

# MANAGEMENT PLAN FOR NO-TAKE ZONES (UNGUJA UKUU AND KIKUNGWI)

---

August 2013



A collaborative effort between Kikungwi and U/Ukuu communities, Western Indian Ocean Marine Science Association, Institute of Marine Sciences, Menai Bay Conservation Areas and the University of Rhode Island's Coastal Resources Center, funded by the United States Agency for International Development



## Table of Contents

ACRONYMS .....	iv
ACKNOWLEDGEMENT .....	v
Executive Summary: .....	vi
Village Introduction .....	1
Unguja Ukuu .....	1
General activities .....	1
Tourism .....	1
Farming .....	2
Kikungwi .....	3
General activities .....	3
Tourism .....	3
Farming .....	3
Fisheries Resource: Trend and Use .....	4
Unguja Ukuu .....	4
Fisheries .....	4
The Cockle/Bivalve gleaning activities .....	4
Kikungwi .....	4
Fisheries .....	4
The Cockle/Bivalve gleaning activities .....	5
No-take zones Establishment Process .....	6
Community Consultations .....	6
Formulation of a no-take zones committee .....	6
Conducting base line survey .....	7
Data analysis and data presentation .....	8
Marking the area .....	10
By law formulation and putting slogan .....	11
The complete new no-take zones in U/Ukuu and Kikungwi .....	11
Monitoring of no take and presenting the data .....	11

Issues that arose during the measuring of sites on selected no-take zones .....	13
No-take zones Management Plan.....	13
Management Area.....	13
Challenges and solutions for cockle management and no-take zones .....	13
Objectives of No-take zones Management Plan 13	
General Objective .....	13
Specific Objectives .....	14
Roles and Responsibilities of Institutions:.....	14
Fisheries Department and Menai Bay Conservation Area (MBCA) .....	14
Pwani project team (WIOMSA and IMS) .....	14
Village.....	14
Work Plan .....	15
Regulations and Penalties .....	17
Future management.....	17
REFERENCES: .....	23

## Acronyms

<b>CRC</b>	Coastal Resources Center
<b>IMS</b>	Institute of Marine Sciences
<b>MBCA</b>	Menai Bay Conservation Areas
<b>TCMP</b>	Tanzania Coastal Management Partnership
<b>URI</b>	University of Rhode Island
<b>USAID</b>	United States Agency for International Development
<b>WIOMSA</b>	Western Indian Ocean Marine Science Association

## Acknowledgments

This management plan has been made possible through the dedicated work of the Pwani Project and its partners. Special thanks to Western Indian Ocean Marine Science Association (WIOMSA), Institute of Marine Sciences (IMS), Menai Bay Conservation Areas (MBCA), Tanzania Coastal Management Partnership (TCMP), Department of Fisheries and the committee of Kikungwi and U/Ukuu for their priceless effort and positive feedback.

The project is thankful to USAID for funding all activities, without forgetting CRC and URI for their crucial technical support.

## Executive Summary

Coastal communities, such as those around Menai Bay, in Zanzibar, Tanzania, depend on marine resources for household needs and as sources of income. Hence, the coastal area and ocean remain crucial assets for local men and women living in the Unguja Ukuu and Kikungwi villages on the Unguja Island, Zanzibar.

The Menai Bay area is situated in the southwest of Unguja, the main island of the Zanzibar Archipelago. The area is extensively covered with coral reefs, sea grass beds and mangrove forest. The area had remained relatively undisturbed until the mid-1990s, when uncontrolled fishing pressures combined with destructive fishing techniques became a serious environmental concern.

Overuse can lead to depletion of marine resources and with those losses, entrenched poverty. Over-harvesting in Menai Bay had been depleting the cockle resources, one of the communities' few dependable sources of income. Women are engaged in the intertidal gleaning on the reef flats, collecting different varieties of shellfish, including cockles, octopus and other species for subsistence and sale. Invertebrate collection has been a crucial source of nourishment for coastal people since the history of man's evolution in Eastern Africa (Richmond 2002).

With technical support from the Pwani project and the Institute of Marine Sciences (IMS), Unguja Ukuu and Kikungwi worked to create no-take zones to minimize depletion of cockles in a segment of Menai Bay.

The process of establishing no-take zones was carried out in phases. The first phase involved and focused on improving the existing zones in Nyamanzi, Bweleo and Fumba. The no-take zones in Bweleo and Fumba showed good progress, but Nyamanzi village decided to remain an open area. The good results in two communities propelled the establishment of no-take zones in Kikungwi and Unguja Ukuu.

This Management Plan is a road map to ensure that these resources are managed sustainably and outlines a set of actions and responsibilities for all key stakeholders. This plan explains the process of establishing no-take zones and shows how the zones are managed under different sets of stakeholder collaboration.

## Village Introduction

### Unguja Ukuu

Unguja Ukuu village is found on the South of Unguja Island. The village is located between Kikungwi and Uzi Island and is a part of a community of three small villages including U/Ukuu Kae Pwani, U/Ukuu Kae Bona and Tindini (Map 1).

Unguja Ukuu is a small settlement that has historical importance as an ancient capital city of Zanzibar.

**Table 1. Population of Unguja Ukuu**

Village name	Male Population	Female Population	Total Population	Average Household Size	Sex Ratio
U/Ukuu Kae Bona	664	698	1,362	4.6	95
U/Ukuu Kae Pwani	796	767	1,563	4.6	104
U/Ukuu Tindini	592	568	1,160	4.5	104
<b>Total</b>	<b>2,052</b>	<b>2,033</b>	<b>4,085</b>	–	–

SOURCE: 2012 NATIONAL POPULATION CENSUS

### General Activities

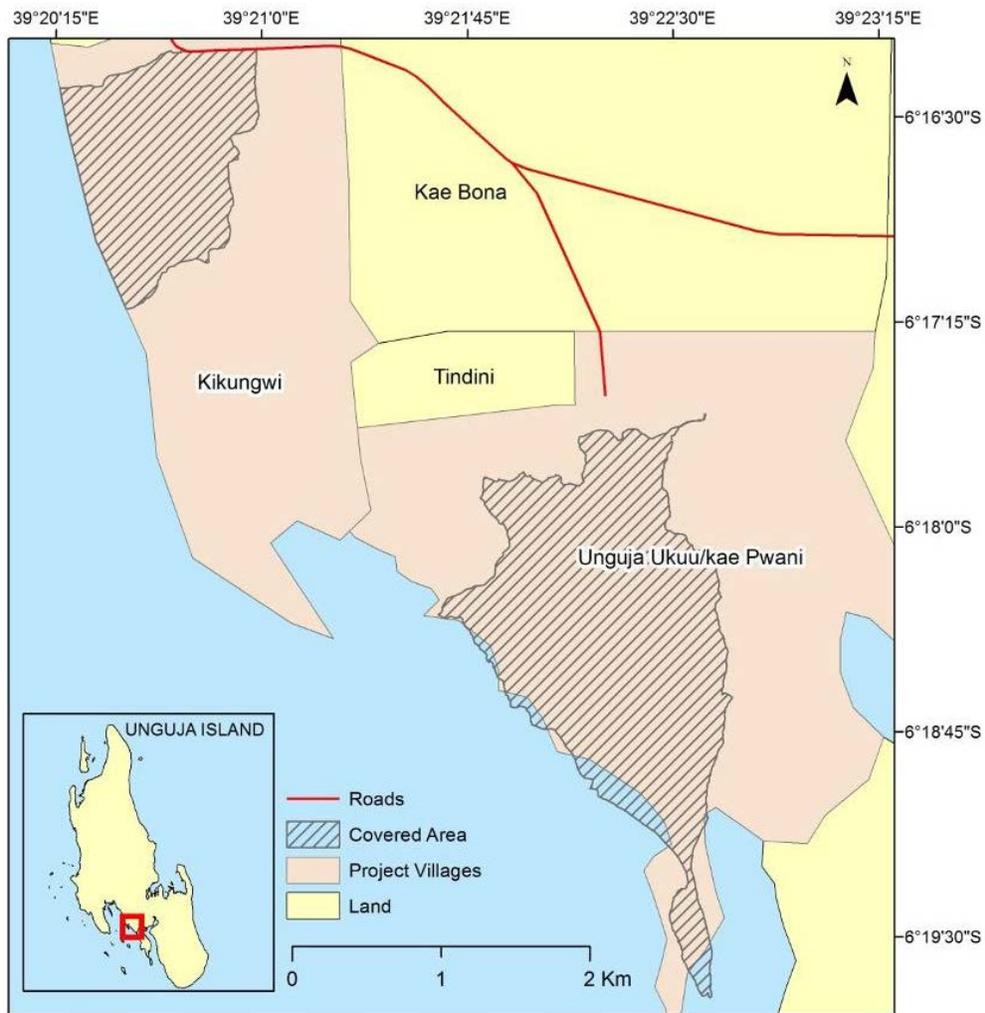
Similar to other coastal villages, the Unguja Ukuu community economy is mainly dependent on activities related to agriculture and marine activities, such as fishing, cockle gathering and seaweed farming (Jiddawi at all 2010). As another source of income, tourism activities are rising very slowly.

### Tourism

Unguja Ukuu is bestowed with many interesting tourist assets as Zanzibar's ancient capital city. The villagers are friendly and produce good quality hand crafts, such as baskets, doormats and other items. Despite these opportunities, tourism activities are less of a priority in the area, and most economic efforts remain in agriculture and marine activities. Although tourism is growing rapidly on Zanzibar, most of the growth is restricted to the East Coast of Unguja Island. Traditionally, tourism development in Menai Bay has been minimal due to the poor roads and difficult access and has not seen the growth that has occurred in Stone Town and the northern tip of Zanzibar near Nungwi and Kendwa. In addition to transportation difficulties, tourist

accommodations are not well developed. (Torell et al 2006). However, as of late good roads and tourism are developing slowly.

**Map 1: Position of Unguja Ukuu and Kikungwi**



## Farming

Although U/Ukuu usually experiences a shortage of seasonal rainfall, farming remains a significant economic activity in the area. Most of the women participate in seaweed farming. Cassava and bananas also are farmed as daily food sources. In addition, small-scale livestock farming, including goats, cattle and chickens, is common.

## **Kikungwi**

Kikungwi village is located on the Southwest of Unguja Island between Bungi and U/Ukuu villages and is part of the Menai Bay Conservation Area. According to the National Census (2012), Kikungwi's population is 972. Further population information is in Table 2.

**Table 2. Population of Kikungwi**

<b>Serial number</b>	<b>Male Population</b>	<b>Female Population</b>	<b>Total Population</b>	<b>Average Households size</b>	<b>Sex ratio</b>
Kikungwi	505	467	972	4.6	108
U/Ukuu Tindini	592	568	1,160	4.5	104
<b>Total</b>	<b>2,052</b>	<b>2,033</b>	<b>4,085</b>	–	–

Source: 2012 National population census

## **General activities**

The village economy is mainly dependent on two activities related to agriculture and marine activities. Meanwhile, tourism is emerging as a new activity and is slowly improving.

## **Tourism**

Like Unguja Ukuu, Kikungwi has few tourism activities. There are no hotels or guest houses. However, the village is an embarking point for tourists coming from the east coast to board boats to Kwale and other islands in Menai Bay.

## **Farming**

In general, most people in this village are involved in farming activities. Common food stuffs include cassava, cereals, coconuts and fruits, with some crops having commercial value. Many women are involved in seaweed farming, and the village has small-scale livestock activities, such as raising goats, cattle and chickens.

## Fisheries Resources: Trends and Uses

### Unguja Ukuu

#### Fisheries

Jiddawi (2010) further highlights that “Ukuu as a coastal village, fishing is among one of the most practiced economic activities. People fish for household consumption and daily income.” The major gears used in fishing activities are basket traps, hand line, spear fishing and nets. Vessels used include dhows, canoes and other boats.

#### Cockle/Bivalve gleaning activities

In Unguja Ukuu village both men and women participate in the harvesting of marine resources, however, activities are gender selective. Most women collect bivalves and gastropods during low spring tides in the intertidal areas while men fish and dive for octopus and snorkel for other types of marine species, such as sea cucumber. Some species harvested by women are cockles (*Anadara sp.*), tiger shells, (*Trapezium sp.*), mussels (*Modiolus sp.*, *Chicoreus sp.*, *Glycymeris sp.*) and oysters.

Zanzibari women collect over 21 species of bivalves, with some more prevalent and favored than others. Women tend to collect mostly cockles (*Anadara antiquata*), giant murexes (*Chicoreus ramosus*), conchs (*Pleuroploca trapezium*) and oysters (*Pinctada margaritifera*). These species are also the most valuable, providing between TSH 825-1250 for about 20 specimens. The abundance of these species varies by area and season, which makes the price swing throughout the year (Torell, et al 2006). The foot of the mollusk, or operculum, particularly of the *Chicoreus ramosus* and *Pleuroploca trapezium*, has been known to be sold for up to TSH 75,000/kilo. Hence, bivalve collection can be relatively profitable, providing cash for women who have few other income-generating options.

### Kikungwi

#### Fisheries

Fishing is a major economic activity in the area, and the residents are heavily dependent on the marine environment for their daily subsistence. Fishing provides most of the households with cash and food, whereas agriculture provides subsistence needs. Most fishermen are involved in artisanal fishing, typically using outrigger canoes, which are small and not suitable for offshore waters. The most common fishing gear includes gill nets, shark nets, small-scale purse seine and a variety of fishing lines. (Torell et al 2006)

Fisheries activities in Kikungwi look similar to U/Ukuu activities in terms of fishing gear and methods. A large number of the Kikungwi community depend on fisheries as a source of income, with men fishing in deep water and women gathering cockles along the rocky shores. The main species normally collected are similar those of U/Ukuu.

## **The Cockle/Bivalve Gleaning Activities**

Kikungwi village is a great source for cockle collection compared with other villages in Menai Bay because of its rocky shore and wide flat reef that attract a mixture of marine creatures.

Women harvest the intertidal areas during the spring tides, and many carry a small metal tool for prying the shells out of the sand and from rocky areas. Shells are placed in plastic sacks called *polo*. Cockles (*Anadara sp.*) are the main species harvested, but species such as oysters, tiger shells, *Trapezium sp.*, *Acrosterigma sp.*, mussels (*Modiolus sp.*), *Glycymeris sp.*, and others are also collected (Jiddawi` et al 2010)

After processing, the cockles are sold locally. The common market is alongside the main road where passersby can stop to make purchases. All cockle sellers are women, who are empowered by this market activity and sometimes visit town to get a better price. As mentioned by Shinula (2005), “the areas don’t have much alternative livelihood activity, especially for the elderly, women and children who form the majority of shellfish collectors. They collect these shells primarily for domestic consumption, and little gets sold at the markets in Zanzibar town.”

At the beginning of the Pwani project, four no-take zones were managed. In the second year the Nyamanzi no-take zone was not functioning due to severe changes of the sea bed (higher accumulation of sand along the area). As a result, most cockles died from being covered by sand while it was a free zone. In the third year of the Pwani project, two new no-take zones (in Kikungwi and U/Ukuu villages) were established and important procedures were put in place.

## No-take Zones Establishment Process

### Community Consultations

The Pwani team conducted several meetings with villagers (in Kikungwi and U/Ukuu) in order to get their buy-in to establish no-take zones in their areas. The team was informed about the problem of marine resource depletion and its causes, and establishment of no-take zones was put forth as a solution. Both villages agreed to establish the zones and promised to work through the process to make the zones sustainable.



**Photo 1: Community meeting to establish no-take zones in Kikungwi**

### Formulation of No-take Zone Committee

Once the team agreed with the villagers on establishing the zones, a special committee of 15 members was formulated in each of the villages. The selection considered gender and profession to include local leaders, beach recorders and fishers. The first job of each committee was to assist experts from WIOMSA and IMS in conducting a baseline survey.

Also, each committee was given certain responsibilities, such as: formulating no-take zones by-laws and by-law enforcement, conducting periodic no-take zone monitoring with the help of experts and conducting village meetings once a month to update the community on the progress of the no-take zones.



**Photo 2: No-take zones committee in U/Ukuu with the experts**

### **Conducting the Baseline Survey**

The same technique was used in conducting the baseline survey. A 100-meter transect line was laid on the reef flat parallel to the shoreline and perpendicular to the no-take zone boundary. A one-meter square quadrat was randomly placed along the line and then at every 10-meter interval (10 quadrats per transect). Women collected cockles found within each quadrat, and these were measured and counted. In each adjacent area and within the no-take zones a total of 100 one-square meter quadrates (10 transects) were sampled. (Jiddawi, 2011)

Earlier on, each village designated three candidate sites in which Pwani members carried out cockle abundance surveys. Once cockle abundances were determined, Pwani members advised local communities to determine which candidate site would be most effective as a cockle no-take zone (Oliver, 2012). In Kikungwi, three sites were surveyed, including Kikadini, Kwamkonde and Kibondenii; while in U/Ukuu the sites surveyed were Mashobokea U/Ukuu, Kae Pwani (site 2) and U/Ukuu Kae Bona (site 1).

# MANAGEMENT PLAN FOR NO-TAKE ZONES (UNGUJA UKUU AND KIKUNGWI)

---

August 2013



A collaborative effort between Kikungwi and U/Ukuu communities, Western Indian Ocean Marine Science Association, Institute of Marine Sciences, Menai Bay Conservation Areas and the University of Rhode Island's Coastal Resources Center, funded by the United States Agency for International Development



**USAID**  
FROM THE AMERICAN PEOPLE



COASTAL RESOURCES CENTER  
*University of Rhode Island*



## Table of Contents

ACRONYMS .....	iv
ACKNOWLEDGEMENT .....	v
Executive Summary: .....	vi
Village Introduction .....	1
Unguja Ukuu .....	1
General activities .....	1
Tourism .....	1
Farming .....	2
Kikungwi .....	3
General activities .....	3
Tourism .....	3
Farming .....	3
Fisheries Resource: Trend and Use .....	4
Unguja Ukuu .....	4
Fisheries .....	4
The Cockle/Bivalve gleaning activities .....	4
Kikungwi .....	4
Fisheries .....	4
The Cockle/Bivalve gleaning activities .....	5
No-take zones Establishment Process .....	6
Community Consultations .....	6
Formulation of a no-take zones committee .....	6
Conducting base line survey .....	7
Data analysis and data presentation .....	8
Marking the area .....	10
By law formulation and putting slogan .....	11
The complete new no-take zones in U/Ukuu and Kikungwi .....	11
Monitoring of no take and presenting the data .....	11

Issues that arose during the measuring of sites on selected no-take zones .....	13
No-take zones Management Plan.....	13
Management Area.....	13
Challenges and solutions for cockle management and no-take zones .....	13
Objectives of No-take zones Management Plan 13	
General Objective .....	13
Specific Objectives .....	14
Roles and Responsibilities of Institutions:.....	14
Fisheries Department and Menai Bay Conservation Area (MBCA) .....	14
Pwani project team (WIOMSA and IMS) .....	14
Village.....	14
Work Plan .....	15
Regulations and Penalties .....	17
Future management.....	17
REFERENCES: .....	23

## Acronyms

<b>CRC</b>	Coastal Resources Center
<b>IMS</b>	Institute of Marine Sciences
<b>MBCA</b>	Menai Bay Conservation Areas
<b>TCMP</b>	Tanzania Coastal Management Partnership
<b>URI</b>	University of Rhode Island
<b>USAID</b>	United States Agency for International Development
<b>WIOMSA</b>	Western Indian Ocean Marine Science Association

## Acknowledgments

This management plan has been made possible through the dedicated work of the Pwani Project and its partners. Special thanks to Western Indian Ocean Marine Science Association (WIOMSA), Institute of Marine Sciences (IMS), Menai Bay Conservation Areas (MBCA), Tanzania Coastal Management Partnership (TCMP), Department of Fisheries and the committee of Kikungwi and U/Ukuu for their priceless effort and positive feedback.

The project is thankful to USAID for funding all activities, without forgetting CRC and URI for their crucial technical support.

## Executive Summary

Coastal communities, such as those around Menai Bay, in Zanzibar, Tanzania, depend on marine resources for household needs and as sources of income. Hence, the coastal area and ocean remain crucial assets for local men and women living in the Unguja Ukuu and Kikungwi villages on the Unguja Island, Zanzibar.

The Menai Bay area is situated in the southwest of Unguja, the main island of the Zanzibar Archipelago. The area is extensively covered with coral reefs, sea grass beds and mangrove forest. The area had remained relatively undisturbed until the mid-1990s, when uncontrolled fishing pressures combined with destructive fishing techniques became a serious environmental concern.

Overuse can lead to depletion of marine resources and with those losses, entrenched poverty. Over-harvesting in Menai Bay had been depleting the cockle resources, one of the communities' few dependable sources of income. Women are engaged in the intertidal gleaning on the reef flats, collecting different varieties of shellfish, including cockles, octopus and other species for subsistence and sale. Invertebrate collection has been a crucial source of nourishment for coastal people since the history of man's evolution in Eastern Africa (Richmond 2002).

With technical support from the Pwani project and the Institute of Marine Sciences (IMS), Unguja Ukuu and Kikungwi worked to create no-take zones to minimize depletion of cockles in a segment of Menai Bay.

The process of establishing no-take zones was carried out in phases. The first phase involved and focused on improving the existing zones in Nyamanzi, Bweleo and Fumba. The no-take zones in Bweleo and Fumba showed good progress, but Nyamanzi village decided to remain an open area. The good results in two communities propelled the establishment of no-take zones in Kikungwi and Unguja Ukuu.

This Management Plan is a road map to ensure that these resources are managed sustainably and outlines a set of actions and responsibilities for all key stakeholders. This plan explains the process of establishing no-take zones and shows how the zones are managed under different sets of stakeholder collaboration.

## Village Introduction

### Unguja Ukuu

Unguja Ukuu village is found on the South of Unguja Island. The village is located between Kikungwi and Uzi Island and is a part of a community of three small villages including U/Ukuu Kae Pwani, U/Ukuu Kae Bona and Tindini (Map 1).

Unguja Ukuu is a small settlement that has historical importance as an ancient capital city of Zanzibar.

**Table 1. Population of Unguja Ukuu**

Village name	Male Population	Female Population	Total Population	Average Household Size	Sex Ratio
U/Ukuu Kae Bona	664	698	1,362	4.6	95
U/Ukuu Kae Pwani	796	767	1,563	4.6	104
U/Ukuu Tindini	592	568	1,160	4.5	104
<b>Total</b>	<b>2,052</b>	<b>2,033</b>	<b>4,085</b>	–	–

SOURCE: 2012 NATIONAL POPULATION CENSUS

### General Activities

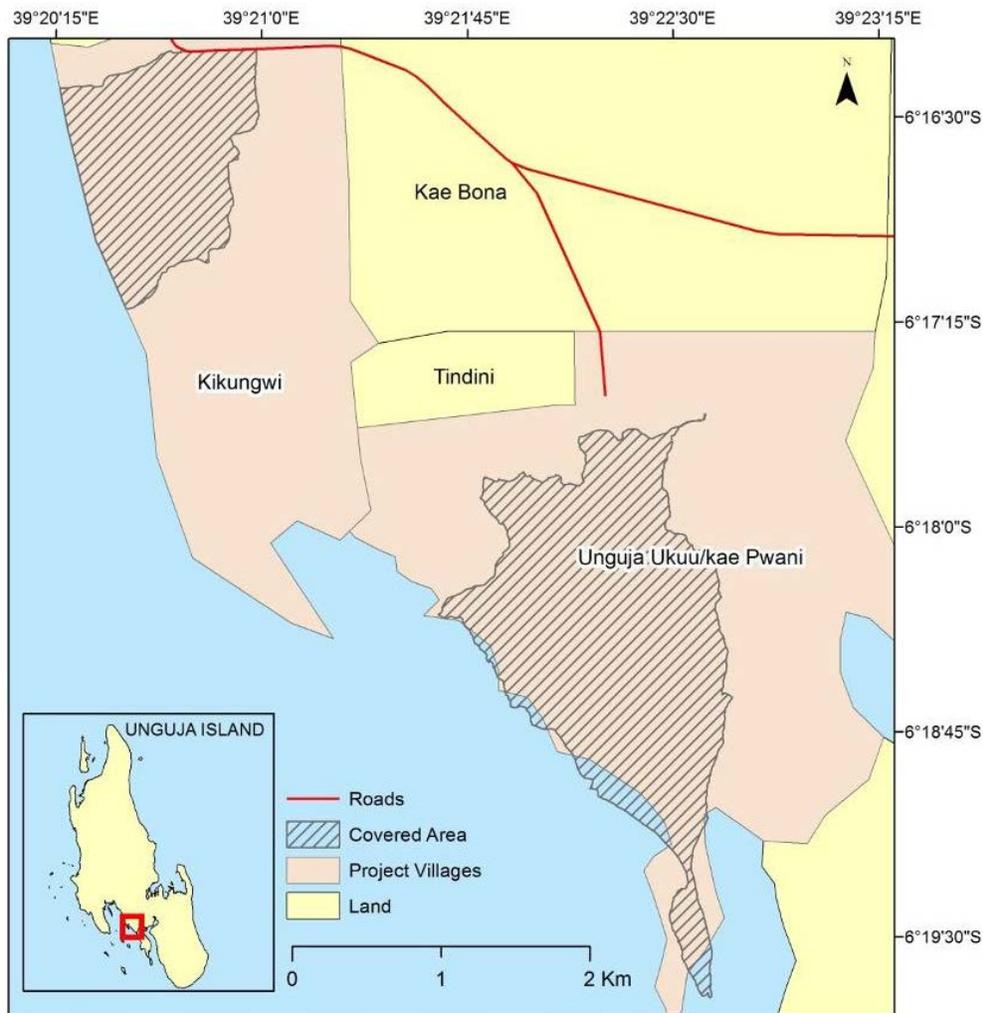
Similar to other coastal villages, the Unguja Ukuu community economy is mainly dependent on activities related to agriculture and marine activities, such as fishing, cockle gathering and seaweed farming (Jiddawi at all 2010). As another source of income, tourism activities are rising very slowly.

### Tourism

Unguja Ukuu is bestowed with many interesting tourist assets as Zanzibar's ancient capital city. The villagers are friendly and produce good quality hand crafts, such as baskets, doormats and other items. Despite these opportunities, tourism activities are less of a priority in the area, and most economic efforts remain in agriculture and marine activities. Although tourism is growing rapidly on Zanzibar, most of the growth is restricted to the East Coast of Unguja Island. Traditionally, tourism development in Menai Bay has been minimal due to the poor roads and difficult access and has not seen the growth that has occurred in Stone Town and the northern tip of Zanzibar near Nungwi and Kendwa. In addition to transportation difficulties, tourist

accommodations are not well developed. (Torell et al 2006). However, as of late good roads and tourism are developing slowly.

**Map 1: Position of Unguja Ukuu and Kikungwi**



## Farming

Although U/Ukuu usually experiences a shortage of seasonal rainfall, farming remains a significant economic activity in the area. Most of the women participate in seaweed farming. Cassava and bananas also are farmed as daily food sources. In addition, small-scale livestock farming, including goats, cattle and chickens, is common.

## **Kikungwi**

Kikungwi village is located on the Southwest of Unguja Island between Bungi and U/Ukuu villages and is part of the Menai Bay Conservation Area. According to the National Census (2012), Kikungwi's population is 972. Further population information is in Table 2.

**Table 2. Population of Kikungwi**

<b>Serial number</b>	<b>Male Population</b>	<b>Female Population</b>	<b>Total Population</b>	<b>Average Households size</b>	<b>Sex ratio</b>
Kikungwi	505	467	972	4.6	108
U/Ukuu Tindini	592	568	1,160	4.5	104
<b>Total</b>	<b>2,052</b>	<b>2,033</b>	<b>4,085</b>	–	–

Source: 2012 National population census

## **General activities**

The village economy is mainly dependent on two activities related to agriculture and marine activities. Meanwhile, tourism is emerging as a new activity and is slowly improving.

## **Tourism**

Like Unguja Ukuu, Kikungwi has few tourism activities. There are no hotels or guest houses. However, the village is an embarking point for tourists coming from the east coast to board boats to Kwale and other islands in Menai Bay.

## **Farming**

In general, most people in this village are involved in farming activities. Common food stuffs include cassava, cereals, coconuts and fruits, with some crops having commercial value. Many women are involved in seaweed farming, and the village has small-scale livestock activities, such as raising goats, cattle and chickens.

## Fisheries Resources: Trends and Uses

### Unguja Ukuu

#### Fisheries

Jiddawi (2010) further highlights that “Ukuu as a coastal village, fishing is among one of the most practiced economic activities. People fish for household consumption and daily income.” The major gears used in fishing activities are basket traps, hand line, spear fishing and nets. Vessels used include dhows, canoes and other boats.

#### Cockle/Bivalve gleaning activities

In Unguja Ukuu village both men and women participate in the harvesting of marine resources, however, activities are gender selective. Most women collect bivalves and gastropods during low spring tides in the intertidal areas while men fish and dive for octopus and snorkel for other types of marine species, such as sea cucumber. Some species harvested by women are cockles (*Anadara sp.*), tiger shells, (*Trapezium sp.*), mussels (*Modiolus sp.*, *Chicoreus sp.*, *Glycymeris sp.*) and oysters.

Zanzibari women collect over 21 species of bivalves, with some more prevalent and favored than others. Women tend to collect mostly cockles (*Anadara antiquata*), giant murexes (*Chicoreus ramosus*), conchs (*Pleuroploca trapezium*) and oysters (*Pinctada margaritifera*). These species are also the most valuable, providing between TSH 825-1250 for about 20 specimens. The abundance of these species varies by area and season, which makes the price swing throughout the year (Torell, et al 2006). The foot of the mollusk, or operculum, particularly of the *Chicoreus ramosus* and *Pleuroploca trapezium*, has been known to be sold for up to TSH 75,000/kilo. Hence, bivalve collection can be relatively profitable, providing cash for women who have few other income-generating options.

### Kikungwi

#### Fisheries

Fishing is a major economic activity in the area, and the residents are heavily dependent on the marine environment for their daily subsistence. Fishing provides most of the households with cash and food, whereas agriculture provides subsistence needs. Most fishermen are involved in artisanal fishing, typically using outrigger canoes, which are small and not suitable for offshore waters. The most common fishing gear includes gill nets, shark nets, small-scale purse seine and a variety of fishing lines. (Torell et al 2006)

Fisheries activities in Kikungwi look similar to U/Ukuu activities in terms of fishing gear and methods. A large number of the Kikungwi community depend on fisheries as a source of income, with men fishing in deep water and women gathering cockles along the rocky shores. The main species normally collected are similar those of U/Ukuu.

## **The Cockle/Bivalve Gleaning Activities**

Kikungwi village is a great source for cockle collection compared with other villages in Menai Bay because of its rocky shore and wide flat reef that attract a mixture of marine creatures.

Women harvest the intertidal areas during the spring tides, and many carry a small metal tool for prying the shells out of the sand and from rocky areas. Shells are placed in plastic sacks called *polo*. Cockles (*Anadara sp.*) are the main species harvested, but species such as oysters, tiger shells, *Trapezium sp.*, *Acrosterigma sp.*, mussels (*Modiolus sp.*), *Glycymeris sp.*, and others are also collected (Jiddawi` et al 2010)

After processing, the cockles are sold locally. The common market is alongside the main road where passersby can stop to make purchases. All cockle sellers are women, who are empowered by this market activity and sometimes visit town to get a better price. As mentioned by Shinula (2005), “the areas don’t have much alternative livelihood activity, especially for the elderly, women and children who form the majority of shellfish collectors. They collect these shells primarily for domestic consumption, and little gets sold at the markets in Zanzibar town.”

At the beginning of the Pwani project, four no-take zones were managed. In the second year the Nyamanzi no-take zone was not functioning due to severe changes of the sea bed (higher accumulation of sand along the area). As a result, most cockles died from being covered by sand while it was a free zone. In the third year of the Pwani project, two new no-take zones (in Kikungwi and U/Ukuu villages) were established and important procedures were put in place.

## No-take Zones Establishment Process

### Community Consultations

The Pwani team conducted several meetings with villagers (in Kikungwi and U/Ukuu) in order to get their buy-in to establish no-take zones in their areas. The team was informed about the problem of marine resource depletion and its causes, and establishment of no-take zones was put forth as a solution. Both villages agreed to establish the zones and promised to work through the process to make the zones sustainable.



**Photo 1: Community meeting to establish no-take zones in Kikungwi**

### Formulation of No-take Zone Committee

Once the team agreed with the villagers on establishing the zones, a special committee of 15 members was formulated in each of the villages. The selection considered gender and profession to include local leaders, beach recorders and fishers. The first job of each committee was to assist experts from WIOMSA and IMS in conducting a baseline survey.

Also, each committee was given certain responsibilities, such as: formulating no-take zones by-laws and by-law enforcement, conducting periodic no-take zone monitoring with the help of experts and conducting village meetings once a month to update the community on the progress of the no-take zones.



**Photo 2: No-take zones committee in U/Ukuu with the experts**

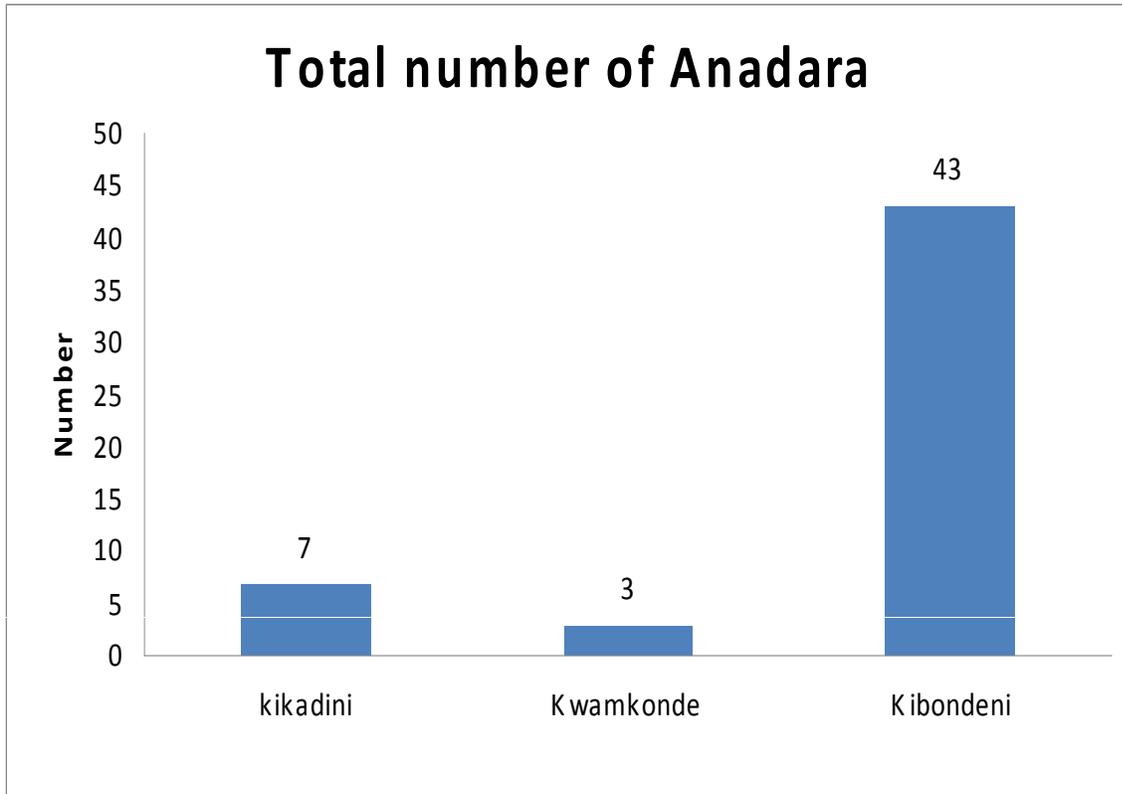
### **Conducting the Baseline Survey**

The same technique was used in conducting the baseline survey. A 100-meter transect line was laid on the reef flat parallel to the shoreline and perpendicular to the no-take zone boundary. A one-meter square quadrat was randomly placed along the line and then at every 10-meter interval (10 quadrats per transect). Women collected cockles found within each quadrat, and these were measured and counted. In each adjacent area and within the no-take zones a total of 100 one-square meter quadrates (10 transects) were sampled. (Jiddawi, 2011)

Earlier on, each village designated three candidate sites in which Pwani members carried out cockle abundance surveys. Once cockle abundances were determined, Pwani members advised local communities to determine which candidate site would be most effective as a cockle no-take zone (Oliver, 2012). In Kikungwi, three sites were surveyed, including Kikadini, Kwamkonde and Kibondenii; while in U/Ukuu the sites surveyed were Mashobokea U/Ukuu, Kae Pwani (site 2) and U/Ukuu Kae Bona (site 1).

## Data Analysis and Data Presentation

Data were put in an Excel spreadsheet, and the analysis was done using simple bar graphs. In Kikungwi the survey showed that the Kibondeni site had much higher cockle abundance, with a value of 43 cockles (as shown in Figure 1). The team advised the Kikungwi village to establish their new no-take zones at the Kibondeni site.

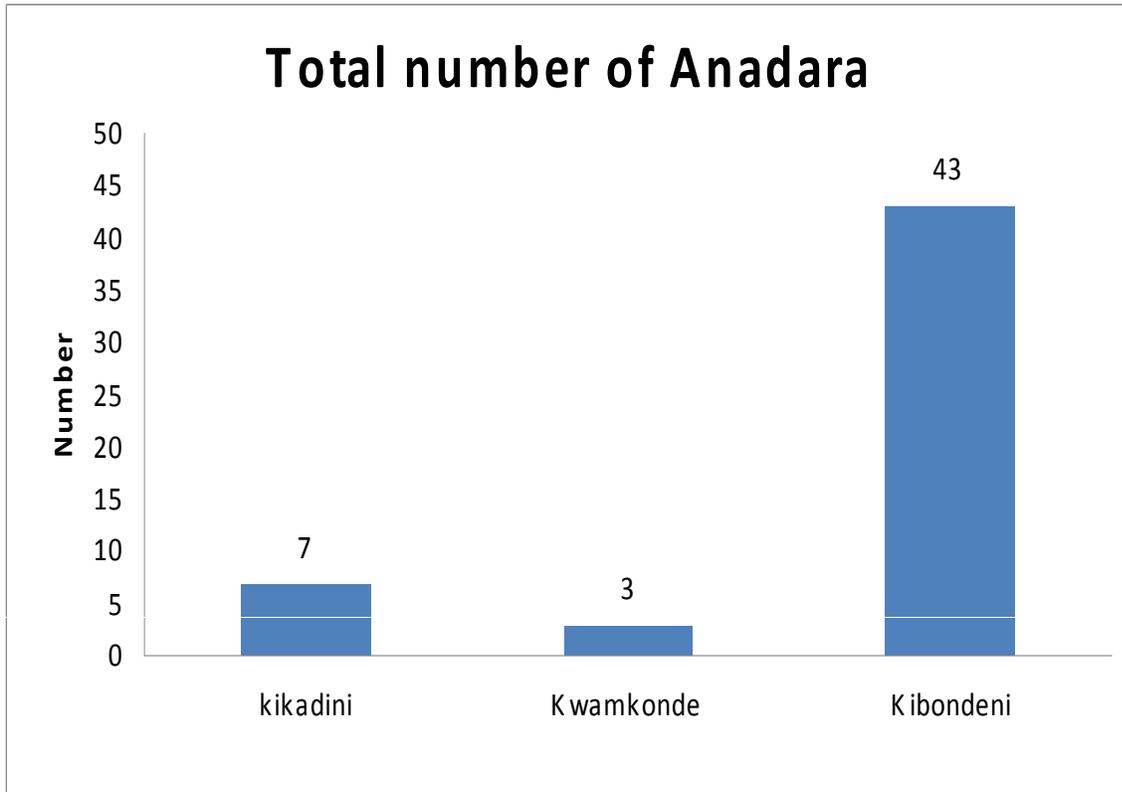


**Figure 2: Comparison of three sites in Kikungwi**

Similarly, in Unguja Ukuu, one potential site contained a much higher number of cockles than the two other candidates. This site was chosen as the site for the new no-take zone for Unguja Ukuu (Dumville, 2012). Thus, Unguja Ukuu Kae Pwani (site 1) became the best site for a no-take zone in U/Ukuu as shown in Figure 3.

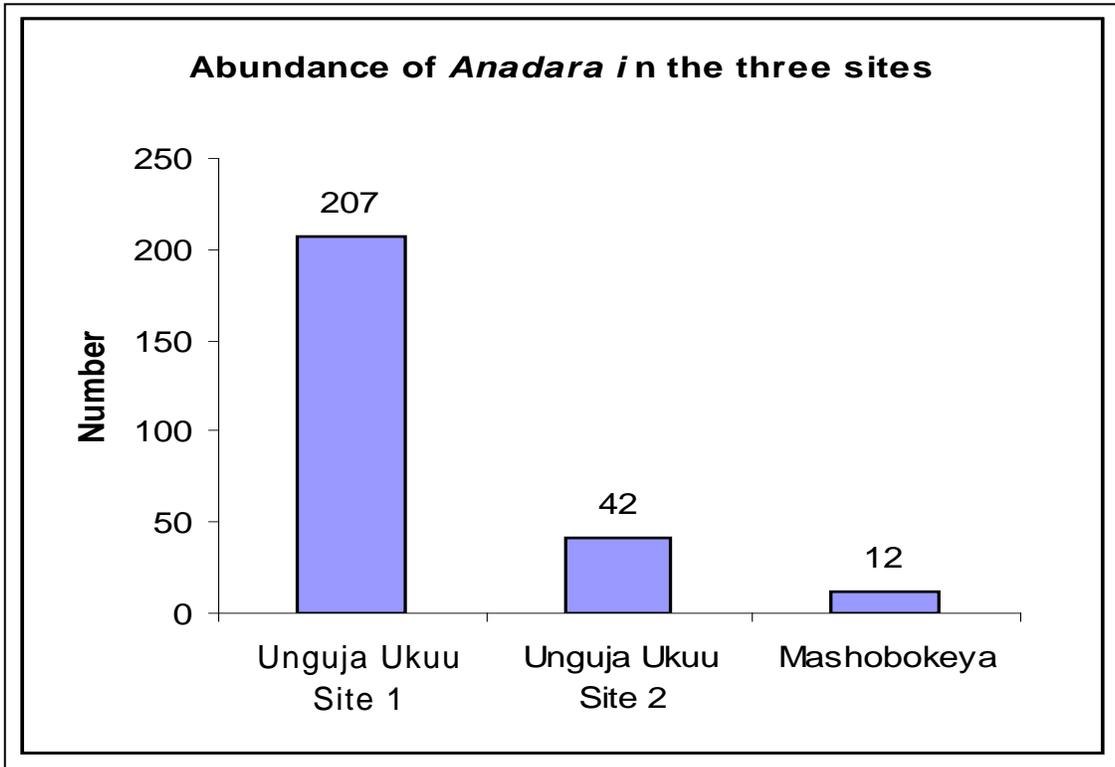
## Data Analysis and Data Presentation

Data were put in an Excel spreadsheet, and the analysis was done using simple bar graphs. In Kikungwi the survey showed that the Kibondeni site had much higher cockle abundance, with a value of 43 cockles (as shown in Figure 1). The team advised the Kikungwi village to establish their new no-take zones at the Kibondeni site.



**Figure 2: Comparison of three sites in Kikungwi**

Similarly, in Unguja Ukuu, one potential site contained a much higher number of cockles than the two other candidates. This site was chosen as the site for the new no-take zone for Unguja Ukuu (Dumville, 2012). Thus, Unguja Ukuu Kae Pwani (site 1) became the best site for a no-take zone in U/Ukuu as shown in Figure 3.



**Figure 3: Comparison of three sites in U/Ukuu**



**Photo 3: Data presentation in Kikungwi**

## Marking the Area

The team went to Kikungwi and Unguja Ukuu and met with village leaders to mark their new intertidal no-take zones. Gender mainstreaming was achieved as both villages' designated two men and two women to carry out the marking process. Temporary markers, such as heavy sticks, were used to delineate the no-take zones and permanent landmarks (Dumville, 2012). The team gave options to the committees on what type of mark they would like in their no-take zones, and each committee agreed to use permanent markers.

To ensure that the precise locations are known in the more distant future, villagers agreed to locally produce lasting and inexpensive markers. Unguja Ukuu decided on a solid cement block attached to an inexpensive floating buoy. Kikungwi decided on a buoy with a solid metal rod



buried in the substrate. Permanent markers were installed in both no-take zones.

**Photo 4: Pwani team with villagers are preparing no-take zones markers in Kikungwi**

## By-law Formulation and Sign Posting

Considering by-laws to be important management tools, the Pwani team decided to work with communities and collect their ideas on the structure and content of the no-take zone by-laws. This was done through previous experience from Fumba Peninsula as explained by Ngowo in 2007, “There are by-laws to manage the no-take zones which were drafted by the communities and signed by all three village heads and by Districts fisheries Commissioners in 2007.” Eventually all villages could come up with by-laws that best work for them.



**Photo 5: The sign identifies the presence of a no-take zone at the area at Kikungwi**

## The Complete New No-take Zones in U/Ukuu and Kikungwi

Below are maps depicting the new no-take zones and surrounding areas. Maps show that the intertidal zone of the Ungujaa Kuu no-take zone is much larger than that of Kikungwi. Indeed, Ungujaa Kuu’s intertidal zone extends much farther beyond its no-take zone, whereas Kikungwi’s no-take zone extends beyond its intertidal zone

## Monitoring of No-take Zone and Presenting Data

The monitoring activities are planned to be conducted once a year. Monitoring is done in collaboration with Menai Bay staff. The first monitoring was done in September 2012 for both sites, after which monitoring data were analyzed and results were presented to the villagers.



Map 2: Location of no-take zones in Kikungwi and Unguja Ukuu

## **Issues That Arose during the Measuring of Sites on Selected No-take Zones**

Despite successes, the no-take zone measurements were not exactly the same as had been mapped out, as explained by Oliver (2012): “GPS coordinates were also taken for mapping purposes and to be used in the eventuality that the site is ‘lost.’ These were saved in Pwani project database. To outline the new no-take zones, 150 ‘steps’ were counted for each side. It was important to use this measurement method to promote cooperation with the stakeholders. Unfortunately, when these measurements were transferred to ArcGIS, the distances were irregular. For example, some boundaries were 135 meters long while others were 115 meters. However, this is of little concern as long as the boundaries surpass the minimums size of 100 meters. The only potential concern is in terms of the aesthetic of the no-take zones on a map.”

## **No-take Zones Management Plan**

### **Management Area**

The Management Plan covers only the two new no-take zones, in U/Ukuu (Kae Pwani) and Kikungwi villages. These villages are approximately 26 and 21 kilometers away from Stone town, respectively. As a result of proximity, these villages share similar characteristics in terms of culture and economy.

### **Challenges and Solutions for Cockle Management and No-take Zones**

People in both villages agreed that they wanted to see an increase in the number and size of cockles for harvesting. Some villagers recognized that action must be taken to achieve this, and a seasonal closing of seashore collection was proposed.

According to Jiddawi (2010), “One woman mentioned that she noted larger-sized cockles on the islands after the monsoon de-facto closure. This woman also said she returns small shells to the reef flat but others collect all regardless of size. These observations and practices provide a starting basis for considering more.”

The Pwani team decided to implement the no-take zones with sustainable management. The team collaborated with many stakeholders, including the Western Indian Ocean Marine Science Association (WIOMSA), the Institute of Marine Sciences (IMS), Menai Bay Conservation Area (MBCA) and local communities (Kikungwi and U/Ukuu).

### **Objectives of No-take Zones Management Plan**

#### **General Objective**

Establish no-take zones and scale up community-based management of cockles and pearl farming in the area.

## **Specific Objectives**

- Protect bivalves and other intertidal resources
- Allow for community-based management within the conservation area
- Empower women, who are the main harvesters of these species, and strengthen their skills as small-business entrepreneurs
- Establish and support pearl farming in the area

## **Roles and Responsibilities of Institutions:**

The roles and responsibilities of various stakeholders are described below. The only new institution is the no-take zone committee, a joint body of representatives from Kikungwi and U/Ukuu Kae Pwani. Each village will have its own committee. The committee should participate in all management activities with the help of their local leaders (sheha).

### **Fisheries Department and Menai Bay Conservation Area (MBCA) Will:**

- Seek technical and judiciary advice for the management area
- Resolve conflict and oversee decision-making within the management area
- Review and approve the management plan and village by-laws from the Pwani team
- Ensure law enforcement
- Provide guidance and oversight to the committee

### **Pwani Project Team (WIOMSA and IMS) Will:**

- Budget for implementation actions
- Ensure proper use of materials provided to villages
- Provide a link between the no-take zones committee and MBCA
- Provide technical advice, personnel and training to villages per request, such as training to monitor no-take zones
- Prepare monitoring report and present it to the villages

### **Each Village Will:**

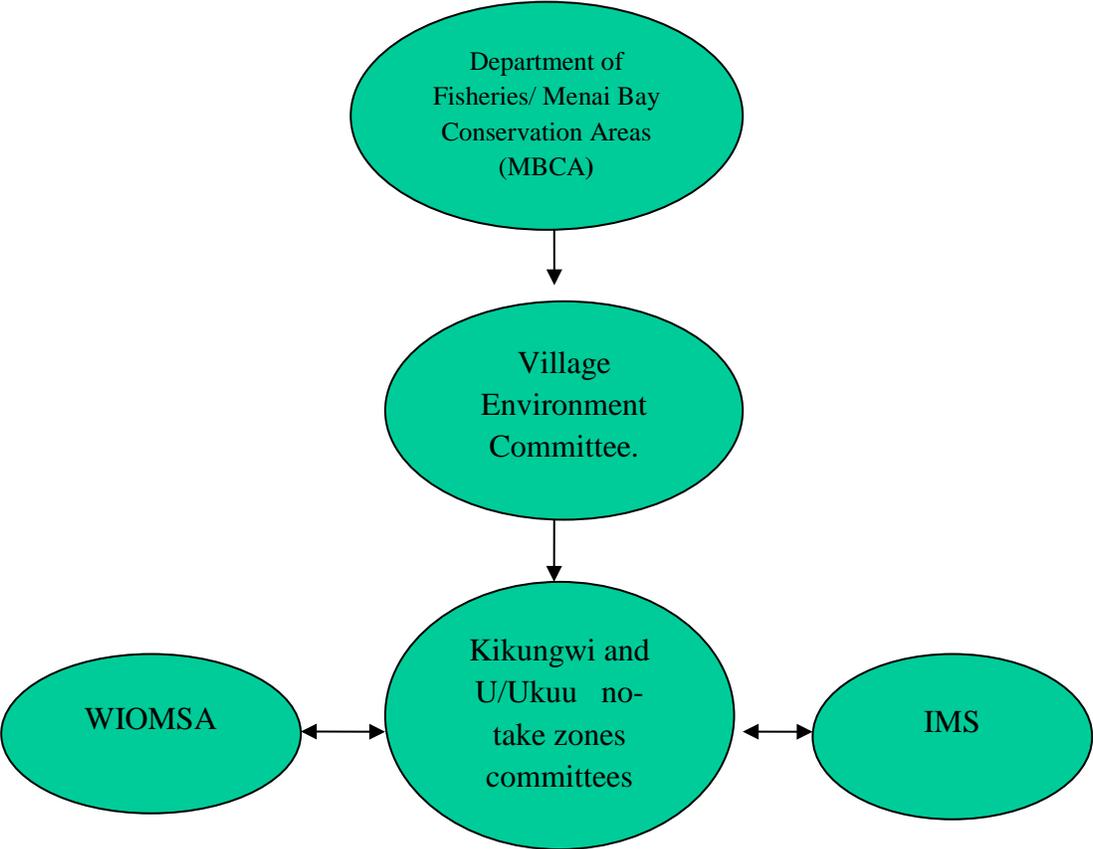
- Formulate no-take zone by-laws
- Conduct scheduled no-take zone monitoring with help from IMS AND WIOMSA
- Committee is responsible for by-law enforcement by sending violators to sheha
- Conduct village meetings once a month, to share updates on the no-take zones

## Work Plan

<b>Issue: No-take zones Management Plan</b>					
<b>Objectives</b>	<b>Actions</b>	<b>Who</b>	<b>When</b>	<b>Outputs</b>	<b>Assessments</b>
1) Establish no-take zones at the villages of (Kikungwi and U/Ukuu)	1a) Proposed three sites in each village for area of no-take zone	No-take zone village committees (Kikungwi and U/Ukuu)	August 2012	Six sites from two villages	To find the two best sites for no-take zones
	1b) Selection of the best site in each village, through baseline survey	WIOMSA, IMS, MBCA and no-take zone village committees (Kikungwi and U/Ukuu)	August 2012	Two selected sites found for no-take zones	“ ”
	1c) Put temporary markers in selected area	WIOMSA, IMS, MBCA and no-take zone village committees (Kikungwi and U/Ukuu)	August 2012	Establish one new no-take zone in each village (Kikungwi and U/Ukuu)	To show the existence of the no-take zone in the areas
	1d) Put permanent markers in selected area	WIOMSA, IMS, MBCA and no-take zone village committees (Kikungwi and U/Ukuu)	Nov. 2012	Two new no-take zones (Kikungwi and U/Ukuu)	“ ”
	1d) Put sign in selected area	WIOMSA, IMS, MBCA and no-take zone village committees (Kikungwi and U/Ukuu)	Nov. 2012	Sign showing existing no-take zone	“ ”
2) Increase enforcement to ensure that no-take zone is managed well	2a) Formulation of no-take zone by-laws		Sept. 2012	No-take zone by-laws.	Minimize poaching activities
	2c) Patrol no-take zones	No-take zone village committees	Lifetime of the no-	Reduction of	“ ”

		(Kikungwi and U/Ukuu)	take zones	poaching at the area.	
	2b) Legal approval of the by-laws	Lawyer from department of fisheries	April 2013	Certified by-laws	
	2c) Signing of the by-laws	District Commissioner	June 2013	Certified by-laws	
2) Monitor the no- take zones	2c) monitoring process done once a year	WIOMSA, IMS, MBCA and no-take zone village committees (Kikungwi and U/Ukuu)	Low Tide Sept. 2013	Observing the impact of no-take zones in the areas	Increase the bivalves in terms of size and numbers

**Organizational Structure**



**Figure 4: Organizational Structure for no-take zones Management Plans**

## **Regulations and Penalties**

There are two sets of no-take zone by-laws (please see Annex i and ii). These by-laws are found in both Kiswahili and English.

From the beginning, the by-laws were developed through a participatory approach involving the Pwani team and villagers. The by-laws were then sent to the fisheries department lawyer for approval and to be signed by the District Commissioner of the area.

## **Future Management**

The project will finish at the end of 2013; all parties involved under the Pwani project will be under the responsibility of the village no-take zone committees, the Fisheries Department and Menai Bay Conservation Area (MBCA).

## Annex I

THE DISTRICT AND URBAN ACT.  
ACT NO. 4 OF 1995  
(PREPARED UNDER SECTION NO. 5 AND 31)  
BYLAWS OF 2013 OF MARINE CONSERVATION AREA.  
KIKUNGWI CONSTITUENCY

**Part One: Title and interpretation**

1. These bylaws are for the marine and beach conservation area of Kikungwi constituency.
2. These bylaws will be used from 01/05/13.
3. In these bylaws:-
  - a) 'Reserved Managing Committee' refers to the committee elected from the Constituency General meeting of Kikungwi for the purpose of protecting the conservation area of Kikungwi.
  - b) 'Marine Organism' refers to any living organism in the sea.
  - c) 'Spearing' is using of sharp pointed stick, spear, hand or anything to remove octopus, oyster or any marine organism from their habitant.
  - d) 'Pick up' means to take or pick up the marine organism like sea shells from its habitat.
  - e) 'Fishing' means to catch a fish or any sea organism by using certain equipments such as lines, traps or hooks.
  - f) 'Snorkelling' is diving down deep in the sea using special equipments.
  - g) 'Reserved area ' refers to the area which is lawfully conserved in order for the sea shells such as oyster, shellfish and other marine organism to multiply, and is not allowed to do any other activities of exploitation in this area.
  - h) 'Village General Meeting' is the meeting of the people living in Kikungwi.
  - i) 'Residents means anyone living in Kikungwi Constituency all the time
  - j) 'Anchor' means a stone or anything heavy tied to a rope and immersed down in the water to float a vessel at the place.
  - k) 'Local Authority' means Kikungwi constituency leadership.
  - l) 'Constituency' means local Authority of Kikungwi.

•  
**Part Two: NO TAKE ZONE**

4. The following area will be conserved for the period of one year from 01/05/2013 for the sake of protecting shells and other resources found in the area (map No.1) and the management for the GPS is as follow.

## KAE PWANI GPS

<b>Position</b>	<b>X</b>	<b>Y</b>
537911 9304451	537911	9304451
537853 9304412	537853	9304412
537977 9304346	537977	9304346
537977 9304347	537977	9304347
537977 9304346	537977	9304346
537919 9304303	537919	9304303

5. It is not allowed for both resident and non-resident of Kikungwi to commit in to the following.
  - a. to be found with tools, vessel or any equipment which might be used for catching fish, spearing octopus or any other sea organism.
  - b. Catching, spearing, picking up, and diving of sea organism around the reserved area.
  - c. Anchoring.
- 
6. It is not forbidden for the vessels and people to pass across the reserved area while going to the other area.

### **Part Three: FAULTS AND PUNISHMENT**

7. Anybody found with a fault of having fishing gears, diving, or tools spearing in the reserved area with aim to fish or picking up oyster and shells will deserved to get the following punishment.
  - a. If a person is caught for the first time the committee will warn him or her by writing him/her a letter and if the caught organism are still alive he/she will be obliged to take them back to the sea under the observation of the committee, and if the organism caught have died, the harbour master assisted by the committee, will sell by auction these caught organism and the money obtained will be compensated and made the property of the village authority.
  - b. If a person is found guilty for the second time he/she will be sent before the harbour Master and the Chief and fined Tshs 25000 and all caught sea organism will be confiscated. And if the organisms are still alive the guilty person will have to take them back to the sea under the custody of the Harbour Master and the village committee. If they are not alive, the village head with collaboration of

Harbour Master and the Committee will auction them and the amount of money obtained will be confiscated and made the property of the village Local Authority.

- c. If a person is found with same fault for the third time, the person will be sent to the Police to be sentenced for the destruction of the people's property disparately. He /she will also be sent before the Harbour Master and Chief of the village to be fined Tshs 50000. The organism caught will be confiscated and the cost paid by the person who did the fault and then the organism will remain the property of the village. If the guilty person could not pay off the fine he or she will be sent to the first magistrate for the further lawful measures against him/ her. But if the organisms caught are alive, the guilty person will have to take them back to the sea under command and observation of both village head and the Harbour Master together with the village committee. If the organisms are dead, they will be sold by head of the village, Harbour Master in collaboration with village committee. The unresent of money obtained will be given to the village local authority.
- d. If the victim will repeat the fault for a fourth time the case will be sent to the Police station for the lawful measures to be taken against him/her after inspection has been done.

●  
**Part Four: SYSTEM AND MANAGEMENT**

8. The following is the system which ought to be followed in the management of the No take zones.
  - a. It is the responsibility of the local authority of the village to fine or to decide on anything concerning these bylaws. The local authority can provide the statement to the management committee of the No take Zone so that it can deal with activity on behalf of the village authority. When the managing committee is ordered to do its activity then it will be responding positively to the village authority.
  - b. The managing committee will be elected by General meeting of the village.
  - c. The money which was obtained from the fines imposed from the people found fault will be deposited in receipt and then 50 percent of the fund will be put in the special fund for improving nursery school of the village and the rest 50 percent will be the village Committee fund.
  - d. The Chairperson or any member of the committee of the No Take Zone area is given any authority to catch anybody who may be found breaking bylaws present and deliver him/her to the management committee of the No take Zone or to the Village head.
    - The duty of any Ordinary Residents is just to send information to the Chairperson or any member of the committee when he/she finds a person fishing or collecting shells in the No take Zone.
  - e. The authority of Village Head in keeping under custody a person considered allegedly to do a fault at the No take Zone for the period when the process of taking

measures upon him or her is on the way it will be as stated at Section 19 on the Local Authority ACT No. 1 of 1988.

- 
- 9. The managing committee will have the following duties
  - a. To make daily survey in order to make sure that the inhabitants in the No take Zone are looked after and more conserved for the benefit of the present and future generations.
  - b. To educate all resident in constituency about the importance of area reserved and the benefit which can be obtained from conservation of the area
  - c. To keep boundaries around the No take Zone and giving education to the parent of this constituency about that boundaries
  - d. With the collaboration of WIOMSA, IMS and Coastal Project will organise and run research after every six months and then give a feed back of the results, to all residents of the constituency.
  - e. To develop a long term and short term strategies which would help enhance the management of the No take Zone of the constituency of Kikungwi.
  - f. With collaboration of constituency, they will call all constituency residents for the meeting after every two months to discuss various issues which have risen concerning the No take Zone management. If the emergency issue happens, which need a meeting to be called; the managing committee will inform the Village Head who will then call for the constituency meeting.
  - g. A committee member can be ousted from the committee if he or she could not participate at three meetings session continuously without prior information or it will be confirmed that in way or another, he or she is taken part in the breaking of their bylaws .
  - h. To inform the Village Head on the criminal issue that happed in the No take Zone and then to keep the record of the various events which are within the criminal events in the No take Zone.
  - i. If a member of the committee decided to oust from the committee himself or herself or is forced to leave because of any reason, the Local Authority Council may propose for another person to replace that sit where the constituency meeting will assign him/her.
- 

**Part Five: NO TAKE ZONE MANAGEMENT**

10. These are the No take Zones which are under the management of the people residing in Kikungwi. Managing Committee will have the responsibility of guarding, make follow up and look after the records of various events or issues happening or taking place in the area which are the conservation activity.

•

**Part Six: AMENDMENT**

11. The managing committee of the No take Zone in collaboration with the Central Government or constituency Council though the decisions by the constituency General Meeting can agree to change or alter or making the amendment which may help to enhance this bylaws.

If the constituency General Meeting decided to delete or change any unit in the local Authority, the local Authority will have to resend these bylaws to the District Commissioner for signing.

The no take zone of Kikungwi,

Prepared by constituency of Kikungwi Unguja Ukuu on

.....Day.....Month.....Year

Kikungwi Village head Signature and Stamp.....

Assigned by District Commissioner

.....Day.....Month.....Year

District Commissioner Signature and Stamp.....

## Annex II

THE DISTRICT AND URBAN ACT.  
ACT NO. 4 OF 1995  
(PREPARED UNDER SECTION NO. 5 AND 31)  
BYLAWS OF 2013 OF MARINE CONSERVATION AREA.  
UNGUJA UKUU-KAE PWANI CONSTITUENCY

**Part One: Title and interpretation**

- 1) These bylaws are for the marine and beach conservation area of U/Ukuu Kae Pwani constituency.
- 2) These bylaws will be used from 01/05/13.
  - 3) In these bylaws:
    - a) ‘Reserved Managing Committee’ refers to the committee elected from the Constituency General meeting of U/Ukuu Kae Pwani for the purpose of protecting the conservation area of U/Ukuu Kae Pwani.
    - b) ‘Marine Organism’ refers to any living organism in the sea.
    - c) ‘Spearing’ is using of sharp pointed stick, spear, hand or anything to remove octopus, oyster or any marine organism from their habitat.
    - d) ‘Pick up’ means to take or pick up the marine organism like sea shells from its habitat.
    - e) ‘Fishing’ means to catch a fish or any sea organism by using certain equipments such as lines, traps or hooks.
    - f) ‘Snorkelling’ is diving down deep in the sea using special equipments.
    - g) ‘Reserved area ’ refers to the area which is lawfully conserved in order for the sea shells such as oyster, shellfish and other marine organism to multiply, and is not allowed to do any other activities of exploitation in this area.
    - h) ‘Village General Meeting’ is the meeting of the people living in U/Ukuu Kae Pwani .
    - i) ‘Residents means anyone living in U/Ukuu Kae Pwani Constituency all the time
    - j) ‘Anchor’ means a stone or anything heavy tied to a rope and immersed down in the water to float a vessel at the place.
    - k) ‘Local Authority’ means U/Ukuu Kae Pwani constituency leadership.
    - l) ‘Constituency’ means local Authority of U/Ukuu Kae Pwani.

**Part Two: NO TAKE ZONE**

4. The following area will be conserved for the period of one year from 01/05/2013 for the sake of protecting shells and other resources found in the area (map No.1) and the management for the GPS is as follow.

## KAE PWANI GPS

<b>Position</b>	<b>X</b>	<b>Y</b>
541011 9301629	541011	9301629
540939 9301592	540939	9301592
540487 9301563	540487	9301563
540353 9301553	540353	9301553
540293 9301642	540293	9301642
540444 9301698	540444	9301698

5. It is not allowed for both resident and non-resident of U/Ukuu Kae Pwani to commit in to the following.
  - a) to be found with tools, vessel or any equipment which might be used for catching fish, spearing octopus or any other sea organism.
  - b) Catching, spearing, picking up, and diving of sea organism around the reserved area.
  - c) Anchoring.
6. It is not forbidden for the vessels and people to pass across the reserved area while going to the other area.

### **Part Three: FAULTS AND PUNISHMENT**

7. Anybody found with a fault of having fishing gears, diving, or tools spearing in the reserved area with aim to fish or picking up oyster and shells will deserved to get the following punishment.
  - a) If a person is caught for the first time the committee will warn him or her by writing him/her a letter and if the caught organism are still alive he/she will be obliged to take them back to the sea under the observation of the committee, and if the organism caught have died, the harbour master assisted by the committee, will sell by auction these caught organism and the money obtained will be compensated and made the property of the village authority.
  - b) If a person is found guilty for the second time he/she will be sent before the harbour Master and the Chief and fined Tshs 25000 and all caught sea organism will be confiscated. And if the organisms are still alive the guilty person will have to take them back to the sea under the custody of the Harbour Master and the village committee. If

they are not alive, the village head with collaboration of Harbour Master and the Committee will auction them and the amount of money obtained will be confiscated and made the property of the village Local Authority.

- c) If a person is found with same fault for the third time, the person will be sent to the Police to be sentenced for the destruction of the people's property disparately. He /she will also be sent before the Harbour Master and Chief of the village to be fined Tshs 50000. The organism caught will be confiscated and the cost paid by the person who did the fault and then the organism will remain the property of the village. If the guilty person could not pay off the fine he or she will be sent to the first magistrate for the further lawful measures against him/ her. But if the organisms caught are alive, the guilty person will have to take them back to the sea under command and observation of both village head and the Harbour Master together with the village committee. If the organisms are dead, they will be sold by head of the village, Harbour Master in collaboration with village committee. The unresent of money obtained will be given to the village local authority.
- d) If the victim will repeat the fault for a fourth time the case will be sent to the Police station for the lawful measures to be taken against him/her after inspection has been done.

**Part Four: SYSTEM AND MANAGEMENT**

8. The following is the system which ought to be followed in the management of the No take zones.
- a. It is the responsibility of the local authority of the village to fine or to decide on anything concerning these bylaws. The local authority can provide the statement to the management committee of the No take Zone so that it can deal with activity on behalf of the village authority. When the managing committee is ordered to do its activity then it will be responding positively to the village authority.
- b. The managing committee will be elected by General meeting of the village.
- c) The money which was obtained from the fines imposed from the people found fault will be deposited in receipt and then 50 percent of the fund will be put in the special fund for improving nursery school of the village and the rest 50 percent will be the village Committee fund.
- d) The Chairperson or any member of the committee of the No Take Zone area is given any authority to catch anybody who may be found breaking bylaws present and deliver him/her to the management committee of the No take Zone or to the Village head. The duty of any Ordinary Residents is just to send information to the Chairperson or any member of the committee when he/she finds a person fishing or collecting shells in the No take Zone.

- e) The authority of Village Head in keeping under custody a person considered allegedly to do a fault at the No take Zone for the period when the process of taking measures upon him or her is on the way it will be as stated at Section 19 on the Local Authority ACT No. 1 of 1988.
9. The managing committee will have the following duties
- a. To make daily survey in order to make sure that the inhabitants in the No take Zone are looked after and more conserved for the benefit of the present and future generations.
  - b. To educate all resident in constituency about the importance of area reserved and the benefit which can be obtained from conservation of the area
  - c. To keep boundaries around the No take Zone and giving education to the parent of this constituency about that boundaries
  - d. With the collaboration of WIOMSA, IMS and Coastal Project will organise and run research after every six months and then give a feed back of the results, to all residents of the constituency.
  - e. To develop a long term and short term strategies which would help enhance the management of the No take Zone of the constituency of U/Ukuu Kae Pwani
  - f. With collaboration of constituency, they will call all constituency residents for the meeting after every two months to discuss various issues which have risen concerning the No take Zone management. If the emergency issue happens, which need a meeting to be called; the managing committee will inform the Village Head who will then call for the constituency meeting.
  - g. A committee member can be ousted from the committee if he or she could not participate at three meetings session continuously without prior information or it will be confirmed that in way or another, he or she is taken part in the breaking of their bylaws.
  - h. To inform the Village Head on the criminal issue that happed in the No take Zone and then to keep the record of the various events which are within the criminal events in the No take Zone.
  - i. If a member of the committee decided to oust from the committee himself or herself or is forced to leave because of any reason, the Local Authority Council may propose for another person to replace that sit where the constituency meeting will assign him/her.

**Part Five: NO TAKE ZONE MANAGEMENT**

10. These are the No take Zones which are under the management of the people residing in U/Ukuu Kae Pwani. Managing Committee will have the responsibility of guarding, make follow up and look after the records of various events or issues happening or taking place in the area which are the conservation activity.

**Part Six: AMENDMENT**

11. The managing committee of the No take Zone in collaboration with the Central Government or constituency Council though the decisions by the constituency General Meeting can agree to change or alter or making the amendment which may help to enhance this bylaws.

If the constituency General Meeting decided to delete or change any unit in the local Authority, the local Authority will have to resend these bylaws to the District Commissioner for signing.

The no take zone of U/Ukuu Kae Pwani,

Prepared by constituency of Kikungwi and Unguja Ukuu on

.....Day.....Month.....Year

U/Ukuu Kae Pwani Village head Signature and Stamp.....

Assigned by District Commissioner

.....Day.....Month.....Year

District Commissioner Signature and Stamp.....

## References

Dumville, Oliver, 2012, Zanzibar No-take zones, Short Report.

Jiddawi, N.S., 2012. Monitoring Results of No-take zones at Fumba Peninsula, Coastal Resources Center, University of Rhode Island. Narragansett. pp. 14.

Jiddawi, N., Patrick Kajubili, P. and Brian Crawford 2010, Characterization of Coastal Communities and Participatory Assessment of Cockle Fisheries in Menai Bay.

Ngowo, R., Jiddawi, N., Crawford, B. and Mmochi A. J. (2007). Management Plan for the Cockle Fishery on the Fumba Peninsular. Report and village by-laws submitted to the District Commissioner of the West District, Department of Fisheries and Natural Resources and Menai Bay Conservation Area and village governments for Fumba, Bweleo and Nyamanzi villages.

Torell, E., Aviti, M., and Palmigiano, K. 2006, *Menai Bay Governance Baseline* Coastal Resources Center, University of Rhode Island. pp. 18.

Shunula, J. P. 2005. A comparison of shell size and meat weight between populations of the bivalve *Anadara antiquata* (Linnaeus 1758) from four sites experiencing different levels of exploitation pressure in Zanzibar. *Tanzania Journal of Science* 30(2):73–76.