

Mnemba Island-Chwaka Bay Marine Conservation Area (MIMCA)



Draft General Management Plan

Revised October 2010



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ACRONYMS

CBD	Convention on Biological Diversity
COLE	Commission for Land and Environment
CNR	Commission for Natural Resources
CORDIO	Coral Reef Degradation in Indian Ocean
DCCFF	Department of Commercial Crops, Fruits and Forestry
DFMR	Department of Fisheries and Marine Resources
DoE	Department of Environment
EAME	Eastern African Marine Ecoregion
EDG	Environment Development Group
EIA	Environmental Impact Assessment
GEF	Global Environment Facility
GMP	General Management Plan
ICM	Integrated Coastal Management
IMS	Institute of Marine Science
IUCN	The World Conservation Union
M&E	Monitoring and Evaluation
MACEMP	Marine and Coastal Environment Management Project
MANREC	Ministry of Agriculture, Natural Resources, Environment and Cooperatives
MPA	Marine Protected Area
MSRASD	Ministry of State for Regional Administrative and Special Departments
NGO	Non Governmental Organization
PRS	Poverty Reduction Strategy
SEA	Strategic Environmental Assessment
SMOLE	Sustainable Management of Land and the Environment
ToR	Terms of Reference
UNDP	United Nations Development Programme
URT	United Republic of Tanzania
VCC	Village Conservation Committee
WIO	Western Indian Ocean
WWF	World Wildlife Fund

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The major coordination role in the development of this General Management plan was carried out by the Department of Fisheries and Marine Resources of the Ministry of Agriculture, Livestock and Environment.

Recognition is herein made, of the consultants whose planned consultations, field observations and expert inputs facilitated the production of this document.

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EXECUTIVE SUMMARY

Mnemba is a small island off the northern tip of Unguja Island which is essentially part of a coral atoll formation supporting important marine life. Following the thirty-three year renewable lease of the island for private tourism development in 1989, the Mnemba Island Marine Conservation Area (MIMCA) was established in 2002 to protect its natural systems. Conflicts of interest have however, existed between the fishers that have traditionally used the area and tourism practitioners. Fishers and conservation officials have furthermore reported damage in some areas of the coral reef, citing the recent tsunami and destructive fishing gears as possible causes. An assessment of the damage was carried out objectively and recommendations were made for necessary actions.

The setting up of MIMCA is provided for under section 7(1) and (32) of the Fisheries Act No. 8 of 1988. The area was officially gazetted as conservation area by an order published in the legal supplement (part II) of the Zanzibar Government Gazette vol. CXI 5974 No. 68 of 22 November 2002. The MIMCA is administered and managed by the Department of Fisheries and Marine Resources Zanzibar within the Ministry of Agriculture, Livestock, and Environment. The activities in the conservation area are fishing, seaweed farming, harvesting of mangrove forest resources and marketing of marine resources.

Fishing activities in the conservation area is carried out by using traditional fishing vessels like dugout canoes, outrigger canoes, sail boats etc which are the dominant vessels (90%). Common gears in use are gillnets, hand-lines and traps. However, spear-guns are also used (Hoekstra et al, 1989) even though they are illegal. Coral fish fishery and octopus fishing are by far the most important fisheries within the conservation area, but sea-cucumber and pelagic fish fishery also provide a significant income to the community.

Sea-weed farming which has developed into a major foreign currency earner is conducted in the coast line within the four villages involved in the conservation area with support from the Department of Fisheries and Marine Resources and private owned companies.

Marine resources along the coast of Mnemba Island has always provided both food and cash income. Traditionally, fish are sold fresh within the area or transported to Zanzibar town where markets are more attractive. Private companies purchase seaweed products directly from communities in the conservation area. Before, these companies provided farm inputs and in turn farmers sell their products to them. However, this system has been changed and the farmer can sell his/her products to any company.

There have been tourism operations around the Mnemba Island, at least since 1994. Tourists engage in a variety of activities which include swimming, diving, snorkeling, sport fishing, bird watching etc. The main problem has often been user conflicts in the conservation area, whereby tourists and local fishers compete for use of the same ecological areas characterized with attractive coral reef ecosystem and rich in biodiversity.

This is the first general management plan for the MIMCA. Recent changes in the environment and natural resources management have prompted the need for a strategic document to guide management decision-making and to better define the mission, goals, objective and strategies for the MIMCA. The document has been prepared in close consultation with the management of MIMCA and a considerable number of stakeholders and stakeholder group representatives. The document identifies the major existing and potential threats and issues facing the conservation area from ecological, social and cultural perspective. The plan specifies management goals and strategies for the MIMCA related to the conservation needs. It is also designed to provide a framework for adaptive management.

Table 1. How to use the MIMCA GMP

This management plan has been designed to be a dynamic document, accessible via hard copy, electronic copy and relevant websites. It should be kept up to date with additional material to allow adaptive management as situations and issues change during consultations and implementation. The content and purpose of each part is given below:

Part 1: Background Information and description of the area

The historical background of MIMCA is presented in section one of the general management plan. Additional information is given on the need for the GMP. Approaches to the report which are based on participatory, partnership and sustainability are described together with detailed methodology to capture and analyze pertinent data and information.

Part I emphasizes on the GMP development and its importance for MIMCA which has been done through active consultations with stakeholders.

It also describes the physical and biological features within the area as well as socio-economic and cultural values within and along MIMCA. Those using the management plan may refer to the information and data for research and development focus on key resources.

Part II: Management Issues, Strategies and Actions

This is the second part of the working document which states mission, goal and objectives of the GMP. It also presents key management issues and problems with regard to resource use in the area and translate them into management strategies and actions. This part has also provides information on the identified areas for zoning (core, specific and general zones) which have been done through resources survey, GIS and remote sensing.

Part II will be of interest to those wishing to develop a more in depth understanding of concerns and issues facing the MIMCA.

This part is of concern to those with an interest in the MIMCA zoning plan and the rationale behind the identification of those areas for zoning.

Part III: Governance, Compliance, Monitoring and Management Guide

Part III is of concern to those with an interest in the MIMCA governance, internal resources monitoring and management guide to be implemented.

Governance in terms of policies, legal and institutional frameworks are presented and the GMP is implemented in compliance with the policies, regulations and frameworks. Monitoring and evaluation of GMP are presented for effective implementation of GMP.

This part also includes activities prohibited in MIMCA and by activities which are regulated as part of the plan implementation.

Part III is to guide the management and stakeholders in implementation of GMP and use and extraction of resources within the conservation area.

1. BACKGROUND INFORMATION

1.1 LOCATION AND AREA

The east coast of Unguja Island stretches from Ras Nungwi in the north to Makunduchi in the south (see Fig 1). It is a relatively straight coastline interrupted only by the elongated Michamvi Peninsula that protrudes in a south-north direction to form the outer barrier of Chwaka Bay, a shallow water body opening northwards into the open ocean. Chwaka Bay supports the largest single area of mangrove forest in Zanzibar and includes other coastal habitats such as seagrass beds and mudflats. The coastline on the east side of Unguja is flanked along most of its length by sandy beaches and a fringing reef of coral that shelters mostly shallow lagoons on the landward side.

Mnemba Island is located approximately 400 m off the northeast coast of Unguja near the villages of Kijini, MUYUNI and Matemwe. The island has a surface area of 9.9 ha and is part

of a coral atoll formation of 150 ha. It is positioned toward the west side of the atoll system, while to the west a 100 m deep channel separates the island from the main island of Unguja. More specifically, Mnemba Island is located inside a coral atoll formation that supports a vast array of reef fish and other marine life. It is the only island off the east coast of Unguja, located off the northeastern side. Along this coastline of Unguja, only the Mnemba Atoll, the Kiwengwa reefs, and part of the Chwaka mangroves and adjoining Jozani Forest are legally protected. Mnemba Island and Chwaka Bay Marine Conservation Area (MIMCA) was gazetted in 2002 to protect the entire atoll including a private area concession. Jozani-Chwaka Bay National Park was established in 2004 under the mandate of the Department of Commercial Crops, Fruits and Forestry (DCCFF). The setting up of MIMCA is provided for under section 7(1) and (32) of the Fisheries Act No. 8 of 1988. The area was officially gazetted as conservation area by an order published in the legal supplement (part II) of the Zanzibar Government Gazette vol. CXI 5974 No. 68 of 22 November 2002. The MIMCA is administered and managed by the Department of Fisheries and Marine Resources Zanzibar within the Ministry of Agriculture, Livestock, and Environment.

The main villages bordering MIMCA are Mangapwani, Matemwe (Kijini, Kigomani, Ndizi, Mnazi Mrefu, Kilima Juu), Pwani Mchangani, Kiwengwa (Cairo, Kumba Urembo), Pongwe, Ndudu Kubwa, Uroa, Dikoni, Marumbi and Chwaka.

1.2 History of MIMCA

The idea of establishing a Marine Conservation Area at Mnemba Island began in the early 2000, primarily to address the then almost rampant disputes between local artisanal fishers along the coast and tourist investors. Mnemba Island as part of a local atoll formation supports a vast array of reef fish and other marine life. The reefs attract local fisherman from Zanzibar who exploit considerable quantities of fish providing food and income for the local community. The area also attracts a great number of tourists who come to the area from virtually all over the world for recreation purposes.

The Department of Fisheries and Marine Resources, in consultation with local fishers, investors and other stakeholders concerning the marine resource-use conflicts around the Mnemba Island area, concluded that the best solution was to declare it as a marine conservation area. Considerations were based on the fact that the area is one of the favorite tourist destinations adding to the country's economy while also contributing significantly towards the economic wellbeing of the local communities close to the area through artisanal fisheries, tourist business employment and ready market for their fishery products. The conservation idea was conceived with rational utilization of the resources in order to enhance the area's unique ecosystem and biodiversity richness.



Figure 1. Map of Unguja Island showing location and boundary of MIMCA

In 1995 the Jozani-Chwaka Bay Conservation Project was established between the Commission for Natural Resources and CARE Tanzania. Initially, a Forest Reserve established in 1996, as protected area in Jozani, has been extended to include part of the mangrove area of Chwaka Bay that adjoins the forest in the north. The Jozani-Chwaka Bay Conservation Area has been upgraded to National Park in 2004 and consists of a core protected area of 56 km² and buffer in excess of 80 km. However, only the immediate mangrove area north of Jozani is included in the national park, extending eastward to the Jozani-Charawe road. Since the creation of the protected area, the roads on the west coast of the park have started to disappear as they are decreasingly used for exploitation of mangroves. Initiatives have been implemented under the Jozani-Chwaka Bay Conservation

Area management to plant mangroves in badly degraded areas. The southern and western shores of the bay remain, however, largely unprotected.

Undoubtedly the Mnemba Atoll is under extreme pressure. Large numbers of people that live in abject poverty populate the villages on the main island that are located immediately across from the lagoon. To the south of Chwaka Bay, Jozani Forest is the largest area of near natural vegetation on Unguja Island representing the vegetation types that were once common throughout the area. Jozani is also part of a larger biodiversity hotspot, the Eastern Arc Mountains and Coastal Forests, which runs along the coasts of Tanzania and Kenya and includes Zanzibar. South of Jozani Forest along the road to Muungoni and Makunduchi, a mangrove stand in Pete marks the northern border of Menai Bay Conservation Area. Seven species of mangrove can be found there and less intensively cut than, for example, the nearby stands of Unguja Ukuu and Uzi. The Pete mangrove stand serves as a feeding ground and probably also a nursery ground for some species of fish. These mangroves interact also with the terrestrial habitats, as red colobus and possibly other small mammals from the The Jozani Wetland was considered in the EAME workshop as a unique wetland forest on porous coral base with high endemism and with a likely link to the marine system through groundwater flow. This important area has been recognised as an Important Bird Area (IBA) by Bird International meeting the criteria for a Ramsar site. It has further been identified as an area of likely importance in the wetlands group that could merit World Heritage listing although information has been considered insufficient. The Jozani Wetland was considered in the EAME workshop as a unique wetland forest on porous coral base with high endemism and with a likely link to the marine system through groundwater flow. This important area has been recognized as an Important Bird Area (IBA) by Bird International, meeting the criteria for a Ramsar site. It has further been identified as an area of likely importance in the wetlands group that could merit World Heritage listing although information has been considered insufficient. Jozani Chwaka Bay figures on Tanzania's Tentative List for World Heritage Sites (WHS). In addition to its natural values, there are a number of shrines, caves and graves that are important in maintaining village culture.

Along the east coast of Unguja, between MIMCA and Chwaka Bay, there is a long stretch of coast that is the target of an already huge but ever growing tourism industry. The main villages and towns along this stretch are (from north to south) Matemwe (Kijini, Kigomani, Ndizi, Mnazi Mrefu, Kilima Juu), Pwani Mchangani, Kiwengwa (Cairo, Kumba Urembo), Pongwe, Ndudu Kubwa, Uroa, Dikoni, Marumbi and Chwaka.

1.3 Why a General Management Plan

This general management plan, (GMP) has been prepared to guide, the management and development of MIMCA for at least the next five years.

This management plan is the principal guiding document for the marine conservation area that aims at providing a strategy framework for long term conservation and sustainable development; more specifically to:

- Raise awareness to the local communities on importance of marine resources ecosystem and environmental friendly activities for the sustainable livelihood.
- Identify the key elements of the marine conservation area that make it a site of national and international significance.
- Identify alternative income generating activities to relieve pressure on marine resources and over exploitation.
- Articulate threats to the marine resources and other issues relating to management.

- Outline strategies to minimize these threats.
- Develop a framework for working in collaboration with local communities and other stakeholders to develop sustainable resource use.
- Provide a framework to work with local government authorities, and tourist operators, to minimize negative environmental and social impacts.

1.3.1 Target audience of the GMP

This general management plan is intended to be used as a broadly accessible document that will, in a transparent manner inform and guide all interested parties of the concept and strategies behind the management of the marine conservation area. The plan is designed to be used by:

- Department of fisheries and marine resources staff in Zanzibar.
- Other government staff involved in the management of marine conservation area in Zanzibar.
- Local communities
- Investors in Mnemba Island area, including tourist operators and artisanal fishers.
- Researchers, scientist and other technical experts working in related fields.
- People involved in marine conservation area management around the world.
- Visitors to Mnemba Island Marine Conservation Area, with particular interest in conservation and development issues.

1.4 Approach and Methodology

The approach and methodology used involved undertaking both desk and field studies, whereby for desk studies search and collection of relevant literature was conducted and review done. For field work, diving, reconnaissance surveys and consultations with stakeholders were carried out.

1.4.1 Approach

Participatory

A participatory approach for development of the GMP of MIMCA was adopted by involving all stakeholders. This involved seeking information/experiences, not only from the key stakeholders, i.e., the communities who are the key actors in the implementation of GMP but also from government institutions, NGOs and private sectors who are directly and indirectly involved in coastal and marine resources use and management.

Partnership

There is always the need to establish networking partnerships (where none exist) and/or improve networking partnerships (where they already exist). In the course of undertaking the development of GMP, a close working collaboration was established with DFMR in particular, the conservation area's management team (MCAs managers and their staff) and its coordination unit (MCU). The joint team utilized the opportunity to assist in the establishment of networking partnerships among the groups of stakeholders. Throughout the project, the consultant interacted and discussed work progress and forward planning with the core team from DFMR.

Sustainability

Sustainable development offers an alternative to conventional development of coastal and marine resources. The study was conducted and made operational in a way ensuring sustainability in line with MIMCA vision, mission and goals.

1.4.2 Methodology

The GMP was accomplished largely through meetings, field interviews and surveys, telephone conversations, community outreach and written communications.

Consultations

Stakeholder consultations and literature review were the main methods used in the GMP development. A preliminary review of the available information on the MIMCA and related literature, which included legislations and national and international policies was done. The GMP drafted in 2002 was carefully read and pertinent baseline information was captured. The report helped to identify areas where further information would be needed in order to identify areas of focus for the GMP report. Furthermore, the review helped to identify key stakeholders.

A consultation and communication plan was developed in which the first step was to consult DFMR and MIMCA management team in Zanzibar prior to visiting several villages within the conservation area. The area visit was vital in order to see its location, its new boundaries, assess the marine resources, coastal areas, mangroves in the area and other physical features in order to gauge the issues and zoning that are likely to be of interest in the GMP. Alongside field consultations, the team obtained additional secondary literature relevant to the development of GMP in MIMCA. Besides consultations, several meetings were held with management of MIMCA, DFMRs staff and government and non-government stakeholders were visited together with formal and informal meetings.

A participatory approach was used for discussions with communities in the MIMCA, in the process of identifying key issues and threats that can be associated with the GMP. The information obtained was used to identify issues of concern, define objectives and management strategies. The study team undertook an open and transparent consultation process to ensure that the views of communities and stakeholders were fully incorporated in the GMP. A more detailed description of the key stakeholders and consultations held are presented in Chapter 3.

2.0 PHYSICAL FEATURES AND PROCESSES

2.1 Climate

The MBCA enjoys the Zanzibar's climate, which is tropical under the changing influence of the seasonally changing monsoon winds of the Indian Ocean. Two distinct monsoon periods occur, the Northeast monsoon (Kasikazi) which prevails from November to February and the Southeast monsoon that blows from April to October (Kusi). In between the changing monsoons there is an intermediate easterly wind (Matlai). The Northeast monsoon is characterized by higher air temperatures ($> 30^{\circ}\text{C}$) and weaker winds while the Southeast monsoon is marked by lower air temperatures (approximately 25°C) as well as stronger winds and rough seas (UNEP, 2001). As a result of stronger winds and rough sea, small fishing crafts like dugout canoes cannot be used during this time. Reverse weather conditions dominate between December and March during the north-east monsoons (Kasikazi) and at this time, the area becomes attractive to visiting fishers and other alike visitors.

2.2 Geomorphology

Mnemba Island is believed to be the remnant of a once larger island, and is surrounded by a ring of a coral reefs to take the form of a coral atoll (hence the conserved area). Another

theory behind the formation of the atoll is that an isolation patch of reef simply grew larger over time, with eroded coral reef fragments accumulation in raised sand clay. The center of the patch reef gradually died as water circulation was restricted to form the present day lagoon.

2.2.1 Bathymetry

Mnemba Atoll is separated from the main Island of Unguja on the Western side by a water current with a depth not less than 100m.

2.3 Oceanography

2.3.1 Winds and currents

The climate of MIMCA follows that of Unguja in general, which is generally tropical and maritime, with influence of monsoon winds (Poyry, 1987). It is influenced by two monsoons namely, the North-east monsoon winds (Kaskazi) blowing from November-March, and the South-east monsoon winds (Kusi), blowing from April-Aug. There is an intermediate easterly wind (matlai) during Sep-Oct. The main rain season (*masika*) occurs between March and May. The short rains (*vuli*), usually starts in October and ends in December. However, some inter-monsoonal precipitations take place. Records show that only about one fifth of the total rains fall in this season (Poyry, 1987, NCDP, 1980). It is therefore estimated that the conservation area, experiences an average of 1,800mm of rainfall during the long rainy season and an average of 1,500 mm. during the short rainy season.

The monsoon winds influence temperature and sea conditions. In places, the North East Monsoon winds influence velocity causing rougher ocean conditions and cooler temperature conditions whereas the South East Monsoon winds influence warmer temperature conditions and low ocean turbulence.

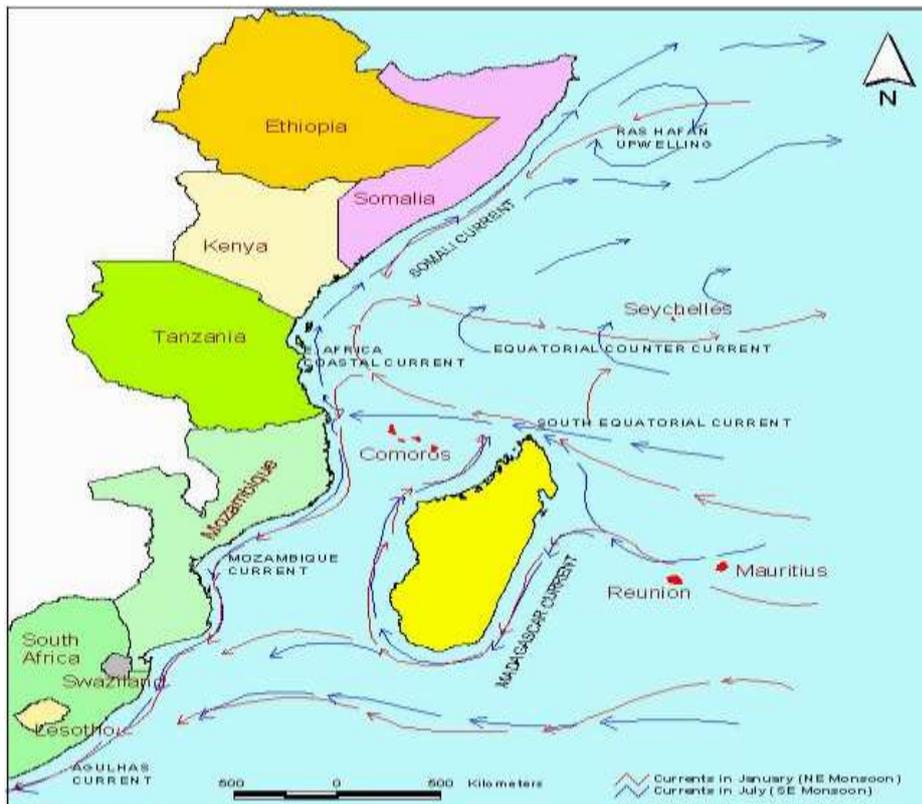


Figure 2. Main currents influencing MIMCA

2.3.2 Temperature

Temperature variation throughout the year is however low. The warmest months are December to March, with daily temperatures ranging from 24°C - 31°C. The coolest month is July with daily temperatures ranging from 20°C - 27°C. Temperature regime rarely exceeds 33 °C, or drops below 20°C.

3.0 BIOLOGICAL FEATURES

3.1 Flora

3.1.1 Mangroves

The study sponsored by MACEMP (Mushi, 2009) for mangrove inventory in Zanzibar indicated that in the general density analysis of different management units, Kinazini-Maruhubi Management Unit is the densest stand with a density of 2578.203 mature trees per ha. Chwaka bay, with a density of 2465.878 trees per ha. becomes the second. The Chwaka Bay mangrove forest is located in the central district of the South region of Unguja Island, about 30km from Zanzibar town. The area to be studied includes the designated four Management Units of Mapopwe, Charawe, Ukongoroni and Michamvi. These management units are divided basing on existing natural boundaries such as fossil boulders and footpaths and named according to the closest convenient land locality, e.g village name.

3.1.2 Seagrasses

Seagrasses cover extensive areas of Chwaka Bay, intermixed with different species of algae and providing feeding space, breeding grounds and shelter to a wide range of marine organisms including sea turtles. Chwaka Bay has been considered a priority subregion in terms of seagrass sponge community in the Eastern African Marine Ecoregion (EAME). The following genera namely, *Halodule*, *Cymodocea*, *Thalassia*, *Syringodium*, and *Thalassodendron* are most common. Others are *Zostrea*, *Enhalus* and *Halophila*.

3.1.3 Macroalgae (Seaweeds)

No significant quantities of macro-algae were observed in any of the dive sites at MIMCA.

Seaweeds (otherwise known as marine macroalgae) are found in plenty in the littoral zone, down to the levels of the sub-littoral zones where there is sun light penetration. Not less than 34 species of sea-weeds are found in the area, including the commercially cultivated species of *Eucheuma* spp. They appear in a diverse array of forms from branching to soft encrusting types on rock surfaces. As well as being primary producers, they also provide critical habitat for a variety of organisms. They are classified under four divisions, namely **Chlorophyta**-Green Algae (*Ulva*, *Enteromorpha*, *Caulerpa*, *Halimeda*); **Phaeophyta**- Brown Algae (*Dictyota*, *Turbinaria*, *Sargassum*); **Rhodophyta**—Red Algae (*Galaxaura*, *Gracilaria*, *Hypnea*, *Eucheuma*). Some of the species including *Eucheuma* are farmed and exported for extracts which are used in the food and medical industries.

3.2 Fauna

In common with other marine turtles, the Green Turtle (*Chelonia mydas*) are commonly found on Mnemba Island and their nesting sites are scattered along the western coast of the

island, on sandy beaches. The common bird fauna on the island include red eyed doves, which breed on Mnemba, but feed on other parts of Zanzibar, while ducks are also abundant on the vegetation around the island. At the high tide, flocks of migratory wading birds (crab Plover, order Charadriiformes) which is one of the most sought after birds by bird watchers, can be seen gathered together on sand bars at Mnemba. Few bird species are resident on the Island, although Paradise Flycatcher, Africa Reed Warbler and Purplebanded, Sunbird, breed on Mnemba, and Mangrove Kingfisher is occasional. Black Kites are often seen soaring over head and raid the nest of the doves.

Ghost crab (*Ocypode madagascariensis*), which burrow up to a meter deep, and which is active during the day, can be seen scurrying back and forth across the beach at Mnemba.

There is a variety of fish species, found in the reef incorporated within the Conserved area, research has shown there is more than 180 species, (57 families) found in the water, the common fish families found in the area includes, Emperors, Parrot fish, Goat fish, Snappers, Groupers, Trigger fish, and Fusiliers. Octopus is however the most harvested species in the area. Beyond the outer fringe and drop-off of the reefs, within the conserved area, the open sea is home to a host of pelagic fish and marine mammals. The Sperm Whale and Humpback Whale, regularly move through these waters on their migratory routes to and from the South Pole. More commonly encountered are the Striped, Spinner and Bottlenose Dolphins, which are resident of Africa's east coast throughout the year, although they are subject to movements in response to the shoaling fish on which they prey. Whale shark is regularly encountered between December and April, while the White-tip Shark is most common around the reef wall. Manta Ray and Devil Ray are seen close to reef drop-offs or the sea bed.

A host of large predatory fish occurs in the open sea. Among those, commonly encountered are various species of Barracuda, Mackerel, Kingfish, Sailfish and Marlin.

A number of invertebrate species are found in the area, for instance, cowries, mussels, crown shell, oysters, etc. Sea cucumbers, sea slugs, are also found in the sea.

On the southern part of Mnemba Island, 10 species of hard corals are found, while 35 species and 28 species are found on the north and middle part of the Island respectively.

3.2.1 Fishes

The northern and south-eastern sides of the Mnemba reef exhibited the greatest variety of fish species in a 1990 survey. The IMS has recorded 226 species of fish in 2005. The common fish families found in the area includes, Emperors, Parrot fish, Goat fish, Snappers, Groupers, Trigger fish, and Fusiliers. Octopus is however the most harvested species in the area. Beyond the outer fringe and drop-off of the reefs, within the conserved area, the open sea is home to a host of pelagic fish and marine mammals. A host of large predatory fish occurs in the open sea. Among those, commonly encountered are various species of Barracuda, Mackerel, Kingfish, Sailfish and Marlin. There is an abundance of fish species associated with the mangroves in Chwaka Bay, including Milkfish (*Chanos chanos*), Rabbit fishes (*Siganus sp.*), Parrot fish as well as crabs such as *Scylla serrata* of considerable fishery potential, and the large numbers of various types of fish larvae that can be found reveal the importance of the bay to the local fisheries.

Indicator fish

Even though all the three families of indicator species were recorded in every site the numbers were generally low (Table 2). However other families and species of fish were

observed in abundance in all the three sites at Mnemba atoll especially at Kichwani where snappers, fusiliers and goat fish were seen in schools of thousands. Whereas the sites off Nungwi had a wide variety of ‘exotic’ species that included sea horses, leaf fish, ghost pipefish, napoleon wrasse etc.

Table 2. Indicator fish species in MIMCA

Dive Site	Angel fish	Parrot fish	Trigger fish
Coral garden	15	8	8
Kichwani	10	7	3
Shein	12	5	3
Kichafi	15	4	13

Sources: Marine Resources Assessment Report, 2010

3.2.2 Sea turtles

In common with other marine turtles, the Green Turtle (*Chelonia mydas*) are commonly found on Mnemba Island and their nesting sites are scattered along the western coast of the island, on sandy beaches. UNEP the northeast coast of Unguja reported 30 nesting females in Mnemba Island and in a 2002 survey under the Sea Turtle Nest Recording Programme Mnemba was among the beaches with highest density of nests, together with Matemwe and Muungoni. Green turtles have been reported in the Chwaka Bay, with nesting beaches existing along much of the shore.

3.2.3 Marine mammals

The sperm whale and humpback whale, regularly move through these waters on their migratory routes to and from the South Pole. Common species of dolphins encountered in MIMCA are spinner, Indo-Pacific bottlenose, Indo-Pacific humpback, spotted and Risso’s dolphins. Entanglement in fishing gear is a major concern for the humpback whales, Indo-Pacific bottlenose, Indo-Pacific humpback, spinner, spotted and Risso’s dolphins in this area: More than 20 incidents with destroyed fishing nets and entanglements of humpback whales are reported every year in this area. It has been reported that the annual bycatch of dolphins was more than 50 individual animals between 1990 and 1995 (Amir et al. 2005). All of these dolphins were killed in gill-net fisheries.

3.2.4 Birds

The common bird fauna on the island include red eyed doves, which breed on Mnemba, but fed on other parts of Zanzibar, while duikers are also abundant on the vegetation around the island. At the high tide, flocks of migratory wading birds (crab Plover, order Charadriiformes) which is one of the most sought after birds by bird watchers, can be seen gathered together on sand bars at Mnemba. Few bird species are resident on the Island, although Paradise Flycatcher, Africa Reed Warbler and Purplebanded, Sunbird, breed on Mnemba, and Mangrove Kingfisher is occasional. Black Kites are often seen soaring over

head and raid the nest of the doves. Birds include three endemic races (*Tauraco fischeri zanzibaricus*, *Andropadus virens zanzibaricus* and *Nectarinia veroxii zanzibarica*), plus a fourth species (*Nectarina olivacea granti*) that is shared with Pemba Island and a fifth (*Cercotrichas quadrivirgata greenwayi*) that is shared with Mafia Island.

3.3 Invertebrates

3.3.1 Coral reefs

The island is surrounded by a ring of extensive hard coral formations in a variety of exposures that increases habitat diversity. A shallow lagoon on the inside of the atoll varies from a metre deep at low tide to several metres at high tide, while the reef face has shelves, submarine terraces and walls with steep slopes. Coral species diversity is greatest around the outer reef slopes. A 1990 survey found *Porites*, *Acropora*, *Stylophora*, *Pocillopora*, and *Favites* to be the five most dominant coral genera in Mnemba Island. More recent research concluded that the Mnemba Atoll had the highest species diversity among the reefs in the northern part of Unguja (including Mnemba Island, Nungwi, and Tumbatu). A total of 36 hard coral genera were recorded by the IMS/SUZA team in 2005, the most dominant being *Porites*, *Goniastrea* and *Astreopora* and the highest density found at Kinani and Mnemba coral garden. The sub-tidal habitat around the conserved area contains coral reefs that are in good condition; however there are some parts that have been damaged, especially in the Northern reefs of the island, which are thought to be caused by illegal fishing practices and over fishing.

The southern parts of the Island have 10 of hard coral species, 35 in the Northern side, whilst the middle part of the island has 28 species.

A total of five sites were surveyed within Mnemba Island Conservation Area (MIMCA). Three sites were dived at the Mnemba atoll and two sites just off Nungwi. The Coral garden and Kichwani sites are already established tourist destination but the dives at Mlango Mkuu, Shein reef and Kichafi included evaluation of their tourism potential.

Without the inclusion of the Mlango Mkuu site (which was a deep dive and hence coral growth was virtually nonexistent) the average hard coral cover for the remainder of the sites was 15%. However the 2% hard coral cover at naturally rocky Kichwani skewed the average. Coral garden showed the highest percentage with 24% followed by Shein reef with 22%. Hard coral cover for Kichafi was 13% but together with Shein reef it was dominated by soft coral (60% and 57% respectively) whereas that of Coral garden had a 57% rock cover.

42 genera of hard corals were recorded within MIMCA with Kichafi having the most genera with 29 closely followed by Shein with 28. 25 genera were observed at Coral garden and only 15 genera were recorded at Kichwani.

The surveyed reefs at the Mnemba atoll are naturally rocky and therefore the low hard coral cover should not necessarily be taken as a sign of stress. However, the coral garden reef is an exception as it is a shallow reef on the less rocky side of the atoll and its low hard coral cover should be translated as a sign of stress. Being under Mnemba island management no fishing is taking place on the reef and possible anthropogenic stress should be coming from recreational activities. The reef is a popular snorkelling destination and number of visitors might be over its carrying capacity. Furthermore there are no mooring buoys around the area indicating a high possibility of anchor damage.

Even though the numbers of indicator species were generally low the large numbers of other fish species seen around the sites indicate MIMCA is not experiencing the worst cases of overfishing and with good management the area can continue to cater for both fishermen and tourists.

In order to avoid user conflict it is crucial to zone the Mnemba atoll. Kichwani and Coral garden should become no take areas while the area to the north of the atoll should be used for sustainable fisheries activities. It is also important that mooring buoys be installed at these sites. Additionally, studies that will determine the carrying capacity of the reefs must be conducted and as a result, the number of visitors be regulated. The Shein reef, Kichafi and Mlanguu mkuu sites have good tourism potential and should be promoted as diving sites. And both Kichafi and Shein reef should be zoned as no take areas.

Hard corals

Without the inclusion of the Mlango Mkuu site (which was a deep dive and hence coral growth was virtually nonexistent) the average hard coral cover for the remainder of the sites was 15%. However the site at Kichwani is naturally rocky and its 2% hard coral cover skewed the average. Without its inclusion the average of the three remaining sites was 20% with coral garden having the highest percentage with 24% followed by Shein reef with 22%. Hard coral cover for Kichafi was 13%. Both the Kichwani and Kichafi reefs were dominated by soft corals (60% and 57% respectively) whereas that of Coral garden had a 57% rock cover.

A total of 42 genera of hard corals were recorded within MIMCA with Kichafi having the most genera with 29 closely followed by Shein with 28. 25 genera were observed at Coral garden and only 15 genera were recorded at Kichwani. Out of the total, 6 genera were only observed at Shein, 3 only at Kichafi, 2 at Kichwani and another 3 only at Coral garden.

The southern part of the Island have 10 of hard corals, and 35 species of a coral are found in the Northern side, whilst the middle part of the island contain 28 species of coral.

3.3.2 Other invertebrates

The inter-tidal area contains of a diverse species of sea cucumbers, mollusks and other invertebrate fauna, e.g. Mussels, Oysters, and Octopus etc. as well as different shell species, soft corals and sea grasses.

Ghost crab (*Ocypode madagascariensis*), which burrow up to a meter deep, and which is active during the day, can be seen scurrying back and forth across the beach at Mnemba. A number of invertebrate species are found in the area, for instance, cowries, mussels, crown shell, oysters, etc. Sea cucumbers, sea slugs, are also found in MIMCA.

4.0 SOCIO-ECONOMIC VALUES

4.1 Administrative Boundaries

Mnemba Island is located 400m off the northeast coast of main island of Zanzibar namely Unguja, in North "A" District about 33 mile to the northeast of Zanzibar Town near the

villages of Kijini, Muyuni and Matemwe.. The island has a surface area of 9.9 ha and is part of a coral Atoll formation of 150 ha. It is positioned toward the west side of the atoll system, while to the west a 100 m deep channel separates the island from the mainland of Unguja. The northern and south-eastern sides of the Mnemba reef exhibited the greatest variety of fish species and other marine life. The island is also an important nesting ground for sea turtles specifically green turtles. There is no fishing protected area zone that extends 200 meters offshore surrounding the island. The island is very popular tourist destination through Mnemba Island Lodge that is currently managed by South African Company, the Conservation Corporation Africa (CCA) who operates tourist hotel/lodges throughout southern and eastern Africa.

Chakwa Bay is located south of Mnemba Island, 34 km East of Zanzibar Town in the main island Unguja. The Bay is enclosed between Unguja's mainland and the Michamvi Peninsula, opening up to the north. This is a shallow water open bay that supports on its southern shores the largest area of mangrove forest in Zanzibar. The Bay covers an area from 20-50km² at low and high water surrounded by 7 villages with a population of 9,100 people (census 2002). There is a limestone reef in the south covered by a dense mangrove forest with an area of about 3,000ha on the seaward side, immediately adjacent to the forest, the bay opens up to large intertidal flats that are covered by a mixed assemblage of sea grasses and algae. Beyond that a coral reef, which is part of the extensive reef fringing the coast of east coast of the island. The Bay forms an important ecological linkage between the marine and terrestrial ecosystem of Jozani forest. Jozani forest which was declared a reserve in 1960 and later upgraded to into a National Park has a 5,000 ha, connecting the Chwaka Bay mangrove to provide a legal base for protection, especially from wood cutting.

4.2 Demography Profile

There are 4 villages/fishing communities, which depend entirely on the conserved area fisheries, for their livelihood. These villages are Nungwi, Kijini, Matemwe and Pwani Mchangani. The Zanzibar national census figures, of 2002 estimate a total population of 20,075, of which 9,821 were males and 10,254 females. However some other villages have been included in the conservation area. The table below shows the population distribution in the area

Population density and human settlement frequency along the east coast of Unguja are somewhat lower than along the west coast and decrease from north to south. Mainly characterized by coral rag, with pockets of shallow, fertile soil, the main sources of income in the eastern area come from the sale of own crops, fish and seaweed. The local communities living along the coast rely almost entirely on the sea, mostly through fishing but also seaweed farming. Lacking appropriate offshore vessels, most fishing activities take place along the reefs, often using destructive methods while during the north east monsoon when the sea is calmer boats sometimes venture a little further into the open sea. Population distribution in some of the villages is as follows:

Table 3. Population Distribution

Villages	Population	Males	Females
Nungwi	7916	3883	4933
Matembwe	7302	3532	3770
Kijini	2646	1307	1339

Pwani Mchangani	2211	1099	1112
Kiwengwa	2429	1308	1121
Pongwe	513	253	260
Charawe	728	370	358
Chwaka	2912	1489	1423
Ukongoroni	752	373	379
Michamvi	1120	595	525
Uroa	2107	1007	1100
Marumbi	966	465	501

Source: Tanzania Census 2002

4.3 Land Rights and Tenure

Land tenure in villages is governed under the national land law. The government owns village land but this is allocated and administered at the village level. Multiple land tenure also exists at villages.

In 2002 conservation efforts in the area were enhanced when Mnemba Island Conservation area was established and officially gazetted in the legal notice number 68 under the Fisheries Act No. 8 of 1988. Mnemba Island Lodge and protected area was established in 1992 and had a small patch (about 1km²) of protected area to manage. Johani Chwaka bay Conservation Area was established in 1995 with an aim of deriving benefits from and at the same time conserve Johani forest's valuable natural resources. These resources include the forest itself (the only standing natural forest left in Unguja as others have been cleared for cultivation and settlements) the Red Colobus monkey (indigenous of Zanzibar), ninety-nine percent of butterfly, and the endangered Ader's duiker.

4.4 Fishing

Fishing activities at the conservation area is dominated by small-scale fisheries using traditional fishing vessels like mashua, dau and ngalawa which are the dominant vessel (90%). Common gear in use are gillnets, hand-lines and traps, however spear-gun is the most used gear (Hoekstra et al, 1989) even though it is illegal. Octopus fishing also takes place within the area. Coral fish fishery and octopus fishing are by far most important fisheries within the conserved area, but sea-cucumber and pelagic fish fishery also provide a significant income to the community.

However big hotels tend to prefer sourcing the fish they need from big markets and middlemen who deal directly with the numerous fishers that live along the coast. A variety of large predatory fish occurs in the open sea. These include Barracuda, Mackerel, Kingfish, Sailfish and Marlin. Marine mammals visiting the waters around Mnemba include Sperm and Humpback Whales, Striped, Spinner, Bottlenose Dolphins, White tip Reef, Great White and Tiger Sharks, and Manta and Devil Rays also occur there. Overfishing by local fishers, the use of destructive fishing gears, and unsustainable exploitation of mangroves are usually rooted in poverty and lack of alternative livelihoods and have negative impacts on the

coastal and marine ecosystem. Fishing and tourism activities that take place along this coastline are, however, posing threats to the same natural resources they depend upon.

Fishers from the villages of Matemwe, Muyuni, Nungwi and Pwani Mchangani have been using the Mnemba Atoll as their main fishing ground for a long time. Also villagers from Chwaka, Michamvi, Ukongoroni and Charawe obtain their livelihood from fishing in the Chwaka Bay and adjacent seagrass beds and reefs, and even fishers from villages further north use the Bay. The most intensive fishing area is the bay south of the reef island, while shell collection takes place on the tidal flat that is mainly covered by sand and sea grasses.

4.5 Seaweed Farming

Sea-weed farming which has developed into a major foreign currency earner is conducted in the coast line within the four villages involved in the conservation area, with support from the Department of fisheries and Private owned companies.

The type of farming is practised largely by women in some villages around Mnemba Island such as Kijini, Matemwe, Pwani Mchangani, Kiwengwa, Michamvi and further south in Kiwengwa and Pongwe, but fishing remains the main livelihood

Seaweed farming in Chakwa is another key resource that the people rely upon. Seaweed farming has increased significantly over the past decade in Zanzibar and currently there are approximately 25,000 seaweed farmers in Zanzibar⁶⁵. It is a labour intensive activity mainly practised by women. The main species under cultivation in the area is *Euchema spinosum*, which is easy to grow and can be cultivated all year around, but that yields low prices to farmers—currently 80 to 90 Tsh/kg (2005). The other species, *Euclidean cottonii*, has a higher price (200 to 220 Tsh/kg) (2005) but is more sensitive to temperature and heavy rains and hence less used. The middlemen who sell it to private companies take the highest share as they sell the seaweed at more than double the “beach price”. One tonne of *Euchema spinosum*, for example, is bought from farmers at around US \$80 and sold at the market for around US \$200. In Chwaka Bay the pole and line farming method was observed, whereby fronds of *Euclidean* are tied to strings stretched between wooden pegs. The soils in this area are more suitable for agriculture than further north along the coast and rice cultivation is practised in the area to the west of Chwaka Bay and near Kiwengwa.

4.6 Mangrove Forest Resources

Endowed with an extensive mangrove forest, Chwaka Bay and its habitats are important sources of livelihood for the local population. The people from Chwaka, Charawe, Ukongoroni and Michamvi have for generations depended on these mangroves. Mangrove wood is used for poles for construction, firewood, and charcoal and lime production. *Ceriops tagal* is reported as the most exploited mangrove species in Chwaka Bay despite its high regeneration capacity. In 1994 the mangroves were reported to contribute to 49% of the area’s household income. Today the villagers from Charawe, Ukongoroni and Bwejuu are the main users of mangroves, selling the wood in Chwaka. Although the area has subsequently been declared protected area, over-exploitation of mangroves was still identified

4.7 Marketing of Marine Resources

Marine resources along the coast of Mnemba Island has always provided both food and cash income. Traditional fish are sold fresh within the area or exported to Zanzibar town where

markets are attractive. Private companies purchase seaweed products directly from communities in the conservation area. These companies provide farm input and in turn farmers sell their products to them.

4.8 Tourism

Tourism is an important economic pillar in this area. There has been tourism, around the Mnemba Island at least since 1994. Tourists engage in variety of activities which include swimming, diving and snorkeling, sport fishing, bird watching etc. The importance of the east coast's natural features lies not only in their tourism potential and other livelihood options but also on their conservation value. The sandy beaches and coral reefs along the coast, as well as the forest habitats in the south, have spurred the growth of the tourism industry. A string of hotels exists along the entire coast, according to the 2004/2005 State of the Environment Report for Zanzibar, there are 200 tourist accommodation venues in Unguja Island, most of which are located on the north and east coasts. One of the few examples is the Zanzibar islets that have been leased to private owners. Mnemba offers a high-end tourism experience in its luxury lodges. The number of both formal and informal tourist operators that base their operations (mostly involving diving and snorkeling) on the natural features that the area offers, is also growing.

However, the benefits to local communities from tourism developments along this coast are perceived by many to be low or even insignificant as there are obviously insufficient benefits coming to the local communities that experience debilitating levels of poverty. The main obstacle appears to be the user conflict of the conservation area, whereby tourists and local fishers compete for use of the same ecological areas characterized with attractive coral reef ecosystem and rich in biodiversity that local people depend on for their own livelihood and sustenance.

Also two-thirds of the owners of the "curio" shops that have proliferated around the hotels are from mainland Tanzania. Most staff employed in hotels are from Stone town, mainland Tanzania or even from as far away as Kenya.

Tourist arrivals in Jozani Forest in Chakwa Bay have increased from 116 in 1990 to 12,793 in 1996, and currently 15,000 to 20,000 tourists visit the Park every year. The bay forms an important ecological linkage between the marine and terrestrial ecosystem of Jozan forest and is one of the most ecologically productive marine areas in Zanzibar in terms of nursery habitat for all forms of marine life and species diversity of mangroves, sea grasses, sea weed, and coral reef. Hotels have proliferated on the east coast north of the bay and along the Michamvi Peninsula, but tourism activity in Chwaka Bay is still low despite the great potential. Along the east coast of Unguja, between MNEMBA and Chwaka Bay, there is a long stretch of coast that is the target of an already huge but ever growing tourism industry. The main villages and towns along this stretch are (from north to south) Kigomani, Ndizi, Matemwe, Mnazi Mrefu, Kilima Juu, Pwani Mchangani, Cairo, Kiwengwa, Kamba Urembo, Pongwe, Ndudu Kubwa, Uroa, Dikoni, Marumbi and Chwaka.

4.8.1 Tourism potential

Mlango Mkuu

The site is located at the east of the Mnemba atoll and is a sand dominated reef down to around 40 m where a rocky wall start and continues down to over 50 m. Large groups of big size kingfish, barracuda, travally and naso were observed. Others have observed other species of big fish for example 3m long giant groupers (personal communication) as well as intriguing caves. The thrill of a forty meters deep dive and the big schools of large and different fish species that can be observed make it a very attractive dive site. However, as it is a very deep dive only especially qualified divers can enjoy the site.

Shein reef

It is a collection of patches of a mixture of rock and coral forms separated by rubble, sand or seagrass substrates. The site has a collection of 'exotic' fish species rarely seen if at all at other sites throughout Zanzibar. Different coloured and rare species of stonefish, lion fish, eel, leaf fish, and scorpion fish were observed. Various schools of snapper and fusilier were also seen but perhaps the most interesting species were the ghost pipe fish and sea horses. Its shallow depth and close proximity to the village of Nungwi (one of the most popular tourist destination) makes it a very interesting dive site especially so for divers interested in underwater photography.

Kichafi

A shallow flat reef just off Nungwi Mnarani, made up of two pieces of continuous reefs separated by a sand patch. The reef is dominated by a wide variety of soft corals and small schools of snappers, fusiliers, sweetlips and damsel fish. Being a shallow reef it was a surprise to see napoleon wrasse, a species mostly seen in deeper reefs. Being in close proximity to Nungwi mnarani and because of its shallow depth the reef has a potential to attract divers especially the novice ones.

4.9 Revenue Sharing

A fee of US \$ 1 per person per day started being charged to tourists visiting MIMCA in March/April 2003. This fee has subsequently been increased to US \$ 3 and may be further increased to US \$ 10 according to information provided by government officials in a recent meeting. Around 20 tourism operators engage in diving and snorkeling activities in the atoll, both from the formal and informal sectors, mainly from Nungwi, Kiwengwa and Matemwe. In days during the high season between June and March there may be up to 300 people visiting the reef, the preferred areas being the House Reef and Kichwani (Map 1). Some of these tourists are guests at the Mnemba Island Lodge, a luxury lodge with 20 beds that enjoys an occupancy rate around 95%.

5.0 STAKEHOLDERS AND KEY MANAGEMENT ISSUES

5.1 Stakeholders

The area GMP is intended to be a transparent document describing the objectives, strategies and actions behind the management of the MIMCA. Key stakeholders of MIMCA are:

- Department of Fisheries and Marine Resources staff in Zanzibar.
- Other government staff involved in the management of marine conservation area.
- Local communities and fisheries.

- Non-government organizations (NGOs) and civil-based organizations (CBOs)
- Investors in MIMCA, including hotel and restaurant owners, tour operators and artisanal fishers.
- Researchers, scientists and other technical experts working in related fields.
- People involved in marine conservation area management around the world.
- Visitors to MIMCA, with particular interest in conservation and development issues.

An important step in establishing effective stakeholder relationships is to identify the stakeholders and their roles within the marine environment. Table 3 summarizes the stakeholder groups of MIMCA and their expected role in the development and implementation of the GMP.

Table 4. Stakeholder groups and their roles

Stakeholder	Role
NGOs	Partnerships with environmental, cultural, heritage and non-governmental / non-profit groups on MIMCA and within the Mnemba
Water Sports	User group encompassing activities such as diving, snorkeling, sailing, power boating, kayaking, kite surfing and windsurfing. Divers and snorkelers are a particularly important stakeholder group as they depend highly on the well being of the marine resource
Marinas and Boat services	User group catering for charter boats, and privately own vessels, mainly operating from Dar es Salaam
Fishermen Artisanal fishing user group	High value placed on the tradition of fishing
Industry	User group including industries in addition to tourism on MIMCA which directly or indirectly affect the area, such as energy production, oil and gas storage, construction.
Law enforcement	The law enforcement agencies, including the community guards, customs, police KMKM and prosecutors office, advise on legal matters, the formulation of legislation, and maintaining/enforcing the legal attributes of the marine Conservation Area (MPA)
Government	Permitting and maintaining the law. Communication towards user groups. The MIMCA Management manages the conservation on behalf of Government.
Tourism	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 MIMCA on a daily basis
Community	The local community depends on the well being of the MIMCA indirectly for income. Educational establishments use the marine Conservation Area as an education tool

5.2 Key Management Issues

Understanding the goals and objectives of a conservation/protected area and the range of direct and indirect issues/threats are essential elements of any management plan. MIMCA chose to adopt an adaptive management framework for its management planning for the conservation area. Adaptive management provides a logical approach to management

planning which is highly prioritised and issues/threats orientated which are generated by stakeholders. The key elements of the adaptive management framework are: 1. Identifying and describing the significance and condition of natural values within the conservation area 2. Identifying and describing the issues and threats facing the natural values 3. Assessing which issues/threats pose the greatest risk to the natural values 4. Developing and prioritizing management objectives 5. Developing and implementing management actions to address issues/threats 6. Measuring the success of those management actions and 7. Adapting management approaches based on the outcome of measured actions. Information on the significance of the ecosystems, habitats and species found within the MIMCA as well as their general condition has been presented in Part 2. This is summarized and highlighted in the statement of significance and values. Part 3 goes on to identify the issues/threats facing the conservation area. Together with the MIMCA's goals and objectives this information is used to build a framework for management and focused strategically clustered prioritize areas for actions as management programmes.

This approach is based firmly on the IUCN management cycle which seeks to ensure that there is continuous learning by reassessing and re-evaluating the success of management actions, programmes and initiatives.

Basically, this General Management Plan emanates from long term observation of stakeholders and their views and vision based on the observed obvious management issues which form the basis of the need for special management program in the Mnemba Island-Chwaka Bay Marine Conservation Area. Following inception of the conservation idea, stakeholders' consultations were pursued as a major tool for establishing this GMP. Consultation approaches included individual discussions, consultative meetings/workshops and participatory planning on the approach and methodology. The key issues identified by stakeholders are summarized into the following topics:

- Legal and policy implementation
- Socio-economic concerns and market services
- Research and monitoring
- Education and awareness
- New and emerging issues

5.2.1 Legal and policy implementation

Poor management and ineffective law enforcement

- Law to ensure sustainable fishing exists, but enforcement has been poorly implemented. As a result, illegal fishing including undersize mesh size, illegal gear, and use of chemicals is consistently reported to occur in some sites in MIMCA. Furthermore, the current fishing effort, being clearly unsustainable in some areas is expected to grow in the future under ever-increasing local market demand.
- Destruction of corals by fishers' and tour operators' boats anchors, as congestion of fishers and tourists at one area necessitates anchoring their vessels at different places in that location. Dropping and hauling up of the anchors do a lot of damage to corals.
- Destruction of reefs by human activities as tourists, fishers and shell collectors step on exposed or partially exposed reef during low tide; therefore causing gradual damage

which results in large areas of flattened reef. Illegal fishing practices and over fishing has also damaged the coral reef, especially the northern reefs.

- Use of destructive fishing gears and methods are prohibited by law but effecting the legislation has not been sufficiently successful. Beach seine nets, drag nets and surround nets are generally operated across reefs and seagrass beds causing significant damage over time. Small mesh size fish nets are not selective and therefore they remove even the juvenile fish of little or no value and in so doing they negate grow-out for next season and even impact natural recruitment and population dynamics.
- Use of spear guns for fishing also causes a lot of damage to the coral reefs. As a result of falling Catch Per Unit of Effort (CPUE), local fishers in various well organized fishing villages are complaining of rise in unsustainable and destructive fishing methods and express their inability to intervene. Biological assessments conducted recently (Assessment of Zanzibar Marine Protected Areas 2010) have shown that the MIMCA's reefs have been considerably degraded, both from human intervention and natural phenomena such as the 1998 coral bleaching event.

Inadequate rules and regulatory framework

Threatened and 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 gillnet fisheries is the most serious threats in the area. The threat is particularly acute for dolphins and turtles, because of their slow life histories and limited potential rates of increase. The bycatch of dolphins occur year round and all recorded catches have been in drift and bottom set gillnets used by local fishers from villages off MIMCA. Every year, several humpback whales swim into fishing gear and get entangled in drift and bottom set gillnets in the area especially from July to September when these whales are most abundant in the area. It is unfortunate that most of these humpback whales swimming away with the fishing net. This situation is negative both for the whales entangled as well as the fishermen who lose a valuable fishing net and an important way of income. It has also been reported that turtles are hunted purposely for meat.

Inadequate financial and management capacity

Financial capacity of the MIMCA to fulfill her mandate is not there. 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.

5.2.2 Socio-economic concerns and market services

- Conflicts between users. Small-scale fishing has been concentrated in the shallow inshore waters, because of limits on the operations of the fishing fleet. Small-scale fishing tends to spark conflicts with tourism business and conservation interests over competition for resources. This is because of the way fishing activities overlap and interfere with tourism sites. These conflicts have been caused because of the utilization and access of resources

in the same area. There is also friction with the MBCA authority over the fishing industry's disregard for established regulation on certain species of fish and frustration over the authority's limited means for enforcement and supervision.

- Weak market support services to address the provision of market information, standards and quality assurance.

5.2.3 Research and monitoring

This management plan 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. A good number of studies have been conducted primarily by university students from abroad for academic purposes, but researches for conservation/management purposes are limited.

Monitoring of resources use in the area is only carried out irregularly such that no readily available analytical fisheries production data, marine and forest habitats conditions, human demography and livelihoods. There is need for information on local resources use patterns and practices and study of utilization needs and trends.

Permitting for various activities in the conservation area has not considered carrying capacity of the activities. Optimum levels must be established for activities in the various areas including fishing grounds, tourist areas etc.

Research and monitoring are essential to enable the respective institutions responsible for management of the resources in the area to adapt management plan. Three key focal areas for research and monitoring associated with the MIMCA include visitor numbers and behavior, physical characteristics, nutrients, biodiversity and populations of exploited species.

There is also a lack of an in-built monitoring and evaluation system. An effective monitoring and evaluation system 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.

5.2.4 Education and awareness

- Lacking entrepreneurship knowledge and skills to perform business prevents communities from initiating alternative means for livelihood. Sustainability can only be achieved through relieving pressure on the existing resources.
- Existing communication gap between tour operators and tourists constrain information transfer from the former to the latter on what to and what not to do during the tour operations.
- There is limited information on biological resources in the MIMCA and also so for available livelihoods and resource use trend.
- Monitoring of resources-use in the MIMCA is only carried out irregularly such that no readily available analytical fisheries production data, marine and forest habitats conditions, human demography and livelihoods.
- There is need for information on local resources-use patterns and practices, mangrove stock assessment and study of utilization needs and trends.

- Permitting for various activities in the conservation area has not considered carrying capacity of the activities. Optimum levels must be established for activities in the various areas including fishing grounds, tourist areas etc.

5.2.5 New and emerging issues

Damaging climate change, driven by greenhouse gases, is now widely recognised as a defining issue of our times. The historic environment is not immune from the impacts of climate change. Shifts, for example, in monsoonal winds, rainfall, temperature and sea level rise could all take their toll in fishing and tourism activities in the area.

For instance, coral reefs are particularly sensitive to climate change because they bleach easily if there are changes to sea surface temperatures (SSTs). The increasing water temperatures as a result of global warming will almost definitely result in coral bleaching and indeed some indications were registered during the diving survey. Incidences of Crown of Thorns Starfish (COTS) outbreaks are being reported in reefs throughout Zanzibar and even though few COTS were observed during the survey, the probability of the same happening within PECCA is very high.

The reefs then become more vulnerable to other threats, such as: overfishing; pollution; creatures that eat them; sedimentation from storm surges and snorkelers; and coastal developments. To mitigate the damage to coral weakened by warming waters, the recent IUCN reports have called for the adoption of a range of measures, such as: improved reef monitoring, use of marine protected areas, transplanting healthy coral to degraded reefs and use of coastal and fishing management schemes which are proposed in the management strategies.

5.3 Summary of key Issues

Table 3 below summarises issues threatening MIMCA as identified by stakeholder consultations and analysed by using less, moderate, high and significant threats, . The most significant issues are selected and prioritized for strategic focus on developing management programmes for MIMCA.

Issues	Less Threat	Moderate Threat	High Threat	Significant High Threat
Historical issues				
Poor fishing gear using mainly canoes and dhows.				x
Lack of law enforcement				x
Lack of funding				x
Current Issues				
Conflict between fishers and other users.				x
Conflict between (DEMA) fishers and divers			x	
Congestion of fishers and tourists at one area				X
Destruction of reefs by human activities.				X

Extensive mangrove clearing			x	
Acquisition and expansion of tourist development			x	
Increased waste generation at sea		x		
Negative impact on fisher's income due to poor traditional fishing gear/vessels.				X
Increased poverty due to little income from fishery activities			x	
Lack of alternative income source earnings				x
Research does not reach people/users.		x		
Permitting for various activities has not considered carrying capacity of the activities			x	
Management Issues				
<i>Governance</i>				
Lack of code of conduct to guide tourists and tour operators		x		
No system of fishery committees to conduct patrols at night.			x	
Poor mangrove management and ineffective law enforcement			x	
Poor coordination among government institutions				x
Lack of procedure, adequate bylaws and regulations to guide fishing activities				X
Poor coordination among different conservation groups			x	
Poor coordination between districts			x	
Deficiencies in sectoral policies, regulations and legislations.			x	
Poor training to those involved in patrols			x	
No conservation/management oriented research programs;				X
Lack of information on biological resources in the MIMCA, available livelihoods and resource use trend.				X
<i>Resources</i>				
Lack of facilities like patrolling and training			x	
Shortage of working facilities for coordination			x	
<i>Finance</i>				
Lack of adequate finances for implementation.				X
<i>Monitoring</i>				
Lack of Monitoring of resources-use in the MIMCA is only carried out haphazardly.				x

6.0 MANAGEMENT GOAL AND OBJECTIVES

6.1 MISSION STATEMENT

The Mnemba Island-Chwaka Bay Marine Conservation Area's Mission Statement is:

To conserve the biological diversity and other natural and cultural values of the area in the long term, while providing recreational, social and economic benefits for the present and future generation.

6.2 MANAGEMENT GOAL

- The goal of this general management plan is to manage the use and harvesting of marine and fisheries resources at ecological sustainable levels, and manage the development of marine tourism in order to maximize economic benefits to the community.
- In the context of this management plan, ecologically sustainable development includes monitoring and research to demonstrate the sustainable harvest of marine resources, identifying the habitats and aquatic environments on which marine resources depend, and, enhancing social and economic benefits for all people.

6.3 OBJECTIVES

- Conserving biodiversity to retain the conservation importance and value of the area.
- Maximizing long-term socio-economic benefits from the area over the long term.
- Improving research and monitoring
- Increasing public awareness of the conservation importance, economic value and management requirements of the area
- Promoting ecotourism

7.0 MANAGEMENT STRATEGIES AND ACTIONS

The following strategies are considered critical for MBCA to deal with and should form the basis of management actions to achieve the key management objectives. Stakeholders should be involved as much as possible and partners consulted, especially the community in the 19 villages for information and best practice sharing.

Strategy 1: Manage unsustainable practices by enforcing regulations

Unsustainable practices relating to fishing and tourism are harming the reefs, other marine habitats and dolphins in MBCA.

Actions

Undertake regular and targeted patrols with the view to eliminating illegal fishing activities. These patrols provide important opportunities for communication and engagement with fishers and discourage illegal activities by providing a physical presence. Issuing penalty infringement notices is also a deterrent to illegal activities.

Promote community reporting of suspected illegal fishing activities and continue to use information derived from fishery compliance risk assessments, reports and historical patrol

activities to priorities, plan and target patrols, inspections and compliance operations to achieve a high level of compliance with the Fisheries Regulations.

Develop appropriate management and regulations for whale and dolphin watching ecotourism in collaboration with the tourism operators to ensure its sustainability. Once whale and dolphin watching regulations are established, enforcement of these regulations should be encouraged through regular monitoring. Involving tourism operators in establishing regulations encourage effective community participation, enforcement and patrolling.

Provide education and information to fishers and tourism operators on sustainable practices that maximize voluntary compliance. Voluntary compliance is best achieved with effective education programs that promote a sense of shared responsibility for maintaining healthy fisheries and tourism for future generations.

Encourage support for dolphin conservation and promote community development through distribution of educational information to tourists. The number of tourists visiting MBCA is increasing every year. However, there is currently very little information available to them regarding the status of the dolphins, threats to the dolphin population, research currently underway or other important aspects of MBCA. It will be essential that information is made available to tourists visiting both Kizimkazi Dimbani and Kizimkazi Dimbani, preferably in exchange for an entrance fee. Educational materials would aim to: (a) provide relevant information on many aspects of the biology and ecology of the dolphins, (b) encourage tourists to pay an entrance fee to contribute towards community development and, (c) elicit local and international support for conservation activities.

Establish village-based dolphin committees, to help ensure community support for the designation and protection of dolphins. In order to initiate the process of developing any dedicated dolphin protection in MBCA, it will be essential that community committees are established where currently none exist. Discussions with these committees (and other members of the village), regarding the specifics of any potential protection (location and regulations) should be initiated as a matter of priority.

Strategy 2: Review existing regulations and enact new and relevant ones

There is a great need for effective mitigation measures to address bycatch of marine mammals in gillnet fisheries.

Actions

Implement a scheme to protect marine mammals and other protected species by establishing monitoring of species taken as bycatch by stationing of observers on board approximately 5 percent of all fishing vessels.

Develop protected species populations management plans.

Research and develop mitigation methods, including innovative ways of setting fishing gears. Development of mitigation measures should involve fishermen and include research on their socio-economic, biological and ecological impacts.

Encourage modification of gillnets by incorporating weak-links in the nets to prevent entanglement of humpback whales.

Promote whale watching during the winter months when humpback whales are in the coastal waters of Zanzibar, which could put an end to the entanglement problems in the area.

Strategy 3: Establish Sustainable Finance Mechanisms

Conservation financing mechanisms should be evaluated as part of a business plan that includes a sustainable financing strategy. The business plan should be based on an evaluation of the costs of operating MPAs or protecting marine resources. A range of potential customers willing to pay for goods and services can then be identified as potential financing sources for marine conservation. Business plans are being developed for single MPAs and for networks of MPAs.

Action

Develop a comprehensive business plan to define the needs such as management, capacity building and research and monitoring programmes and potential financing sources for an MPA network under MCU in Zanzibar. The business plan should analyze the costs of administering existing and proposed marine conservation areas to estimate the total investment needed to effectively manage MPAs in Zanzibar.

Improve revenue collection, allocate adequate funds into fisheries management and seek new sources of financing to support vital management activities.

Strategy 4: Market MBCA as a wilderness and nature based tourism destination

Actions

Develop and distribute promotional material for the MBCA to key tourism and information centres.

Develop a website

Lobby relevant agencies to ensure MBCA is featured in tourism marketing and included on tourism routes.

Erect appropriate road signage informing passing visitors and tourists of the existence of the MBCA.

Identify actual and possible resource-use conflicts in the area and develop a participatory zoning plan which will help mitigate conflicts and lead to sustainable resource use.

Strategy 5: Promote scientific research

Actions

Identify information gaps and develop research programmes aimed at gathering/consolidating data on biodiversity and exploited species.

Encourage research into the diversity and distribution of invertebrates within the marine conservation area.

Encourage research on biology, distribution, abundance and behaviour of dolphins in the area.

The economic impacts of management measures should be fully investigated and analyzed to ensure a fair review process and the adoption and implementation of the improved management measures.

Engage local research institutes and universities to collaborate on priority research projects.

Solicit research funding support.

Strategy 6: Plan and implement an integrated program of survey and monitoring to increase knowledge of natural and cultural resources and visitor use

Actions

A systematic monitoring program needs to be established for the MBCA that evaluates fundamental resources, such as fish, dolphins, seagrass coral reef conditions, sea surface temperatures, etc, through space and time – providing the means to establish trends of resource quality (e.g., species populations, community structure, etc.).

Strategy 7: Develop an effective education and awareness programme for the conservation area

Actions

Facilitate opportunities for local tourism operators to establish and manage visitor facilities which act as a focal point where visitors can go to learn more about the area, its conservation importance, the ecology of the area, the cultural and archaeology significance of the area, and the need for rationale behind existing management interventions.

Commission educational and informative material including signage, posters, pamphlets and relevant literature to be housed in the visitor centre and other appropriate localities that will enhance visitor experiences.

Providing education and information that maximises voluntary compliance.

Encourage field excursions to the area by local schools, community groups and other stakeholder groupings.

Actions

MBCA to address the lack of Integrated Coastal Zone Management

Suggested improvements from stakeholder input include insisting on a comprehensive Environmental Impact Assessment for any new developments within the MBCA. Educate the government through outreach and frequent consultations about the importance of the marine environment to the island and the impacts of development.

Support the pursuit of an ecosystem approach to ICZM

To work together with the DOE in implementing the ICZM strategies.

The cross-sectoral representative of central and local governments.

Support and establish a close working relationship with national and international conservation organizations.

Strategy 8: Reduce Pollution

Pollution on MBCA mainly comes from sewage, fuel, litter and garbage. These directly affect the health of the marine environment and humans using the marine environment. As Zanzibar depends on a perceptibly healthy and clean marine environment for attracting tourist activity pollution levels must be reduced.

Actions

Raise awareness

Continue with awareness programmes in schools and solid waste management programmes, working in partnership with other NGO's. Identify and target main sewage polluters (hotels, lodges, tour operators, island camping and boat operators) and oil polluters (e.g. barge in the port) with specific outreach materials. Approach religious groups and other civil society about making offerings and help reduce littering of the marine environment.

Establish Pollution Prevention Principles

Clearly define implications of PPP for potential polluters

Set enforcement methods

Establish enforcement procedures by working closely with government and law organizations

Seek for government support

Prepare pollution control proposal to the government seeking support for pollution reduction, emphasizing the importance of MBCA on the tourism industry.

Monitoring

Establish monitoring protocols with clearly defined goals and objectives to assess the impact of sewage, hydrocarbons and garbage.

At first sight the likely impact of climate change on the MBCA does not appear dramatic, but there could be significant changes to the character of the area. It will be necessary therefore to analyse the risks to the MBCA of climate change and to develop appropriate adaptation strategies to minimise its effects.

7.1 Management Program

Strategy	Actions	Performance indicator	Implementation	Time Frame	Estimated Budget (US\$)
Enforce regulations	Strengthen capacity to undertake regular and targeted patrols	<ul style="list-style-type: none"> Staff and resources capacity strengthened Regular patrols 	MIMCA and key partners	2011-2015	400,000
	Promote community reporting of suspected illegal fishing activities	<ul style="list-style-type: none"> Reporting of illegal fishing activities improved 	MIMCA and community	2011	
	Provide adequate resources to enable the implementation of the management plan	<ul style="list-style-type: none"> Performance evaluations 	MIMCA and key partners	2011	
	Provide education and information to fishers and tourism operators on sustainable practices that maximize voluntary compliance	<ul style="list-style-type: none"> Voluntary compliance improved 	MIMCA and key partners	2011-2015	
	Encourage support for dolphin conservation and promote community development through distribution of educational information to tourists.	<ul style="list-style-type: none"> Improvement in compliance 	MIMCA and key partners	2011-2015	
	Establish village-based dolphin committees	<ul style="list-style-type: none"> Village-based dolphin committees established 	MIMCA and key partners	2011	
Review existing regulations and enact new and relevant ones	Implement a scheme to protect marine mammals and other protected species	<ul style="list-style-type: none"> A scheme to protect marine mammals and other species implemented 	MCU and management team	2011	200,000
	Develop appropriate management and regulations for whale and dolphin watching ecotourism	<ul style="list-style-type: none"> Regulations for whale and dolphin watching ecotourism developed 	MCU and management team	2011	

	Research and develop mitigation methods, including innovative ways of setting fishing gears	<ul style="list-style-type: none"> • Research project • Mitigation methods developed 	MCU and management team	2011-2012	
	Promote whale watching during the winter months when humpback whales are in the coastal waters of Zanzibar	<ul style="list-style-type: none"> • Whale watching established 	MCU and management team	2011-2012	
Establish Sustainable Finance Mechanisms	Develop a comprehensive business plan to define the needs and potential financing sources	<ul style="list-style-type: none"> • A long-term financing plan developed 	MCU and management team and key partners	2011	
	Improve revenue collection, allocate adequate funds into fisheries management and seek new sources of financing to support vital management activities.	<ul style="list-style-type: none"> • Funds secured 	MCU and management team	2011	
Market MBCA as a wilderness and nature based tourism destination	Develop and distribute promotional material for the MBCA to key tourism and information centres.	<ul style="list-style-type: none"> • Promotional material is available 	MCU and key partners	2011-2015	500,000
	Develop a website	<ul style="list-style-type: none"> • Website developed 	MCU	2011	
	Lobby relevant agencies to ensure MBCA is featured in tourism marketing and included on tourism routes	<ul style="list-style-type: none"> • MBCA is featured in tourism marketing 	MCU and management team and key partners	2011-2015	
	Erect appropriate road signage informing passing visitors and tourists of the existence of the MBCA	<ul style="list-style-type: none"> • Road signage erected 	MIMCA	2011	
	Identify actual and possible resource-use conflicts in the area and develop a participatory	<ul style="list-style-type: none"> • Resource-use conflicts resolved 	MIMCA and key partners	2011-2015	

	zoning plan which will help mitigate conflicts				
Promote scientific research	Identify information gaps and develop research programmes aimed at gathering data on biodiversity and exploited species	<ul style="list-style-type: none"> • Research projects • Scientific reports, papers and publications 	MCU and management team and key partners	2011-2015	600,000
	Encourage research into the diversity and distribution of invertebrates within the marine conservation area	<ul style="list-style-type: none"> • Research projects • Scientific reports, papers and publications 	MCU and management team and key partners	2011-2015	
	Encourage further research on biology, distribution, abundance and behaviour of dolphins in the area.	<ul style="list-style-type: none"> • Research projects • Scientific reports, papers and publications 	MCU and management team and key partners	2011-2015	
	Investigate and analyze the economic impacts of management measures to ensure a fair review process and the adoption and implementation	<ul style="list-style-type: none"> • Monitoring data and reports 	MCU and management team and key partners	2011-2015	
	Engage local research institutes and universities to collaborate on priority research projects.	<ul style="list-style-type: none"> • Research projects • Scientific reports, papers and publications 	MCU and management team and key partners	2011-2015	
	Solicit research funding support	<ul style="list-style-type: none"> • Funds secured 	MCU and management team and key partners	2011-2012	
Plan and implement an integrated program of survey and monitoring to increase knowledge of natural and cultural resources and	A systematic monitoring program needs to be established for the MBCA that evaluates fundamental resources	<ul style="list-style-type: none"> • Monitoring system established • Monitoring data and reports 	MCU and key partners	2011-2015	250,000
	Monitor marine flora and fauna to gain an understanding of	<ul style="list-style-type: none"> • Monitoring data and reports 	MCU and key partners	2011-2015	

visitor use	factors which influence marine communities in the area.				
	Monitor recreation and commercial use to determine the impacts of human use on marine communities	<ul style="list-style-type: none"> Monitoring data and reports 	MCU and key management issue	2011-2015	
Develop an effective education and awareness programme for the conservation area	Facilitate opportunities for local tourism operators to establish and manage visitor facilities	<ul style="list-style-type: none"> Visitor facilities open to public 	MIMCA and key management issue	2011-2015	500,000
	Commission educational and informative material including signage, posters, pamphlets and relevant literature	<ul style="list-style-type: none"> Posters, pamphlets, signage, literature 	MCU and key management issue	2011-2015	
	Providing education and information that maximizes voluntary compliance	<ul style="list-style-type: none"> Education and information provided 	MCU and key management issue	2011-2015	
	Encourage field excursions to the area by local schools, community groups and other stakeholder groupings.	<ul style="list-style-type: none"> Field excursions established 	MCU and key management issue	2011-2015	
Reduce Pollution	Raise awareness	<ul style="list-style-type: none"> Awareness raised 	MCU and key management issue	2011-2015	300,000
	Establish Pollution Prevention Principles	<ul style="list-style-type: none"> Pollution Prevention Principles established 	MCU and key management issue	2011-2015	
	Set enforcement methods	<ul style="list-style-type: none"> Enforcement methods set 	MCU and key management issue	2011-2015	
	Establish monitoring protocols with clearly defined goals and objectives to assess the impact of pollution.	<ul style="list-style-type: none"> Monitoring protocol established 	MCU and key management issue	2011-2015	

8.0 ZONING SCHEME

8.1 Justification for Zoning Scheme

The fisheries resources are very important for the sustainable development of the local population but are also of interest to the national fishing industry. Small-scale fishing has been concentrated in the shallow inshore waters, because of limits on the operations of the fishing fleet. This has caused a competition for resources with local small-scale fishers, the tourism business, and conservation interests.

Zoning is the primarily management tool of multiple-use marine protected areas. Its aim is to harmonize otherwise conflicting conservation and livelihood objectives by spatially separating extractive resource use areas from sensitive habitats. In similar cases in order to avert conflicts in resource use as well as accommodate multiple uses, zoning schemes have been used. Zoning schemes divide the multiple-use areas into use-zones that have different levels of protection depending on their respective conservation and economic importance. Zoning provides all users with a greater amount of clarity and predictability. Beyond this, the regulations in zones permitting resources-use ensure that resources-use activities are productive and sustainable. Zoning schemes can however only be implemented through a full public consultative process.

8.2 Aim of MIMCA Zoning Scheme

The aims of this zoning scheme are

- To protect critical and species-rich habitats including sub-tidal areas, mangroves, forest, bird nesting, fish spawning, turtle-breeding grounds.
- To safeguard beliefs and customs of local residents by protecting the sacred sites
- To protect the biodiversity and ensure aesthetical values of MIMCA are maintained
- To safeguard traditional/local community fishing grounds and provides a means for continued but controlled use;
- To provide a geographic basis against which to evaluate resource use and to monitor and review the effectiveness of the management plan;
- To provides a framework for surveillance and patrolling activities by focusing enforcement in zones with higher levels of protection

8.3 Definition of Zone Types

There are four designated types of zones which have been developed for the management purposes within MIMCA:

Sensitive Resource Conservation (Core) Zones, Specified use zone, General Use Zone and the Buffer Zone.

- Zones types were designated and mapped through a participatory zoning workshop and inputs from scientific assessments carried out in MIMCA.
- The zones have been designated according to the preference by stakeholder and the need to maintain the ecological, cultural and social integrity of MIMCA.
- Some Sensitive Resource Conservation Zones (core zones) are designated, where the impact on the local communities is limited but where the most critical habitats exist. Close monitoring will assess and document the impacts of the closure, including

impacts on adjacent areas through the 'spill over' effect. Based on the results of this monitoring the boundaries and location of these zones will be modified, as appropriate.

- Sensitive Resource Conservation Zones have been designated to cover significant areas of coral reefs, sea grass beds and mangroves

Zones designation is shown in Appendix

8.4 Scheme of Designated Areas

8.4.1 Areas designated as sensitive resource conservation (core) zones

1) The area around Kichwani spot

This area is rich in beautifully colored coral reefs particularly at depths below 30m. with so many species of reef fishes. Reef sharks, Eagle and Manta rays can also be found in this area. The area is frequented by tour operators, divers, fishers with a variety of gears, and collectors of sea shells and holothurians. They walk on the shallow water or partially exposed reefs, thereby causing tremendous damage gradually. Over-utilization of resources is very clearly seen, environmental degradation is vivid and decline in resources potential is already obvious. It is recommended that this area be declared a no-take zone.

2) The area around Mnemba coral garden:

This area is characterized with flat sandy bottom giving rise to a variety of colorful corals that form good natural habitat for beautiful coral fishes. Tour operators, fishers and collectors utilize the resources haphazardly such that adverse impacts are now clear. It is recommended that this area be declared a no- take zone.

3) House reef:

4) Tangini

8.4.2 Specific-use zone

Shein and Kichafi Reefs

8.4.3 Areas designated as general use zones

The remaining area of MIMCA which are not in core and specific zones is designated as General Use zone.

Mnemba Conservation Area
Core Zones and Specific Use Zones

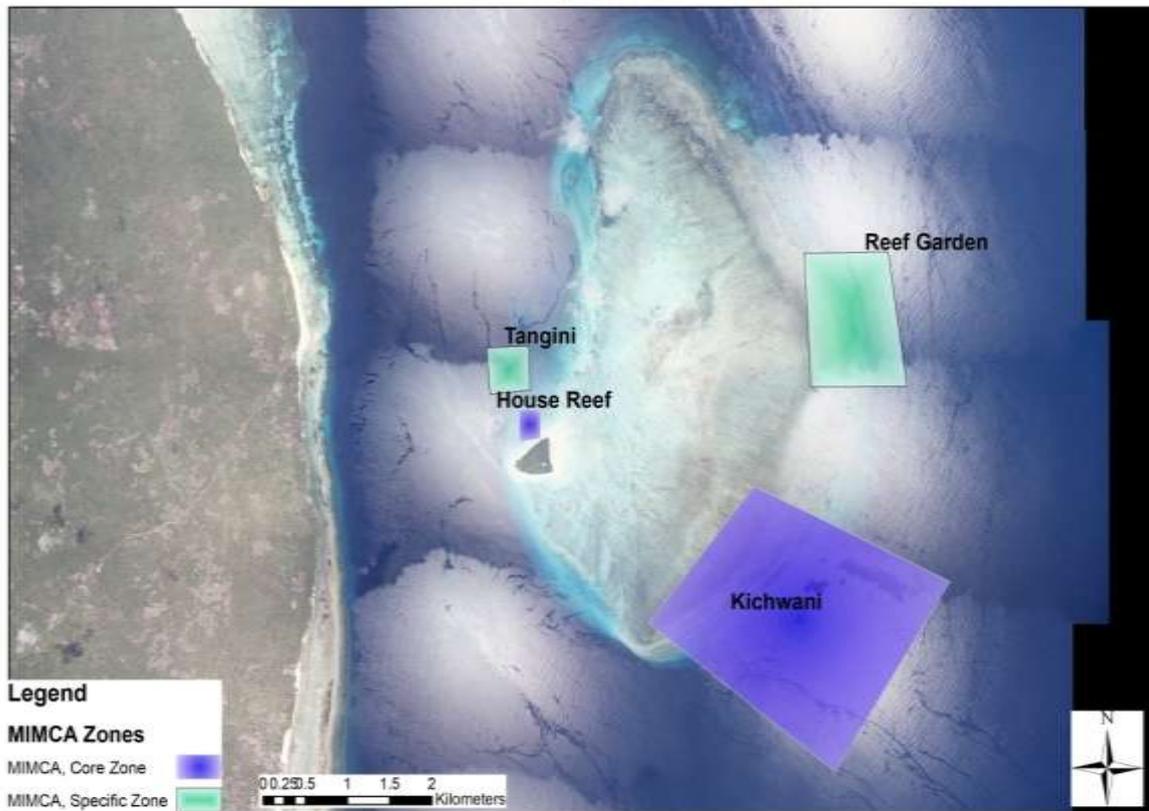


Figure 3. MBCA core and specific use zones

9.0 GOVERNANCE

9.1 Policies, Legal and Institutional Framework

A range of relevant policy and legislation tools exist to support implementation of GMP. That is from National legislation to MIMCA legislation through international treaties and conventions. Policy is important as it gives guidance from the Revolutionary Government of Zanzibar. If made public it also has legal consequences because it gives direction to everyone in the community.

9.2 Policies

Policies which are relevant for the GMP are presented. These include the Fisheries Policy (2000), the Forest Policy (2005), the Environment Policy (1992) and Tourism Policy (2004). These policies affect sectoral activities and influence resource use in the conservation area. The new forestry, environment and fisheries policies allow for the effective participation of local communities.

The Fisheries Policy of 2000 states that the objectives of fisheries management are to:

- Increase fish catches in artisanal fisheries in a sustainable manner
- Stop the use of destructive fishing gear
- Promote the conservation of the marine environment through enforcement of the legislation, community participation and environmental education.

The policy promotes collaborative management and the development of local by-laws to guide local fishing, as well as co-management of coastal zone areas to ensure sound management practices, and it encourages coordination through integrated and holistic approaches. It does not go into detail or specify levels of community involvement and processes to achieve it, but states that the aims are to: “institute management plans, which will cater for the multiple use of the coastal zone ecosystems”.

The National Environmental Policy of 1992 Zanzibar acknowledges that “the coastal environment is an area of great ecological diversity and complexity, major economic importance and rapid development” and highlights the need for an integrated approach to management. The policy thus recommended that a programme for Integrated Coastal Area Management be developed. The policy promotes the protection and management of the country’s environmental assets in order to sustain development, using an integrated approach, appropriate research, monitoring, data gathering, environmental education, protection of indigenous species, and use of EIA procedures, among other activities.

The National Forest Policy of 2005 was prepared to establish priorities for integrated management and conservation. The policy deals with management, conservation and biodiversity of forest, mangrove and watershed habitats, forest products, and capacity building and financial policies. In relation to MIMCA, its primary relevance is that it promotes community-level planning and management, the establishment of national parks and identifies the need for preparing management plans for protected areas, and retaining revenue from tourism generated funds for management. Policy 4 concerns the conservation and management of Zanzibar’s mangrove resources and identifies the need to set aside mangrove areas permanently.

The Tourism Policy 2004 sets the framework for tourism development in the archipelago and is conducive to community participation in the sector. In addition to the development of long term programmes towards better and timely strategies for resources utilization and environmental protection, the policy mentions the creation of a zoning system to encourage the establishment of marine parks areas. The policy emphasizes sustainable projects, the enforcement of Environmental Impact Assessment (EIA) requirements for tourism developments, the use of technologies that impact less on the environment such as solar energy, and monitoring programmes to understand the impacts of tourism development.

Zanzibar takes special attention to its islets, with a view to avoiding any development that will impact on their biodiversity and often undisturbed nature. The Zanzibar Tourism Zoning Plan proposes that no further islets should be allocated to hotel developers.

The GMP must be implemented in compliance with these policies.

9.3 Legal

MIMCA has a legal status. A second form of marine protection found in Zanzibar is the management by private companies of small protected areas with the agreement of the government, as is the case of Chumbe Island Coral Park in MIMCA. The GMP will be implemented mainly in the overall context of legal frameworks for natural resource management. All national legislation that supports environmental conservation and sustainable use of the marine and coastal resources will be adapted and enforced. Some of these environment related legal frameworks that are of relevance to the GPM include:

9.4 Fisheries

The 1988 Fisheries Act has yet to be revised to reflect this, but nevertheless provides the necessary legal support for much of the enforcement of MIMCA, allowing for the establishment of closed fishing areas, prohibiting the capture of sea turtles, and banning the use of destructive fishing methods such as explosives.

9.5 Investments

The Zanzibar Investment Promotion Act (1986) requires investors to minimize pollution ‘by providing acceptable sewage disposal arrangement and ensure that the chemical, biological substances and agents under their control are without risk to health. The Zanzibar Nature Conservation Trust (ZNCT) supports the government in undertaking conservation activities through formal agreements.

9.6 Land use

The Land (Distribution) Decree (1966) makes any grant of land conditional upon good husbandry and soil conservation. · Land Alienation Decree (Cap. 94). · Town and Country Planning Decree (Cap. 85) require that town plans be adhered to; Prohibits construction close to the beaches since this can block access, spoil the scenery, and degrade the beach, cause problems of noise and destabilize the beach. Public Land Decree (Cap. 93) Removal of Natural Produce Rules deals with collection of stones, sand, gravel and rocks that require a permit. The National Land Use Plan was prepared in 1996 under the auspices of the now abolished Commission for Land and Environment (COLE). The purpose of the Plan was to be used as guidance but its status is uncertain and its content outdated. Land use planning that ensures the protection of the west coast’s biodiversity and sustains the coastal population calls for a Strategic Environmental Assessment (SEA) of the area.

9.7 Natural Resources

Forest Reserve Decree (Cap. 120) and woodcutting Decree (Cap. 121) are for the establishment of forest reserves, protection and management of forest and bush.

Wild Animals Protection Decree (Cap. 128) deals with protection of wildlife species of Zanzibar (the green turtle and marine mammals). The Wild Birds Protection Decree (Cap. 129) prohibits hunting and trade of many bird species throughout the year, but allows hunting from 1st October to 31st March. The Fisheries Legislation (Revised 1988) deals with marine Conservation Areas, sanctuaries, and controlled areas which may be created by order, pollution prevention, prevention on dynamiting, control on spear fishing and beach seining, sea life including corals, shells, trade and export.

9.8 Environment

The Environmental Management for Sustainable Development Act (Environment Act), No 2 of 1996 is the main supporting legislation for some of the earlier sustainable development policies. Part VIII of the Act covers Protected Areas and Biological Diversity and allows for the establishment of protected areas. It defines four categories (Controlled Areas (subsequently referred to as Conservation Areas), Reserves, Parks, and Sanctuaries), and gives powers to communities to make their own environmental management plans. The Act provides for revenue collection and management, and, at the recommendation of the Chief Conservator, for local community participation in management decisions for a given conservation area. It also requires the establishment of a National Protected Areas Board as a consultative authority to provide policy guidance. The board draws members from ministries responsible for natural resources, environment, local government, finance as well

the scientific community and Tanzania mainland counterparts. The functions of the Board include to:

- formulate, advise and coordinate the implementation of the policies of the government on PAs
- recommend to the Minister responsible for the national protected area system those areas which are suitable for national protected area status
- approve management plans for national protected areas
- designate the appropriate lead institution to manage the national protected area system established under the Act.

Under a 1999 supplement to the Environment Act, a Zanzibar Nature Conservation Areas Management Unit is to be set up that will manage protected areas.

In the case of the development of new area, this need for integrated management of natural resources stated in the Environmental Act of 1996 once again underscores the need for an overdue SEA which is a missing link in the conservation area. The Act provides a legal basis for the establishment of ICM in Zanzibar. Another issue listed was the need to “developing environmentally sensitive area; including forests, mangroves and small islets and water catchments” requires a Scoping Study 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.”

9.9 Key Legal Instruments in Marine Protected Area Management

As a result of the sectoral management approach, there are different legislation and acts that influence coastal resource management in Zanzibar: Fisheries Act 1988 in general and No. 8 of 1988 in particular laws related to MIMCA Forest Act of 1996, The Town and Country Planning Decree 1955, Zanzibar Investment Promotion Act 1986, District and Town Councils Act of 1994 (Town and Country planning, Zanzibar Investment Promotion Act, COLE and District and Town Councils Act provide the legal basis for tourism development).

The Environment Act establishes a National Fund for Protected Areas Management, which once implemented will receive government subventions, donations, entrance fees and permits, and fines for violations of the Act. The 1999 supplement allows for the establishment of a Nature Conservation Development Fund that will help to support the work of the Nature Conservation Areas Management Unit. Neither of these Funds is operational and currently revenue from entrance fees is managed at MIMCA under separate arrangements.

9.10 Government Vision, Strategies and Programmes

The Vision 2020 is a national development tool to be used in planning for the development of the quality of village life. The document describes the country’s main socio-political and economic objectives and strategies for a period of 20 years. The Government of Zanzibar launched in 2002 Zanzibar’s Poverty Reduction Plan (ZPRP), which is the first step on the road to implementing the Zanzibar Vision 2020. The Poverty Eradication Programme is a five years action plan, The five action priorities are: community-based projects, improvement of health services for “poor”, better education facilities for all, improved agricultural productivity and better use of natural resources, and public service reform and capacity building.

According to the Zanzibar Biodiversity Strategy for the fisheries sector, “the overall objective of aquatic biodiversity in Zanzibar, as perceived by the Sub-Commission of Fisheries, is to stop further damage on biodiversity and improve it to sustainable levels”. This overall objective shall be achieved in two ways: a) total protection of rare and endangered species (e.g. turtles and coconut crabs) and habitats facing irreversible destruction; and b) rational and sustainable exploitation of the biodiversity resources. The Zanzibar Biodiversity Strategy defines the strategy and action plan for the tourism sector. Other guidelines for the tourism sector exist, such as the Guidelines to Investors, which do not address sufficiently environmental concerns, and the Guidelines for the Preparation of Preliminary Environmental Reports for Hotel Projects. Nevertheless, there is a need for a SEA as well as a Tourism Plan and guidelines to be conducted in the target area.

In 2003 the National Integrated Coastal Management (ICM) Strategy was published to provide a framework and process for linking different sectors and balancing their decisions about conservation and use of coastal resources. Some of the means to achieve this balance include local level integrated planning and management and stakeholder involvement in the coastal development process and policies.

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.

9.11 International Treaties

Table 6. International Treaties and Conventions Relevant to MIMCA

CITES	Convention Of International Trade In Endangered Species 1975 [Ratified 1979]
CBD	Convention On Biological Diversity 1992 [Ratified 1995]
CMS/Bonn	On The Conservation Of Migratory Species Of Wild Animals
Ramsar	Convention On Wetlands of International importance 1971 [Ratified 2000]
MarPol	International Convention For The Prevention Of Pollution From Ships
Nairobi Convention	UNEP Convention for the Protection, Management and development of the marine and coastal environment of Eastern African Region 1985
UNCLOS	United Nations Law of the Sea Convention 1982 [Ratified 1985]
UNESCO	World Heritage Convention 1975 [Ratified 1977]

The GMP programmes are implemented in compliance with the vision, strategies and programme of the government and international treaties.

9.12 Institutional Framework

Zanzibar is part of the United Republic of Tanzania. The union creates a unique political situation, since Zanzibar under the Union Constitution retains a wide range of autonomy in most areas of government and its economy. The Revolutionary Government of Zanzibar deals with matters concerning Zanzibar, whereas the Union Government deals with those in respect to the Tanzania Mainland. The Constitution governing the Union designates only 22 subject areas, including the following: Research, Meteorology, Harbours, Management of the Exclusive Economic Zone, and Mineral Oil Resources. Authority over territorial waters and matters of natural resource management are within Zanzibar’s exclusive jurisdiction. Zanzibar Islands have five administrative regions: Urban West, Zanzibar North, Zanzibar

South, Pemba North, and Pemba South. The regions are sub-divided into districts, constituencies, wards and “Shehias”. As such the administrative structure of government is well established up to the local level. There are many national ministries that are mandated to manage some components of marine and coastal resources and the environmental issues. The main ones are:

Ministry of Agriculture, Livestock and Environment
Department of Environment · Department of Fisheries
Ministry responsible for Transport
Ministry of State for Regional Administration

9.13 Management of MIMCA

The management and operational frame work for the management MIMCA is set out in accordance with fisheries Act No 8 of 1988, Orders made under sections 7 (1) and 32 of 2002. The management committee is the organ responsible for the management of the conservation area, receiving advice from the Advisory Committee on the management issues. Day to day management and operations of the MIMCA are in the domain of the Manager supported by delegated professionals and support staff in the field.

The management of the MIMCA operates at the levels of the village, district and country. In each of the villages covered by the conservation area there is a Village Conservation Committee (VCC) (which has been replaced by the Fisheries Coordination Committee, FCC) that works in cooperation with the Shehias and a fisheries officer based in the village. The VCCs’s role includes articulating the views and concerns of the villages to the staff and the management and steering committees, and their aim is to ensure full village participation in the MIMCA activities The District Conservation Committees (DCCs), in turn, articulate the views of the VCCs to District authorities and the Standing Committee.

9.14 MIMCA Human Resources

In accordance to the Order of 2002, the management committee has the mandate to employ any person or find an agent as executants or perform any of its responsibilities, however the overall staffing for the MIMCA will evolve on a need basis depending on available financial resources. Staff job description and responsibilities will be defined, and ongoing training undertaken as relevant. In the meantime a team of around 6 staff seconded from the DFMR is responsible for daily management of the area and 7 on contract involving mainly from community members. 1 staff is on further training which is supported by MACEM.

9.15 MIMCA Physical Resources

MIMCA has 1 motor vehicle, 6 motorcycle and 2 boats. There is also a radio communication equipment installed. Diving equipments, computers, photocopiers and printers are provided by MACEMP. There is a field office built at Kijijini –Mbuyuni.

9.16 MIMCA Finance Resources

MIMCA is financed through a combination of government subvention, donor funding, and visitor fees. The government subvention covers some of the salaries and the office costs. Currently, all activities of the MIMCA are funded by MACEMP. Seventy percent of the revenue raised is retained for the management activities of MIMCA and 30% is retained and granted to the local communities to support development programme as a form of benefit sharing.

An entrance fee of US\$ 3 for a non resident and Tshs. 1000 for a resident are charged per day. for recreation. Other user fees include, filming fee (US\$ 100 for residents, US\$ 200 for a non resident and US\$ 500 for a group) and research fee (US\$ 20 for residents, US\$ 30 for a non resident and US\$ 50 for a group).

10.0 INTERNAL RESOURCES

10.1 Financial Management Strategy

The principle of sustainability, as applied to the use of conserved natural resources should ideally extend to the financing of the area itself. The financing plan will be designed to fund long-term operating costs, from the collection of permits, conservation area entrance and user fees.

10.2 Collection of User Fees

Fees will be efficiently collected to ensure that the effort of patrol officers are not merely weighted toward the collection of fees, but rather the enforcement of zoning provision that will govern unsustainable resource use.

Visitor's entrance fees will be paid by tour operators, and hoteliers, that bring their visitors to the conservation area, by purchasing tickets or vouchers from the MIMCA office. MIMCA management will not be involved in issuing licenses or collecting revenues from artisanal fishers.

10.3 Account System

All revenues accruing from the conservation area will be held in the conservation area account. The terms and condition for the use of fund will be in accordance to the MIMCA order. The most important elements in achieving the required controls are detailed budgeting, clear account procedures and transparent reporting. The manager will be responsible to prepare a forecast of revenue for the conservation area, based on discussions with tour operators, hoteliers and commercial marine users, and plan the operating cost accordingly. The budget will then be submitted to the Advisory Committee for comments, and then to the Management Committee for approval. Disbursement of funds from the MIMCA Development fund will be the responsibility of the Manager upon approval by the Management Committee subject to control procedures. Such procedures will be detailed by the Management Committee on advice of the Advisory Committee.

10.4 Distribution of Net Revenue

The money collected will be used for the management of MIMCA including costs for Advisory and Management Committee meetings, patrols and administration activities, and by various development activities within the community, and shall be disbursed in the manner approved by the Management Committee. A share of the fund will be used for the benefit of the MIMCA surrounding villages involved in the conservation of the area, percentage of which is still negotiated.

10.5 The Permit System

10.5.1 Local resident fishing licenses

Issued to all Zanzibar fishermen, for their everyday fishing activities.

10.5.2 Game/sport fishing licenses

Issued to all game fishing boats the entering the conservation area for recreational purposes, and can have a validity of two weeks, one month or one year to carry out sport fishing activities. These conditions apply to both locals and non local residents.

Issuing Authority

The issuing authority for licenses in all the fishing activities will be in accordance to the Fisheries Amendments Act 2010 is the Director of the Department of Fisheries and Marine Resources of Zanzibar.

10.5.3 Water sport licenses/tickets

Issued to any person entering the conservation area for recreational purposes, like snorkeling, diving, swimming and others

10.5.4 Filming licenses

Issued to any person(s) entering MIMCA for purpose of undertaking filming activities; and the license is divided into three categories, the Tanzania's, Non Tanzanian and group of people filming together.

10.5.5 Study tour/research license

Issued to any person(s) under entering MIMCA for purpose of taking study tour or research activities; and It is divided into three categories, the Tanzanian, the non Tanzanian and group of people under taking the study tour/Research together.

Issuing Authority

The licensee Issuing Authority for the above mentioned activities according to is the MIMCA management.

10.5.6 Communication and information sharing

Appropriate information dissemination techniques and consultations will be adopted to sensitize stakeholders to regulations and ensure that all groups have proper opportunities to give feedback on issues of concern to them. In the longer term, conservation objects will be best achieved through education and awareness creation among local and business communities, as well as tourists.

Ongoing interactions with local communities will primarily be undertaken by MIMCA staff in conjunction with village environmental and fishing committees. An environmental education and awareness-raising Programme will be developed in association with schools and other community groups. A priority will be to establish mutually agreed policy frame work with tourism and other commercial investors, through participatory development of relevant policy planning documents.

The MIMCA management through its information center will provide both official and informal visitors with reader friendly information about the conservation area and inform them about MIMCA policies, regulations and ongoing activities. Use of newsletter, public sign, audio visual material and other appropriate media will be considered as appropriate

11.0 COMPLIANCE AND MONITORING

11.1 Compliance and Enforcement

Implementation of the management strategies as outlined in this plan will be effective to curb illegal activities in the MIMCA only when law enforcement team are highly visible on site. This will require a carefully developed compliance and enforcement plan. The plan will be prepared in consultation with relevant law enforcement agencies such as KMKM, marine Police etc. The primary goals of this strategy are to encourage a high level of public awareness and support the values of MIMCA, maximize compliance with relevant parts of the Fisheries Act, regulations and orders and management plans, and enforce the legislation transparently, lawfully, equitable and fairly. These goals will be reflected in the Compliance and enforcement plan for MIMCA.

Other important elements of the compliance and enforcement plan will be to continue to facilitate an on site management presence in all parts of the conservation area throughout the year including regular patrols both land and sea, and to develop surveillance, compliance and enforcement services through a cooperative arrangement with agencies including KMKM, Marine Police, Navy and Fisheries Patrol team.

Another element of compliance and enforcement plan will be the production and distribution of educational material to inform stakeholders of the purposes of MIMCA, details of restrictions and to raise awareness on the conservation values of the MIMCA.

11.2 Performance Assessment (Evaluation)

Performance assessment program for MIMCA will be developed in collaboration with the scientific community, local communities, private operators and government institutions. The primary purpose of the performance assessment program is to identify whether management is effective. Performance assessment also provides a means of identifying where management can be improved and also provides a basis for re-evaluating the MPA's strategic objectives, management goals and strategies, and the effectiveness of compliance and enforcement. The program will be applied through the identification of applicable environmental indicators, which are derived from the legislative framework, IUCN Management guidelines, strategic objectives and goals, and an analysis of the Biodiversity and the potential pressure on the major values of the Conservation Area. The indicators will measure the state (or condition of the environment), pressure (threats and impacts) and response (reaction to pressure) of the environment. Indicators will be monitored over short and long timeframes (temporal variability) and over a number of sites (spatial variability). They are developed to track changes in important elements or dynamics in the MPAs and surrounding environments and the impacts of human activities.

Baseline surveys are a necessary first step in performance assessment providing a bench mark for monitoring, and building upon the existing data. A monitoring program using the environmental indicators to document and evaluate biodiversity condition and trends over time, will be established and will build upon the baseline data.

The performance assessment framework and performance reports will be produced in consultation with relevant stakeholders.

Key elements of the performance assessment for MIMCA will be:

- Water quality monitoring, this will include water quality measures (turbidity, chlorophyll and nutrients) and pollution (oil)

- Monitoring of key species targeted by artisanal fisheries i.e. Snappers for reef fishery etc.
- Monitoring the impact of human visitation, specifically relating to critical habitats and mooring and anchoring of vessels
- Marine and terrestrial introduced species, specifically their means of introduction and impact on natural values
- Process indicators which will focus on the success of the management plan and the implementation of management strategies.

As mentioned above this work involves liaison with relevant research institutions and individuals.

11.3 Reviewing the GMP

The management plan for MIMCA will operate for five years unless revoked or amended sooner by another management plan for MIMCA. The GMP will be reviewed approximately two years before the expiry.

Results from the performance assessment program will be used to undertake the review of the plan. The result of the review will be used in the development of the next General management plan for MIMCA

12.0 MANAGEMENT GUIDE

12.1 Conflict Resolution – Local Resident User’s Permits, Concession

User conflicts over the same area among different groups have been common. Resource conflicts have also contributed to over utilization of resources. Strategies to ease these conflicts have been put in place and if well implemented, the situation may be contained.

12.2 Activities Prohibited in All Zones

Outlines below are activities that are prohibited within the Menai bay Marine Conservation Area as a whole or those are restricted within particular zone types. It follows the resource-use strategies for zone types outlined in section 5.4 of the previous chapter. Following implementation of this management plan, regulations will be drawn up in line with this plan and legislated by the order under the Fisheries Act, 1988 and its subsequent amendments.

12.2.1 Prohibited extraction of living resources

- Use of beach seine nets”
- Any activity involving mechanical damage to, or breakage of, coral and other benthic habitats or organisms, whether by hand or by use of poles or other implements
- Killing of turtles, whether accidental or deliberate, including removal of turtle eggs
- Killing of dolphin and purpose, whether accidental or deliberate
- Trawling
- Use of propelled spear-guns and harpoons
- Use of dynamite
- 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
- Mangrove cutting for commercial sale
- Mining of live coral from inter-tidal and sub-tidal areas
- Using of monofilament or likembe
- In addition, the use of pull nets with stretched-mesh size of less than 2.5 inches, mosquito nets – including clothes (tandilo) a – will be phased out within the boundaries of the Conservation Area

12.2.2 Prohibited extraction of non-living resources

- Mining of dead coral from inter-tidal and sub-tidal areas
- Sand mining from beaches and sub-tidal areas
- Any form of seabed mining
- Hydrocarbon exploration and drilling (other than the existing gas well, where exploitation will be subject to review by the Manager and other relevant authorities) • Production of salt by heating sea water using fuel wood or other hydrocarbons

12.2.3 Prohibited construction and development

- Port development and/or dredging (marina development and permanent docking facilities – including wood jetties - will require submission of an EIA and prior approval of the Manager)T

12.2.4 Prohibited tourism activities

- Jet skis
- Landing of amphibious plane
- Sport fishing
- Sale and buying of marine curios in the reserves
- Over speeding of boats

12.2.5 Introduction of alien species of plants and animals

- Alien species of flora and fauna are prohibited in the MIMCA

12.2.6 Prohibited marine transportation and shipping activities

- Shipping activities
- Speeding of commercial marine vessels

12.3 GUIDE TO REGULATED ACTIVITIES

12.3.1 Fishing activities

- All fishing will be prohibited in the core zones
- All fishing in the Specified Use zones will be restricted to artisanal fishers who are resident in the MIMCA
- All artisanal fishers in the conservation area will be issued a fishing license and will provide all required information on the type of vessel/gear they use
- Lobster and octopus fisheries may be subject to minimum catch weight limits
- Destructive and illegal gears will be phased out with due compensation
- Sport fishing will be restricted to designated areas within the Marine Park
- Sport fishing will be subject to prior issuance of sports fishing license and payment of the appropriate fees
- Sport fishers 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 will show permits and provide catch information to any duly authorized MIMCA staff.
- Furthermore, and, as deemed necessary by the Warden and subject to scientific justification, a Marine Conservation observer may be posted on sport fishing vessels, at the sport fisher's expense.

12.3.2 Mud brick making and coral mining

- Mud brick making will be restricted to MIMCA residents who will have to obtain a permit to do so.
- Sea Coral Mining will be prohibited save for occasions when it will be absolutely necessary and at the request of the village government, and for non commercial purpose the Manager will give a permission to do so.
- Land Based Fossil Mining will be permitted on special designated site.

12.3.3 Mangrove harvesting

- Harvesting of mangrove products, especially tree cutting, will be strictly regulated under a permit system.
- In addition, the following will apply:
- Mangrove harvesting will be strictly prohibited in all core zones
- Mangrove harvesting for charcoal and firewood for kilns will be forbidden
- Mangrove harvesting will be restricted to MIMCA residents who have obtained a permit to do so.
- Harvesting mangroves for commercial purposes within the MIMCA boundaries is prohibited.
- Non-residents caught harvesting mangroves within MIMCA boundaries will be prosecuted to the full extent of the law.
- Even when a permit has been granted, clear felling of mangroves should be limited.
- Further regulation may establish limits on the species of mangroves that may be harvested.
- Permit issuance may be subject to a limited number of mangroves to be cut and may require the applicant to plant seedlings.
- Prior to harvesting, a cutting site may be specifically approved by the Manager or one of his/her representatives.

12.3.4 Non-mangrove forest products

- Harvesting of non-mangrove products will be subject to a permit system.
- Pole cutting will be strictly prohibited in all core zones
- Pole cutting will be restricted to MIMCA residents who have obtained a permit to do so. The number of permits issued will be limited. Even where a permit has been issued, the cutting of poles may be subject to replanting alternatives as a condition of cutting natural trees
- Burning of any forest products is illegal in the MIMCA area

12.3.5 Salt making

- Commercial salt making will require a permit and subject to the EIA clearance.

12.3.6 Construction

- Construction for residential purpose or at small scale will be permitted in the general use and specified use zone.
- Large scale Commercial construction will be permitted after satisfying EIA requirement

12.3.7 Scientific research

- All scientific research within the MIMCA boundaries will be subject to prior issuance of a scientific permit by the Manager, at his/her discretion but subject to scientific justification
- A scientific permit allows for the limited collection of specimens for scientific reasons, but not for bio-prospecting purposes
- A differential fees system will be applied to Tanzanians and non-nationals, though the fees may be waived if the Manager deems the planned research to be in the interest of the MIMCA
- All the results from scientific research carried out in the Menai bay will be forwarded to MIMCA in the most useful format (and in GIS format wherever possible)
- Any publications based on scientific research carried out in the Menai Bay should be forwarded to MIMCA as soon as they become available
- Failure to abide by these requirements may result in a ban on further scientific research within the MIMCA for the individuals/institutions involved

12.3.8 Regulated tourism activities

- Sea-planes

12.3.9 Seaweed farming

13. RECOMMENDATIONS

The following recommendations provide an outline of the extra issues needing to be addressed in the longer term. These should be dealt with as and when the opportunity arises.

13.1 Detailed Zoning Plan

A revision of the initial zoning plan has been done during the development of the GMP. The shoreward and seaward boundaries of the marine Conservation Area however; should be explicitly defined in consideration with existing policies and legislation (especially the Land and Forest Policies). A system should be developed based on GIS which is linked to a website for easily access to and interaction with by stakeholders.

13.2 Information Gaps

The following sources of information have been identified as useful for protected areas by Kenchington, R. A. 1990.(Managing Marine Environments; published by Taylor and Francis, New York). The development of those that are not available to the marine Conservation Area management would increase the management capacity of the institution. This should be done as soon as and when the opportunity arises.

Information Source	Comments
Geological maps	GIS topography map and map of MIMCA pending
Maps of currents	No updated information available
Bathymetric	No updated information
Tide tables	No updated information available
Baseline habitat maps	only for terrestrial vegetation through the Forestry Division
Community descriptions	Environmental Management plan for each village
Species list	No information
Status of commercial important species	No Information
Endangered, threatened, endemic species status	No Information
Aerial photographs	No updated info
Hydrological survey	Not done
Land use plans	Not yet developed
Topographical maps	Available
Economic valuation	Not done
Cultural valuation	Not done
Traditional user	Known
Current use//usage levels	Not done

13.3 Monitoring and Review

A strategic programme for monitoring the health of natural resources in the MIMCA is needed. Any historical monitoring data should be summarized and used to form a comprehensive monitoring plan. Fish stock monitoring can be established with the fishermen. Partnerships with national and international academic institutions should be sought to increase the amount of research available to MIMCA management. Success Projects to ensure MIMCA management

activities are also monitored for success. Extensive usage statistics should also be sought for hotels, tourists, cruise ships, divers and the other key users. For divers, this information should be captured from the sale of dive tags. To record the numbers of divers visiting the various dive sites should be a legal requirement in the MIMCA for operators to fulfill.

13.4 Update Website

A Website should be developed and be updated on monthly basis for conservation and marketing purpose. There are a number of reasons why an effective website is beneficial. Generally, the population on the Internet is well-educated and affluent. Most own a computer; others have access to one. Internet users are interested in convenience. Many prefer the ease of finding information directly from their computer screens. This includes researchers, holidaymakers, local people, government and a range of other MIMCA stakeholders.

13.5 Frequent Stakeholder Consultations and Information Dissemination

Stakeholders should be consulted on a regular basis and in a structured fashion to increase the feedback that the MIMCA receives. Bi-monthly meetings at a set location with all stakeholders who wish to take part are one option. Such meetings should be used to identify key issues and as a marketing and update platform.

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