
3.3.1 Work with school authorities and wildlife clubs (and other groups) to develop strategy to reach more sc3ools	TBC													
3.3.2 Learn from CHICOP experience and develop marine educational tours for local schools														
3.3.3 Provide transport to school groups to facilitate visits to MBCA for organized educational trips														
Action 3.4: Promote relevant research on climate change														
3.4.1 Review existing information on climate change, targeted research on climate change indicators and potential climate change mitigation and restoration measures	TBC													Climate change study reports available by …….
3.4.2 Conduct regular surveys and research activities to identify degraded or threatened marine resources														
3.4.3 Develop consensus and prioritize research aimed at reducing, minimizing/halting resource damage														
3.4.4 Partner with institutions involved in research to synthesize information on climate change														
3.4.5 Develop and design potential mitigation and restoration measures and monitor implementation														
Action 3.5: Raise awareness on climate change impacts, mitigation and adaptation measures														

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Management Action and Activities	**Persons responsible**	**Timeframe**												**Proposed milestones**
		2022		**2023**		**2024**		**2025**		**2026**		**2027**		
		1	2	3	4	1	2	3	4	1	2	3	4	
3.5.1 Partner with research institutions to raise awareness on results and recommendations of climate change studies in MBCA	TBC													Information from the climate change study disseminated by …….
3.5.2 Synthesize and package awareness information in an easy to understand format														

Action 3.6: Promote research collaboration and dissemination of information														Stakeholders are made aware of activities regularly
3.6.1 Form a forum between researchers, managers and the MBCA community	TBC													
3.6.2 Enhance existing regional mailing lists														
3.6.3 Initiate an annual research forum														
3.6.4 Update key stakeholders of relevant activities going on in MBCA														
Action 3.7: Develop a central (DMC) data and information management system														A database management system for research and management information developed by .....
3.7.1 Develop a monitoring and assessment system to get information that can be used to respond to threats and to tailor management interventions to the changing environment	TBC													
3.7.2 Collate, analyze, interpret and make available information that is collected														
3.7.3 Develop a database which will be upgraded into comprehensive information and an archiving system with linkages to national and international data systems														
3.7.4 Train managers and stakeholders on usage information retrieval systems														
Action 3.8: Develop an ecological monitoring programme and build capacity to implement the programme														An ecological monitoring system developed by .....
3.8.1 Review applicable elements of the Management Information System (MIS) and expand as appropriate to cover the needs of the ecological monitoring programme specific to MBCA	TBC													
3.8.2 Establish baseline data, record changes in resources and evaluate effectiveness of the MBCA														
Action 3.9: Review and revise management practices effectiveness with managers														Management effectiveness report produced annually
3.9.1 Review applicable elements of the Management Information System (MIS) and expand as appropriate to cover the needs of the management effectiveness elements specific to MBCA	TBC													
3.9.2 Analyzed data and determine whether modifications to management practices are necessary														

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ELOPMENT AND MANAGEMENT PROGRAMME

rpose and Strategy

evelopment and Management Programme is:

n product, based on the special marine biodiversity, scenery and local culture at MBCA, that offers a memorable visitor experience

rotected areas in Zanzibar, the MBCA is one of the highest visited due to the volume of day visitors, primarily based on SCUBA and snorkelling trips to reef areas and sandba
e MBCA undoubtedly has significant tourism potential, more so given its newly expanded east coast component, good road access to the Stone Town, and the well-establish
sland and through which most visitors to the east coast will pass and stop at some point. The diverse and unique tourism attractions that MBCA offers, are also accessible fr
tation points.

identifies the Inadequate of prioritised initiatives to monitor overvisitation and allow for coastal and environmental habitat conservation, and prioritises environmental in
by improved environmental sustainability moving forward to 2030, and that by 2050, tourism is self-sustaining, so carrying capacity has been reached and Zanzibar is glob
ation of choice. The Zanzibar Development Vision 2050 aspires to sustainable exploitation of marine-related resources and products within an operational blue economy fra
planning, environmental preservation and clear investment procedures; and continued adherence to and support for regional and international blue economy institutions a
the marine environment and promote economic cooperation. Meanwhile, the 2020 Blue Economy Policy recognizes that the diversity, productivity and core functions of m
ntained and protected to preserve and conserve marine biodiversity. To align with the Vision and these two policies, there is strong need for improvement of the manageme
gration of users in the MCAs of Zanzibar, including the MBCA.

ns outlined in this plan (e.g. construction of two boardwalks), and increased collaboration between local tourism stakeholders and the DMC that is creating a conducive envir
MBCA is bound to attract more visitors. The Ministry of Tourism and Heritage is a key partner for the actions that are proposed for this programme. The three guiding princip
e development and implementation of the Tourism Development and Management Programme.

ism Development and Management Programme, MBCA Management, with participation of stakeholders and partners, will endeavour to ensure that:

ely developed to not impact on the marine and coastal ecosystems and authenticity of the local culture

e a strong and sustainable source of support for the management and conservation of the MBCA. However, uncontrolled tourism development can destroy the MBCA values
which are the backbone of tourism sector. Most visitors to the MBCA are presently attracted by the dolphins of Menai Bay, the sandbanks off the Fumba Peninsula, the qua
oon on the east coast, and the rich local culture.

re a few isolated successes of local coastal communities and tourism enterprises interacting positively towards marine conservation with shared benefits. One such example
and the associated Kwanini Foundation, at Makangale in the NW of PECCA. In 2018, a byelaw designated the KMPA a no-take zone, within which all extractive and cultivat
MPA is a small area (< 0.5 km^2), with sand and seagrass, lagoon, reef flat and fringing reef slopes. Social and economic benefits/outcomes for current/future generations are
oods (income, food security) and access to financial/scientific expertise from their role as partners in the KMPA and through improved and sustainable fish and marine resou
an example where the right kind of tourism can promote the right type of investment in biodiversity conservation. It is clear that degraded and impoverished marine biodiver
interest.

ent and Management Programme, MBCA management will endeavour to ensure that tourism activities do not impact the ecological integrity of its ecosystems and the
his will be achieved through implementation of management actions outlined under the five programmes of this GMP that include the proposed zonation scheme.To ens
ects also do not impact negatively on the ecosystem's integrity and social fabric, new proposed developments will be subjected to an ESIA prior to approval and constructi

The ESIAs will consider size of projects with respect to the carrying capacity of the MCA, traditional beach access by local resource users, waste disposal and sewage systems.

- **Tourism support infrastructure is developed and maintained**

Based on scant tourist numbers, the tourism potential in the MBCA is likely to be reaching its carrying capacity (pending findings from the Action 2.4 below. The overall income is not known and there may be opportunities for expansion. The DMC and relevant stakeholders need to explore ways and means of ensuring that appropriate infrastructure proposed in this GMP is developed to enhance visitor satisfaction and experience while safeguarding marine biodiversity and community livelihoods.

Thus, under this management programme, an enabling environment will be created for investors to facilitate development and operation of diverse tourism facilities.

- **Tourism products are diversified**

Currently the mainstay of tourism at the MBCA is the marine biodiversity, the cleanliness of the inshore waters, the scenic shores and mangrove-fringed inlets, extensive white sand beaches and regular dolphin encounters off Kizimkazi. In addition, communities living within and around MBCA have rich cultural and historical resources such as the Mkwaka Kogwa, that can be used to further promote cultural tourism, if appropriately developed in close collaboration with the relevant local communities, potentially adding further to the tourist attractions of the area. This programme aims to encourage and support the development of diverse cultural tourism attractions in the MBCA and adjacent areas in southern Unguja.

4.2 Targeting Tourism Development and Management Actions

As summarized in Table 7, the threats that currently impact or are likely to impact on the MBCA conservation targets and their KEAs include pollution, tourism pressure on the marine environment, plus wastewater/Insufficient waste disposal, boat anchoring and coastal development associated with the tourism sector. Mindful of the over-riding tourism objectives of diversifying the tourism 'product', developing the sector in a sustainable fashion and increasing revenue from the sector, the priority threats are addressed in the management actions proposed in the following sections.

4.3 Management Objectives and Actions

In implementing the Tourism Development and Management Programme, the MBCA management, with participation of development and conservation partners and stakeholders, will endeavour to ensure that the above guiding principles are followed. These three principles are intended to guide the implementation of the Programme's four MOs. For each of the following MOs a brief description of the relevant management issues and opportunities is given, which provide the specific context and justification for the actions.

MO 1. Adequate tourism support infrastructure and equipment provided

MO 2. Tourism activities and attractions diversified and managed

MO 3. MBCA's tourism marketing improved

MO 4. Visitor management systems improved and updated

Objective 1: Adequate tourism support infrastructure and equipment provided

Currently, it is not known if accommodation facilities in the MBCA are adequate to support the in-

creasing number of visitors expected in coming years. Further, infrastructure to assist visitors to explore marine resources, such as moorings, are Inadequateing. This objective has been designed to ensure that adequate and quality tourism infrastructure and facilities are provided and maintained in the MBCA and adjacent areas to support the envisaged increased tourism growth whilst ensuring that visitor experience is improved. Existing and future tourism enterprises have a leading role to play in this regard, in collaboration with the MCA Manger and SMC. The three management actions that will be implemented to achieve this objective are elaborated in the following sections.

Action 1.1: Develop and maintain two new boardwalks

Learning from the experience of Jozani, where an existing 1 km-long mangrove boardwalk at Jozani Forest National Park operated by the Jozani village, that offers scenic views of the mangrove forest which allows visitors to enjoy the scenery through interpretation that is provided by a local guide. There is high potential for establishment of another boardwalk at Vundwe Island, or between Uzi and Unguja Ukuu. Consequently, through this action, the MBCA will support two local communities, to be identified, in constructing two separate boardwalks. Eventual boardwalk managers and officials will be trained in project management to help ensure that the community managed boardwalk project does not fail.

Action 1.2: Liaise with the Department of Archives, Museums and Antiquities (DAMA) to develop and maintain historical and cultural resources in the MBCA

The greater MBCA has several sites of cultural and historical importance. Two of the prominent sites of cultural tourism importance include the Dimbani Mosque and the archaeological sites at Unguja Ukuu. Most are managed by the local community with technical assistance from the DAMA. There is room for community guides to be trained on provision of interpretation at these sites and as such should also benefit from provision of guiding. Tourism revenue accruing from entry charges is not current used locally, but confirmation is needed on this and the possibility of income to support diverse community projects. Cultural norms at these sites need to be respected. Several caves and sink holes also exist, many with spiritual significance. A now world-famous cultural festival takes place annually at Makunduchi, intertwined with the Muslim religion, and could also be improved in terms of tourism volume and facilities. Cultural considerations need to be considered, as there are may be sensitivities regarding tourism at sacred sites. Any initiatives must be carried out with full consultation and agreement, especially with the local council of elders.

Under this management action, MBCA management will liaise with the DAMA and the local community to improve visitor experience at selected sites, noting that some sites require improved visitor access and safety, as well as toilet facilities. In addition, to further promote cultural tourism, if deemed necessary, the local community will be supported to establish a cultural centre at one of the historical buildings such as in Dimbani or Unguja Ukuu.

Action 1.3: Tourist boat mooring buoys

Tourist boats on snorkeling and SCUBA excursions, and in comes cases fishing vessels, occasionally drop their anchors in areas where they drag and damage coral reefs and seagrass beds. This damage can become extensive in heavily used areas. To mitigate such damage, the installation of mooring (or pick-up) buoys is used. The most appropriate design and positioning of the mooring buoys will need to be investigated and materials purchased, assembled, and installed. Depending on the site-specific condition and exposure to sea condition during the two monsoon periods, moorings may need to be seasonally re-located. Where moorings are installed, tourist boats will be obliged to used them. The recommendation would be benefit from inputs from conservation and boat operator partners on MBCA so that design and installation are correctly achieved. It will also be important to balance the need and number with actual tourism numbers. One conservative approach would be to install boat moorings gradually (starting small) and monitor the use before scaling up.

Improving facilities (and safety) for SCUBA operators to anchor may also increase the volume of SCUBA diving. SCUBA and snorkeling can be low impact activities, but only when these are well-regulated. Many examples exist, for example in MIMCA, of SCUBA dive sites that have been extensively damaged by tourist divers and their boats. In some areas, expanding the SCUBA and snorkeling tourist volume on existing sites should not be considered, but rather, new SBUA and snorkeling sites should be created (e.g. through sinking wrecks or purpose-built reefs) and more terrestrial options should be developed.

Objective 2: Tourism activities and attractions diversified and managed

The future desired state at the MBCA is where visitor experience is enhanced through visitor participation in a wide range of activities. Among Zanzibar's MCAs, MBCA is currently expected to be leading in terms of visitation and revenue generation. Despite this, the MBCA is believed to still have the potential to sustainably support more visitors if visitor activities and attractions are diversified. Increasing the diversity of the tourist products and providing essential information on these products will increase understanding and appreciation of the exceptional resources in the protected area thereby enhancing visitor experience and satisfaction. There are currently significant tourism versus local community resource use conflicts on the east coast of MBCA. These could be resolved through management of the local area, and collaboration in open discussion over the qactions that follow andotehs that maz be needed, including the SMC, the MCA Manbager and other interested parties.

In addition to the actions above on cultural tourism options being diversified and improved, the focus here is on developing and maintaining nature trails, promoting ornithological safaris and promoting canoe safaris. To ensure that this objective is realised, five proposed actions are presented in the following sections.

Action 2.1: Develop and maintain nature trails

To improve the experience and allow better appreciation of the rich biodiversity and scenic values offered by the mix of terrestrial and marine ecosystems in the MBCA and adjacent areas, nature trails are needed that can be used by visitors to explore the local forests such as those of the islands of Uzi, Pungume and Kwale. To facilitate identification and establishment of the nature trails, a survey of existing nature trails and potential sites for new trails will be carried out. Chumbe Island has such a trail from which lessons can be learnt. The MCA Manager should work with conservation and research partners to conduct a study to identify the key ecotourism sites and to inform development of eco-tourism plans. From such a study, sites can be developed to community led mangrove parks, nature trials and species conservation spots. See comment above (Action 1.2) regarding cultural sensitivities regards tourism. New nature trails will thereafter be designed and constructed guided by best practices in trail construction. Once established, appropriate maps showing trail routes and interpretation locations will be produced and disseminated to visitors at MBCA offices.

Concurrently, to further increase the enjoyment of the marine ecosystems by visitors as well as provide a marine education tool for local schools, an underwater nature trail representing the diverse marine ecosystems in the area will be developed.

Action 2.2: Promote ornithological guided tours

The MBCA and adjacent areas are rich in both resident and migratory birds. Mangroves and seagrass beds are important areas for migrating bird species, such as Crab plovers, as well as various herons and egrets and kingfishers, due to the availability of food and the adjacent roosting sights in mangroves and sand banks during low tide. Many of the smaller islands and islets are important roosting habitats for migratory birds that visit between January to March and July to September. These islands also serve as breeding grounds to some resident birds. One of the small rocky outcrops near Chumbe Island shelters migratory roseate terns that at times come in large numbers for breeding and it is for this reason that the island is internationally recognized as an IBA by Birdlife International.

Based on these ornithological values, MBCA could be marketed as a prime bird-watching destination, especially the migratory birds. Research will need to be conducted on the migratory bird species and their migration routes and timings as well as on resident species and their habitats. For this action to be successful, a network of bird-watching sites and trails will be defined, and local guides trained to offer birdwatchers a unique experience. Conservation and research partners with experience in ornithology will be vital to develop this action. Integrating such birding routes with the IBS of Jozani and East Coast (notable Chwaka Bay) and the Pemba IBA will add value to product and benefit the other sites as well.

Action 2.3: Promote canoe *safaris*

Dugout wooden canoes used by local fishers (or modern fibreglass or plastic versions) are an attrac-

tion to visitors who seek to be ferried across the Uzi Channel to Vundwe Island, for example, in this mode of transport. Canoes permit visitors to explore some of the many accessible mangrove and inshore reef areas. To enhance and improve the canoe *safari* enterprise, the MBCA management and relevant stakeholders will identify and support operators of seaworthy canoes to offer canoe safaris across sheltered and biodiversity-rich portions of the MBCA. Further, to ensure a safe and conflict-free canoe *safaris* venture, regulations will need to be developed, in collaboration with canoe and boat operator associations and tour operators.

Action 2.4: Conduct a visitor impact and carry capacity study

The rich biodiversity values in the MBCA attract a substantial number of visitors annually. Preserving these biodiversity values requires ensuring visitor pressure (among many other pressures) does not exceed thresholds that, if surpassed, will lead to degradation of these values. Data on the precise numbers of visitors that the MBCA receives is not available nor is the number of boat trips taking visitors on dolphin trips, for picnics and snorkelling or SCUBA diving, or even recreational fishing trips. Careless anchoring in shallow water among corals and novice snorkelers and SCUBA divers who occasionally cause damage to corals, are examples of degradation. Consequently, the extent of damage caused by inappropriate boating, recreational visitors and fishing activities will be assessed to quantify their impact on conservation targets.

So far, observations show that the SCUBA diving industry is relatively unsaturated in the MBCA. However, snorkelling is an extremely popular activity that is mostly concentrated around Kwale Island. It is therefore important that limits of visitors allowed to participate in various activities at a time are determined to ensure that visitor satisfaction is enhanced. Towards this, the visitor carrying capacity of the MBCA will be determined through a study to assess environmental, physical, social and economic visitor carrying capacities of specific sites within the MCA that are of interest to visitors. For example, the physical carrying capacity of for SCUBA/snorkelling over a particular reef needs to consider the availability of boats which ferry visitors to the reefs, the number of mooring buoys available, the physical space, size and shape of the reef, as well as the composition of the coral communities and sandy areas. The selections of sites should include the most popular ones, namely Kwale, Pungume and surround reefs, but the final selection should be made with the MCA Manager, SMC and relevant stakeholders (namely SCUBA and snorkelling operators and hotels). The evaluation itself (to cover pressure/damage, habitat sensitivity and resilience) will require assistance for research and conservation partners.

A less obvious aspect is the social carrying capacity, which needs to consider the limit to visual contact between SCUBA divers/snorkelers beyond which they become dissatisfied. The carrying capacities defined from the studies for various tourist activities and facilities will inform tourism development and management strategies in the MBCA. Equally, studies on tourism trends, dive operations, boat use and commercial and recreational fishing will provide useful information that will ultimately lead to both increase in tourism and improved conservation of critical habitats.

As a parallel activity, to be agreed with the MCA Manager and SMC, a carrying capacity study of local community activities (mostly related to impacts associated with fishing, shellfish harvest and seaweed farming) should be considered. Thus the monitoring and verification metrics should extend to the local communities who also leave trash on the beaches and at sea.

Action 2.5: Develop community-based tourism activities

In order to contribute to diversifying the tourism product, and involving local community members, focused study guided by appropriate skilled experts are proposed to develop activities that can be guided and led by local community members. Suggestions include underwater trails, community tourism ("a day in the life of") and community-guided fishing trips.

Developing and implementing this action will likely take some time and require many prior activities to build upon (technical trainings and language/hosting training, development of "products", quality, etc.). Assistance from development and research partners will be very important for this action once it has been prioritized. Added to that, a scenario where community-based tourism activities, supported by a legally agreed mechanism, whereby communities can benefit from their own tourism ini-

tiatives (for example, snorkel tours to permanent closed areas) would serve to boost local economies and add value to the conservation tool which is the RZs.

Objective 3: Improved marketing of MBCA's tourism

Is increased visitation and enhanced visitor satisfaction, combined with sustainable visitor activities and footprint are the future vision for the MBCA. The increase in visitors can potentially contribute to the costs for protecting the marine resources of MBCA. The increase in vistors can potentially contribute to the costs for protecting the marine resources of MBCA. This can be achieved through design and implementation of a vigorous marketing strategy that combines ecological, social and partnership marketing approaches. Under this MO, MBCA management will seek to work with stakeholders in the Zanzibar tourism sector such as tour operators, hoteliers and boat operators, as well as development partners, to implement marketing strategies that aim at maintaining and attracting increasing visitor numbers, of the right type of visitor, at the same time as increasing public support for the MBCA. For this objective, the Ministry of Tourism and Heritage is a key entity and it needs to be involved in the activities and actions that directly involve the tourism sector. Activities targeting the local community are described under Chapter 7 Community Support Programme, with this section focused more on the implementation of proposed actions directed specifically towards the tourism sector, as outlined below.

Action 3.1: Conduct market research

To develop an effective tourism marketing strategy for MBCA it is important to understand the tourism market segments that are and could in future visit and experience MBCA. To obtain information on the various visitor markets and their needs and to design messages and programmes to deliver to each market segment, tourism market research is vital. Under this action, the MBCA management in collaboration with DMC (with the same for the other four MCAs of Zanzibar) and development partners, ideally with the lead taken by the Ministry of Tourism and Heritage, carry out market research to develop profiles of customers' needs, behaviour and characteristics. The study should also include cultural norms and acceptable behaviours. The findings will be used to develop and target marketing materials for sites within and MBCA as a whole. Consideration should be made of the option to adopt the Mwambao-MCCC participatory market system development (PMSD) package where all market chain actors are involved.

Action 3.2: Upgrade and regularly update the DMC website to improve marketing of MBCA

For the last fifteen years, the Internet has become a vital tool for pre-visit research by potential visitors. There is therefore the need to have a website with comprehensive and accurate information on the MCAs of Zanzibar, to assists visitors to plan their trips in detail. The DMC does not maintain a website that provides detailed information and facts about the MBCA, and its unique values and attractions are thus not elaborated. Most of the MBCA tourism marketing is done by private tour companies and hoteliers that often do not cover aspects of the MBCA in their own websites.

Therefore, to promote the MBCA through the Internet, the information on the DMC website will be expanded to cover the MBCA and its adjacent areas (as well as the other MCAs in Zanzibar). Through this action, the DMC website will be enriched with high quality images showing details of the variety of wildlife present in the MBCA. A video clip will also be uploaded to provide detailed information on the MBCA, its attractions and uniqueness. Collaboration on this action could be obtained from research and development partners.

Action 3.3: Develop and update a tourist map, guidebook and awareness brochures

Information materials that are used to educate visitors on the MBCA and its resources, to enhance visitor experience and satisfaction, and as marketing tools . Such materials are essential and standard formats include maps, guidebooks, brochures or leaflets, that area provided to visitors through the Internet or at the visitor information centre. Currently, there is scant information materials on the site, and it is outdated.

It is especially important to keep awareness and educational materials up-to-date to reflect the changing dynamics in the MBCA and raise interests of stakeholders. To increase awareness on marine issues and enhance public understanding, it is essential that education and outreach tools are upgraded. These can be linked to the DMC website (see Action 3.2, abovje). Material will be designed to correctly portray information specific to the MBCA, targeted at various social strata, from international tourists to local schools, seaweed farmers and elder fishers. Underwater films on the MBCA, prepared by professional diver, with support from local MBCA staff, should be produced to reflect the unique marine life of the MBCA. Marine videos should be regularly updated.

Thus, there is a need to update this information to cover the new key components of the MBCA ecosystem and its extent and coverage. Consequently, under this action, a tourist map of the MBCA ecosystem with summary information on various biodiversity, scenic and cultural resources of touristic importance will be developed. This action should be developed in collaboration with DMC (with the same for the other four MCAs of Zanzibar) and development partners, ideally with the lead taken by the Ministry of Tourism and Heritage. The guidebook and brochure will also be updated to capture tourism resources in the terrestrial part of the area.

Action 3.4: Install and maintain information materials at strategic locations

Opportunities exist for educating visitors about the tourist attractions in the MBCA and thereby influencing their behaviour. Examples include provision of information at the point of entry to the MBCA, or at strategic locations along various routes followed by visitors on their way to the MCAs (e.g. airport and ports), or specific sites within it. It is important that information that is made availed to MBCA customers is up to date, hence materials need to be reviewed and updated accordingly.

To further increase information on tourism products and attractions in Zanzibar's MCAs, appropriately sized and placed billboards could be installed at strategic points (e.g. Zanzibar International Airport), as well as other strategic places deemed appropriate by MBCA management and stakeholders. This action should be developed in collaboration with DMC (with the same for the other four MCAs of Zanzibar) and development partners, ideally with the lead taken by the Ministry of Tourism and Heritage.

Concurrently, measures to increase the use of research information for marketing the MBCA and other MCAs will be explored and a stronger liaison between marketing specialists and MCA managers developed.

Action 3.5: Review existing community projects and encourage tour companies to include them in their tour packages

Most of the MCAs and other MCAs of Zanzibar include a range of community eco-tourism projects, such as the Jozani Forest mangrove board walk, Jozani butterfly farm, ecological spice farms, and others that generate income for the local community. A review of all such projects within the boundaries of the MBCA will be conducted from which selected projects will be supported through the MBCA and introduced to tourism stakeholders. The MBCA management will thus liaise with tour companies to promote community-based ecotourism projects in their tour packages. Development and conservation partners may also have a role to play in the activity, mindful that visits to community projects by tourists are not always appropriate and any cultural sensitivity issues must be addressed through consultation with stakeholders. Information on these projects will be posted in the tour companies' websites, MBCA's Facebook page, website and brochures.

Action 3.6: Disseminate tourism informationthrough working with tourism stakeholders

Related to proposed action 3.3, tourists rely on tour operators, travel agents and the media, to obtain information on sites to be visits. As such updated information dissemination is important and must be consistent and correct across all outlets, to avoid misinformation. This action should be developed in collaboration with DMC (with the same for the other four MCAs of Zanzibar) and development partners, ideally with the lead taken by the Ministry of Tourism and Heritage. The MBCA management will work with tourism stakeholders to share dedicated brochures and other site information. Where appropriate, the MBCA management will further liaise with the local media to provide coverage of the MBCA in other platforms.

Action 3.7: Organize and market local events that promote MBCA goals and objectives

In many marine protected areas around the world, organizing local level events, such as boating, cycling, sailing or marathon races, has become commonplace, to raise awareness of the site and maybe raise funds. This action should be developed in collaboration with DMC (with the same for the other four MCAs of Zanzibar) and development partners, ideally with the lead taken by the Ministry of Tourism and Heritage. Potential events include annual seafood festivals to promote local fish and seaweed products, or an annual *Kizimkazi Dolphin Cup* canoe or outrigger race. Once suitable events have been identified and agreed upon by relevant stakeholders, they will be advertised nationally and internationally. The sustainability of seafood festivals needs to be examined before promotion, to ensure that no ETP species are implicated.

Objective 4: Visitor management systems improved and updated

After successful implementation of the above actions under MOs 1, 2 and 3 an increase in visitor numbers is anticipated. Numbers may increase even without implementation of the above actions. In any case, strengthening of the MBCA's tourism management and administration systems will be required. The purpose of this MO is to ensure that the management of tourism in the MBCA is strengthened, so that the desired tourism product can be provided – thus meeting obligations to tourism investors – but with minimal impacts on the area's natural environment. To achieve this objective, five proposed management actions have been developed, as described below.

Action 4.1: Review and update the visitor code of conduct

All marine tourism activities need to be properly regulated, to avoid and minimise undesired social and ecological impacts. It is known, for example, that coral reefs are increasingly being impacted by anchors of fishers as well as tourist boats. Many examples exist around Mnemba Island (MIMCA) and in Menai Bay (MBCA). To minimize these impacts, following a detailed review of the impacts and sources, a set of MBCA specific codes of conduct for each marine recreational activity will be prepared, to ensure appropriate tourist behaviour and protection of marine biodiversity and scenic values.

The code will include wildlife interaction protocols, in addition to interactions between resource users from different sectors, for example SCBUA divers and fishers, to avoid conflicts. Any existing codes will be reviewed and adapted for MBCA as appropriate. In addition, the developed codes will be published in brochures and leaflets and made available at the Kizimkazi MBCA office and other sub-offices, as well as main tourist facilities. This action would benefit from involvement of conservation and development partners.

Action 4.2: Develop and implement dolphin watching guidelines

Dolphins are the flagship species of the MBCA and many visitors come with the aim of watching or swimming with them. Dolphin-watching tourism is of great importance to the local communities and residents in Kizimkazi/MBCA (Berggren et al., 2007). Dolphin tourism, though useful in awareness raising, has sadly led to harassment of dolphins through increased human traffic around dolphin pods, especially in the MBCA. In some instances, boat operators chase dolphins when they sight them to please their customers. Research on dolphins have revealed that dolphin tourism negatively affects the behaviour of dolphins by disturbing their activities and reducing the time dolphins spend foraging, nursing and resting which may have both short- and long-term effects on population health (Stensland and Berggren, 2007; Christiansen et al., 2010).

A reduction of the bycatch (from gill-nets) and regulation of dolphin-watching tourism is urgently needed to prevent a long-term decrease in survival and reproductive success that could result in a decline in population size and/or dolphins leaving the area. This would then result in a reduction in the tourism potential which would have serious socio-economic implications in the MBCA area. Therefore, to attempt to reduce the pressure from dolphinwatching tourism on the dolphins off the south coast of Zanzibar, a management option might be to have fewer tourists paying more money for the experience, a strategy supported by the result of a socio-economic study conducted in the area (Berggren et al., 2007). That would potentially lower the number of dolphin-watching trips off

the south coast of Zanzibar, and thus the pressure on the dolphins, without reducing the economic benefits to the region. A second strategy would be to encourage a similar activity in other areas around Zanzibar e.g. Nungwi and Matemwe which also would reduce the pressure in the MBCA by providing tourists with different options on locations that offer the same experience.

To safeguard this tourism value, therefore, MBCA management in liaison with dolphin researchers and boat operators will develop appropriate regulations to guide dolphin watching, re-visiting those in the Tourism Regulations of 2009. Once the regulations are developed, awareness creation campaign on these regulations will be extended to all residents of MBCA, and particularly the boat operators and fishers. Large, updated posters will be placed at tourism embarkation points to inform visitors on the regulations of watching dolphins. All boats ferrying tourists to the MBCA will have the code of conduct and park regulations placed strategically in the boats, accessible to all visitors.

Action 4.3: Liaise with Commission of Tourism to organize regular workshops for boat/beach operators

As in many dolphin viewing situations, boat operators at Kizimkazi and Fumba have a tendency to crowd and scramble around tourist minibuses to solicit customers. This potentially gives a Insufficient impression of the organization inside the MBCA and it is therefore important that boat /beach operators are informed on the negative impacts of their behaviour to ensure this problem is eradicated. MBCA management will work with the Commission of Tourism to organise awareness raising workshops for boat/beach operators, that can also be used as a forum for the operators to air any grievances related to the protected area and the management, and to develop strategies to overcome tourism harassment.

In the 1990s there was a KIDOTOA, focused such issues, including boat operations around dolphins. Attempts will be made to re-organise this association, and to equip beach and boat operators with tools to form an organisation that will regulate members' behaviour.

Operators will also benefit from training in health and safety handling, necessary in case of emergencies, through support from MBCA management. Support to boat operators to establish a community-based tourism operator's forum, registered by the Commission for Tourism will contribute to visitor safety standards and resolve conflicts among members.

Action 4.4: Reduce waste generated by visitors and improve tourism embarkation facilities

Solid waste management in Pemba and Unguja islands (including the MCAs of PECCA and other MCAs on Zanzibar) is a major problem that has not been resolved, though progress has been made on banning single use plastic bags. Plastic bottles used by tourists end up either dropped on the streets, or in the forests from where they end up in the ocean due to surface run-off, or are abandoned on beaches or sandbanks, or dropped directly in the ocean. To improve the management of solid waste, local boat operators should be encouraged to stress to visitors the need to use re-fillable bottles, and not transport singleuse plastic bottles on their boats. With correct health and sanitary conditions, large volume plastic water containers can be used by tour operators to fill the bottles of visitors.

At MBCA, tourist embarkation points exist in the Fumba and Kizimkazi areas, and other sites. From these points visitors usually spend 3-5 hours at key attractions sites that are located some distance from the shore, often in coral reef areas. To enhance the comfort of visitors before and after boat rides and to minimize pollution from Insufficient waste disposal, the construction of restrooms/changing rooms within the environs of embarkation points should be considered after consultations with operators and tourists alike.

Concurrently, publicity material will be designed and developed in appropriate languages to encourage responsible waste management of visitors and local communities. MBCA management will also work with the tourism sector in seeking effective ways for getting waste management messages to visitors. Regular monitoring will be needed to document marine litter, visitor satisfaction and visitor behaviour and determine whether waste is being reduced.

Action 4.5: Establish a MBCA tourism forum

A common forum for tourism sector participants is not in existence for the MBCA. The creation of one would improve coordination with this important stakeholder, and aid overseeing the activities of tourism entities in the MBCA as well as assist in resolving tourism related conflicts. Potential members include DMC and associated units, boat operators, hoteliers, ZATI and ZATO, development partners among others. Once established, such a forum could hold bi-annual meetings. In 2019, Mwambao-MCCC had organized a meeting including communities to explore potential for coordinated community support which could be interesting to re-visit and potentially repeat.

Monitoring Framework

The monitoring framework presented in **Table 10** has been designed to provide guidance for the assessment of the potential impacts resulting from the implementation of this programme. The framework presents potential positive and negative impacts that may possibly occur during implementation of activities for each objective. The framework also includes easily measurable and quantifiable indicators for assessing impacts, and potential sources of information needed. Monitoring impacts of the plan implementation ensures that timely changes to management approaches are made when the situation demands.

Table 10. Tourism Development and Management Programme Monitoring Plan (modified from KWS, 2015).

Objective	Potential Impacts (positive and negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Adequate tourism support infrastructure and equipment provided	Increased number of visitors to the MBCA Increased tourism revenue	Annual visitor numbers; Revenue data	MBCA visitor and revenue database
	Environmental degradation from increased tourist use/pressure on marine environment	Evidence of pollution/litter or habitat degradation at sites where infrastructure located or at tourist attractions spots e.g. coral reefs	Targeted inspections by MBCA staff

Objective 2: Tourism activities and attractions diversified and managed	Increased number of visitors to the MBCA	Annual visitor numbers	MBCA visitor database
	Increased length of stay in the MBCA	Average number of nights spent in the MBCA per visitor	Bed occupancy reports of hotel facilities in the MBCA-adjacent areas
	Increased revenue	MBCA revenue data	Revenue database
	Enhanced visitor satisfaction	Visitor satisfaction data	Visitor satisfaction survey reports
	Environmental degradation from new tourist activities and/or supporting infrastructure	Evidence of pollution/litter or habitat degradation at sites where activities or infrastructure are located	Targeted inspections by MBCA staff
Objective 3: Improved marketing of MBCA's tourism	Increased number of visitors to the MBCA	Annual visitor numbers	MBCA visitor database
	Increased visitor satisfaction	visitor satisfaction data	Visitor satisfaction survey reports
	Increased public support for MBCA	Increased public awareness and domestic tourism	MBCA visitor database
Objective 4: Visitor management systems improved and updated	Increased collaboration between DMC, tour operators and MBCA investors	Number and participation at tourism stakeholder and MBCA management meetings	MBCA meeting minutes
	Improved visitor handling standards	Visitor satisfaction data	Visitor satisfaction survey reports
Notes. 1. The institution that will carry this out exercise of establishing and running the database needs to be determined through agreement between MCA Manager, SMC and conservation and research partners.			

4.4 Implementation Schedule

The following pages set out the proposed first six-years of the ten-year implementation schedule for the MBCA GMP (see Table 11). The activity plan details the activities, responsibilities, timeframe and milestones necessary for the delivery of each management action, starting in 2022, which need to be finalized by the MCA Manager and SMC.

Table 11. Tourism Development and Management Programme Implementation Schedule (first six years).

Management Action and Activities	Persons responsible	T				
		2022		2023		20
		1	2	3	4	1
Objective 1: Adequate tourism infrastructure and equipment provided						
Action 1.1: Develop and maintain two new boardwalks						
1.1.1 Conduct feasibility study to select a site for a mangrove boardwalk e.g. Uzi, Vundeme or other islands	TBC					
1.1.2 Support local community in constructing boardwalks at designated sites, learning from Jozani village						
1.1.3 Train boardwalk managers and officials in project management						
Action 1.2: Liaise with Department of Archives, Museums and Antiquities to develop and maintain historical and cultural resources in the MBCA						
1.2.1 Liaise with the DAMA and the local community in improving visitor experience at sites in the MBCA	TBC					
1.2.2 Explore opportunities to promote visits to local caves and including needs for access						
1.2.3 Support the local community to establish a cultural centre at one of the historical sites						
Action 1.3: Tourist boat mooring buoys						
1.3.1 Conduct site studies in MBCA for mooring buoys mindful of possible need for seasonal re-location	TBC					
1.3.2 Conduct a study of the appropriate design and positioning of the mooring buoys						
1.3.3 Purchase materials, assembled, and install mooring buoys						
1.3.4 Inform and train tourist boat operators on how to use mooring buoys						
Objective 2: Tourism activities and attractions diversified and managed						
Action 2.1: Develop and maintain nature trails						
2.1.1 Conduct a feasibility study to select a site for an island and a underwater nature trails	TBC					
2.1.2 Develop at least one nature trail at the selected forest site on the islands e.g. Kwale						
2.1.3 Produce maps showing trail routes and interpretation locations and market them						
2.1.4 Initiate guided safari walk, birding, mangrove walks, and self-walk safaris						

Management Action and Activities	Persons responsible	Timeframe												Proposed milestones
		2022		2023		2024		2025		2026		2027		
		1	2	3	4	1	2	3	4	1	2	3	4	
Action 2.2: Promote ornithological guided tours														Bird watching sites and trails identified and developed by ……
2.2.1 Develop a local bird watching marketing strategy														
2.2.2 Conduct more research on migratory bird species to inform management and tourists														
2.2.3 Establish bird watching sites and trails	TBC													
2.2.4 Develop guidebooks for local birders														
2.2.5 Train community naturalists in local bird watching and guiding skills														
Action 2.3: Promote canoe safaris														At least one canoe safari operation active by ……
2.3.1 Conduct a feasibility study to select a site for canoe safaris	TBC													
2.3.2 Train local canoe and boat operators in managing canoe safari operations for tourists														
2.3.3 Produce maps showing canoe safari routes and interpretation locations and market them														
Action 2.4: Conduct a visitor impact and carry capacity study														Study on carry capacity completed by ……
2.4.1 Assess extent of damage caused by inappropriate boating, recreational visitors and fishing activities	TBC													
2.4.2 Estimate the visitor carrying capacity for reef tourism to determine optimal levels of use, avoid overuse or crowding, and maintain visitor satisfaction														
2.4.3 Carry out studies on tourism trends, dive operations, boat use and recreational fishing														
Action 2:5 Develop community-based tourism activities														New communitybased tourism activities operational by ……
2.5.1 Identify and contract study guide/appropriate skilled experts to diversify the tourism products	TBC													
2.5.2 Identify community members interested in participating in learning new skills to work with tourists														
2.5.3 Consider underwater trails, community tourism ("a day in the life of") and community-guided fishing trips, and others depending on feedback from study														
2.5.4 Operationalize the activity with support from the MPA Fund and MCA Manager														
Objective 3: Improved marketing of MBCA's tourism														
Action 3.1: Conduct market research														Marketing materials available by ……
3.1.1 Develop profiles of customers' needs, behaviour and characteristics	TBC													
3.1.2 Design and develop marketing materials														

Action 3.2: Design, upgrade and regularly update the DMC website to improve marketing														DMC website displaying MBCA information and updated regularly
3.2.1 Update MBCA website and set up a link to local stakeholders' web pages	TBC													
3.2.2 Expand DMC website to cover the MBCA and its adjacent areas														
3.2.3 Upload a video clip to provide detailed information on the MBCA, its attractions and uniqueness														
Action 3.3: Develop and update a tourist map, guidebook and awareness brochures														MBCA information materials available by ……
3.3.1. Develop content for the information materials	TBC													
3.3.2 Update the guidebook and brochure to cover both marine and terrestrial tourism resources														
3.3.3 Partner with local SCUBA professionals to produce an underwater promotional video od MBCA														

Management Action and Activities	**Persons responsible**	**Timeframe**												**Proposed milestones**
		2022		**2023**		**2024**		**2025**		**2026**		**2027**		
		1	2	3	4	1	2	3	4	1	2	3	4	
Action 3.4: Establish, install and maintain information materials distribution at strategic locations														Signboards and billboards installed by ……
3.4.1 Install billboards at strategic open places	TBC													
3.4.2 Renovate, add information and install signboards at locations close to tourist facilities														
Action 3.5: Review existing community projects and encourage tour companies to include them in their tour packages														Visits to community projects increased by 20% by ……
3.6.1 Liaise with tour companies to sell community-based ecotourism projects in their tour packages and post information on these projects on their social networks	TBC													
3.6.2 Encourage and motivate tour companies so their tour drivers take visitors to community projects														
Action 3.6: Ddisseminate tourism information through working with tourism stakeholders														At least two articles published on MBCA annually
3.8.1 Work with tourism stakeholders to develop and share tourism information on MBCA	TBC													
3.8.2 Work with Journalists to write accurate stories on the MBCA														
Action 3.7: Organise and market local events that promote MBCA goals and objectives														AT least one promotional event held annually
3.9.1 Hold a consultative meeting with DMC to initiate a unique local promotional event based on the resources and theme of the MBCA	TBC													
3.9.2 Advertise the annual event locally, nationally and internationally														
Objective 4: Visitor management systems improved and updated														
Action 4.1: Review and update the current visitor code of conduct														Revised code of conduct published by ……
4.1.1 Develop new regulations and review and implement MBCA specific codes of conduct for each marine recreation activity	TBC													
4.1.2 Publish brochures and leaflets to be availed at DMC offices and tourist accommodation facilities														

Action 4.2: Develop and implement dolphin watching guidelines														Awareness of dolphin watching guidelines increased among visitors by 20% by ……
4.2.1 Liaise with dolphin researchers and boat operators to develop regulations for dolphin watching	TBC													
4.2.2 Install a poster at tourism embarkation points to inform visitors on dolphin watching guidelines														
4.2.3 Place code of conduct and park regulations strategically in all boats ferrying tourists to the MBCA														
4.2.4 Assess the viability of increasing visitor fee against reduced vessel numbers, and of alternative dolphin tourism sites to ease pressure on MBCA populations														
Action 4.3: Liaise with Commission of Tourism to organize regular workshops for boat/beach operators														Boat operator work-shops held each year, starting by ……
4.3.1 Familiarize operators on MBCA specific codes of conduct for each marine recreation activity nd increase their overall awareness of the MBCA's values, rules, and the various visitor codes	TBC													
4.3.2 Support tour guides to form an association which will help regulate their conduct														

Management Action and Activities	**Persons re-sponsible**	**Timeframe**												**Proposed milestones**
		2022		**2023**		**2024**		**2025**		**2026**		**2027**		
		1	2	3	4	1	2	3	4	1	2	3	4	
4.3.3 Conduct awareness campaign on regulations to all residents of MBCA, boat operators and fishers														
Action 4.4: Reduce waste generated by visitors and improve tourism embarkation facilities														Tourist toilets installed at least at MBC HQ by ……, with sub-stations equipped by ……
4.4.1 Build toilets and changing rooms within the environs of the embarkation points	TBC													
4.4.2 Encourage local boat owners to allow only visitors with their own re-fillable bottle on their boats instead of single-use water bottles to improve solid waste management														
4.4.4 Develop publicity material to encourage responsible waste management														
Action 4.5: Establish a MBCA tourism forum														Tourism form formed by …….
4.5.1 Establish a tourism forum to oversee the activities of tourism players in and around the MBCA including all key tourism player	TBC													
4.5.2 Hold bi-annual meetings with the tourism forum														

5. FISHERIES RESOURCE MANAGEMENT PROGRAMME

5.1 Programme Purpose and Strategy

The purpose of the Fisheries Resource Management Programme is to:

Ensure that MBCA's fisheries resources are restored and sustainably managed in collaboration with all stakeholders

The MBCA includes a fringing coral reef system along its south and eastern seaboards and a complex of patch reefs, islands and inlets throughout its western waters. Seagrass beds, live coral and coral rubble areas provide important habitats for various reef and inshore fish species, while mangroves in the Menai Bay area provide important nursery grounds and deeper waters support larger pelagic species, including tuna and billfish.

Most of the fish catch originates from the shallow coastal waters, almost exclusively by local fishers using artisanal gears. Visiting fishers seasonally arrive in the western areas, with shallow water *dago* fishers camped at Pungume Island, and drifting large-meshed gillnet fishers based at the two Kizimkazi villages during the NE monsoon season. The approximately 8,000 fishers within MBCA use a variety of fishing gears, including traps (*dema*), hook and line, seine-nets, gill-nets, and spears (see Table 3). There are also 15 ring-nets but no purse-seines reported, reflecting the low volume of fishing for small pelagic fish such as Indian mackerel, sardine and anchovies. No data are provided of the number (or lengths) of large-meshed gill-nets used for catching large pelagic and demsersal fish species. Fisheries resources have provided a vital source of livelihood for Zanzibar coastal communities including those within and adjacent to MBCA. Since the 1990s, these same fisheries resources have also served as basis for water-based tourism activities including dolphin-viewing, snorkelling, SCUBA diving and recreational or sport fishing. The later operate off the reefs and in deeper waters, also often on a seasonal basis. Local fish stocks also contribute a vital resource to the resident dolphin population of MBCA.

Due to the growing human population and increased tourism requirements for fish, there has been a large increase in fishing effort, with increased pressure on fish stocks, resulting in reduced sizes and weight of fish landed. In addition, the use of illegal and unsustainable fishing methods such as ring-nets and spearguns (and even use of dynamite and other explosives) in coral areas, and beach seine-nets over seagrass beds has increased considerably over the last ten years, especially since the end of the period when MBCA was supported by WWF. As a result, there has habitat widespread degradation. There is now an urgent need to implement measures to allow re-building of fish stocks in MBCA, and protect sensitive habitats such as coral reefs, to enable recover of degraded areas and to allow the continued support primarily to local fisher livelihoods and water based-tourism activities.

The Fisheries Resource Management Programme measures proposed in this GMP are consistent with those in the Priority FMPs and Fisheries Master Plan. There are 14 actions proposed, for implementation within the next ten years. Through these actions, the aim is to realize conservation and

sustainable utilization of fisheries resources to support both local livelihoods and the wider economy (specifically the tourism sector), while concurrently promoting fish stock and environmental recovery. Three principles will guide MBCA management in implementing this programme and in achieving its purpose.

Guiding principles

While implementing the Fisheries Resource Management Programme, the MBCA management, with participation of stakeholders, will endeavour to ensure that:

- **Restore viable fish stocks and healthy habitats, protect and maintain them**

Only through restoring then maintaining the integrity of marine habitats while at the same time controlling fishing pressure can the balance between conservation and sustainable utilization of fisheries resources be achieved. In achieving this, the over-riding goal of the MBCA will be met, being "to restore and conserve the diversity, abundance and ecological integrity of all physical and biological resources in the MBCA". This requires protecting all the resources, particular the resource base – mangroves, corals, seagrasses, water column. Because of the way components in the marine environment are inextricably linked, through a complex web of direct and indirect relationships and interactions, management of all coastal and marine habitats is vital. Visible manifestation of this interlinkage are predator-prey relationships, with a notable local example being the mass outbreaks of sea urchins in the absence of trigger fish and other inshore fish that feed on them, while less obvious ones are nutrient exchange and species migration. Local tourist boat operator's main concerns were including destructive fisheries, especially the *mtando* technique that continues in the area. There is good sense of readiness to participate in conservation especially for measures against destructive fishery.

- **Fisheries ecological components in MBCA are conserved and monitored**

Under various international agreements, the RGZ has obligations to protect and manage a number of biological features (e.g. threatened species and critical habitats). Thus, to ensure biodiversity conservation and productivity are maintained, and conservation targets met, it is necessary to monitor the status of keystone species (e.g. their distribution and abundance).

MTo determine the impact of fishing on stock (or populations), on yields and thus on livelihoods of local communities, as well as on other species and biodiversity within the MCA it is essential that there be fisheries monitoring in and around MBCA. If new election procedures are adopted by SFCs, these groups will represent the local fishers, as well as those involved in mariculture. While the various fisheries within the MBCA may continue to provide for local needs, though data are scant, a number of local anthropogenic threats to the ecological basis of fisheries are known and include:

- Significant increase in the overall number of local fishers in the MBCA waters
- More widespread use of illegal and destructive gears e.g. ring-net, spearguns and beach seine nets inside MCAs
- Increasing fishing pressure from visiting *dago* fishers, from other parts of Zanzibar and mainland Tanzania

- **Strengthen collaboration with fisheries resource stakeholders strengthened**

A wide pool of fisheries stakeholders is involved in the management of the MBCA fishery resource from local communities to state and non-state sectors. At the local community level, stakeholders include local fishers based within MBCA and their respective SFCs, local *dago* fishers from other parts of Zanzibar, fish traders, and CBOs. Government agencies include local government or Districts authorities, and central government, represented by the MBEF (and the DFDMR and DMC within it), Zanzibar Maritime Authority (ZMA), and Zanzibar Environmental Management Authority (ZEMA). Relevant national research entities are the State University of Zanzibar (SUZA) and the IMS of University of Dar es Salaam, among others. Non-state agents presently include the following NGOs: Mwambao,

Sazani Associates, the Society for Environmental Research and Conservation Zanzibar, WWF, WildAid, Wildlife Conservation Society (WCS), The Nature Conservancy (TNC), among others.

Many of these stakeholders have engaged in fishery monitoring, research and conservation efforts for many years. Of note however, is the absence of a coordination of efforts between these activities and outputs. The MBEF for example has been licensing fishing activities in Zanzibar, including to fishers inside the MBCA without necessarily consulting the MBCA which manages the overall fishing activities under its jurisdiction. Similarly, District officers have been accepting and managing migrant *dago* fishers (e.g. ring-netters, drifting gillnetters) to fish in and around MBCA without seeking input and approval from local fishers. Such un-coordinated decision-making process has led over many years to multiple tensions among fishers (for example, of those in support versus those against ring-net fishers), and between environmentalists, tourist operators and the MBCA authorities.

Promoting and enhancing wider stakeholder collaboration geared towards ensuring that the activities of the different institutions and organizations are coordinated and integrated towards achieving the Fisheries Resource Management Programme's purpose. Only then can there be achievement within TUMCA waters of both conservation and sustainable fisheries. To facilitate collaboration, effective and sustainable coordination mechanisms in this regard is also important.

A pre-condition to any collaboration is that all stakeholders adhere to the relevant fisheries and environmental legislation applicable to fishery management. One of the main roles of the MBCA management authorities is in enforcing legislation. Compliance will greatly be enhanced if all stakeholders actively participate. And to achieve that, there is a need for a common strategy and focus among all stakeholders to ensure that the utilization of the fishery resource can continue, but in ways that permit fish catches and socio-economic benefits while at the same time ensuring sustainable conservation of the resource itself.

5.2 Targeting Fisheries Development and Management Actions

As summarized in Table 7 the threats that currently impact or are likely to impact on the MBCA conservation targets and their KEAs. Over-exploitation of resources, destructive exploitation (use of destructive gears and methods), removal of keystone species (such as trigger fish), boat anchoring, overfishing predatory fish that feed on urchins and entanglement of turtles, dolphins and whales in fishing gears. These are identified as threats associated with the artisanal fisheries sector. Mindful of the over-riding fisheries development objectives of diversifying fisheries, developing the sector in a sustainable fashion, and increasing landings, the priority threats are addressed in the management actions proposed below.

5.3 Management Objectives and Actions

When implementing the Fisheries Resource Management Programme, the MBCA management, with participation of development and conservation partners and stakeholders, will endeavour to ensure the above guiding principles are followed. These three principles are intended to guide the implementation of the Programme's five MOs:

MO 1. Enforcement and surveillance of fishing activities strengthened

MO 2. Improved research on fishery management

MO 3. Effective stakeholder participation in fishery management

MO 4. Fishing pressure within MCAs at sustainable levels

MO 5. Impacts on emerging issues in fisheries resources assessed and addressed

The sections that follow describe these five MOs with a brief description of the relevant management issues and opportunities, and the specific context and justification for the proposed actions.

Objective 1: Enforcement and surveillance of fishing activities strengthened

For several decades, and for many reasons, there has been inadequate enforcement of fisheries laws in Zanzibar, including in and around MCAs. There is misalignment between licencing, enforcement and conservation of the fisheries resources, which needs to be resolved. The Fisheries Act, 2010 and the MCU Regulations 2014 of Zanzibar are the key legal instrument used by the now DMC to manage MCAs including their fishery resource. The licensing of fishing activities and enforcement of fishing regulations in Zanzibar is the responsibility of the DFDMR thereby performing fisheries management whilst promoting marine resource conservation lies with the DMC. Yet both are part of the same institution. This arrangement is increasingly perceived to lead to conflict of interest in that sustainable fisheries management needs to recognise the need for marine resource conservation.

In addition, SFCs which mainly consist of local fishers, are well placed to be watchmen, providing the 'eyes on the ocean', yet these entities have not been empowered to deal with fisheries issues within their fishing areas. The role of the fisher community, most probably through the SFCs, to co-manage marine areas within the MCAs needs to be addressed. It is not possible to include co-management zoning within the GMPs at this stage, but it is important to begin to develop a vision and outline strategy as to how co-management area zoning can/should be developed over the period of the GMP (ie. 5-10 years). Comanagement zoning of MCAs is something which is being included in the on-going revision of the MCU Regulations in the near future, to give co-management areas within MCAs a foothold in legislation/governance framework. Future revisions of the GMPs will certainly be looking to formally include co-management related to zoning of the MCAs. The concept needs to be explicitly focused on local management of shared fishing grounds, and there might be local institutional arrangements (ie. co-ordination between SFCs) to consider.

The absence of any form of on-site enforcement of fisheries regulations has contributed to an increase of illegal fishing practices in all MCAs of Zanzibar. This objective seeks to enhance collaboration between state and non-state actors, to reduce conflicting mandates, establish coordination, and pool resources and efforts to facilitate and improve effective enforcement of fisheries legal provisions.

Action 1.1: Enhance capacity to facilitate effective law enforcement and increase awareness

When faced with infringement of fisheries regulations, the absence of response and action from enforcement entities associated with the MBCA, or of agents failing to perform their duties and demonstrating favouritism or other unethical practices, illegal fishing practices in MCAs have continued unabated. The situation is worsened by the scarcity of appropriate patrol boats and trained personnel, and availability of fuel and serviceable engines. In order to counter this, adequate resources will need to be provided to facilitate fishery monitoring, control and surveillance (MCS) which includes among other approaches, to ensure adequate surveillance, at times with joint patrols (involving all relevant stakeholders), supported by appropriate land-based surveillance and communication. Training, acquisition of equipment, development of increased awareness of regulations, offences and their punishments, monitoring, licencing, vessel registration, prosecution, sanctions and other features are described fully in **Chapter 8 MCS Strategy**.

One of the main goals of this action is the elimination of unsustainable fishing practices, which includes working with the authorities to ensure that illegal fishing gears and species that are illegal to catch and trade are not sold locally. It is vitally important that the fisheries restrictions that are currently laid down and supported by the MBCA GMP are enforced within the whole area, notwithstanding any specific management prescriptions targeting No Take Zones. This action also should be clearly identified and shared with stakeholders to coordinate possible future projects and ideally involve communities in monitoring.

Action 1.2: Review existing and development of more effective MCA regulations

The existing fisheries and environmental legal mandates need updating and alignment to better promote conservation and sustainable utilization of fisheries resources of Zanzibar. Various entities have commented on the inadequacies of the existing framework laws e.g. ZATI (2005), and especially EcoAfrica's legislative review commissioned by the MANRLF, McLean et al (2012) that identified 13 key needs to strengthen the policy, legal and regulatory framework for marine conservation in Zanzibar. Important elements that need to be addressed include the need for improved transparency, multilateral dialogue between ministries and departments (notably entities managing environment, fisheries, forestry, and tourism), participatory involvement by non-state actors, and establishment of oversight bodies to promote intersectoral coordination and accountability. Alignment between government sectors is almost non-existent and has no legal basis that transcends existing Acts (Fisheries Act No.7 of 2010, Forestry Resources Management and Conservation Act No. 10 of 1996, and Environmental Management Act No 3 of 2015). While attempts have been made to work together under the Integrated Coastal Zone Management (ICZM) Committees, Inadequate of resources, lowered conservation and protection interests and other divergent priorities from the sectors have not fully exploited the utilization of the ICZM Committee. Significant improvement to this situation can be achieved through a professional revision of the MCU Regulations and applicable legislation to resolve inconsistencies in the interest of improved and sustainable marine and coastal resource management. This proposed action applies to all MCAs on Zanzibar and is aligned with the **MCS Strategy** (Chapter 8).

To support the implementation of this action, training on regulations should be organized for MCA Managers, including review of ICZM provisions and to ensure it is aligned to make fisheries management better integrated.

Action 1.3: Create awareness on fisheries resource management issues to the judiciary

On Zanzibar, arrests of fishers engaged in illegal practices rarely lead to eventual conviction of perpetrators, and usually, very low penalties are accorded even when convictions are issued, thus failing to serve as effective deterrents to discourage repeat offences. There is need to create awareness and transparency among the judiciary for it to better understand the magnitude of the impacts that illegal activities have within protected areas. Without the support of the judiciary, deterring over-exploitation of fishery resource and/or related crimes will always be a challenge.

The weak knowledge among court prosecutors who draft charges and the magistrates who convict offenders needs to be addressed and strengthened. The DMC management will endeavour to increase awareness and sensitize the police and the judiciary officials on the consequences and implications of unsustainable fishing on both fish stock and conservation and the resulting socio-economic setting, leading to eventual loss of earnings to the RGZ. Exposure trips, field tours or exchange programmes will be organised to deliver the training. The activities that address this action and related needs are one of the focus areas of **Chapter 8 MCS Strategy**.

Action 1.4: Empower SFCs to execute their mandate

At present, the operation of the SFCs have not met the standards envisaged, as defined on the MCU Regulations, consequently they are not delivering the performance and resulting benefits. Factors responsible for this situation include Inadequate of appropriate training and capacity building on the roles of SFCs in fisheries management, as well as internal conflicts and incompatible agendas. The provision of skills and support to SFC members is a much-needed step towards improving this critical component of the fishing fraternity, leading to improved management of fisheries resources in the MCAs - one of their main goals. This section is critical to a co-management approach and is very

high priority. The new Fisheries Bill is expected to address many of these issues an enhance fisheries involvement in marine resource management.

Since 2019, the old MANRLF (now MBEF) has been offering relevant training to SFC leaders at selected SFCs within the MBCA, notably training on SFC roles and responsibilities, governance and fisheries management (including enforcement of regulations), training that would be beneficial if it extended to all the relevant SFCs inside and beyond MCA boundaries (e.g. Kukuu in South Pemba, a very proactive community adjacent to PECCA boundary at Kangani).

Protocols and strategies should be developed to be shared with the fisheries and research partners involved in the MBCA to ensure common approaches. There needs to be support of enforcement authorities to community-led patrols (follow-up arrests but also engage in joint patrols), including reactive community networks (e.g. regular and participatory FEC meetings, maybe also at district level "DEC" to address neighbouring SFCs conflicts and management questions). MCA Mangers should engage with NGOs that have developed community-based resource management initiatives and strategize the approach so that all SFCs covered.

Finally, SFCs should also be assisted in having stronger legally binding arrangements, formalised, signed and gazetted by-laws, that provide them with greater influence and authority, especially over non-compliant fishers operating within their areas of jurisdiction. This change could be brought about through the review of MCU Regulations (see Action 1.2, above). The process for approval of by-laws needs to be prioritised and streamlined. Proposed activities to address that, as well as MCS-specific training, SOPs, sustainable financing and co-management agreements are one of the focus areas of **MCS Strategy** (Chapter 8), notably under Objectives 2 and 4 and the proposed actions therein.

Action 1.5: Manage access of migrant fishers to MBCA's fishery

There are migrant fishers, mainly from Pemba and mainland Tanzania, who fish in the MBCA. The MBCA management needs to be aware of the potential threat, because migrant fishers may not be aware of the MBCA rules and conditions or may object to their gears being excluded from use in the MBCA and choose to use destructive fishing gears. Experience from elsewhere suggests these fishers are more experienced in fishing, and some of their boats are owned by influential businesspeople, hence most of the time they are 'permitted' to fish in Zanzibar's waters, including those of the MBCA. Since many of these fishers use more efficient gears, such as ring-nets, they can land more fish than the local fishers, sometimes creating tension and conflict at the local scale.

There is need to review the existing migrant fisher permission procedure to give MCA and local management (SFCs) a say in the process. To ensure that conflicts between local and non-resident fishers is minimised, MBCA management will be quided by the DFDMR and District authorities to ensure that there is vigilance and transparency in the permitting system. This will also include monitoring whether both local and non-resident fishers have paid the requisite fishing licensing fees and enforcement of the law regarding illegal fishing methods and MBCA regulations with respect to gears and zonation.

The fishing effort of visiting fishers will be subjected to annual review to determine whether it is impinging on the carry capacity for each fishery, based on outputs from Action 2.2 on focused fishery research. The camp sites will also be periodically visited with the intention to ensure hygiene and environmental conditions are maintained and other wildlife or forestry or biodiversity features are not harmed.

A separate action, under the MCS Strategy, plans for a centralized fishing licensing system with identification of the numbers for canoes, *ungalawa* and other boats and an associated surveillance system. SFCs should have an incentive to participate and be first port of call for itinerant fishers arriving. Maybe include provisions to deal with itinerant fishers in SFC SOPs (if not already there). The carrying capacity of the *dago* needs to be established and translated into permitting agreements and education of migrant fishers as to the details of local by-laws and MBCA regulation is needed. 'Dago' surveys need to be carried out and the involvement of SFCs would be appropriate to gather this information.

For monitoring of fishing effort of migrant fishers, see **MCS Strategy** Objective 10.

Objective 2: Research for fishery management improved

Fisheries monitoring and research, on biological and socio-economic issues, is essential for effective MCA management, including fishery resources. Data on the natural environment are also vital to understand ecosystem function and change, especially how it responds to management interventions, such as those proposed in this GMP. For similar reasons, socioeconomic data is needed to identifying changes in local livelihoods and well-being.

The old MANRLF (now MBEF) has performed the essential fisheries monitoring functions for many years, usually summarised in fisheries frame surveys (FFSs). Typically, the data that are routinely collected every ten years or so includes location of fishing operations (based on landing sites) and fishing effort (based on number and type of boats, of gear types and fishers). Some catch data are also collected at selected landing sites and dates. The DFDMR also maintains a dedicated database on fisheries statistics, the status of which is not known.

As described under the Guiding Principles, despite the many years of fishery monitoring and research, there has been inadequate dissemination of research information to MCA managers and planners; hence science-driven management has been minimal. Currently, data and information generated from DFDMR is not easily available for use by MCA managers.

This objective aims to streamline dissemination of monitoring and research findings and/or outputs among relevant stakeholders and research partners. It also aims to develop and operationalize the fisheries research database, establish information exchange and advocate for a focus on priority research in each MCA including exploration of the impacts of new fishing gears on fish stocks and the environment. Implementation of the FMPs for the priority fisheries are also a mechanism for streamlining monitoring and research findings. These interventions are elaborated under the following three proposed actions.

Action 2.1: Improve fisheries information sharing within MCAs and stakeholders

Existing fisheries information and data that is relevant to Zanzibar's MCAs, including the MBCA, may at times be available but not always be accessible to MCA managers. These data are needed for input to management approaches that they might present to the FMCAC or SMC, for example. Such data is most likely in one of the sections of the DFDMR, thus what is needed is a more efficient means of sharing information that is de-centralised to the various MCAs. In addition, some information relevant to specific MCAs might become linked to individual staff hence in the event of a staff transfers or loss, information is also lost.

An accessible research database that includes past and on-going research outputs will be established, for access to DMC staff including MCA managers. As a first step, an annotated bibliography of all fisheries-related research conducted in Zanzibar will be prepared, with efforts made to solicit research outputs (reports, publications, documents and data) that are currently not readily available.

Of benefit to all MCAs and respective managers will be the establishment of an annual forum where MCA managers gather and share information regarding their respective MCAs. Quarterly fora for MCA managers and selected staff, as well as the SMC and participation of SFC members, might be appropriate over time, thereby providing an opportunity to share issues for discussion and discuss appropriate management interventions.

The website for MBCA and/or other MCAs (described in Action 3.2 in the Tourism Development and Management Programme) should include relevant information and data to be shared with partners and stakeholders, with access restricted. Events and workshops could be advertised on the website and associated newsletters. It is critical to have a to have a more reactive and dynamic management momentum. Communities, NGOs, even private sector, should be able to input to the site.

Action 2.2: Prioritize MBCA research focused on addressing pertinent fisheries issues

Most fisheries issues are generally of a similar nature throughout Zanzibar, though areaspecific issues do exist. Research that allows more detailed understanding of the fishery in the MBCA will be guided to focus on the following key areas:

- Catch (weight) and catch composition: for species and/or higher taxa harvested.
- Fish lengths: important for standard specific fisheries stock assessments.
- Fishing effort: including type, duration, and location of fishing operations.
- Costs and revenues: these cover fish prices, fuel, gear costs and wages.
- Effort survey: number of fishers, fishing gears and vessels operating.
- Fishing grounds: mapping of the physical and seasonal distribution of fisheries.
- Contribution to livelihoods: determining fisheries contributions to food security and poverty alleviation, through analysis of fish catches, marketing, and distribution of catch and the number using the MCA resources regularly.
- Collaborating with SFCs: working with SFC members in research data collection will develop trust and transparency and facilitate adoption and implementation decisions based on the joint findings.
- Monitoring indicator and keystone species: understanding changes to populations and other features of indicator and keystone fish species of economic and biological importance in the MBCA (e.g. triggerfish) is important to understand consequences of management interventions.
- Keystone species should include elasmobranchs: monitoring these fisheries has been an eye-opener in terms of the threatened species caught. Include seagrass fishes. Monitoring of alternative livelihoods.
- Emerging gear analysis: working with fishers to understand and research the impacts and possible need for management interventions with respect to new or emerging fishing gears versus customary and legal ones is needed to reduce the evolution of new and more destructive fishing methods.
- Consideration of alternative gears: alternative gear or techniques should be researched and where appropriate encouraged. Examples could include use of Fish Aggregation Devices (FADs) at offshore sites, gear exchanges, and brushwood enclosures or artificial modules ('casitas') designed for lobsters.
- Mwambao-MCCC is currently researching gear modifications in PECCA with regard to traps (*dema*) and line fishing. This is local level research and could be repeated for other gears, and other MCAs. Mwambao-MCCC has also trained an in-water biodiversity monitoring team using the CORDIO methodology. This team carried out annual survey in selected sites but can be used to monitor other areas of interest. This

  is an example of more sustainable way of detecting changes both in habitats and fish populations.
- Development and adoption and monitoring of alternative livelihoods. Studies on alternative livelihoods and improved value chains should be conducted on specific fisheries.

Over the long term, periodic assessments of fisheries research will ensure it contributes to MCA man-

agement effectiveness with minimum duplication of efforts, and that new data and information builds on the results of previous work. Implementation of the FMPs for the priority fisheries are reviewed and produced on an annual basis. As such these serve as the mechanism for periodic assessments.

A catch data collection system should be developed a deployed and management measures should be considered given the results of these studies and the ecological surveys of the area. Several open-source data collection solutions exist that can be used to help facilitate collection, analysis and reporting. Protocols to map fishing grounds have been developed by WCS and others and some of this work has been started in target communities in Zone 3 of PECCA. The MCA Manager should work with the fisheries scientists and research partners to avoid duplication of efforts and ensure that efforts are guided to maximize credibility and scientific rigour.

This approach will contribute to decision-making, planning and management processes. For MCA Managers to understand the implications and limitations of research results, regular discussions and feedback sessions with fisheries scientists and research partners will be organised. Of note is that the MCS Strategy (Chapter 8) includes proposals for specific training programs for SFCs, MCA staff, District based Fisheries Officers and beach recorders (*bwana diko)* with additional actions on review of the catch data collection system.

Action 2.3: Conduct studies on fishing vessels, gear use, and their catch levels

Fishing vessels, gear type and technology used by fishers are regulated and licensed by the DFMRD. With limited enforcement of regulations on use of inappropriate and illegal gears, due to financial constraints, Inadequate of awareness and vested interests, fishers are at liberty to use fishing methods such as beach seines, ring-nets and spear guns that are not appropriate and potentially destructive. Unfortunately, these methods are being adopted by local fishers in the MBCA. The level of damage caused by both illegal and legal fishing gears has not been measured. Studies on catch trends, benthic substrates and fishing patterns have been conducted by WCS in Zone 3 to support zoning and management of community fisheries and lessons learnt could be applied to other MCAs. Participatory mapping of fishing grounds and fishing calendar is highly recommended.

A study involving local fishers will thus be conducted to generate information on gear use and impacts of individual gears to understand the level of damage caused by each, to inform management decisions, and be used to work with local fishers as information to improve their awareness of fishing impacts. The principal elements of the catch and gear monitoring programme are incorporate in the Management Information System (MIS).

Objective 3: Effective community participation in fishery management

The successful management of Zanzibar's MCAs depends on the active participation of stakeholders, particularly fishers. Most of the challenges related to fisheries in the MBCA require concerted efforts and a close working relationship between fishers and marine conservation entities (including CBOs, NGOs) and government entities (e.g. DMC). The present situation is one with virtually no coordination among these stakeholders, except for a few examples of private sector entities or NGOs working with SFCs to effectively manage small areas.

The MBEF has prioritised collaboration with fishers in fisheries management. Of highest priority in the present and on the wider scale, it is important that working relations between stakeholders are strengthened and coordinated to generate synergy and strengthen unity of purpose. One of the proposed actions to meet this objective is to re-revitalise the MCA oversight committees, the other to be an active participant at District authority meetings. Increasing participation of the fishers themselves in fisheries management is the focus of

Objective 4 (see Action 4.1 below). Further support for resource users is described in Chapter 7 Community Support Programme, with support for mariculture described in Chapter 6 Mariculture Development Programme.

Action 3.1: Establish vibrant and effective MCA committees

This action is relevant to all MCAs on Zanzibar, and includes operationalization of the SMC and the MCTAG which embraces representatives of most of the relevant stakeholders as well as the FMCAC (as outlined in Section 1.6). Such recommendations mirror those proposed in the legislative review by McLean et al (2012), as described in the background to Action 1.2, above. The above committee, group and council have yet to be recognized and thus have never met to fulfil their obligations. This must be rectified as soon as possible, so that all relevant entities are able to formally contribute to decisions regarding the management of the MCAs of Zanzibar. As a first step, the new mandates, prescribed members, roles and functions of the above committee, group and council will need to aligned with the requirements of the actions proposed in the GMP. The goal being to produce a transparent, effective and participatory management framework that embraces all stakeholders. Through successful implementation of this action, there will be improved oversight and participation in the management of all MCAs on Zanzibar.

The MCA Manager should consider including reactive community networks e.g. regular and participatory FEC meetings, maybe also at district level to address neighbouring SFCs conflicts and management questions, and/or District level MBCA sub-committees for resolving local issues and management decisions. This will be more cost and time effective. Stakeholders should be able to contribute to define the agenda of committee meetings. All such meetings included FEC meetings need to be minuted and FEC members need to be actively responsible for disseminating decisions made.

Action 3.2: Participate in District administrative meetings

The active participation of MBCA management in District administrative meetings is needed to increase its visibility, generate awareness of marine resource management issues and provide opportunity for the MBCA to lobby for support from appropriate government agencies, and, where relevant to argue for support with fishery related interests.

One advantage of the MBCA becoming a more visible and formal participant in District matters, with a recognised role/function, including when conflicts arise, for example, over access to landing sites and beach access routes. Successful outcomes of such engagement will strengthen relations between the fisher community and MCA management. Other aspects likely to be influenced to the advantage of MBCA include control of visiting fishers, whose permits to reside inside MCAs are obtained from the District authorities.

There previously were District Fishery Committees and perhaps it is worth investigating whether it is possible (appropriate) to have District level MBCA committees (as described for Action 3.1, above), which might allow for more targeted actions on fisheries issues.

Objective 4: Fishing pressure within MCAs at sustainable levels

The continued fall in productivity of nearshore fishing grounds around Zanzibar, including withing the five MCAs, necessitates the development of alternative sources of livelihood, known also as alternative income generating activities (IGAs). Over recent years, the tourism sector has provided much needed employment opportunities, but for many reasons, it cannot accommodate all school-leavers and inevitably, fishing remains a major option for young men, especially in Pemba where tourism development is very low. This is the main point of intervention for alternative livelihoods and as such it will require a longerterm approach, aimed at slowing growth of fisheries sector,

It is always a challenge to define, and get fishers to adopt, alternative livelihood opportunities in the context of rural, tropical landscapes such as that of Zanzibar, with general low levels of education, few manufacturing industries, little area to increase agricultural activities and growing populations. Despite the small range of obvious options, alternative livelihoods for the fishers need to be explored. This objective explores two areas of interest: establishment of community managed fishery areas (CFMAs), and support for fishers to access devolved funds for other livelihoods, both of which are described further below. Mariculture options such as seaweed farming, fish farming and ranching of sea cucumbers are elaborate on in Chapter 6 Mariculture Development Programme. Ideally, such alter-

native IGAs encourage participation of existing fishers from the fishery, but in practice they may also intercept those that would go into the fishery or have nothing to do with the fishery. Outputs from the focused research described above in Action 2.2 of this chapter may, in time, deliver additional opportunities to consider, such as for example, trial of lobster 'casitas' and brushwood parks in creeks.

Action 4.1: Support the establishment of empowered community managed fishery areas

In support for the objective of devolving management of fisheries resources to local communities, including and beyond simply supporting SFCs, the MBCA management will support establishment of collaborative management groups (CMGs) to manage specific areas. By supporting SFCs to govern more of the fishing grounds, the MBCA authorities are also instilling trust and ownership on the local fisher community, and the reduce costs associated with patrols. The MCS Strategy elaborate further on specifics such as by-laws, assigning resources to SFCs and formalising agreements.

For over five years, CMGs have been developed in many of the existing MCAs on Zanzibar, usually with technical and some financial support from NGOs or the private sector, for example hotels. From the experience to date, numerous challenges persists, including, but not limited to limited enforcement and institutional capacity, a general Inadequate of awareness of fishing licenses, encroachment into season closures and use of illegal gear (SCUBA, seines and spearfishing), limited in area size and Inadequate of clear demarcation.

As described above (under Action 1.4 in this chapter), the need to empower SFCs to be able to enforce fisheries regulations is an essential requirement to effective CMGs. As described earlier, the means to achieve that is by having formally agreed by-laws. A model that has developed for effective CMGs includes each SFC having a resource management plan for the fishing grounds under its responsibility, with the management (and zonation) of these areas subject to the details in the gazetted by-laws (this includes areas that are not 'closed' but are subject to gear restrictions for example, as proposed for the MBCA, in Section 2.5). Experience has shown that all closures, whether temporary or permanent, require by-laws and that areas will change over time and with experience of the local SFC. Examples include temporary closures for octopus and other species, as well as no-take zones where all extractive activities are banned.

Additionally, through CMG agreements, for example with tourist companies, local communities derive associated benefits, namely tourism related income, but also other forms of assistance such as for community projects. The SFC standard operating procedures (SOPs) currently being developed, have mechanisms by which this can be operationalised in CFMAs. Such arrangements when successful, may persuade community members that conservation of small portions of traditional fishing grounds can be a source of tourism-based livelihood more profitable in the long-run than traditional methods of fishing. Further, the build-up of fish stocks in small, closed areas, will serve to re-populate other fishing grounds that continue to be fished. Operations and procedures are described fully in the MCS Strategy. Final boundaries need to be agreed but should not depend on the fishery or the users (as fishers travel considerably from one area to another) but rather on local area of jurisdiction (responsibility) based on proximity. Visiting fishers will have to abide by local by-laws.

In the above scenarios, there is a clear role for the private sector and NGOs to play in contributing to the overall goals of the MCAs, working in partnerships with local communities inside the MCAs.

For monitoring of fishing effort of migrant fishers, see **Chapter 8 MCS Strategy**.

Action 4.2: Establishment of sustainable credit schemes

To contribute to empowering the fisher community to improve their livelihoods, the establishment of credit schemes is one strategy that has been successfully tried in other parts of the world. Lessons also exist from the Kwanini Foundation and from Mwambao MCCC on eco-compliance loans (MKUBA) for communities in the PECCA, which would be relevant to MBCA. This is an appropriate management-compliance based scheme. Additional livelihood options might include gear replacement schemes, through provision of appropriate fishing gears in exchange for surrendered destructive fishing gears (e.g. large-meshed gill-net or straight shanked hooks for circle hook long lines), or as-

sistance with improve fish preservation techniques (e.g. introducing the use of the Chorkor kiln for more efficient fish smoking).

The action requires identifying and contractng appropriate skilled expert(s) to lead sustainable credit scheme analysis, and to identify fisher community members/SFCs interested in participating in credit schemes trial. Development and research partners may have a role here. Once initiated with selected groups, the process will be monitored for an agreed period and evaluated for success and challenges. Learning from the feedback and experiences the scheme can be rolled-out to wider fisher community. Credit schemes should come with clear conditions and safeguards to avoid leading to additional fishing pressure (by funding new harmful fishing gears for instance). Related value chain addition should be evaluated in the context of management actions. The risk is to increase pressure on the resource by increasing profits on value chains. Value addition needs to be developed as an access restriction mitigation measure and not in isolation.

Objective 5: Impacts of emerging issues in fisheries assessed and addressed

Emerging issues can occur at village, district, national, regional and even global scales. Of relevance to MCAs, some issues directly or indirectly effect fishery resource management and general conservation initiatives. Accepting that most emerging issues are beyond the scope of MCA management, planning for such events is important since it lays the ground for coping with their implications when they actually do occur. Examples of emerging issues of a global scale include climate change impacts on seawater conditions and resulting impact on fishery resources management, and the Covid-19 pandemic that resulted in a significant drop on tourism activity and associated employment, income and markets.

On national and district levels, under new legislation (Local Government Authority Act, 2014 and Regional Administration Act, 2014), natural resources are to be managed by Districts, including resources and activities within existing MCAs. This change in governance is likely to necessitate a change in strategy to address fisheries and other resources in the MCAs. This an example of an emerging issue, as is new coastal infrastructure development, whether in the form of large tourism projects, luxury housing and marina construction, port expansion or oil and gas exploration.

The on-going oil and gas exploration that has recently started with seismic surveys through inshore waters and plans for the expansion of Zanzibar Port are developments that might affect coastal waters and impinge on the integrity of MCAs including by affecting local stakeholder and resource users. At present, the detailed implications for these activities on fish stocks and sensitive marine habitats within the MCAs is not yet known.

To address these concerns, one proposed action is described to guide the MCA Manager to become aware of future emerging issues and thus be in a position to define possible impacts of these (and other) emerging issues, and report to the SMC (and MCTAG) to develop appropriate responses.

Action 5.1: Participate in elaboration and review of local district development plans, including private sector and government initiatives

It is vital that management of all MCAs be aware of, be represented and formally participate in all potential development plans that may affect the areas under their jurisdiction. Only through prior knowledge of such plans will managers be in a position to consider impacts on the fisheries resources and environmental sensitivities. Establishing and presenting development plans for coastal communities is the type of work that should ideally be based on a marine spatial plan (MSP) which that should identify critical habitats and threats to ecosystems. Support to develop this type of action is typically provided by NGOs that re development partners.

At District levels, through participating in elaboration and reviews of development plans, MCA managers are better placed to influence formulation of by-laws on utilization of fishery resource in districts that are important for MCAs. Participation in such fora can also be used to raise concerns against specific resolutions that may jeopardize conservation initiatives, for example permits to visiting fishers during certain seasons in conflict with conservation goals for selected species, or politicisation of

conservation initiatives related to fishing.

Finally, proposed activities include participating in all ESIAs and Audits (EAs) related to private sector, oil and gas or government development projects in or close to MCAs. This will require frequent collaboration with ZEMA, to be updated on up-coming ESIAs, and to participate as part of the general public during scoping stages, in other public feedback phases of the ESIA process, and in monitoring during project implementation. The MBCA representative should be able to present accurate and current baseline data for any proposed project impact areas, particularly on biological, socio-economic status, ecosystem functioning and bio-physical aspects. By having such data at hand will contribute to defining potential consequences from project implementation and form the basis for decision making on project impacts.

Action 5.2: Development of guidelines and management systems and responses for addressing emerging issues

Initiate a fora or meeting mechanism for MBCA Manager and staff to engage with community representatives, scientific advisory bodies and NGO partners to discuss emerging issues. Initiate a fora or meeting mechanism for MCA technical and scientific advisory bodies to discuss emerging issues identified at the MBCA level and from other MCAs. Develop guidelines, management systems and responses to priority emerging issues and implement at MBCA level.

Monitoring Framework

The monitoring framework presented in the Table 12 was designed to provide guidance for the assessment of the potential impacts resulting from implementation of the Fisheries Resource Management Programme highlighting the potential positive as well as negative impacts. The framework also includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information needed. Monitoring the impacts of the plan implementation will ensure that timely changes to management approach are made when the situation demands.

Table 12. Fisheries Resource Management Programme Monitoring Plan (modified from KWS, 2015).

Objective	Potential Impacts (positive and negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Enforcement and surveillance of fishing activities strengthened	State and non-state actors collaborate to facilitate effective enforcement of legal fisheries provisions	No. and nature of management and enforcement collaborations	MBCA management and enforcement records
	Reduced illegal natural resource use in the MBCA	No. of illegal natural resource use incidents in the MBCA	MBCA enforcement records
	Sustainable utilisation of fisheries resources	Adherence to zoning scheme and permitted fishing methods	Fisheries utilisation records and MBCA enforcement record
	Increased un-employment, reduced catches (short-term), political interference.	No. of fishers actively fishing and village population data	MBCA enforcement records and village data
Objective 2: Improved research on fishery management	Marine research wellcoordinated and findings disseminated to stakeholders to support decision making	No. of research dissemination meetings held; Use of research in identifying and implementing mitigation measures	MBCA management and research reports
	Increased community awareness of and importance of the MBCA and willingness to adhere to regulations	No. of local community members arrested for illegal activities in MBCA; Use of incidence of illegal fishing as a proxy for importance of MBCA	MBCA enforcement Records
Objective 3: Effective community participation in fishery management	Working relations between stakeholders strengthened and coordinated to generate synergy and strengthen unity of purpose	Number of functional collaborative agreements between MBCA stakeholders	MBCA records
	Increased value and importance of the MBCA to surrounding communities	Income from diverse activities linked to conservation of MBCA	MBCA records
Objective 4: Fishing pressure within MCAs at sustainable levels	Communities have alternative sources of livelihood that reduce pressure on fisheries	No. of non-fishing IGAs initiated and successful; No. of fishers (potential or former) as participants in IGAs	MBCA records

Objective 5: Impacts on emerging issues in fisheries assessed and addressed	Negative environmental impacts of marine activities understood and mitigated	No. of ESIAs and audits; Mitigation actions included in appropriate plans and implemented	ESIAs and Audit reports

5.4 Implementation Schedule

The following pages set out the proposed first six-years of the ten-year implementation schedule for the MBCA GMP (see Table 13). The activity plan details the activities, responsibilities, timeframe and milestones necessary for the delivery of each management action, starting in 2022, which need to be finalized by the MCA Manager and SMC.

Table 13. Fisheries Resource Management Programme Implementation Schedule (first six years).

Management Action and Activities	Persons responsible	T				
		2022		2023		20
		1	2	3	4	1
Objective 1: Enforcement and surveillance of fishing activities strengthened						
Action 1.1: Enhance capacity to facilitate effective law enforcement and increase awareness						
[see MCS Strategy]						
Action 1.2: Review existing and development of more effective MCA regulations [to align with MCS Strategy]						
1.2.1 Constitute a task force (or consultant) to audit existing legislation and regulations and their efficacy	TBC					
1.2.2 Organize stakeholder workshop to revise MCA regulations in support of fishery resource						
1.2.3 Prepare workshop proceeding and submit to MBEF for adoption and gazettement of suggested regulations and changes to legislation						
Action 1.3: Create awareness on fisheries resource management issues to the judiciary						
[see MCS Strategy]						
Action 1.4: Empower SFCs to execute their mandate						
[see MCS Strategy]						
Action 1.5: Manage access of migrant fishers to MBCA's fishery [to align with MCS Strategy]						
1.5.1 Formalize visiting fisher priorities and procedures with District authorities	TBC					
1.5.2 Ensure visiting fishers are aware of fishing regulation and restriction applicable in the MCA						
1.5.3 Provide and maintain hygiene and sanitation facilities at camp sites						
1.5.4 Periodically inspect camp sites to verify hygiene, sanitation and environmental standards						
Objective 2: Research for fishery management improved						
Action 2.1: Improve fisheries information sharing within MCAs and stakeholders						
2.1.1 Develop and populate information sharing infrastructure for simple access by MCA staff	TBC					
2.1.2 Organize annual fisheries information sharing meetings with staff/stakeholders						
2.1.3 Update strategy of information sharing as dictated by prevailing conditions/circumstances						
2.1.4 Support MCA staff participation in conferences (national/regional/international) to enhance information gathering and learning from experiences in other MPAs						

Action 2.2: Prioritize MBCA research focused on addressing pertinent fisheries issues														Research on fisheries is conducted by .....
2.2.1 Profile fisheries issues of concern for MBCA	TBC													
2.2.2 Seek funding to actualize research for identified research priorities														

Management Action and Activities	**Persons responsible**	**Timeframe**												**Proposed milestones**
		2022		**2023**		**2024**		**2025**		**2026**		**2027**		
		1	2	3	4	1	2	3	4	1	2	3	4	
2.2.3 Liaise with local and/or other relevant research entities for targeted fisheries research														
2.2.4 Organize a forum/workshop to facilitate research feedback to all MCA staff and other parties														
2.2.5 Organize a meeting with stakeholders to assess the impacts of emerging gears versus customary ones														
2.2.6 Implement research recommendations and evaluate their validity from subsequent results after some specified period e.g. one year.														
2.2.7 Conduct annual meeting between MCA staff, fishers, District official and fisheries researcher to review findings and agree on future interventions														
Action 2.3: Conduct studies on fishing vessels, gear use, and their catch levels [see Management Information System (MIS)]														
2.3.1 Conduct a study to generate information on gear use and impacts of individual gears, to understand the level of damage caused, involving local fishers	TBC													Study on gear use and damage conducted by .....
2.3.2 Assess the gears used and catches realized														
2.3.3 Use findings to generate awareness among MBCA fishers of impacts of gears on the environment														
Objective 3: Effective community participation in fishery management														
Action 3.1: Establish vibrant and effective MCA committees														DMC and MBCA oversight committed functional by .....
3.1.1 Review members of MTCAG and SMC and contact representatives of each category	TBC													
3.1.2 Organize an MCA-wide meeting to publicize the need for management committees to become active														
3.1.3 Agree schedule for first meeting of the Technical and MBCA MTCAG and SMC														
3.1.4 Develop a coordination mechanism for future meetings and reporting														
Action 3.2: Participate in District administrative meetings														MBCA staff attending District meetings by .....
3.2.1 Introduce MBCA staff to relevant districts and participate in District level meetings	TBC													
3.2.2 Organize a meeting for District officials to sensitize them on role played by fishery and other aquatic resource in supporting livelihoods, conservation and tourism														
3.2.3 Submit fishery and other fauna related reports to District administration on regular basis and seek feedback where appropriate														
Objective 4: Fishing pressure within MCAs at sustainable levels														

Action 4.1: Support establishment of empowered community managed fishery areas															Meetings held with SFCs on CMFAs by ……
4.1.1 Consult with and visit existing CMFAs to learn of their strengths, weaknesses, opportunities and threats	TBC														
4.1.2 Carry out an outreach program to encourage fishers to embrace CMFAs in and outside MCAs															
4.1.3 Provide technical support to SFCs intending to embrace CMFAs and seek funding and support															
Management Action and Activities	**Persons responsible**	**Timeframe**													**Proposed milestones**
		2022		**2023**		**2024**		**2025**		**2026**		**2027**			
		1	2	3	4	1	2	3	4	1	2	3	4		
Action 4.2: Establishment of sustainable credit schemes															MBCA fisher communities benefitting from credit schemes by ……
4.2.1 Identify and contract appropriate skilled expert(s) to lead sustainable credit scheme analysis															
4.2.2 Identify fisher community members/SFCs interested in participating in credit schemes															
4.2.3 Initiate credit scheme and monitor for agreed period and evaluate success															
4.2.4 Lear from the feedback and experiences and roll-out to wider fisher community															
Objective 5: Impacts of emerging issues in fisheries assessed and addressed															
Action 5.1: Participate in elaboration and review of local district development plans, including private sector and government initiatives															MBCA staff attending District meetings by ……
5.1.1 Actively participate in District development plan review meetings	TBC														
5.1.2 Actively participate in ESIA making process for coast development project within and around MBCA															
5.1.3 Help in enforcing the MBCA provisions by reporting non-conformities in project implementers															
Action 5.2: Development of guidelines, management systems and responses for addressing emerging issues															MBCA guidelines, management systems and responses to priority emerging issues prepared annually
5.2.1 Initiate a fora or meeting mechanism for MBCA Manager and staff to engage with community representatives and scientific advisory bodies to discuss emerging issues															
5.2.2 Initiate a fora or meeting mechanism for MCA technical and scientific advisory bodies to discuss emerging issues identified at the MBCA level and from other MCAs															
5.2.3 Develop guidelines, management systems and responses to priority emerging issues and implement at MBCA level															

6. MARICULTURE DEVELOPMENT PROGRAMME

6.1 Programme Purpose and Strategy

The purpose of the Mariculture Development Programme is to:

Empower and encourage local community to develop and benefit from sustainable forms of mariculture

As stipulated in the 2011Fisheries Policy (Draft), the goal for aquaculture is "To increase the production of seaweed, cultured finfish, crustacean and mollusc species to complement the declining production from capture fisheries." With most of the coastline on Unguja and about half of that of Pemba now included in one of the five MCAs, promoting aquaculture, or as termed here, mariculture, will inevitably be considered as alternative livelihood options. Since this activity is thematically distinct from other forms of nearshore or land-based activities, in this GMP, it has been allocated this small but important chapter.

Despite keen interest in mariculture to develop potential alternative livelihood IGAs, there is also incomplete knowledge on several aspects of each form of mariculture, from environmental impacts to socio-economic benefits and security issues. To fill these gaps, a series of investigations and interventions are needed, whether it be related to seaweed farming, fish, shellfish and bath sponge farming, or sea cucumber ranching. For example, while the seaweed sector has good potential for growth, there is a need to confirm the absence of negative impacts from the activity, such as use of mangrove poles and plastic littering, and investigate value-adding at local level to increase the value of the sector and break buyer monopoly (i.e. low prices fetched for dried unprocessed product), to understand the differences in production in Unguja compared to Pemba, whether there are changes in coastal water conditions that favour or hinder growth, and to address health complications associated tending to the seaweed lines (DHI/SAMAKI, 2014). The following two guiding principles underpin the Mariculture Development Programme.

Guiding principles

By implementing the Mariculture Development Programme, the MBCA management, with participation of stakeholders, will endeavour to ensure that:

- **Mariculture and related activities are practiced in sustainable ways with minimum negative impacts**

When general, there are no obvious threats or impacts on MCAs from mariculture activities. Most take place in intertidal zones, in sandy areas for sea cucumber and in rock shores for oysters. Tidal currents facilitate cleaning and water replacement. So far there has been no attempt any monitoring of aquaculture, though it is prudent that appropriate indicators are monitored to verify that environmental, socio-economic and security issues do not develop.

- **Mariculture is conducted in ways that contribute to local livelihood options**

Seaweed faming has contributed to local livelihoods of Zanzibar for many decades, including parts of the MBCA. One of the functions of the MBCA is to raise awareness on sustainable livelihood options. As such, management actions are designed to ensure that appropriately guided mariculture opportunities are explored and trialed by local community groups. The MBCA management, in collaboration with DFDMR mariculture experts and those from academia, will strive work with community groups so that they can exploit mariculture opportunities available in the MBCA and adjacent areas.

6.2 Targeting Mariculture Development Actions

As summarized in Table 7 the threats that currently impact or are likely to impact on the MBCA conservation targets and their KEAs include invasive species, pollution (debris), land erosion/sedimentation, and seabed ecology impact from seaweed farms. These are are identified as threats associated with mariculture. Mindful of the over-riding mariculture development objectives of diversifying marine resource, developing the sector in a sustainable fashion, and increasing production, these priority threats are addressed in the management actions proposed in the following sections.

6.3 Management Objectives and Actions

When implementing the Mariculture Development Programme, the MBCA management, with participation of development and conservation partners and stakeholders, will endeavour to ensure that the above guiding principles are followed. These two guiding principles are intended to guide the implementation of the Programme's two MOs. For each of the MOs a brief description of the relevant management issues and opportunities is given, which provide the specific context and justification for the actions.

MO 1. Seaweed farming production maintained or expanded sustainably

MO 2. Alternative mariculture options developed and implemented

The following sections present brief description of the relevant management issues and opportunities, and the specific context and justification for the proposed actions.

Objective 1: Seaweed farming production maintained or expanded sustainably

Production of seaweed from the villages surrounding the MCA has suffered in recent years from disease and profitability as only the *E. spinosum* species is currently yielding sufficient growth. Various issues surround the problems of price and yields. This objective seeks to strengthen collaboration with the seaweed farming communities, to understand their challenges and opportunities and through working together, find ways to ensure production is maintained or expanded sustainably. Through improved income security, especially among women, opportunities for socio-economic development will be explored, without compromising sustainable natural resources and environmental management. The indirect or long-term beneficiaries will be the coastal populations at large. Action 1.1: Evaluate the potential for expanding seaweed production

Seaweed farming is being practiced in over twenty villages that border the MBCA. The purpose of this action is to evaluate the potential for greater production and activities under this action include developing a relationship of trust between the farming communities and the MBCA, from which the MBCA management can develop means to support the communities. A pre-requisite is to conduct

a SWOT analysis, to understand more precisely the strengths, weaknesses and opportunities (including economic benefits) and threats associated with the current activity, as practiced in different parts of the MBCA. The second task is to determine that there are areas of seabed that are available for the activity, that don't conflict with other users. Mapping of seaweed activity within MCAs enables spatial planning and contributes to zoning. Through use of PMSD techniques the importance of seaweed stakeholders within MCAs can be better understood. There is a then a need to establish that pollution (e.g. from plastic string or floats), environmental damage (e.g. to seagrass beds or other benthic communities, use of mangrove poles), conflicts (e.g. with other water and space users such as tourism water sports) and other potential issues are resolvable.

The impact of seaweed farming on reef flats (not lagoons) through nutrient flushes, trampling to gain access and shading requires better assessment (at least in the MBCA context) before the activity is more widely promoted. If this activity (as well as walking fishers) is to be promoted, then the appropriate exclusion zones need to be established before the practice is allowed to increase. Thus, techniques, options and means need to be made available to reduce impacts in the MBCA. Other areas to explore include the market system's issues/bottlenecks that prevent development expansion, determining the maximum extent of seaweed farming depending on technique used, and how to emphasise climate-resilient mariculture practices e.g. tube-grown seaweed.

Further, it has been reported that the seaweed farms contribute to increased availability of fish in the farmed area, compared to non-farmed areas. Whether it is a perception or fact that seaweed farming can indirectly maximize fish production needs to be determined through scientific investigation.

Once the above are documented, through collaboration with the aquaculture unit at DFMRD, the Zanzibar Seaweed Cluster and other groups and researchers, MBCA management will develop a Seaweed Management Plan for MBCA be able to assist communities through targeted interventions (Action 1.2. below) , mindful that any value addition activities need careful market research.

For any expansion of seaweed farming or other maricutlture activity it would be appropriate for the MCA Manager to consider possible specific zoning to prevent conflict between users but also to protect biodiversity.

Action 1.2: Support existing seaweed production areas and activities to expand

Pending the study on potential for expansion of seaweed farming, and appropriate areas, and once the MBCA management are convinced there are areas for further development into which to expand that do not conflict with conservation objectives (Action 1.1, above), and potential for improvement of growth performance, it will assist local communities to participate. To support those currently practicing seaweed farming, MBCA management will encourage local groups to establish co-operatives to streamline marketing of seaweed and related products (jelly, soup and sauce, etc.), and help formalize MBCA support. Encouraging the creation of seaweed farmers network and union to be able to advocate their matters may also be considered. By working with the aquaculture unit at DFDMR, the Zanzibar Seaweed Cluster and other groups, the MBCA management will encourage more fishers to try a hand in seaweed farming thereby decreasing fishing pressure for wild fish stocks. Funding from the MPA Fund may be allocated based on merit and in accordance with the MPA Fund guidelines (see Action 2.3, Chapter 7), while other means of funding will be investigated.

Action 1.3: Research and management of stress related physiological changes, diseases and epiphytes

For some years there have been growth issues with seaweeds farmed, especially on Unguja, with physiological changes, epiphytes and disease affecting the plants. The first steps is to identify and contract appropriate skilled expert(s) to lead the study and analysis, and to identify seaweed farmers in MBCA (and TUMCA, MIMCA and PECCA) who are interested in participating in the study and potential trial of techniques to address these deterrents to growth. Once trials are underway, the process will be monitored for an agreed period and evaluated for success and challenges. Learning from the feedback and experiences the approaches to manage these stress related changes, diseases and epiphytes can be rolled-out to wider farming community. This should involve the appropriate local seaweed farming associations and advisory entities and be conducted to cover all MCAs except

CHABAMCA where there is no seaweed farming.

Objective 2: Alternative mariculture options developed and implemented

Fish and shellfish farming are considered appropriate alternative source of income for coastal artisanal fishers, especially when faced with declining wild fish stocks. Three types of mariculture that can be undertaken include pond culture landward of mangroves, suspension culture (cage and raft) in sheltered inlets of sufficient depth, and rack culture in the shallow areas. The latter has been attempted around Fumba but eventually failed. Piloting of mud crab farming has been successful in other parts of the region and yields a product with high attractive value for the tourism sector, with low-cost pens integrated in mangrove areas that require little capital inputs but labour availability is important. A fish farming trial is being conducted at Jozani village focused on milkfish *Chanos chanos* that has recently shifted to farming *Tilapia*. Local fish hatcheries are being developed on Zanzibar, including at Bweleo in the MBCA. Sponge farming has been piloted by a private sector entity at Jambiani and sea cucumber ranching is being tested in Unguja Ukuu. Action 2.1: Evaluate the potential for expanding non-seaweed mariculture production

An analysis of potential non-seaweed mariculture options needs to be conducted to objectively ascertain available options. The pre-requisite is to conduct a SWOT analysis, to understand more precisely strengths, weaknesses, opportunities (including economic benefits) and threats associated with potential alternatives for fish, shellfish and sponge farming, by building on these activities as currently practiced in different parts of the MBCA, and other parts of Zanzibar and the wider region. The second task is to determine that there are suitable areas available for the activity, that don't conflict with other users. There is also the need to establish that pollution (e.g. from plastic associated with the activities), environmental damage (e.g. to seagrass beds or other benthic communities), conflicts (e.g. with other water and space users such as tourism water sports) and other potential issues are resolvable. Whether the potential activities contribute to increased availability of fish in farmed areas, compared to non-farmed areas, can also be investigated.

Once the above are documented, through collaboration with the aquaculture unit at DFDMR, the Zanzibar Seaweed Cluster and other groups and researchers, MBCA management will develop a Non-seaweed Management Plan for MBCA be able to assist communities through targeted interventions (Action 2.2. below), mindful that any value addition activities need careful market research as well as an understanding of the market system's issues/bottlenecks that prevent development expansion.

Action 2.2: Support implementation for non-seaweed mariculture activities

The local community in the MBCA-adjacent areas will be assisted to start non-seaweed mariculture (fish, shellfish and sponge) farming as alternative sources of livelihood. Examples of candidate species for culture include milkfish, mullet, shrimps, oysters, mud crabs and bath sponges. Production of cultured fish is hoped to sustain the increasing demand for fish protein among human population adjacent to MBCA and beyond.

Once the MBCA management are convinced there are areas for development of nonseaweed mariculture (Action 2.1, above), and there is potential for development at least on trial basis, it will assist local communities to participate. To support interested local community members, MBCA management will encourage local groups to establish cooperatives to streamline marketing of their products and help formalize MBCA support. By working with the aquaculture unit at DFDMR, those working on existing activities, researchers, and other groups, the MBCA management will encourage more fishers to nonseaweed mariculture thereby decreasing fishing pressure for wild fish stocks. Funding from the MPA Fund may be allocated based on merit and in accordance with the MPA Fund guidelines (see Action 2.3, Chapter 7), while other means of funding will be investigated. Action 2.3: Develop guidelines on introduction of new mariculture techniques and species

The promotion of sustainable aquaculture needs to be balanced with the potential introduction of alien species. To guide the sector, a set of guidelines outlining the process and risks and necessary checks associated with introductions of non-native species. This action requires leadership from qualified mariculture and marine invasive species professionals to consider candidate species for

farming and approaches to verify introductions of invasives is avoided. The action is applicable to all MCAs and the country. Monitoring Framework

The monitoring framework presented in Table 14 was designed to provide guidance for the assessment of the potential impacts resulting from the implementation of the programme. It sets out the potential positive and negative impacts that may possibly occur during implementation of the programme's proposed activities and includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information needed. Monitoring the impacts of the plan implementation will ensure that timely changes to management approach are made when the situation demands.

Table 14. Mariculture Development Programme Monitoring Plan (modified from KWS, 2015).

Objective	Potential Impacts (positive and negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Seaweed farming production maintained or expanded sustainably	Marine research well coordinated with findings disseminated to stakeholders to support decision making	No. of research information dissemination meetings held	Community Support records at MBCA
	Working relations with stakeholders strengthened and coordinated to generate synergy and strengthen unity of purpose	No. of functional collaborative agreements between MBCA stakeholders	Community Support records at MBCA
	Communities have alternative sources of livelihood reducing pressure on fisheries	No. of non-fishing IGAs initiated and successful	Community Support records at MBCA
Objective 2: Alternative mariculture options developed and implemented	Marine research well coordinated with findings disseminated to stakeholders to support decision making	No. of research information dissemination meetings held	Community Support records at MBCA
	Working relations with stakeholders strengthened and coordinated to generate synergy and strengthen unity of purpose	No. of functional collaborative agreements between MBCA stakeholders	Community Support records at MBCA
	Communities have alternative sources of livelihood reducing pressure on fisheries	No. of non-seaweed farming IGAs initiated and successful	Community Support records at MBCA

6.4 Implementation Schedule

The following pages set out the proposed first six-years of the ten-year implementation schedule for the MBCA GMP (see Table 15). The activity plan details the activities, responsibilities, timeframe and milestones necessary for the delivery of each management action starting in 2022, which need to be finalized by the MCA Manager and SMC.

Table 15. Mariculture Development and Management Programme Implementation Schedule (first six years).

Management Action and Activities	Persons responsible	Timeframe												Proposed milestones
		2022		2023		2024		2025		2026		2027		
		1	2	3	4	1	2	3	4	1	2	3	4	
Objective 1: Seaweed farming production maintained or expanded sustainably														
Action 1.1: Evaluate the potential for expanding seaweed production														Seaweed Management Plan drafted by ……
1.1.1 Liaise with individuals/institutions that study seaweed farming in/around MBCA	TBC													
1.1.2 Undertake SWOT analysis, study environmental and other impacts and markets for seaweed products including through value-adding (also part of income diversification)														
1.1.3 Develop a Seaweed Management Plan for MBCA														
Action 1.2: Support existing seaweed production areas and activities to expand														A new seaweed farming project initiated by ……
1.2.1 Encourage local groups to establish co-operatives in order to streamline marketing of their products														
1.2.2 Support groups to access funding, including through applications to the MCA Fund														
1.2.3 Ensure follow-up and reporting is undertaken to learn from experiences and monitor progress														
Action 1.3: Research and management of stress related physiological changes, diseases and epiphytes [to cover all MCAs except CHABAMCA]														Farmed seaweed physiological changes, diseases and epiphytes reduced by 50% ……
1.3.1 Identify and contract appropriate skilled expert(s) to lead the study supported by local seaweed farming associations and advisory entities	TBC													
1.3.2 Identify seaweed farmers in MBCA (and TUMCA, MIMCA and PECCA) who are interested in participating in the study and potential trial of techniques														
1.3.3 Once trials are underway, monitored process for agreed period and evaluated for success and challenges.														
1.3.4 Learning from the feedback and experiences the approaches to manage these stress related changes, diseases and epiphytes and roll-out finding and guidance to the wider farming community.														
Objective 2: Alternative mariculture options developed and implemented														
Action 2.1: Evaluate the potential for expanding non-seaweed mariculture production														Non-seaweed Management Plan drafted by ……
2.1.1 Liaise with individuals/institutions that study and work with non-seaweed farming in/around MBCA	TBC													
2.1.2 Undertake SWOT analysis, study environmental and other impacts and markets for products from non-seaweed mariculture including through value-adding														
2.1.3 Develop a Non-Seaweed Management Plan for MBCA														
Action 2.2: Support implementation for non-seaweed mariculture activities														A new non-seaweed farming project
2.2.1 Encourage local groups to establish co-operatives to streamline marketing of their products and help formalize MBCA support	TBC													

Management Action and Activities	Persons responsible	Timeframe												Proposed milestones
		2022		2023		2024		2025		2026		2027		
		1	2	3	4	1	2	3	4	1	2	3	4	
2.2.2 Support groups to access funding, including through applications to the MCA Fund														initiated by ……
2.2.3 Ensure follow-up and reporting is undertaken to learn from experiences and monitor progress														
Action 2.3: Develop guidelines on introduction of new mariculture techniques and species [Action is applicable to all MCAs and the country at large]														Guidelines on Avoiding Marine Invasive Species in Mariculture drafted by ……
2.3.1 Identify study leader experienced and qualified in mariculture and marine invasive species.	TBC													
2.3.2 Consider candidate species for farming and approaches to verify introductions of invasive species is avoided.														
2.3.3 Work with Department of Mariculture, mainland Fisheries Dept and prepare draft Guidelines														
2.3.4 Circulate for review and finalize Guidelines														

7. COMMUNITY SUPPORT PROGRAMME

7.1 Programme Purpose and Strategy

The purpose of the Community Support Programme is:

To empower and encourage local communities within MBCA to actively participate in the restoration, sustainable conservation and management of marine resources

Over the least twenty years, local communities from the 27 main coastal wars that border the MBCA have witnessed a doubling of the resident population and an exponential increase in tourism development. Both the communities and the tourism sector rely heavily on local marine resources for their livelihood and existence, key among them being fisheries resources and areas for tourism related activities as well as seaweed farming. Arable farming and livestock husbandry also occupy a proportion of the local community, with a marked seasonal pattern of activity, being greater during the wetter months of the year. Firewood collection and manufacture of charcoal are also important land-based activities that occupy small numbers of community members from coastal villages.

The increase in population and tourism activity has raised the demand for marine resources and space, leading to over-exploitation and use of illegal or destructive fishing gears in some places. The Community Support Programme will work towards mitigating these adverse impacts through improving awareness of the MBCA's values among local communities and other resource users, and by nurturing a constructive and supportive relationship between these entities and the MBCA management. Four guiding principles underpin the Programme.

Guiding Principles

When implementing the MBCA's Community Support Programme, MBCA Management, with participation of stakeholders, will endeavour to ensure:

Effective communication with communities enhanced

Communities will only participate in conservation measures if they are informed and understand their importance. Therefore, communication between MCA management and all resource users, be they local communities or other sectors, is a pre-requisite for effective stakeholder participation. Addressing this principle, of engaging with the tourism sector, is described in the Chapter 4. Local communities refers to resident individuals and their families that border the MBCA. During the 5-6 years when WWF was supporting the development of the MBCA, there was wide community participation, based on good communication with stakeholders, especially covering the Menai Bay area. From 2002 to the present, effective communication has dwindled. A revised, bottom-up approach to marine resources planning and management is needed, and to achieve that, community communication mechanisms need to be enhanced between the MBCA management, local communities and District authorities.

Strengthened collaboration by local stakeholder in resource management

Most of the significant threats to the sustainable use of the marine resources in the MBCA derive from destructive practices by the local community (including visiting fishers), tourism activities and over-exploitation. As described elsewhere in this GMP, the scale and intensity of these impacts is increasing and need to be urgently addressed. The pursuit of partnerships and collaborations with local institutions, including District authorities, focused on the resident local communities is critical to this principle.

Communities receive tangible benefits from marine resource conservation

One of the stated functions of MCAs on Zanzibar is to ensure shared benefits to local communities. MBCA management will endeavour to ensure that benefits to communities from MPA Fund support

are aligned with benefit sharing guidelines being developed (presented below). Collaboration with District authorities and support from development and conservation partners is needed to build capacity of community groups so that they can exploit diverse tourism opportunities in the MBCA and surrounding areas.

Local communities and Zanzibar's public are aware of the conservation significance of the MBCA

To gain support for marine conservation locally and nationally MBCA need to provide conservation education and raise awareness on the importance of protected areas. Educating different targets within the local community on the significance of the MBCA and its importance to the wider community and socio-economic setting needs to be addressed, so that conservation and sustainability messages reaches different social strata, from school children to fishers and farmer and government.

7.2 Targeting Community Support Actions

As summarized in Table 7 the threats that currently impact or are likely to impact on the MBCA conservation targets and their KEAs include over-exploitation of resources (mangroves), pollution (debris), wastewater/Insufficient waste disposal and charcoal production, identified as associated with local communities. Mindful of the over-riding community development objectives for improvements in economic growth to be accompanied by higher overall standard of living as well as the attainment of near-zero extreme poverty (Zanzibar Vision 2050), and that the improvement of local livelihoods be in a sustainable fashion, the priority threats are addressed in the two MOs proposed.

7.3 Management Objectives and Actions

When implementing the Community Support Programme, the MBCA management, with participation of development and research partners and stakeholders, will endeavour to ensure that the above guiding principles are followed. These are intended to guide the implementation of the Programme's two MOs, as described in the following sections, with an outline of the management actions needed to achieve them.

MO 1. Community environmental education and outreach programmes enhanced

MO 2. Community participation in natural resource management enhanced

Objective 1: Awareness of importance to conserve marine resources improved

To promote public understanding, appreciation and enjoyment of the natural resources through interpretation/education is part of the first major objectives of the MBCA. Environmental education to create awareness among various stakeholders and resource user groups on the importance and urgency of conserving the MBCA is critical, as described in other sections in this GMP. This objective is designed to increase awareness, understanding and participation of the public in the MCA and thereby promote behavioural change towards reducing the over dependency and pressure on natural resources. For example, school children will be reached through school events and environmental clubs; while adults will be educated through conservation seminars and workshops organised by MIMCA management, and through stands and events held locally.

Because of the over-arching importance and relevance of improved awareness of the environment, sustainable resource use, and of the role and functions of the MBCA, many chapters in this GMP include actions that address this objective. The main actions proposed in previous chapters that focus on boosting awareness among stakeholders include:

Chapter 3 Ecological Management Programme

Action 1.2: Disseminate information and increase public awareness on sea turtle conservation and management

Action 3.2: Develop and mainstream the implementation of an environmental

awareness programme

Action 3.3: Liaise with school authorities, wildlife clubs (and other groups) to develop a marketing strategy targeting schools and citizens

Action 3.5: Raise awareness on climate change impacts, mitigation and adaptation measures

Action 3.6: Promote research collaboration ad dissemination of information

Chapter 4 Tourism Development and Management Programme

Action 3.3: Develop and update a tourist map, guidebook and awareness brochures

Action 3.7: Organise and market local events that promote MBCA goals and objectives

Chapter 5 Fisheries Resource Management Programme

Action 2.1: Improve fisheries information sharing within MCAs and stakeholders

Accepting that the above eight actions have captured much of the engagement with the range of stakeholder than need to be aware of the MBCA, the marine environment and the approaches needed to conserve hem, the two action propose here focus first on the staff who will be responsible for coordinating the delivery of these important actions, as elaborated in more detail below. The second actions will focus on the facilities at the main MBCA HQ in Kizimkazi Dimbani and at the two other proposed stations (at Fumba and Pongwe). These sites will foster education and awareness-raising activities, present information centres with informative posters of marine biodiversity and MBCA's exceptional resources attractively displayed and maintained.

Action 1.1: Strengthen MBCA staff capacity on education and community awareness

Currently the MBCA does not have staff deployed to engage in conservation education and outreach work. Given the importance of biodiversity and the recreational significance of MBCA and the many associated threats facing it, there is need to have a coordinated approach for implementing the conservation and education programme. MBCA management will strive to engage at least one conservation education officer, who will be responsible for developing a robust conservation education programme that when implemented, will lead to increased community support for conservation. Assistant officers may be needed as the activities develop. To initiate this action, conservation partners will be needed for training of MBCA staff other others involved, and the participation of District based Fisheries Officers may need to be considered. Over time there is likely to a need to increase education staffing to cover the large area of work.

Action 1.2: Construct and equip resource centres at MBCA offices and sub-stations

The current education centre at the MBCA serves the entire south coast. Yet the facility is small and Inadequates requisite education tools to effectively convey conservation messages to large organized groups. Under this management action, a robust resource centre will be constructed at the HQ, but also at the Ranger sub-station at Fumba and a yet unspecified location on the east coast. All three facilities will provide a lecture hall, library and associated facilities that present informative posters of marine biodiversity and MCCA's exceptional resources attractively displayed and maintained. These sites will foster education and awareness-raising activities. In addition, modern education and outreach equipment will be procured and deployed to the resource centre. Support from education and conservation partners will be needed to the develop the information and educational material which should also include traditional knowledge. Assistant officers may be needed as the activities develop. To initiate this action, conservation partners will be needed for training of MBCA staff other others involved, and the possible participation of District based Fisheries Officers may need to be considered to boost numbers. The selection of staff should prioritize local community educated people.

Experience from previous initiatives, for example the *Sustainable Dolphin Tourism Workshop* and plans for a visitor's centre and delivery of dolphin-awareness information, managed by KIDOTOA, will be garnered to help guide future centres.

Objective 2: Communities actively involved in resource management

For many local communities, economic social and environmental factors limit the development of livelihoods. These factors include poverty, low levels of education, subsistence-based lifestyles, climatic variability and seasonality, Inadequate of access to finance and technology, restricted access to assets, and weak land tenure. For many local communities along the coast, there has been an over-dependency on fishing accompanied by the unsustainable increase in fishing effort. Inadequate of conservation awareness is a factor contributing to use of destructive practices and to permitting others from doing the same, especially when enforcement is weak, as was the case after the WWF supported period came to an end in 2002. Identifying potential alternative livelihood options is a challenge (as described under Objective 4 of the Fisheries Programme, Chapter 5).

Realisation of this objective involves a range of community stakeholders e.g. fishers (including mariculture), mangrove users and those engaged in tourism livelihoods. It is realised that fishers (including mariculture) participation in management will be greatly enhanced through implementation of the roles and responsibilities of SFCs as being developed by the co-management component and suggested by the MCS strategy.

It should be noted that the proposed actions that follow are focused on wider local community groups other than SFCs. Also, that the emphasis of the actions proposed in this chapter emphasize the groups themselves rather than actual development opportunities. The latter are described under other chapters, namely in:

Chapter 4 Tourism Development and Management Programme

Action 1.1: Develop and maintain of two new boardwalks

Action 2.1: Develop and maintain nature trails

Action 2.2: Promote ornithological guided tours

Action 2.3: Promote canoe safaris

The above actions focus on creating opportunities for local business associated with developing new tourism experiences, while the following two actions specifically target the SFCs:

Chapter 5 Fisheries Resource Management Programme

Action 1.4: Empower SFCs to execute their mandate

Action 4.1: Support establishment of empowered community managed fishery areas

This management objective has been designed to strengthen local communities into groups that can be better placed to exploit opportunities presented by natural and cultural resources in the area, and as groups, also be more effective recipients of support, with the assistance of the MBCA management in collaboration with District efforts.

Action 2.1: Evaluate previous and on-going community projects

The MBCA management will conduct a critical evaluation of current and previous projects carried out in the context of the MBCA to discern any constraints to project implementation or characteristics that have ensures success in the past. One example if the experience of the KIDOTOA described above (section on Marine Megafauna, page 10). It is important that the lessons learned from this evaluation exercise will be used to support the design of future community projects that will deliver the intended outcomes, improve community livelihoods and enhance marine conservation. One of

the goals of this action of to end up diversifying livelihood activities to help conservation and forgo illegal activities, and to promote coastal and fisheries integrated management to cover forest and other land use management.

Also, it is important to appreciate that "community projects" may not have a direct relevance to management (e.g. local school, mosque, etc.) but these activities often build buy-in for management. There can be a lot of diversity: cooperatives, youth clubs, religious groups, etc. The purpose/mission of these groups could be profit on non-profit and therefore the nature of their needs and the support offered should also be diverse too. This evaluation will be carried out by the MBCA Community Officer in collaboration with the relevant District Development Officer, community members through a Participatory Rural Appraisal (PRA) approach. Focus areas will be organisation structures, financial capability, skills and training needs, with finding used to help define community groups for future support (Action 2.2).

Action 2.2: Strengthen local community groups and select groups for funding

Following the outcomes of the Action 2.1 (above), the MBCA management will have an updated evaluation of programmes and projects of selected community groups that MBCA will consider partnering with and supporting. Once the gaps in the capacity of the community groups have been identified, MBCA management will be in apposition to support training of community group officials in line with the identified training needs. The training will mainly focus on project design, implementation and maintenance and will be carried out through short training workshops. Training to rationalize their institutions and enhance management of the resources is important, as is to facilitate planning and implementation of their management plans. As will most local development groups, entrepreneurship knowledge and skills among local communities need to be boosted to enable them to develop alternative means for livelihood where appropriate, as sustainability can only be achieved through relieving pressure on the existing resources. It will be important that here too the relevant District development officers and NGOs active in the area are involved through an open and transparent process.

Once a group is registered, they will be supported in developing a business plan which will outline the activities that will be implemented to achieve the defined group mission. The MBCA management and its partners will support implementation of the participatory business plan with priority being given to activities that will enhance environmental conservation. One obvious example would be assisting local applicants to prepare funding proposals, such as for ecotourism initiatives (nature trails, ornithological safaris, canoe trips, or simply organizing regular workshops for boat/beach operators – see Actions 2.1,

2.2, 2.3 and 4.3 in the Tourism Development chapter).

Funding from the MPA Fund may be allocated based on merit and in accordance with the MPA Fund guidelines (see Action 2.3, below), while other means of funding will be investigated. Numerous devolved funds exist at community level, with common generic examples being district government funds, youth and women empowerment funds, economic stimulus funds, etc. However, communities dependent on MCA resources are often unaware of the existence of such funds. Some may not appreciate the opportunity or not be confident in applying for the same. Any eventual fund systems must be fully transparent and should emphasize gender balance and equity throughout all management levels.

The MBCA management view these funds as a valuable prospect for local MCA resource users and will actively support local user groups, guided by the Community Development Officer, to access funds to support livelihood projects. When successful, the beneficiaries will reduce fishing pressure on MCA resources.

Action 2.3: Develop guidelines for disbursement from the MPA Fund

Following the prescription as per the MCU Regulations, of 70% for management and 30% for community development, the DMC will contract a specialist to consult with all interested parties, the FMCAC, MCTAG and SMC, including the Principal Secretary, to design a transparent and un-biased procedure, aimed at equitable sharing of resources from the MPA Fund (or equivalent) to eligible ap-

plicants and projects, with appropriate follow up and monitoring. Consideration should be made for adoption of the Jozani Chwaka Bay funding and sharing system for efficiency. Either way, it is recommended that any community costs for resource management are part of the 70% budget allocation.

Before engaging in sharing scare funds, an annual review of expenditures would be prudent, as would defining eligibility for community project funding, which shouldn't necessarily include covering local management costs, with these coats preferably directly supported by other funding and in-kind support mechanisms.

Action 2.4: Nominate and recommend gazettement of a MBCA Honorary Warden

Addressing emerging community concerns more promptly can be achieved by nominating and formally involving a responsible and respected member of the local community who is passionate about conservation to work closely with MBCA management on conservation issues. An example would be someone from one of the SFCs. Once nominated and gazetted, the Honorary Warden (or "community champion") will be assigned tasks by the MBCA Manager, primarily of a marine conservation awareness nature as well as responding to emerging issues within the local SFCs and fisher groups. He/she will regularly report on progress and update the MBCA management. There may be a need to manage the potential (likely) jealousy that can be generated, and the selected individual should be a representative but have really a collaborative/collective approach, as self-less as possible.

Monitoring Framework

The monitoring framework presented in the Table 16 was designed to provide guidance for the assessment of the potential impacts resulting from the implementation of the programme. The framework sets out the potential positive as well as negative impacts that may possibly occur during the implementation, includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information needed. Monitoring the impacts of the plan implementation will ensure that timely changes to management approach are made when the situation demands.

Table 16. Community Support and Management Programme Monitoring Plan (modified from KWS, 2015)..

Objective	Potential Impacts (positive and negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Awareness of importance to conserve marine resources improved	• Improved understanding of the MBCA's conservation importance	• Number of local • community members • involved in conservation projects in the MBCA	• Community Support records at MBCA
	• Increased community awareness of and respect for MBCA rules and • regulations	• Number of local community members • arrested for illegal activities in the MBCA	• MBCA enforcement records
Objective 2: Communities actively involved in resource management	• Reduced illegal natural resource use in the MBCA	• No. of illegal natural • resource use incidents in the MBCA	• MBCA enforcement records
	• Sustainable utilisation of fisheries resources	• Adherence to the zoning scheme as well as recommended fishing methods	• Fisheries utilisation records and MBCA enforcement records

7.4 Implementation Schedule

The following pages set out the proposed first six-years of the ten-year implementation schedule for the MBCA GMP (see Table 17). The activity plan details the activities, responsibilities, timeframe and milestones necessary for the delivery of each management action, starting in 2022, which need to be finalized by the MCA Manager and SMC.

Table 17. Community Support Programme Implementation Schedule (first six years).

Management Action and Activities	Persons responsible	Timeframe												Proposed milestones
		2022		2023		2024		2025		2026		2027		
		1	2	3	4	1	2	3	4	1	2	3	4	
Objective 1: Awareness of importance to conserve marine resources improved														
Action 1.1: Strengthen MBCA staff capacity on education and community awareness														New conservation education recruited and trained by ……
1.1.1 Recruit and train a conservation education officer to MBCA	TBC													
1.1.2 Develop and implement a MBCA conservation education and outreach strategy														
Action 1.2: Construct and equip resource centers at MBCA offices and sub-stations														Once resource centre constructed and equipped by ……, the other two by ……
1.2.1 Review experience from previous initiatives in Zanzibar to develop educational centers	TBC													
1.2.2 Prepare a proposal justifying the construction of the resource centers at Fumba Ranger Station, Kizimkazi HQ and appropriate site on the east coast, and forward proposal to DMC for consideration														
1.2.3 Solicit for MPA Fund to construct the three resource centers														
1.2.4 Award construction services competitively														
1.2.5 Prepare information and educational materials to be displayed at the Resource Centers														
Objective 2: Communities actively involved in resource management														
Action 2.1: Evaluate previous and on-going community projects														Report of community project prepared by ……
2.1.1 Identify 20 funded community projects implemented in villages that border MBCA over last 5 years	TBC													
2.1.2 Select a sample of projects for evaluation, focusing on those with a conservation element														
2.1.3 With District CDOs conduct PRAs in villages where selected projects have or are being implemented														
2.1.4 Assess organization structures, financial capability, skills and training needs														
2.1.5. Use the finding from the evaluation to help define community groups for future support (Action 2.2)														
Action 2.2: Strengthen local community groups and select groups for funding														Resource user groups accessing funding and developing community projects by ……
2.2.1 Identify local community groups interested in conservation-based projects	TBC													
2.2.2 Sensitize groups on existence of alternative government funding sources besides MCA Fund														
2.2.3 Organise a meeting for community groups to identify their strengths and weaknesses														
2.2.4 Support community groups in developing business plans and proposals to solicit funding														
2.2.5 Support implementation of selected activities from the community actions plans with MPA Funds														
2.2.6 Monitor the conservation activities of the community groups in line with MPA Fund guidelines														

Management Action and Activities	Persons responsible	Timeframe												Proposed milestones
		2022		2023		2024		2025		2026		2027		
		1	2	3	4	1	2	3	4	1	2	3	4	
Action 2.3: Develop guidelines for disbursement of MPA Funds to communities														
2.3.1 Contract a specialist to coordinate the task, starting with wide consultation	TBC													MPA Fund Guidelines approved by ……
2.3.2 Develop a proposed mechanism for the application process, selection, nomination and follow up														
2.3.3 Ensure stakeholder feedback incorporated and finalise operation of the MPA Fund for gazettement														
2.3.4 Publicize the MAP Fund and MPA Fund guidelines and solicit applications														
2.3.5 Ensure that MPA Fund support is allocated to at least two resource user groups each year.														
Action 2.4: Nominate and recommend gazettement of a MBCA Honorary warden within the area														Honorary Warden appointed by ……
2.4.1 Identify potential local honorary wardens	TBC													
2.4.2 Recommend the identified honorary wardens for gazettement														
2.4.3 Develop a collaborative framework for working with the honorary wardens														

8. MONITORING, CONTROL AND SURVEILLANCE STRATEGY

8.1 Overview

While the activities of key resource users (predominantly fisheries and tourism) varies between MCAs and there are localised examples of effective MCS, it can be concluded that non-compliance with the law is extensive and effective MCS in Zanzibar's MCA network is weak.

The regulatory conditions under which fishery resources can be exploited are generally considered appropriate to manage the fishery, yet several factors are limiting implementation.

Increased fishing pressure over the last decade under an open access system makes it difficult to control fishing effort and significantly hinders MCS. The existing 'top-down' management regime from DFDMR also Inadequates the required financial and human capacity to plan and implement effective MCS measures. To put this in perspective, at present, most of the MCAs have newly-appointed managers and the supporting committee (the proposed SMC) as well as the proposed MCTAG and the FMCAC have not been formally established and have never met. There is not enough strategic monitoring of resource use and non-compliance to be able to make informed management decisions. The results is a limited surveillance presence in MCAs and a general Inadequate of awareness and/or respect for the law.

Co-management in Zanzibar, represented by the SFCs, has great potential to assist but the system is currently unable to function effectively given that SFC members essentially serve on a volunteer basis and similarly to DFDMR, Inadequate essential training and resources to carry out surveillance and enforcement.

A clear set of guidelines is required that are understood and can be continually referred to by MCA users and stakeholder groups. All responsibilities ought to be clearly defined and each involved should have the necessary capacity to carry out these responsibilities.

A number of strategic objectives to strengthen MCS in the artisanal fisheries sector were identified in the 2019 FMPs for three priority fisheries supporting a range of management inputs controls and associated technical measures. To support implementation of the FMPs, these objectives have been carried forward into the MCS Strategy and adapted where necessary to suit the specific needs of the MCA. Tourism is also a key impactor to marine biodiversity within MCAs, so objectives focused on improving MCS of this sector have also been incorporated.

As well as pro-active enforcement, this MCS Strategy considers measures to improve voluntary compliance though education and outreach and incentives to fishers. Where available, best practice guidelines and case studies in enforcement and surveillance of MPAs have been utilised to suggest the most practical and impactful interventions. The application of alternative modern technologies for both surveillance and monitoring have also been included.

8.2 MCS Strategy Objectives and Associated Actions

This MCS Strategy has ten Objectives and associated Actions which are summarised in Table 18. The details are provided in the full MCS Strategy document, with monitoring indicators included in Annex 1 of the same. Under **Objective 4, a detailed surveillance programme** has been proposed including patrol routes and the distribution of MCS personnel around the MCA. An indicative illustration of the routes is given in Figure 12.

Figure 12. Indicative patrol routes to support the MCS Strategy.

Table 18. Definition of the ten MCS objectives and associated actions.

Objective 1. Define and formalise the MCS responsibilities of relevant entities
Action 1.1. Re-define the MCS focus and responsibility for each entity
Action 1.2. Make informal/formal partnership agreements with other government agencies, NGOs or private entities to facilitate outsourcing and coordinated MCS of the MCA
Action 1.3. Produce and regularly update an MCS Guidance Document for MCA
Objective 2. Strengthen human resource capacity
Action 2.1 Improve staff skills in MCS
Action 2.3. Set up MCS SFC sub-committees
Objective 3. Improve communications within the MCA
Action 3.1. Establish a Marine VHF radio network
Action 3.2. Set up a surveillance co-ordination centre and define lines of communication
Objective 4. Strengthen the enforcement of MCA user activities via a decentralised and risk-based surveillance programme
Action 4.1. Increase fisheries surveillance responsibility and resources to SFCs
Action 4.2. MCA surveillance team take on a more reactive role in surveillance complemented by targeted patrols of known violation hot-spots
Action 4.3. DFOs to focus on land-based MCS, specifically verification of fishing licences camping permits
Action 4.4. Increase land-based surveillance coverage using rangers on foot or lookouts at strategic posts
Action 4.5. Increase the number of joint patrols as part of a co-ordinated joint patrol plan
Action 4.6. Utilise the tourist boat sector as a surveillance platform
Action 4.7 Increase surveillance and enforcement of tourist and tourist operator activities
Action 4.8. Apply best practice patrolling principles
Action 4.9. Implement the detailed surveillance plan
Action 4.10. Deploy key staff to implement the surveillance programme
Action 4.11 Review compliance on a regular basis to ensure risk-based planning
Action 4.12 Consider implementing alternative technologies for surveillance
Objective 5. Promote voluntary compliance and prioritise a 'soft' approach to enforcement where possible
Action 5.1. Incorporate 'soft' enforcement into training
Action 5.2 Develop and launch a Zanzibar wide regulations awareness campaign

Action 5.3. Provide incentives to fishers that will improve respect for MCA management
Objective 6. Phase out the most damaging fishing gears
Action 6.1 Set up task forces to control the most destructive fisheries in the MCA
Objective 7. Equipment to support implementation of MCS is provided and maintained
Action 7.1. Procure equipment needs for MCS in the MCA
Action 7.2 Maintain equipment
Objective 8. Infrastructure to support implementation of MCS is developed and maintained
Action 8.1. Install and maintain demarcation for identified priority areas
Action 8.2 Review the state of MCA building and upgrade if necessary, according to needs and best practice
Action 8.3 Review the need for SFC offices/resource centres
Action 8.4 Review the state of fisheries landing sites and upgrade priority sites
Action 8.5 Install basic infrastructure for surveillance posts at key locations
Objective 9. Develop more enforceable prosecution and sanction systems
Action 9.1 Develop more meaningful sanctions related to MCA user activities
Action 9.2 Establish a simple reporting tool and practical database that allows for case monitoring and recording repeat offenders
Action 9.3 Define a clear process for the implementation of by-laws for management at the local level
Action 9.4. Carry out training for judges, prosecutors, local police, and other enforcement/legal authorities
Objective 10. Modernise current fisheries catch and effort monitoring systems to phase out the current open access regime
10.1 Pilot modernised licensing and registrations systems in the migrant fishery
10.2 Pilot electronic catch data collection systems

9. IMPLEMENTATION APPROACHES AND PRINCIPLES

9.1 Overview

This section describes the suggested overarching process by which the GMPs could be implemented. This GMP includes 102 proposed actions (36 MCS Strategy + 66 from the GMP itself).

As prescribed in the CAP approach (Figure 1), once the objectives and actions (and activities, or measures) have been reviewed, these need to be prioritized and implementation timeframes reviewed. This should be done by the MCA manager working with the SMC and community level organisations e.g. SFCs/FEC. The prioritised actions need to be costed and form the basis of the budget request (from the MCA Fund, RGZ and other sources – see below). Only then will it be possible to decide which action should begin in the first year and those that can be developed in the coming years. The precise work plans needed to implement these actions should then be developed by the MCA Manager and management team.

Work plans to be developed need to be clear on the activities to be undertaken, which includes the identification of those individuals and entities responsible for each activity/task, and the associated budget. The plans also need to include measures defined to monitor progress. Monitoring of progress is a key part of activity implementation that produces the information required to evaluate the efficacy of those activities. As per the guidance of the CAP approach, the evaluation sequence for monitoring should be based on analyse (or test), learn, adapt and share. These are the last steps in the CAP approach, requiring that the MCA Manager and management team systematically take the time to evaluate the actions they have implemented, to update and refine their knowledge of the MCA objectives, and to review the results available from the monitoring data collected. This reflection provides insight on how the GMP actions are working, what may need to change, and what to emphasize in the following phases. This step then asks the MCA Manager to document what has been learned and to share it with other stakeholders so they can benefit from the successes and failures.

Three critical elements are needed to carry out the implementation of the GMP: adequate funding, stakeholder involvement and their roles and responsibilities, and fisheries comanagement systems. These are described below with proposed approaches outlined.

9.2 Funding for implementation of GMPs and MCS Strategy

The existing GMPs, e.g. MBCA GMP (2010) described inadequate financial and management capacity, stating that the financial capacity of the MCA to fulfil its mandate was not there, and that due to inadequate government budget allocation, the human resources development as well as service delivery to the general public has been insufficient. The inadequacy and uncertainty of funds have impacted negatively on management operations ranging from recruit of staff, training, research and monitoring activities. By 2019, there was no apparent improvement in the situation.

The three principal issues related to funding are explored below.

(a) Current MCA Funding Sources

Tourism

By the end of 2019, the collected visitor entrance fees made a significant contribution to the overall MPA Fund. However, due to uncertainties over the stability of the tourism industry on Zanzibar, revenue generation from MCA visitor fees and tourism activities is not always guaranteed. Realistic contingency plans will be required for periodic downturns (such as the downturn observed during the Covid-19 pandemic).

A strengthening of the relationship between the tourism sector and the MCAs is required as it is currently very weak. For example, having 2-3 tourism representatives on each MCTAG and/or SMC, and ensuring that this committee has a clear and empowered role in MCA management would better allow the sector to become more involved and more invested in the management of MCAs. If there

is an eventually look to increase tourism fees, or charge bed night levies on accommodation (see (c) below), being actively involved in the MCAs will improve the possibilities to agree on revised format of revenue generation. *Government*

An increase in government budget allocation to MCAs is one of the most efficient ways of ensuring adequate funding, both to supplement periodic downturns in tourism-related funding or as a more long-term financing strategy.

Existing MPA and Environment funds

Under the Environmental Management Act 2015, a Zanzibar Environment Fund is recommended. Both the MPA Fund and the former fund appear to have very similar overall objectives, yet are held under different institutions, each with its own management detail.

(b) Support for SFCs

SFCs will be assigned greater fisheries MCS responsibility under the new MCS Strategy. Funding of their activities and active involvement in MCA management are critical to the successful implementation of the MCS Strategy and GMP. Therefore, costs incurred by SFCs to help the MCA staff implement management measures are management costs, not community development costs. A review is needed of the current system whereby 30% tourism entrances and associated fees are allocated to community development activities. Part of that review would include understanding the differences between 'community development' and 'management' in this context.

Similarly, co-management work is planned to involve having groups of SFCs prepare agreements/action plans for their co-management fishing areas. This would allow SFCs to contribute to MCA management, and MCA Managers to support and manage the input of SFCs. The CAP cycle could be run sequentially in SFC fishing areas and the MCA to allow prioritisation based on local and national priorities and to ensure good communication throughout the MCA. This would act as a major incentive for communities to respect MCA rules and regulations.

Furthermore, as the 30% allocation is currently arbitrary and not based on number of fishers/SFC members, even at full hotel occupancy, in some MCAs there will be very little generated for community development. It is suggested that these funds are distributed on a per-capita basis, still drawn from the main community development funding source (e.g. the MPA Fund) but distributed evenly to match the number of members and recipients in the MCA.

(c) Specialist study on funding mechanisms for marine conservation on Zanzibar

An urgent priority for the RGZ is to develop a strategy for achieving financial sustainability for the MCAs, as it is unlikely that tourist visits and individual visitor fees will be able alone to finance operating costs on a permanent basis. Given the above, it is thus recommended that a financial specialist be contracted by the DMC to undertake a dedicated study on sustainable financing for marine conservation on Zanzibar. The study should consider the following main elements:

(i) MCA Funding requirements

Work with MCA managers to determine realistic and pragmatic operational budgets and the most appropriate means of developing matching funding.

(ii) Allocations from existing MPA/Environment funds

Conduct an analysis and harmonization over which fund is the most appropriate and applicable to MCAs to contribute to the current uncertainty over financial sustainability. Design a transparent and un-biased procedure, aimed at equitable sharing of resources from the MPA Fund (or equivalent) to eligible applicants and projects, with appropriate follow up and monitoring. Funding from the MPA Fund may need to be allocated based on merit and in accordance with special MPA Fund guidelines.

Another possible financing option in the longer term, would be to set up some form of MCA Legacy Fund into which donors, a percentage of tourism revenue, other private sector sources (e.g. energy sector) could channel capital funds.

As an eco-tourism focused economy, it is essential that Zanzibar incorporates carbon offsets into its strategy to ensure that it remains competitive in the tourism market which will increasingly demand carbon credit options. 'Blue carbon' habitats (mangrove forests, seagrass beds and salt marshes) sequester and store carbon at significantly higher rates than terrestrial habitats. Zanzibar has extensive blue carbon habitats that could be leveraged through innovative community-led projects to conserve these habitats, support sustainable tourism and grow the local Blue Economy.

(iii) Alternative sources of funds

If an increase in government allocation is not available, and allocations from existing MPA/Environment funds are insufficient, other interventions are needed. Options for revenue streams will need to function regardless of the outcome of restructuring, including decentralisation. Alternative revenue streams and funding-related interventions need to be investigated and might include some of the following:

- Continued use and systematic collection of the MCA entry fee charged to all resident and non-resident visitors, potentially strengthened to improve efficiency and transparency, by implementing an electronic/telecoms-based payment system.
- Fees collected from visitors at ports (air or sea) before receiving entry stamps.
- At-source collection of revenue via a very small (e.g. 0.5) percentage of taxes (such as hotel levies or airport taxes from foreign/national flights/ferry tickets/restaurants/etc) that are channelled directly into the MPA Fund.
- A bed-night levy on all accommodation within MCA areas, for accommodation located with 1 km of the high tide mark, on the assumption that visitors at such facilities are directly enjoying/benefiting from the MCA environment.

(iv) Supporting SFCs

There is a need to investigate suitable alternative revenue generating mechanisms for SFCs. One option might be to consider proposals made by SFCs to the Government to include landing site levies/ catch levies and fines (already taking place in closed seasons). Linked to this, formalizing procedures for SFCs to set up and manage bank accounts would assist in management of their funds. Any increase in allocations to SFCs from existing sources should consider individual SFCs demonstrating MCS performance and functionality and adequate financial management capacity and auditing at SFC level. Also relevant would be to clearly define methods for SFCs to generate their own revenue in the next Regulations to be issued.

9.3 Stakeholder Involvement and Roles and Responsibilities

Throughout the GMP reference has been made of the need to involve local communities, the SFCs (see also Section 9.4), the tourism sector, NGOs, academics and technical experts, among others. This range of participants reflects the diversity of issues and proposed actions that are associated with the sustainable management of MCAs on Zanzibar today. The failure to involve at least some representatives from these sectors will weaken the effectiveness of the MCA and most likely prevent many of the objectives from being met.

Reviewing, agreeing and finalizing the proposed RZs for example, will require MCA Managers to work with SFCs in the MCA and the working groups within the four priority fisheries, together with scientists to provide technical knowledge and inputs that are vital to the evidence-based decision-making process.

One of the main roles of the MCA Manager is to development an open and transparent enabling framework, within which the activities and actions can be reviewed, adjusted where necessary, implemented and monitored. This system will also have to cope with implementation of activities from other sectors not currently included in MCTAG. For example, how would an MCA implementation plan be impacted by a wind farm project? For these many stakeholders to be effectively involved there needs to be in place a management system with clearly defined roles and responsibilities.

The Inadequate of management systems with clear roles and responsibilities from the DMC to SFC was a weakness in the past, preventing a clear process of participation from this vital stakeholder group. Though some roles are specified in the 2014 MCU Regulations (see Section 1.6), in practice, the roles and responsibilities, including those of the MCTAG need to be revised periodically so that management systems reflect the requirements of effective activity implementation. This should also be an intrinsic part of the CAP cycle for MCAs in Zanzibar.

Whereas the CAP cycle provides a logical approach to MCA management, its success and that of other adaptive management processes depend on effective monitoring and evaluation of implementation. Limited resources will invariably mean prioritisation of expenditures (as discussed above, Section 9.2) and this may mean that certain activities may not be implemented. This often results in funds not being available for monitoring and/or research if they are separate activities to be funded by the MCA. Separate funding for research often leads to delays in results/findings being made available. Both these issues would compromise the CAP planning cycle as well and the ability to demonstrate that management interventions have begun to deliver results.

Participatory approaches to research and monitoring could be undertaken alongside activity implementation as an approach to be considered to safeguard the CAP planning cycle: defining the project - developing strategies and measures – implementing strategies and measures – using results to adapt and improve.

9.4 Fisheries Co-management Systems

It has become widely accepted that fisheries co-management has the potential to proactively engage fishing communities in managing the marine resources on which their livelihoods depend, within defined areas of shared fishing activity. Consequently there is much in common with the goals and objectives of marine protected areas such as the MCAs of Zanzibar – there is a shared common interest. This form of local management has been gaining traction in Tanzania Mainland, Kenya and Mozambique.

Four of the key benefits of the fisheries co-management approach include:

- It supports and strengthens implementation of government policies including blue economy development, national fisheries management plans (FMPs), and other development plans such as for aquaculture or other sectoral plans.
- Specifically within MCAs, fisheries co-management areas can be treated as focal areas within which NGO and tourism sector partners can work with authorities and fishing communities to improve fisheries management and production.
- It provides the means to harmonise national and local priorities thereby incentivising local ownership and action and catalysing local blue economy development.
- It provides for cost-effective co-management and potentially reduces conflicts.

On mainland Tanzania, collaborative fisheries management areas (CFMAs) have been under development since 2007, building on earlier work in Tanga, while 12 new CFMAs are being established under the SWIOFish project in six coastal districts. By the end of 2021 there will be 31 CFMAs in total, covering 11 of the 17 coastal districts and ~ 80% of the mainland coastline. Mainland CFMAs typically contain between 2-7 fishing communities / beach management units (BMUs).

On Zanzibar, informal pilot trials of fisheries co-management already exist in the form of local temporary closed areas, for example of octopus fisheries, as documented by the NGO Mwambao-MCCC on Pemba and also around parts of Unguja. More formal piloting of comanagement zoning in Zanzibar MCAs under SWIOFish has been underway since 2018, through the DFDMR with NGO partners. Provisionally six co-management areas were identified in PECCA, five in MBCA with two in each of MIMCA and TUMCA (included in the relevant GMPs). These areas might be further divided subject to consultations and mapping of fishing patterns. Each co-management area contains 6-10 SFCs and forms the basis of a collaborative management group (CMG) between the SFCs within each area.

A CMG management plan format and planning process has been developed and endorsed and is ready for implementation in both Pemba and Unguja. The latest development is defining standard operating procedures (SOPs) for SFCs and CMGs, produced by the DFDMR -District co-management teams in Unguja and Pemba in consultation with NGOs, FECs and SFCs. The management areas and SOPs have been welcomed and endorsed by SFCs, FECs, Districts and NGOs and are now awaiting approval of DFDMR.

It is clear at this stage in the evolution of the concept of fisheries co-management in Zanzibar that it is not possible to include co-management procedures and zoning within the GMPs at this moment in time. However, at the time of preparation of this GMP, comanagement procedures and zoning within MCAs is in the process of being adopted into revision of the legislative and governance framework for fisheries management in Zanzibar. Therefore a process of identification and establishment of co-management areas within MCAs is an intrinsic part of the vision and strategy for spatial zoning, to be developed over the period of the GMP (i.e. 5-10 years) as part of its implementation.

One of the future steps is for the co-management procedures and zoning within MCAs to be incorporated into the draft revised GMPs for each MCAs, including how to incorporate them into the MCA institutional structures. The elaboration of the necessary stepwise process, management structures (SFC co-ordination) and instruments (subsidiary comanagement plans) should be part of the focus areas for the MCA Managers in the coming years.

Within each MCAs, defining the overall coordination of activities, including fisheries comanagement, will require the collective participation of the relevant stakeholders, principally the local community, the SFCs, the tourism sector and relevant government agencies, overseen and guided by the MCA Manager and the management team. The precise structure and representations will need to be developed as the GMP begins to be understood by all parties. This is a process that inevitably will take some tie and require much patience.

9.5 Summary of immediate priorities for the MCA Manager

Once the GMPs have been formally approved by Government, the work of the MCA Manager will begin. In addition to the many internal tasks related to staffing, infrastructure and administration, there are the following three sets of important tasks that relate specifically to GMP implementation.

Involve research, conservation development partners

- Identify and meet with representatives of stakeholder groups that are relevant to the implementation of the GMP (at a minimum, these will include local fisheries (SFCs), local seaweed farmers, Fisheries Dept, Marine Conservation Dept, NGO-SFC Collaboration representatives, local hoteliers, local SCUBA operators, local sandbank or fishing trip operators, local tour operators, other investors, school and social or community groups, port authorities, etc)

- Keep stakeholders, partners and the new oversight committee, the Stakeholder Management Committee, informed on details of the final management framework as it become legally binding.

- Identify potential development and conservation partners for some of this work in the GMPs. Most of the narrative of the proposed actions indicate where partners have a role.

- Remind stakeholders regularly that the GMP and MCS Strategy are guiding documents and that their implementation is based on adaptive management, learning from doing, adapting and progressing. This recognises that periodic reviews of action implementation are needed.

Finalize the Replenishement zones Replenishment Zone

- Revise all Replenishment Zone proposed in the GMPs, with the Stakeholder Management Committee and agree on the boundaries and regulations for each site. Site visits will be required. Zoning has to be defined only through collective agreement among all stakeholder groups, led by the MCA Manager.

- Once RZs are agreed, convene a meeting with the MCS, Co-Management and Conservation and Marine Resources units within the DMC to define the markers and zoning tools and markers and beacons that will be installed and the timeframe.

- Work with the relevant entities to re-draw any maps requires that accurately reflect the final decision on the RZ and ensure that RZ maps are distributed in appropriate languages and format for the understanding of those entities and stakeholders to whom the RZ will affect.

Revise and prioritize proposed actions for the five GMP programmes and the MCS Strategy

- There are 66 proposed actions under the five thematic areas (ecology, tourism, fisheries, mariculture and community development), plus 36 actions related to MCS. The MCA Manager and SMC need to review each action and prioritize them with respect to the available budget, research, development and conservation partners, government priorities and other driving factors.

- Once prioritized, the timeframes for each proposed actions needs to be set and agreed with the persons responsible and participating entities.

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9. ANNEXES

Annex 1. Conservation Action Planning outline

Conservation Action Planning

The Nature Conservancy
Protecting nature. Preserving life.™

Conservation Action Planning (CAP) is a powerful process to guide conservation teams to develop focused strategies and measures of success. CAP is The Nature Conservancy's version of the "Open Standards for Conservation". It has been utilized with hundreds of diverse projects at multiple scales from different parts of the world and is supported by a network of trained professionals that make up the Conservation Coaches Network.

The CAP process guides project teams to identify effective conservation strategies. It provides an objective, consistent and transparent accounting of conservation actions and the intended and actual outcomes of conservation projects. It enables project staff to responsively adapt their actions to improve strategy effectiveness and achieve greater conservation impact.

A brief summary of the CAP Process is provided below. For a full set of CAP and Open Standards information, visit http://conserveonline.org/workspaces/cbdgateway/cap/index_html.

THE 10 STEPS OF THE CAP PROCESS

1. Identify People Involved In Your Project

This step asks you to identify your most valuable resource – the people who will be involved in designing and implementing your project. Addresses questions like: ♦ *"Who will design our project?* ♦ *"Who will be responsible for ensuring the plan goes forward?, " "Who can give us advice?,* ♦ *"Who will help us through this process?"*

2. Define Project Scope & Focal Conservation Targets

With this step you define the extent of your project and select the specific species and natural systems that your project will focus on as being representative of the overall biodiversity of the project area. This step helps your project team come to consensus on the overall goal and scale of the project and your ultimate measures of success. Addresses questions like: ♦*"Where is our project?"* ♦ *"What are we trying to conserve or restore?"*

3. Assess Viability of Focal Conservation Targets

This step asks you to look at each of your focal targets carefully to determine how to measure its "health" over time. And then to identify how the target is doing today and what a "healthy state" might look like. This step is the key to knowing which of your targets are most in need of immediate attention, and to measuring success over time. Addresses questions like: ♦ *"How do we define 'health' (viability) for each of our targets?"* ♦ *"What is the current status of each of our targets?"* ♦ *"What is our desired status for each of our targets?"*

4. Identify Critical Threats

This step helps you to identify the various factors that immediately affect your project's focal targets and then rank them so that you can concentrate your conservation actions where they are most needed. Addresses questions like: ♦ *"What threats are affecting our targets?"* ♦ *"Which threats are more of a problem?"*

5. Conduct Situation Analysis

This step asks you to describe your current understanding of your project situation – both the biological issues and the human context in which your project occurs. This step is not meant to be an unbounded analysis, but instead probes more deeply into the conditions surrounding your critical threats and degraded targets to bring explicit attention/consideration to causal factors, key actors, and opportunities for successful action. Addresses questions like: ♦ *"What factors positively & negatively affect our targets?"* ♦ *"Who are the key stakeholders linked to each of these factors?"*

6. Develop Strategies: Objectives and Actions

This step asks you to specifically and measurably describe what success looks like and to develop practical and *strategic* actions you and your partners will undertake to achieve it. In particular, you want to try to find the actions that will enable you to get the most impact for the resources you have. Addresses questions like: ♦ *"What do we need to accomplish?"* ♦ *"What is the most effective way to achieve these results?"*

7. Establish Measures

This step involves deciding how your project team will measure your results. This step is needed to help your team see whether its strategies are working as planned and thus whether adjustments will be needed. It is also needed to keep an eye on those targets and threats that you are not acting on at the moment, but may need to consider in the future. Addresses questions like: ♦ *"What do we need to measure to see if we are making progress towards our objectives and whether our actions are making a difference?"* ♦ *"Are there other targets or threats that we need to pay attention to?"*

8. Develop Work Plans

This step asks you to take your strategic actions and measures and develop specific plans for doing this work as your project goes forward. Addresses questions like: ♦ *"What do we specifically need to do?"* ♦ *"Who will be responsible for each task?"* ♦ *"What resources do we need?"*

9. Implement

Action and monitoring plans won't do any good sitting on the shelf – your challenge here is to trust the hard work you have done and implement your plans to the best of your ability. Implementation is the most important step in this entire process; however, given the diversity of project needs and situations, the only requirement is: ♦ *Put your plans into action*

10. Analyze, Learn, Adapt, & Share

This step first asks you to systematically take the time to evaluate the actions you have implemented, to update and refine your knowledge of your targets, and to review the results available from your monitoring data. This reflection provides insight on how your actions are working, what may need to change, and what to emphasize next. This step then asks you to document what you have learned and to share it with other people so they can benefit from your successes and failures. Addresses questions like: ♦ *"What are our monitoring data telling us about our project?"* ♦ *"What should we be doing differently?"* ♦ *"How will we capture what we have learned?"* ♦ *"How can we make sure other people benefit from what we have learned?"*

Annex 2. MBCA Stakeholders Contacted

Name	Affiliation
Resource Users	
Ussi Khamis Ussi	Chairman-Fisheries Committee-K/Mkunguni
Abasi Juma Amer	Chairman-Fisheries Committee -/K/Dimbani
Azan Mohammed Khamis	Member- Fisheries Committee - K/Mkunguni
Nassor Rajab Mwalim	Boat captain-Kizimkazi
Christian Lucas Lukosi	The Sun Rise Tours Manager
Sebastian	Jambiani Kite Center
Martien	Unguja Lodge Zanzibar
Marc Verhaegen	Fumba Water Sports, Fumba Beach Lodge Dive Instructor/ Center Manager
Eleanor Griplas	SAFARI BLUE Group -ZATI
Eric Allard	Extreme Blue Water Spearfishing Director
Makame Salum Nassor	C-weed corporation (retired DFD Director)
Johann	Owner/Manager- Zanzibar Divers Zanzibar Parasailing Team
Eleanor Carter	Sustainable Solutions & Co-Director. Chumbe Island Coral Park Founder, Director,
Khamis M. Khamis	Nakupenda Isles Safari Zanzibar
Vivian Farris	Nakupenda Isles Safari Zanzibar
Monica	Nakupenda Isles Safari Zanzibar
Dim Versluis	Kite Centre Zanzibar
Ulli Kloiber	Research director -CHICOP
Nayra Pluma	Rising Sun Dongwe
Natalia Niznik	Zanzibar Kite Paradise (Zanzibar White Sand Luxury Villas & Spa Co. Ltd.)
Helen Peeks	Director
Gary Greig	MD One Ocean
Lena Horlin	Emerson Foundation
Tonino Garou	Coastal Aviation
Julia Bishop	VC ZATI

Helen Peeks	Director ZATI
Ali Idrissa Ali	Secretary SFC Kizimkazi
Hukum Dau Hukum	Boat operator
Mtumwa Abdalla	Fishermen
Hassan R. Makame	Boat owner-operator
Juma Haji Othman	Fishermen
Suleiman Muhsin Adam	Retailer
Hamid Abdulhamid Khamis	Halmashauri Wikusini
Yussuf S Omar	Safari Blue
Christian Vaterlaus	Marine Cultures
Ali Mahmudi Ali	Marine Cultures
Abdul-Fattah Ahmad Shani	Rumba Sea Safari
Zimam Yussuf Salum	Jambiani
Kassim Ali Haji	Rumba Sea Safari
Frank David Mouel	Dive Point Zanzibar
Adam Sokolski	Dive Point Zanzibar
Hilal Khamis Ali	Hatchery
Ludovic Govenec	ScubaFish Dive Centre
Laura Rosset	ScubaFish and Under the Wave
Omar Nyange	Chumbe Island
Ulrike Kloiber	Chumbe Island
Ben Taylor	Chumbe Island
Hassan Shaaban Ali	Johari Tours
Ali Omar Mohammed	Maruhubi
Dale Gernet	One Ocean Dive Centre
Faida KH Ali	W/Mjini
Mussa R Said	WUBU
Mwanaisha M Simai	Furahia Wike

Musiafa H Mkadam	West District
The Rihlaltb	Wilaya Kati
Fadhila Suleiman	Wilaya Miini
Governance: management and regulatory entities	
Hon. Mahmoud Thabit Kombo	Minister for Information, Tourism and Heritage
Maryam J. Abdulla	MANRLF Principle Secretary
Dr. Omar Amir	Vice Principle Secretary
Musa Jumbe	DFD Director
Mohammed Chum	DFD
Abdulaziz Mussa	DFD
Nassor A. Nassor	DFD
Jaala Simba Khamis	DFD
Haji Shomari Haji	DFD- ZNZ
Mkubwa S. Khamis	DFD
Jaala Simba Khamis	DFD
Mohamed Chum Juma	DFD
Mkubwa S. Khamis	DFD (MIMCA)
Daudi H. Pandu	DFD SWIOFISH
Mchanga S. Khamis	DFD-Planning
Mwanakhamis M. Ali	DFD-Value Addition
Nafla Saleh	DFD-F/OFFICER
Makame Haji	DFD-MCS
Haji Shomari Haji	DFD-MCS Coord.
Mgeni Mohammed Faki	DFD- Statistics
Mwaka H. Abdalla	MCU
Haji Shomari Haji	MCS
Mwajuma Ali Makame	MCU
Hashim Muumin	MANRLF-SWIOFISH
Semeni Moh'd Salum	Dev. Comm SWIOFISH

Khalfani Issa Hasi	MBCA Revenue
Ussi Khamis Ussi	MBCA Chairman-Fisheries Committee-K/Mkunguni
Abasi Juma Amer	MBCA Chairman-Fisheries Committee -/K/Dimbani
Azan Mohammed Khamis	MBCA Member- Fisheries Committee - K/Mkunguni
Khamis Ussi Juma	SUZA
Nassor Seif Juma	SUZA
Aboud S. Jumbe	DOE
Farhat A. Mbarouk	DOE
Subira W. Mzee	ZEMA
Sheha Mjaja Juma	ZEMA
CDR Hussein Ali Makame	KMKM COPO
LCDR Idrissa Khamis Hamdan	KMKM

LT Abdi Simm Haji	KMKM
M/CPO Abeidi Ali Abeidi	KMKM
M/CPOI Saleh Moh'd Mahmoud	KMKM
PO Khalid Hassan Jecha	KMKM
Eng. Khalfan Hamad	Zanzibar Maritime Authority ZMA
Capt. Muslim Idd	Zanzibar Maritime Authority ZMA
Capt. Usi	Zanzibar Maritime Authority ZMA
Omar Zuberi Ismail	Oil and Gas ZPRA
Hassan Ameir Vuai	Zanzibar Commission for Tourism
Khamis Hamad Said	Head of patrol Pemba
Sharif Hamad Said	DFD Fisheries Officer
Khamis Sharif Haji	Secretary EX:Co
Bi. Maryam Keis	Section head Ofisi ya raisi Tawala za Mikoa na vikosi vya SMZ (PORAG)
Bi. Masika Rajabu	Afisa Mipango Ofisi ya raisi Tawala za Mikoa na vikosi vya SMZ (PORAG)
Bw. Ali Shauri	Afisa Rasilimali watu katika mamlaka ya serikali za mitaa
Aly Mwalim Mahfoudh	DFO
Haji Mtego Hassan	Ofisi Ya Wilayakisi

Khamis Bai Khamis	West A
Mohammed Soud	DFD
Ibbi Omar Khamis	M/Kiti
Aly Mwalim Mahfoudh	DFO
Ashura Mwinyi Mwinshehe	WUBU
Feisal B Mussa	Makupenda
Zimam Yussuf Salum	Wahi
Said Shaib Said	DMC
Mohammed Omar Juma	DMC
Mwaka Haji Agdalla	DMC
Shibli Miwita Haji	CHABAMCA
Mininyi M Mininyi	ID UHIFADHI
Haji J Haji	West B District
Wahida Juma Muhidin	DC Office South
Hamid Abdulhamid Khamis	Halmashauri Wikusini
Omar Hakim Foum	DMC
Sharifa M Miraji	DFD
Khamis A Khamis	DFD
Ali A Ali	SWIOFISH
Sharah Jaffar	SWIOFISH
Mohammed Said Khamis	SWIOFISH
Sharah Jaffar	SWIOFISH
Silimn Ich Icifirn	SWIOFISH
Khamis Hassan Hayi	Utalis
Salma Sururu	SWIOFISH
Mwaka Haji Agdalla	DMC
Key informants: specialist skills and expertise	
Dr Per Berggren	Marine MEGAfauna Lab, Newcastle University Marine mammal expert
Dr Gill Braulik	St Andrews University, Scotland Sea Mammals Research Unit

Tanguy Nicolas	**Programme Manager (Marine), Africa Fauna and Flora International**
Lorna Slade	**Mwambao**
Fatma A. Khamis	**Mwambao**
Danielle Stem	**Mwambao**
Nuru Salum	**Mwambao**
Ali Thani	**MCCC**
Michael Markovina	**WCS**
Bakari Asseid	**Retired Principal Secretary**
Graham Stewart Leslie	**CEO- Heritage Tourism Conservation Regeneration**
David Meyers	**Conservation Finance Alliance Exec Dir CF Alliance**
N S Jiddawi	**WIOMSA**
Felicity Pike	**WIMS**
Eleanor Carter	**CHICOP**
Ulli	**CHICOP**
Sibylle Riedmiller	**CHICOP**

MBCA GMP

MENAI BAY CONSERVATION AREA

GENERAL MANAGEMENT PLAN 2022–2032

Prepared for
Ministry of Blue Economy and Fisheries, Zanzibar
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