# CARE International in Tanzania

## ASSESSMENT OF VULNERBILITY TO AND PLANNING FOR PREPAREDNESS AND MITIGATING IMPACT OF NATURAL DISASTERS IN THE COASTAL AREAS OF MAINLAND TANZANIA AND ISLANDS OF ZANZIBAR

Main Document

**June 2006**

**Financed by Ford Foundation**

# CARE INTERNATIONAL IN TANZANIA

## ASSESSMENT OF VULNERABILITY TO AND PLANNING TO MITIGATE IMPACT OF NATURAL DISASTERS IN THE COASTAL AREAS OF MAINLAND TANZANIA AND ISLANDS OF ZANZIBAR

**Submitted by:**


FANRM
FOOD AGRICULTURE & NATURAL RESOURCES MANAGEMENT RESEARCH CONSULTANTS

P.O. Box 70463, Dar es Salaam
*E-mail Address*: fshao@muchs.ac.tz

Phone: (022) 2451400
*Fax: (022) 2451400*
*Mobile: 0744 – 270682*

Mobile: 0784 – 270682

**Prepared by:**
Francis Shao
Faith Magambo
Erasto Mlay
Lewis Nzali


30th June, 2006

# TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

## ACRONYMS

| | |
|---|---|
| CBO | Community Based Organization |
| CCC | Conservation Central Committee |
| DC | District Commissioner |
| DED | District Executive Director |
| DMD | Disaster Management Department of the Prime Ministers Office |
| EAC | East African Community |
| EIA | Environmental Impact Assessment |
| FANRM | Food Agriculture and Natural Resources Management (*Research Consultants)* |
| GAW | Global Atmospheric Watch |
| GCOs | Global Climate Observing system |
| NGO | Non Governmental Organization |
| ICM | National Integrated Coastal Management |
| IECO | Information Education and Communication |
| IMS | Institute of Marine Science |
| IUCN | The World Conservation Union |
| JECA | Jozani Environmental Conservation Association |
| JHU | John Hopkins University |
| KICAMP | Kinondoni Integrated Coastal Area Management Programme |
| LCG | Learning Coalition Groups |
| MAFSC | Ministry of Agriculture, Food Security and Co-operatives |
| MBWEDEFU | Mbweni Development Fund |
| MICA: | Misali Island Conservation Area |
| MICODEP | Misali Island Conservation and Development Programme |
| MLHSD | Ministry of Lands and Human Settlements Development |
| MIMCA | Misali Island Marine Conservation Area |
| MIMP | Mafia Island Marine Park |
| MKUKUTA | Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Tanzania *(National Strategy for Growth and Reduction of Poverty)* |
| MMP | Marine Park and Mangrove Management Project |
| MPLA | Multi-stakeholder Participatory Learning Approach |
| NSGRP | National Strategy for Growth and Reduction of Poverty |
| MW | Ministry of Water |
| PECCA | Pemba Channel Conservation Area |
| PMO | Prime Minister's Office |
| REMP | Rufiji Environment Management Programme |
| RIPS | Rural Integrated Programme Support |
| SADC | Southern Africa Development Cooperation |
| TCZCDP | Tanga Coastal Zone Conservation and Development Programme |
| TMA | Tanzania Meteorological Agency |
| UCLAS | University College of Lands and Architectural Studies |
| UNDP | United Nations Development Programme |
| UNDRO | United Nations Disaster Relief Organization |
| VCCs | Village Conservation Committees |
| VMT | Village Monitoring Teams |
| WEO | Ward Executive Officer |
| WDC | Ward Development Committee |
| WHO | The World Health Organization |
| WMO | World Meteorological Organization |
| WWW | World Weather Watch |

# ACKNOWLEDGEMENT

Sincere gratitude is expressed to CARE International in Tanzania for commissioning and financing this study.

Many people were instrumental to the success of this study; our special appreciation go to Ms Theonestina Kaiza-Boshe of CARE International in Tanzania Dar es Salaam for providing the background information to the research team, Mr.Thabit S. Masoud of CARE International in Tanzania Zanzibar for co-ordinating and organizing the field work in Unguja and working with the team throughout the study period including organizing the National Stakeholders workshop. The team is also indebted to Mr. Amour B. Amour of CARE International in Tanzania Pemba for coordinating and organizing the field work in Pemba and Mr. Hamoud S. Abdullah CARE representative for accompanying the team in the field in Pemba. Mr. Kasase of CARE International in Tanzania Dar es Salaam accompanied the team during the field work in Dar es Salaam and Tanga.

We would like to thank the District Executive Directors and District Commissioners of the respective study districts for coordinating our field visits and the Sheha and Mtaa/Village Chairpersons for their assistance during the fieldwork and for facilitating the data collection process in their respective Shehia/Mtaa/Village. Their contribution in data collection process is highly appreciated.

We are also indebted to all the Key Informants and Heads of Households in the respective Shehia/Mtaa/Village who took their time to provide information to enable the team to complete the study process in the field.

Our Sincere thanks go to the enumerators who administered the questionnaires in the field in both Zanzibar Islands and Mainland Tanzania and Mr Yohana Mtoni for entering the data to the computer for analysis.

Last but not least, this study could have not materialized without the dedication and commitment of the research team who travelled to the different villages in the study districts in Mainland Tanzania and the Islands of Zanzibar to guide the field work and back in Dares Salaam organized the data for analysis and input into the report preparation.

# EXECUTIVE SUMMARY

The study to assess vulnerability to and planning to mitigate impact of natural disasters in the coastal areas of Mainland Tanzania and Islands of Zanzibar was commissioned by Care International in Tanzania and implemented by FANRM Research Consultants.

The study was conducted using participatory approaches involving review of available information, individual and group discussions with key informants, field survey and Multi-stakeholder Participatory Learning Approach (MPLA) workshops, together with facilitating a stakeholder National Workshop organised by the client in the end. The representative study sites were Chwaka and Matemwe in Unguja, Wambaa and Makangale in Pemba, Mbweni, Kunduchi Pwani and Ununio in Kinondoni, Dar es Salaam and Moa in Muheza, Tanga.

Selection of these sites was based on already set criteria including the focal issue of vulnerability to coastal disasters and the presence of ongoing interventions as regards natural resources conservation, existence of diverse coastal natural resources important for livelihoods of the poor and natural resources management programmes.

The main topics studied include management of coastal natural resources, natural resources linkages to disaster mitigation and policies and guidelines that direct management of the coastal natural resources. This formed the basis of this final report. Comments from the National Workshop were incorporated in the final report.

Occurrence of natural disasters in coastal environments is a common phenomena, but the frequency, extent and severity differ from one place to another. It has been noted that in recent years the frequency of occurrences of more serious natural disasters has increased. Occurrences in Tanzania are on record but lessons have not been widely circulated for stakeholders to take necessary actions as regards preparedness and mitigation.

The December 26, 2004 Indian Ocean tsunami caused by the deep sea earthquake near Northern Sumatra that resulted in a death toll of about 350 thousand people in a dozen countries around the Indian Ocean in Southeast Asia and Eastern Africa became a warning lesson that sensitized different International Organizations, NGOs and civil society organizations to invest in documenting the effects in the affected countries. In this regard, CARE International in Tanzania has commissioned this study to assess the vulnerability and inform a plan to mitigate the impact of natural disasters in the coastal areas of Mainland Tanzania and Islands of Zanzibar.

**The Main Findings**:
Majority of the population in these areas, particularly the poor, depend on the coastal natural resources for their livelihoods and protection against natural disasters.

Although Tanzania has developed good policies on natural resources management, there are some weaknesses in their implementation. There is a general lack of awareness of the policies by most stakeholders. This may be due to inadequate financial resources to involve all key stakeholders at the formulation stage and inadequate human and financial resources to sensitize the public in the implementation of the policies. Either, following the decentralization and implementation of the local government reform, there is lack of direct linkages between sector Ministries and their staff in the districts under the Ministry of Regional Administration and Local Government (MRALG). This creates communication and command chain breakdown between the district level and the ministries in the implementation of policies.

On the management of coastal natural resources and implementation of policies that direct on their sustainable use, it was found out that in general the process is difficult due to the complex multi-sectoral livelihood activities being undertaken by local communities and economic development activities by government and investors. While specific sectoral policies may address specific coastal resources and activities, other sectors contravene the same. There is need for strategies to address complex multi-sectoral issues existing in coastal areas collectively.

With the exception of the National Disaster Management Policy and the National Agriculture and Livestock Policy of Tanzania mainland, and the National Tourism Policy of Zanzibar, other policies did not mention anything on the management of disasters such as preparedness, mitigation of impacts, and rehabilitation of impacted areas.

The National Disaster Management Policy requires other sectors to mainstream relevant activities into their policies. Since this policy is still new, it will take time for the mainstreaming to take place. The exercise also requires proper planning as it has financial implications.

The field study revealed that majority of the population in the study areas are poor artisanal fishers or peasants and living in houses with walls made of wooden polls and mud or cement bricks and roofs of corrugated iron sheets or grass thatched. Their main sources of livelihood are fishing, farming and business. Villages whose main livelihood activity is business seem to have better incomes followed by fishers, while farming communities are the poorest.

The coastal communities, both male and female, claim the right to own and utilize the coastal natural resources in the study area which include mangroves, fish, coastal forests, sea grass, coral reefs, land, sea, rivers, limestone and

beautiful beaches. However, most of the resources are reported to have declined especially the coastal forests, fish catch, sea grass, coral reefs and mangroves. Many communities in the study sites implement some type of conservation activities basically linked to on going projects or programmes such as the Kinondoni Integrated Coastal Area Management Programme and the Tanga Coastal Zone Conservation and Development Programme.

In both Zanzibar Islands and Tanzania Mainland, individual households seem to play a limited roles in conserving the natural resources, which include mainly raising public awareness, abiding by the laws and conserving the environment.

Conflicts on the ownership and utilization of the coastal natural resources especially the land, beaches and mangroves are common, involving groups or clans on the ownership of the sea, villages and individuals or villages and villages over land, and hotel investors and communities over use of the beaches. In both sides of the Republic conflicts are mostly resolved at the local level involving the Sheha in Unguja and Pemba and Village or Mtaa chairperson on the mainland.

On the knowledge of policies, laws and bylaws there seem to be very limited knowledge or even awareness of the policies on the conservation of the natural resources and environment. As already mentioned this may be due to low level of participatory formulation and implementation of the policies and awareness creation. Overall, Zanzibar Islands seem to be more aware of the policies than Tanzania Mainland. The laws and bylaws for conservation of natural resources are better known, but more in Unguja and Pemba. This is partly because there is more awareness creation in the process of enforcing the laws and bylaws and basically the communities are involved in formulating bylaws.

Communication channels on impending disasters are limited to individuals or through local leaderships. On land at work, person to person, radio or television, and signals or alarms are the main channels. In the open sea, signs and signals from other vessels, and radio are the main communication channels in both sides of the Republic

On the steps to take in response to a warning of impending disaster when in open sea, the main actions mentioned were locating the vessel, run to safety in shallow waters, returning to shore and offer necessary support to the affected

The study confirmed that the Indian Ocean tsunami of 26$^{th}$ December 2004 was a unique phenomenon in Tanzania. In both Zanzibar and Tanzania Mainland it was observed as an unusual frequency of high and low tides or strong waves with increased water speed. Most people in both sides of Republic did not take any action or stayed calm and looked at the event. This is caused by low or lack of awareness on this type of disasters, and therefore did not know what they should do to save their lives should the situation became worse.

Unorganized and excessive tree cutting especially mangroves was identified as the leading activity contributing to degradation of coastal natural resources. It was acknowledged by all key informants in all sectors that natural resources help to mitigate impacts of natural disasters.

In the case of households staying in areas known to be prone to natural disasters various reasons were given. The most common reasons are related to poverty, cost of living and the need to stay in a place where one can earn a living through farming, fishing or easy reach to work places. In some cases people settle in places without knowing these are subject to disasters such as floods.

In the workshops the natural resources were mapped for each site and trends discussed. The most important resources linked to disaster mitigation include land, ocean outcrops: (islands, coral reefs, limestone rock and sand dunes), mangroves and coastal forests.

Participants shared experiences on their land near the shore being eroded (eaten away), submerged under water and/or bought away by investors leaving the poor community groups with less per household. The value of land is also getting higher as demand for seaside plots is increasing but without any proportionate economic gains on the part of the communities. This is probably being aggravated by policy gaps and governance issues related to utilization and management of this important resource. The fertility of existing farmland is low due to bad farming practices and/or bad alternative use practice such as on site lime production.

Different methods of conservation measures to stop sea encroachment have been proposed, which include replanting mangroves. Isolated actions such as building sea walls or stone riprap are affecting the unprotected areas of the poor community members.

Ocean feature such as islands, rock outcrops, coral reefs and small islands exist in the areas where artisanal fishers frequent for fishing activities. Coral reefs form an important environment for fish and other invertebrates. Participants shared experiences on the importance of these features in the wake of a tsunami, hence the need to avoid dynamiting them for short-term gains.

Fisher participants to the workshop reported increasing scarcity of fish as days go by. Some of the most commonly caught species are becoming extremely rare. Among the reasons pointed out include over fishing in the same spots, increased number of fishers and bad fishing methods particularly dynamite fishing and beach seining.

Discussing the mangrove trends participants were concerned about the over utilization of the resource and were very bitter about recent clearance of mangrove land in some sites to give way for beach front hotels and residential

houses. Participants learned the importance of coastal forests including source of high value forest products important to the livelihoods of the poor and watershed protection. These forests are under threat from a range of unsustainable human activities such as shifting cultivation, charcoal production, fuel wood collection and pole cutting, timber extraction and mining are additional problems. As human population grows agricultural areas continue to expand into forest areas. In the study areas most of these forests have disappeared except Mwakangale (Ngezi Forest, Pemba). Only small-scattered pockets are left.

**Major Recommendations:**
Since most people in the study areas are poor fishers or farmers this makes a strong case for reformulating/modifying policies, strategies and programs to include protection of the poor against natural disasters as part of the national development strategy.

The coastal communities, both male and female claim the right to own and utilize the coastal natural resources in the study area which include mangroves, fish, coastal forests, sea grass, coral reefs, land, sea, rivers, limestone and beautiful beaches. At the same time these resources are known to be under government control but are declining. The communities are working to improve them through programmes such as the Kinondoni Integrated Coastal Area Management Programme and the Tanga Coastal Zone Conservation and Development Programme. There is need for government to clarify on the ownership, management and utilization of these resources in order to ensure their sustainability and avoid conflicts with hotel investors and other stakeholders.

Due to lack of clear implementation plans and inadequate resources in the other implementing sectors, the Disaster Management Department in the Prime Minister's Office is sometimes forced to implement the policy instead of coordinating. The study has revealed that other sectors and definitely the communities are much less sensitized on disaster management and vulnerability which are important in addressing disasters in their areas. There is a need to build the human and financial capacity at all levels for better implementation of the policy and management of disasters, awareness raising and mainstreaming of the disaster component in all natural resources sectors.

There are no effective early warning systems from the communities or even service providers in both Mainland Tanzania and Islands of Zanzibar. Such a system would be achieved if the vulnerable coastal communities are prepared and act properly in a timely manner upon notification of an approaching disaster such as floods or a tsunami. The Tanzania Meteorological Agency in collaboration with the Disaster Management Department need to improve facilities for early warnings of severe weather and extreme climate events such as heavy rains, floods, tropical cyclones, strong winds and tsunami

In both sides of the Republic the tsunami was observed as an unusual occurrence of high and low tides or strong waves with increased water speed. Most people did not take any action or stayed calm and looked at the event. This was caused by low or lack of awareness of this type of disasters, and therefore did not know what they should do if the situation became worse. This type of reaction was also observed in India where many people died. There is need to educate the people about simple precautions that can be taken to save lives during tsunami and other natural disasters, for example awareness by the communities that a receding sea is an early warning for an impending killer waves.

Low-lying areas are common in the coastal belt. Such areas are prone to coastal natural disasters. In this context those who have settled in the lower areas of Chwaka, Matemwe (in Unguja), Wambaa (in Pemba), Mbweni Ununio, Kunduchi Pwani and Moa on the Mainland and other similar places are highly vulnerable to flooding due to sea rise and or a tsunami like the 26$^{th}$ December 2004 occurrence. These communities need to scale up conservation programmes that include mangroves and other trees planting and coral reef conservation to reduce the impact of any ocean associated natural disasters and increase their knowledge on preparedness.

Coastal communities should be sensitised to continuously refresh local knowledge and maintain activities that improve their preparedness for natural disaster occurrences. Education is fundamental to building an informed community and to ensure that future generations are equally prepared. Public awareness should be an integral part of school education system. In this context resources are needed to raise awareness and sensitize preparedness. Greater and coordinated conservation measures of the coastal natural resources are needed to reduce community vulnerability towards natural disasters. All these require political support, regulatory laws and guidelines alongside strengthened institutional responsibilities and role play.

The MPLA methodology as used in this study is a useful tool to get communities share accumulated knowledge and learn how to manage their common natural resources sustainably for their livelihoods and reduced vulnerability to coastal natural disasters. The importance of participatory approaches in the community activities and the resource mapping empower learning by doing. It helps them to brainstorm where they went wrong and what collective efforts are needed to improve. Further more the tool on the role of natural resources in mitigating the impact of disasters is important, as it stresses the need to conserve the existing natural resources as part of their preparedness against natural disasters. The approach fits well with the objectives of the study.

# 1.0 INTRODUCTION

## *1.1 Background*

Since the December 26, 2004 Indian Ocean tsunami, caused by the deep sea earthquake near Northern Sumatra that resulted to a death toll of about 350 thousand people in a dozen countries around the Indian Ocean in Southeast Asia and Eastern Africa and described as the worst natural disaster of the kind in recorded human history, a number of International Organizations, NGOs and Civil Society organizations have invested in documenting the effects in the affected countries. They have engaged resources justifiably in analyzing the impact, studying the history of natural disasters and preparedness in the affected countries, the state of the coastal natural resources and coastal developments as well as coastal conservation legislation in these countries.

In Eastern Africa the affected countries ware Somalia, Kenya and Tanzania. In this regard, CARE International In Tanzania has commissioned this study to assess the vulnerability and plan to mitigate the impact of natural disasters in the coastal areas of mainland Tanzania and Islands of Zanzibar.

### 1.1.1 Geographical location

The United Republic of Tanzania is located on the East coast of Africa and lies within longitudes 29º 36' to 40º 29' east and latitudes 1º to11º 45' south. It covers an area of about 945,087 $km^2$ that includes Mainland Tanzania and the Islands of Zanzibar (Unguja and Pemba). Mainland Tanzania is divided into 21 administrative regions while Zanzibar has 5 regions. The regions are further sub-divided into districts and the districts into divisions, wards and villages/shehia (in Zanzibar and Pemba) for administrative purposes. The village or shehia is the lowest administrative entity with legislative powers.

The country frontiers to the Indian Ocean in the east with a total length of about 800 km coast line extending from the boarder with Kenya in the north to Ruvuma River in the south on the mainland, 430 km around Unguja and 450 km around Pemba. There are five coastal regions on the Mainland Tanzania including Tanga, Coast, Dar es Salaam, Lindi and Mtwara. The Coast region includes the Island of Mafia and numerous islets and the catchments areas.

### 1.1.2 Demography

The population of Tanzania has grown from 23.1 million people recorded in the 1988 census to 34.569 million based on the 2002 census (Mainland – 33,584,607; Zanzibar – 984,625). The average population growth rate is higher than 3 percent per year ranging from 4.8 percent recorded in Kigoma region to 1.4 percent recorded in Lindi in the 2002 census. While the population density and rate of increase in the coastal zone in general are below the national average, there is high level of out-migration to the big cities (Dar es Salaam, Tanga, Bagamoyo, Lindi, Mtwara, Zanzibar, etc) according to that census. Taking the five Mainland coastal regions together and the five regions of

Zanzibar and Pemba Islands, the population in the coastal zone in 2002/2003 was around 7,933,563 (about 23% of the population of Tanzania), depicting a rapid demographic change in the zone as compared to the 1988 census). It is estimated that the population growth rate of the five coastal regions now ranges between two and six percent. At this rate, a doubling of the population (about 16 million people) could be expected on the coast by year 2010, which will be about 110 people per square kilometre.

### 1.1.3 Social / economy

The economy of Tanzania is heavily dependent on agriculture, which is predominantly smallholder and subsistence in nature. Agriculture accounts for 45% of the GDP, provides 60% of exports (raw and processed) and a source of employment and livelihood for 82% of the total workforce and the majority of Tanzanians (NSGRP 2005).

Fisheries is a component of agriculture in Zanzibar. It employs about 25% of the population either as fishers or as service providers of supportive fisheries services. Fisheries products are a major source of animal protein to the majority of Zanzibaris. It also has a great potential for export and increase its percentage contribution to the GDP, which is low (3.7percent in 1997) possibly due to being undervalued because of under pricing as a component of agricultural GDP. (Fisheries Policy 2000).

Due to the natural and mineral endowments of Tanzania, tourism and mining are envisaged to contribute favourably to the Tanzanian economy. In 1998 tourism contributed 7.6 percent of GDP, up from a meagre contribution of 1.5 percent in early 1990s and the sectors growth rate averaged 22 percent. The number of tourists visiting Tanzania increased by 34 percent from 36,000 in 1997 to 482,000 in 1998 boosting foreign exchange earnings from the sector by 45 percent (from US$ 392 million in 1997 to US$570 million in 1998). (World Bank country study 2001). The core of the tourism business is now market oriented and guided by the National Tourism Policy of 1998.

The mining sector has been fully opened to the private sector which has attracted many mineral prospecting investors especially for gold. In 1998 the mining sector contributed 1.8 percent of GDP and grew 27.4 percent (World Bank country study 2001).

Despite macroeconomic and structural reforms of the government in recent years, poverty has remained widespread especially in the rural areas where over 70 percent of the population live. Urban poverty has also increased as a result of the rapid rural to urban migration without increased employment opportunities.

The National Strategy for Growth and Reduction of Poverty (NSGRP) has been developed recently (June 2005) as a second national organizing framework after the Tanzania Vision 2025 to put the focus on poverty reduction high on the

country's development agenda. The strategy recognizes that poor people rely heavily on natural resources (land, forests, and water) and are most vulnerable to external shocks and environmental risks, including drought and floods. It proposes putting in place strategies to mitigate effects of natural disasters, halt deforestation, promote water conservation practices and pursue sustainable use of natural resources through community based natural resources management and enhanced district level planning.

### 1.1.4 Tanzania Coastal Zone Ecosystem

The coastal zone is that area surrounding the interface between land and sea, which for Tanzania includes coastal plains, river deltas, wet lands, lagoons, beaches, dunes, mangroves and other coastal features including the continental shelf.

The coastal zone is narrow and varies between 20 and 30 km wide. It has been estimated the total coastal land area is about 30,000 $km^2$ that includes the three major Islands (Unguja, Pemba and Mafia) and numerous small islands and reefs. The continental shelf is 5.8 kilometres wide, except at the Zanzibar and Mafia channels where the shelf reaches a width of 62 kilometres. The total estimated shelf area is about 17,500 $km^2$.

Numerous rivers entering the Indian Ocean drain the coastal plain, some of which are minor and seasonal. The major and more permanent rivers include Pangani, Wami, Ruvu, Rufiji, Matandu, Mbwemkuru and Ruvuma. These rivers and the many smaller and seasonal ones indent the Tanzania shoreline forming extensive estuaries and deltas, creating important marine habitats and drainage systems, which also influence the seashore erosion and sedimentation process. The Rufiji River is the largest and enters the sea through many deltas causing extensive sedimentation, mainly sand and debris from the eroded lands in the hinterland forming a unique habitat on the Tanzanian Coast. Figure 1 below shows the coastal natural resources of Tanzania.

*Figure 1: Coastal Natural Resources of Tanzania*

### 1.1.5 Global occurrence of coastal natural disasters

Globally, it has been observed that in recent years the world has witnessed a succession of disasters including floods, wildfires, storms, earthquakes, volcanic eruptions, landslides etc claiming many thousands of lives and causing material losses worth in the billions of dollars and inflicting terrible death tolls on developing countries in particular where disasters divert attention and resources from development needed to escape poverty.

The Indian Ocean Tsunami caused by the deep sea earthquake near Northern Sumatra on 26 December 2004 causing a death toll of 350 thousand is quoted as by far the worst natural disaster of that kind in recorded human history (Achukorala and Resosudarmo March 2005). They listed five previous deadliest tsunami (with death toll in brackets) as:

- Indonesia -27 August 1883 (36,000)
- Portugal -November 1755 (30,000),
- Japan -15 June 1896 (27,000),
- Japan -21 May 1792 (14,000) and
- Japan -27 March 1933 (3,000)

The Indian Ocean Tsunami, an earthquake measuring 9.0 on the Richter scale occurred about 30 km off the west coast of Sumatra, the extreme western end of the "Ring of Fire" (a zone of frequent volcanic eruption partly encircling the Pacific Basin that accounts for over 80 percent of the world's largest earthquakes). It was reported as having two unique features, which make it valuable laboratory for the study of disaster management in the new millennium. First, it was the world's first truly global disaster with lives shattered in a dozen of countries in two different continents. Second, the response to the disaster was also global in a way never seen before, with tens of millions of ordinary citizens reaching into their pockets to send aid in addition to donor and government and agencies (Achukorala and Resosudarmo March 2005). In Asia the worst affected countries were Indonesia (Aceh province and Sri Lanka. Others were Thailand, Myanmar, India (Tamil Nadu, Andaman and Nicobar Islands), Malayasia and Maldives.

The December 26 2004 earthquake and tidal wave that decimated many of the coastal regions of South Asia extended a path of destruction all the way to the eastern coast of Africa (Africare January 2005). The hardest hit African nation was Somalia, where hundreds of people were killed and many fishermen reported missing. Off the coast of Somalia, almost all of the buildings on the Island of Hafun were swept away. Thousands of refugees have fled the coastal areas to seek aid inland.

In Seychelles, the tsunami caused considerable damage on two of the country's most populous islands, Mahe and Praslin. Millions of dollars of damage occurred to the public infrastructure and the tourism industry, and many citizens were rendered homeless or displaced due to the flooding and continued rainfall.

In Kenya and Tanzania, a small number of people were reported killed and many fishing boats were damaged as a result of the tsunami. In Madagascar, over 1,000 people were made homeless.

The December 26 tsunami was first and foremost a human tragedy, which caused total official death toll of over 220,000 reported by February 2005 and over 50 thousand people still missing then. The macroeconomic impact on Indonesia, Thailand and India was high but unlikely too severe compared to the shocking human toll (Athukorala and Resosudarmo June 2005).

### 1.1.6 Occurrence of coastal natural disasters in Tanzania

Due to its Geographical position and the ecology Tanzania has been experiencing a number of natural disasters for many years now, resulting in losses of life, property and disruption to the environment. The National Disaster Management Policy of 2004 defines disaster as "A serious disruption of the functioning of a society causing wide spread human, material and environmental losses which exceed the ability of the affected society to cope with using its own resources". This is adopted from the United Nations Disaster Relief Organizations definition (UNDRO, 1991). Other definitions have been provided which more or less carry the same message.

The World Health Organization (WHO, 1990) defines the term disaster as any occurrence, which causes damage, ecological disruption, loss of human lives, deterioration of health and health services on a scale of sufficient to warrant an extra ordinary response from the affected community.

Gunn (1990) defines disaster as a result of vast ecological breakdown in the relations between man and his environment leading to serious and sudden event (or as slow as drought) on such a scale that the stricken community needs extraordinary effort to cope with it, often with outside help or international aid.

Davis (1990) explains that disaster is the product of the impact of a natural event upon a vulnerable population to cause disruption damage and causalities beyond the unaided capacity of locally mobilized resources.

The UNDP expressed this definition of disaster mathematically as follows;

$$D = \frac{H * V}{M}$$

Where,

D = disaster

H = hazard, M = manageability, V = vulnerability

Hazard is a natural or human caused event that could cause loss of life or damage to property and environment. Hazard includes earthquakes, storms,

drought, fire, strong winds, floods, volcanic eruptions, war and major accidents. A hazard becomes a disaster when it strikes vulnerable people.
Manageability refers to the degree to which a community can intervene and manage a hazard in order to reduce its potential impact. The term comes from the word “manage” and manageability therefore refers to the extent to which a particular hazard can be manageable.

Robert Chambers defines Vulnerability as:
Defencelessness, insecurity and exposure to risk, shocks and stresses and difficulty in coping with them. Vulnerability has two sides: an external side of risks, shocks and stress to which an individual or household is subject and an internal side which is defencelessness, meaning a lack of means to cope with damaging loss.

Periperi, Oxfam (2002) define Vulnerability as:
The characteristics that limit any individual, a household, a community, a city, a country or even an ecosystem’s capacity to anticipate, manage, resist or recover from an impact of natural or other threat (often called “hazard” or natural “trigger”)

The National Disaster Policy quotes the major hazards that carry the danger of causing disasters in Tanzania to include disease epidemics, pest infestations, droughts, floods, major transport and industrial accidents, refugees and fires. Earthquakes and strong winds are quoted as few and of rare occurrence.

A recent study on vulnerability assessment by the University College of Lands and Architectural Studies (UCLAS) in collaboration with John Hopkins University (JHU) and the Disaster Management Department (DMD) of the Prime Minister’s Office identified the three most common types of hazards as drought, disease and pest outbreaks and are based on agro ecological zones in Tanzania.
The coastal zone is probably more prone to floods than all the other agro ecological zones, being the recipient of all the rivers from the hinterland. Beach or coastal erosion has also caused loss of coastal communities’ properties including houses, farms and roads.

Some of the major natural disasters that have hit the coastal zone include:

- The cyclone of 1951 that devastated Mtwara causing damage to the environment, farmlands, property and unreported deaths in isolated cases.
- The Tropical Cyclone over the Indian ocean (Alberta) that hit Dar es Salaam in 1989/90 causing destruction of the environment, property and Infrastructure.
- Landslides and flooding in 1995 in Mtwara as a result of three days continuous rain causing damage to farmlands, environment, roads, property and some unrecorded deaths. One Government Officer died in a plane accident while inspecting the damages.
- The El-Nino of 1997/98 that caused serious flooding, destruction of roads and property countrywide with Mtwara being the most affected.

- The Tsunami of December 26, 2004 that affected most of the northern part of the East African coastline from Dar es Salaam to Somalia and Unguja and Pemba. In Dar es Salaam it caused the deaths of 10 people who were out swimming in the sea and damage to fishing boats and harbour facilities.

The direct link of the Tanzanian coast line to South East Asia through the Indian Ocean makes the coastal zone vulnerable to the effects of strong disturbances happening in that part, such as strong winds, cyclones and tsunamis.

The 26 December 2004 earthquake that occurred in the western coast of Sumatra is such an example. Given that there was no history of tsunami in this part of the Indian Ocean and that there was no early warning system of the impending disaster, the 26 December Tsunami was a completely new phenomena to government institutions and coastal communities in Tanzania. Many people especially in coastal villages watched the prior receding of the waves with curiosity and to date most cannot tell exactly what occurred. Fortunately the tsunami waves were not too high when they lashed against the shoreline and so did not continue inland.

According to the Expert Mission to Indian Ocean Countries to assess requirements and capacity for an effective and durable national tsunami warning and mitigation system which visited Tanzania 16-17 June 2006, the 26 December tsunami arrived at the Tanzania coasts during low tide, causing minimal damage. If it had occurred during high tide, the height of the sea would have been 1.8 m higher. In such a case the tsunami would have impacted heavily on numerous flat areas and could have resulted in substantial casualties. The distance of the Tanzanian coastline from the epicentre of the quake in Sumatra (about 5000km) could also have accounted for the reduced effects in Tanzania compared to places like Sri Lanka (1500km away) where the impact was much higher and seawater columns entered up to 5km inland from the sea, swallowing everything in its path.

Despite these observations, the 26 December 2004 tsunami resulted in notable casualties and damage to harbours, individual properties and the environment in various places including Dar es Salaam. According to the Disaster Management Department of the Prime Minister's Office the tsunami effects included:

- Death of ten people in the Indian ocean while swimming.
- Small fishing boats damaged (number not determined).
- Eight TIPER oil products handling pipelines damaged in Dar es Salaam Harbour. They included fuel oil, gas oil, ATK, LPG (liquid), LPG (gas), crude oil, Kerosene and Gasoline pipes.
- The damaged pipelines resulted to oil spill impacting loss to the owner of the oil and causing pollution of the environment in the area.

### 1.1.7 Management of coastal natural resources in Tanzania

The Livelihoods of the coastal people, most of whom are poor, depend on the coastal natural resources. Their livelihood options include small holder farming, artisanal fishing, subsistence forestry, lime and salt production, seaweed farming, livestock husbandry and small scale trade. There are also important economic development activities located in the coastal areas; 75 percent of the country's industries are located in urban coastal areas. Coastal tourism, mariculture development and natural gas exploitation are becoming important economic development activities in these areas. These economic opportunities need to be developed to benefit the coastal communities, along the principles of sustainable management and protection of the natural resource base. However, due to increased number of people depending on these resources for their livelihoods and desire to increase income, destructive practices are still being used, leading to degradation of the coastal resources. These methods include dynamite fishing, trawling by international fishing boats, exploitation and uncontrolled use of forests and mangroves, coral mining and unplanned settlements. There is also increased pressure from tourism, industry and population growth.

Management of the coastal natural resources is made difficult due to the complex multi-sectoral livelihood activities being undertaken by local communities and economic development activities by government and investors. While specific sectoral policies may address specific coastal resources and activities there is evidence of other sectors or sections of the community acting on the contrary. In this regard there is the need for strategies to address complex multi-sectoral issues in the coastal areas collectively. The National Integrated Coastal Management (ICM) attempts to address the above concerns as a continuous dynamic process that unites government and the community, science and management and sectoral and public interest in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources.

The ICM strategy is intended to improve decision-making for sustainable coastal development by providing clarification on the governance and rights issues on resource use and allocation at the national and local levels. It is supposed to provide increased power and access to resources by the communities.

While sectoral participation and involvement remains central for effective coastal environment management, the strategy promotes cross-sectoral planning and action to fill institutional gaps and resolve coastal issues. Most of the national sectoral policies (land, fisheries, forestry, environment, tourism, agriculture and others) also support an integrated and participatory resource management approach to resolve cross cutting issues and take advantage of development opportunities initiated centrally at national level like the NSGRP (MKUKUTA).

A number of locally based coastal management programs have been initiated to address declining coastal resources in those areas. These include:

- Tanga Coastal Zone Conservation and Development Programme (TCZDCDP)
- Kinondoni Integrated Coastal Area Management Programme (KICAMP)
- Mafia Island Marine Park (MIMP)
- Rural Integrated Programme Support (RIPS)
- Rufiji Environment Management Programme (REMP)
- Mnazi Bay and Ruvuma Estuary Marine Park (MBREMP).

The National Environment Policy of 1997 links environmental destruction to poverty and prioritizes sustainable resource use for poverty eradication. The ICM programme in Tanzania addresses poverty eradication in six broad areas including managing geographical areas of concern and critical habitats. These are areas along the coast that require proactive planning and management because of their unique ecological importance and economic value or because of intense user conflict. They fall into two categories as follows:

- Geographical areas of concern, which include coastal areas where major new economic facilities and infrastructures such as ports or new developments like beach hotels and others are planned. Here, processes are needed to proactively identify and resolve potential user conflicts before they occur, as well as identifying and managing high hazard areas from natural and man-made forces including erosion and flooding.
- Critical coastal habitats which include estuaries, mangrove forests, beaches, coral reefs, sea grass beds, watershed and wetlands are systems which interact with each other and together supply the natural wealth upon which the coastal communities are dependent upon.

In order to protect and manage the biodiversity of these irreplaceable systems once lost, a number of tools have been developed. The National Mangrove Management Plan of 1991 currently implemented by the Ministry of Natural Resources and Tourism provides a framework for sustainable use of Mangroves. Marine parks are “special management areas” for critical coastal and marine habitats with high biodiversity, managed under the authority of the Marine Parks and Reserves Act Board of Trustees. There is potential for a system of marine parks to play a central role within the national ICM strategy. Coral reef management initiatives in Tanga and elsewhere could also provide models for critical coastal habitat management.

The geographical areas of concern and critical coastal habitats are very important in mitigating coastal natural disasters. Proper planning and management of these areas will therefore play this critical role in addition providing the natural resources required for livelihoods and poverty reduction. However, the mainland ICM strategy does not cover the Isles. It is important that issues for ICM planning and management are also developed for Zanzibar.

### 1.1.8 Management of Coastal Natural resources and Linkages to disaster mitigation (Global and Tanzania)

In the aftermath of the December 26th 2004 Tsunami, environmentalists and rescuers from across South and South-Eastern Asia and other affected countries have pointed to the importance of enforcement of coastal environment regulations on the management of coastal natural resources as the key disaster mitigation policy. Athukorala and Resosudarmo (March 2005) observed that although the height of the waves and their global spread were purely the work of nature, there is clear evidence that the sheer loss of human lives was partly a result modern progress, ruthless destruction of natural defences such as coral reefs, forests and mangrove swamps, and building oceanfront hotels and villas in violation of coastal conservation legislation.

In Indonesia a rather low death toll was noted in Simeulue Island, which is situated only 100 km away from the epicenter. The Island was severely hit by the Tsunami, resulting in destruction of approximately 5,500 houses and hundreds of people injured, but only seven deaths were recorded (Kompas, 1 April 2005). Two possible reasons were suggested for the surprisingly low death toll. First, the well managed coastal ecosystem comprising the coral reef, sea grass and mangrove forests in the northern part of the island softened the force of the giant waves. Second, local culture in the island has an important precautionary procedure transferred from generation to generation for facing a tsunami. Once one recognizes some indication of an impending tsunami, he/she would run to the nearest hill shouting *"smong----smong----smong"* (tsunami in local language). Others who hear the warning would run to the nearest hill while contributing to the *"smong---smong ---smong*" chorus. This simple procedure proved to be very effective in the recent tsunami (Wetlands-International-Indonesia Program 2005). Other parts of Indonesia (Aceh and North Sumatra) which were severely hit do not have such simple traditional mitigation procedures embedded in their local culture.

Evidence of the importance of the coastal ecosystem in mitigating the impact of tsunami was also noted in the other affected areas of Indonesia. The impact of the tsunami was less severe in areas along the west and east coast of Aceh where the coastal ecosystem remained in relatively good shape. The damage was more severe in coastal cities where the ecosystem has been disturbed by housing, tourism and destructive fishing (Wetland International-Indonesia Program 2005).

In Sri Lanka which was the second most hit country, it was also observed that the tsunami disaster held lessons in the area of coastal resource management (Clarke 2005). Here it is reported that the rule which regulates construction within 300 meters of the shore had been ignored or openly flouted by individuals as well as hotel developers and shrimp farmers; there had been gross violation of regulations prohibiting mining coral reefs and destroying coastal mangrove forests which act as barrier to the waves of the sea. Fishermen use dynamite to

stun and catch fish, blowing everything for meters around and thus wrecking the reef. The tsunami damage was observed to be greater in areas where the incidence of violation of these environmental regulations was worse. This gives clear evidence that thousands of lives could have been saved if the environmental regulations had been enforced and observed.

In Southern India (Pitchavaram and Muthupet regions, it is reported that mangroves acted like a shield and bore the brunt of the tsunami, protecting around 1700 people living in hamlets built inside between 100 to 1000 meters from the mangroves.

Construction of Sea Walls as means of protecting the coast has been considered. The Tata Institute of Social Sciences reported that in Tamil Nadu the desire to protect oneself from the sea by means of physical barriers was an immediate response to the tsunami, with some seaside communities putting pressure on the government to build sea walls. The government took this up as a priority issue, but unfortunately without researching the pros and cons of this option adequately. Sea walls, while they protect the part of the coast they are built in from the waves, they usually result in severe seawater intrusion which makes the sea hit the adjacent part of the coast or the adjacent village with even more force causing severe damage. In one area, more than 50 meters of beach was lost in less than seven months due to the sea wall built in the neighbouring village. Before the tsunami, some villages in Kanyakumari did have sea walls, though improperly constructed. These crumbled under the impact of the waves, causing injury and deaths.

Issues related to access to the sea also come up in villages with sea walls.
People living along the coast and environmentalists have suggested alternatives to sea walls, which include developing natural barriers such as mangrove forests and other bio-shelters along the coast. They concluded that given the many uncertainties that exist regarding the efficacy and safety of sea walls, it is vital that careful research is done on the subject to explore alternatives and make use of traditional and scientific knowledge before investing in them.

In Tanzania the 26 December 2004 Tsunami was a new phenomenon and its effect on the coast was not serious. This has been attributed to the greater distance from the epicenter and the fact that it arrived at coast during low tide. There is no evidence that the state of the natural resources along coast could have contributed to the mild effect of the tsunami. However, based on lessons from the other countries that were more seriously affected the role of the coastal resources in mitigating the effects of the tsunami is indisputable. It is important therefore that Tanzania makes clear policies, governance and institute rights issues on the management of the coastal natural resources. This is important as these resources affect the livelihood of the coastal communities and their vulnerability to natural disasters.

## *1.2 Objectives of the study*

### 1.2.1 Overall objective

To identify policy, governance and rights issues underlying vulnerability to natural disasters and develop strategies for strengthening community preparedness capacity to reduce vulnerability and mitigate impact.

### 1.2.2 Specific objectives

1.2.2.1 To develop a methodology for examining land and resources related governance, rights and policy issues as relate to community preparedness and response to natural disasters and livelihood security.

1.2.2.2 To explore and document policy, governance and rights issues that affect the management of shared coastal natural resources and the underlying community vulnerability to natural disasters in the coastal areas of mainland Tanzania and Zanzibar Islands.

1.2.2.3 To raise awareness about the linkages between sound natural resources management and disaster preparedness in target communities.

1.2.2.4 To inform the development of program of action to assist communities to improve governance, reduce conflicts over mangrove and other vegetation areas and reduce their vulnerability to natural disasters.

Detailed terms of reference for the study are presented in Appendix 1.

# 2.0 METHODOLOGY

## *2.1 Overall research strategy*

CARE International in Tanzania required the consultant to carry out participatory research processes in coastal communities to identify the policy, governance and rights issues affecting the management of mangroves and other coastal natural resources that affect their livelihoods and vulnerability to natural disasters and input the results to develop strategies for strengthening community preparedness capacity and therefore reduce their vulnerability and mitigate impact of these disasters.

The consultant employed three participatory approaches to carry out the assignment together with facilitating a stakeholder National Workshop organised by the client at the end. The three approaches involved first review the existing information including relevant policies, strategies and guidelines; second undertook field work involving administering a questionnaire to community households and a checklist to key informants at national, district and local levels (shehia/mtaa/village leadership and or technical personnel); and thirdly organized and facilitated multi-stakeholder participatory learning workshops. Comments from the National workshop were incorporated in the final report. Further details of the methodology are described under the relevant subsections below.

### 2.1.1 Review of existing information

The review was intended to establish the global occurrence of coastal natural disasters to gather information on experiences from other areas in the world, occurrence of coastal natural disasters in Tanzania in the past and management of coastal natural resources and linkages to disaster mitigation globally and in Tanzania.

Relevant policies and strategies in natural resources management and natural disasters were also reviewed to establish weaknesses and opportunities in the existing policy framework so as to identify the policy, governance and rights issues of relevance to future plans to mitigate the impact of occurrences of natural disasters in coastal Tanzania.

Major sources of information for review included searching from the Internet and available published documents. Additionally information on natural disaster occurrences and management in coastal Tanzania was obtained through search of records available in the Ministry of Natural Resources and Tourism, Ministry of Agriculture, Food Security and Cooperatives, National Environment Council Tanzania Meteorological Agency archives/library and discussions with staff members. Relevant policies and strategies documents on management of natural resources including National Fisheries Sector Policy Statement, Agriculture and Livestock Policy, National Forest Policy, Environment Management Policy and Strategy and Water Resources Policy papers were obtained and reviewed. National Disaster Management Policy, and National Guidelines for Disaster

Management, and National Strategy for Growth and Reduction of Poverty or MKUKUTA were also reviewed. The information so collected was summarized to prepare the required report as part of the final submission required.

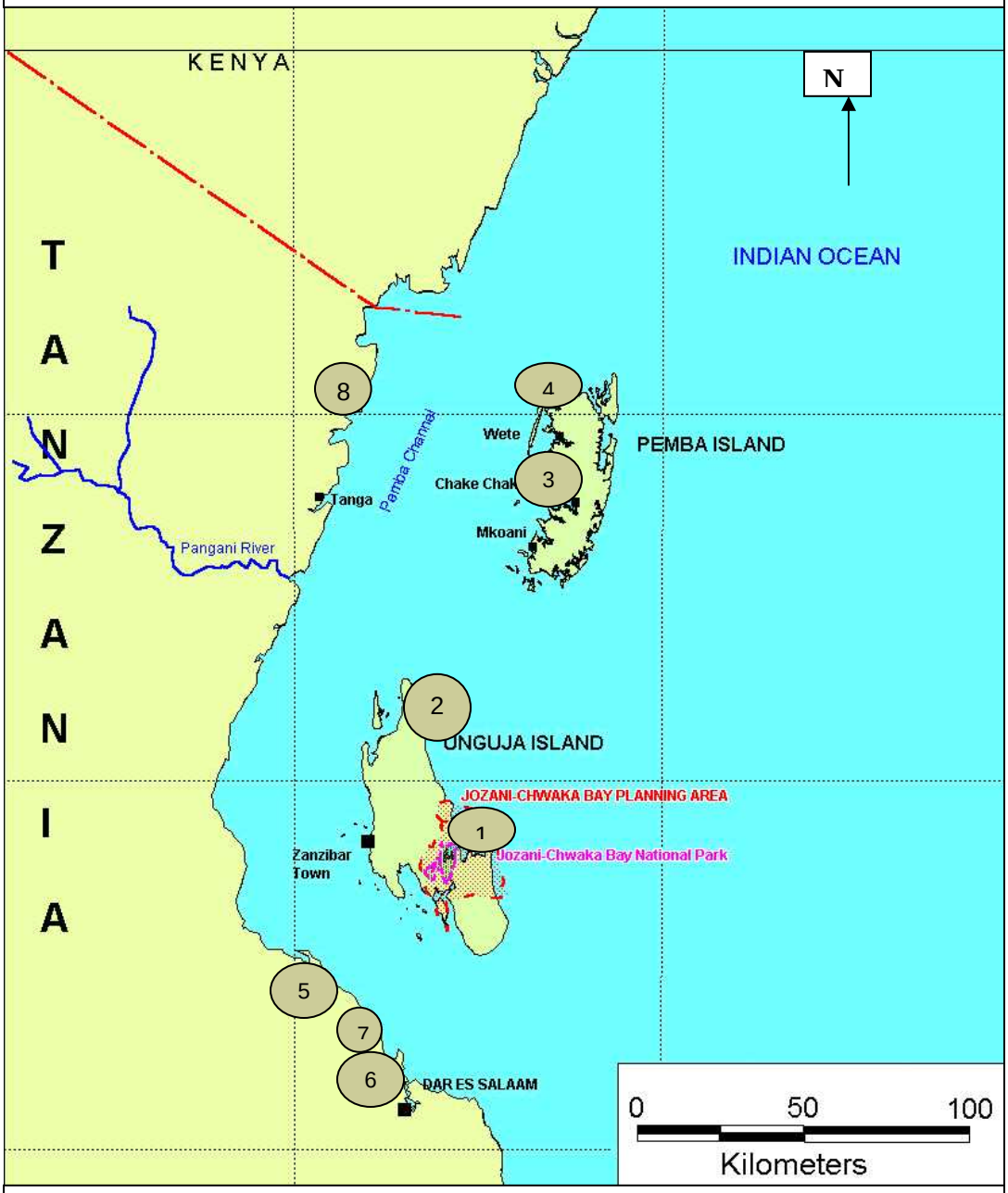
### 2.1.2 Field Work

The field work involved visits and discussions with key informants and guided by preset checklist. The key informants included relevant heads of departments and project managers at national and district levels and local leadership. A field survey involving administration of structured questionnaire was administered to twenty heads of households in each of eight selected sites in six districts. Following this activity the consultant organised and facilitated four district level multi-stakeholder participatory learning workshops involving representatives form the participating villages and district technical and/or administrative representatives. The selected sites were: Unguja Central district (Chwaka Shehia), “North A” district (Matemwe Shehia), Pemba Micheweni district (Makangale Shehia), Mkoani district (Wambaa Shehia); Dar es Salaam Kinondoni District (Mbweni, Ununio and Kunduchi Pwani fishing villages) and Tanga Muheza district (Moa fishing village). At district level the combined fieldwork activities ware completed within 5 – 7 days.

#### 2.1.2.1 Field survey with Questionnaire

One of the approaches used as part of the overall research strategy was the field survey, making use of designed structured questions to capture the study objectives. Data was collected in sampled areas of Unguja and Pemba Islands and Dar es Salaam and Tanga regions. They included Chwaka and Matemwe (Unguja), Makangale and Wambaa (Pemba), Mbweni, Kunduchi Pwani and Ununio (Dares Salaam) and Moa (in Muheza Tanga). Care International earmarked these areas of interest based on set criteria that include the focal issue of vulnerability to coastal disasters, presence of ongoing interventions focussed on natural resources conservation and existence of diverse coastal natural resources important for livelihoods of the poor together with reduction of the effects of coastal natural disasters.

*Fig.2. Map showing the study sites*




Key to study sites

1 =Chwaka
2 =Matemwe
3 =Wambaa
4 =Makangale
5 =Mbweni
6 =Kunduchi Pwani
7 =Ununio
8 =Moa

#### *2.1.2.1.1 Questionnaire design*

The questionnaire was the basic tool for data collection. It was designed based on the study objectives, terms of reference and the expected outputs. It comprised of mostly short precise questions and a few open-ended questions to solicit general inputs from the respondents. Section A of the questionnaire covered background information of the area and household head. Section B covered household composition by age, sex and relationship. Section C covered characteristics of the house in which the household live (walls and roof) and ownership, while section D covered the economic situation of the household. Section E covered aspects of household food security. Section F was the core section covering the state of natural resources and the coastal environment over the years and conservation measures undertaken as perceived by the respondent. In addition the section dealt with measures undertaken to raise the level of awareness and management of natural disasters among communities, policies and legislations, conflicts relating to resource ownership and use, and ownership of various assets including livestock, means of transport and fishing gear. Section H covered household access to potable water resource and also solicited general recommendations on the core subject.

#### *2.1.2.1.2 Questionnaire pre-testing*

The questionnaire was pre-tested in Unguja, Zanzibar prior to its administration. After pre-testing aspects which needed further probing to get good responses were looked into while unnecessary details were removed. Furthermore, aspects which were specific to the Zanzibar situation were added.

#### *2.1.2.1.3 Sampling plan*

Sampling of households and respondents was done in collaboration with the respective Sheha and Committee members (in case of Zanzibar) and the ward executive secretary, village chairperson and sub-village leaders and members of the Mtaa (City Section) and village governments in the case of Dar es Salaam and Tanga. The sites had to be representative of coastal communities, focus on the poor vulnerable group and were to be manageable size.

The respondents were the heads of households. In total there were 160 households which included 40 from Unguja, 40 from Pemba, 60 from Dar es Salaam and 20 from Tanga,

#### *2.1.2.1.4 Administration of the questionnaire*

Collection of quality data puts special demand on enumerators and supervisors. Enumerators for each site were identified and recruited with the help of key collaborating agencies, based on their previous experiences in undertaking related studies. These were mainly from fisheries, forestry and agricultural sectors / departments, who had varied experiences in conducting surveys. The training was informal and emphasized on the use of socio-economic information management and the procedure to collect such data. They were introduced to

the background of the survey, the questionnaire, different sections and the specific content of the respective questions for standardization. Further instructions were given as the activity progressed where enumerators met specific situations that needed further clarification.

#### *2.1.2.1.5 Data coding and entry*

After the field work the completed questionnaires were scrutinized to identify errors, incompleteness, misclassifications and gaps in the information obtained from the respondents and code consistency. Then each was given a reference number for identification and the questions coded to facilitate numerical value entry, sorting and tabulation during entry into preset computer programme for analysis.

#### *2.1.2.1.6 Data Processing and Analysis*

The coded data was computerised and subjected to statistical analysis using frequency and cross tabulation techniques. Cumulative frequencies were used to determine level of income. The analysis was done in the light of the objectives and the expected outputs of the study. The results are presented under the findings in the form of tables, graphs or bar charts..

### 2.1.2.2 Key Informants Interviews

A checklist of questions was prepared for discussion at interviews with key informants at national, district, village government, national Institutions and departments, projects and programmes, NGOs, CBOs and Civil Societies involved in natural resources management and/or natural disasters management. This information complemented that obtained through the formal questionnaire and Multi-stakeholder Participatory Learning Approach (MPLA) workshops.

### 2.1.2.3 Organisation and facilitation of Multi-stakeholder Participatory Learning Workshops

Four MPLA workshops were conducted to cover the eight selected sites. The venues for the workshops were Unguja at Forest Centre involving Chwaka and Matemwe shehias, Gombani Stadium conference Centre Mkoani district involving Makangale and Wambaa shehias in Pemba, Basihaya Campsite Boko Dar es Salaam Kinondoni District involving Kunduchi Pwani, Ununio and Mbweni villages and at the Tanga Coastal Zone Conservation and Development Programme conference room involving Moa fishing village of Muheza District Tanga.

#### *2.1.2.3.1 Rationale for MPLA*

Multi-stakeholder Participatory Learning Approach in simple terms may be defined as a process of learning together through sharing experiences and ideas on economic, cultural and social activities surrounding our communities and how available resources, natural resources in particular, are being used to sustain

local livelihoods (TMLA, 2003). The learning emphasizes the need to collectively manage the limited natural resources sustainably for current and future generation needs. The learning involves interactions between local, districts, national and even international groups learning how to sustain a particular environment.

The goal of the learning process is to enable local institutions to provide appropriate solutions and services for small-scale producers practicing sustainable agriculture and or artisanal fishing (Light Foot, *et al*,). Three main objectives arise in this learning process.

- To promote more responsive service provision
- To strengthen the capacity of community-based organizations involved in farming and or fishing to demand and access services they need to implement their plans.
- To influence policies and environmental legislation towards more consultative and sustainable natural resource management plans.

Along side those major objectives stakeholders learn how to co-manage existing shared resources, stimulate identification of the right services with improved delivery and good governance and issues that affect their livelihoods. This process weaves together biophysical and social information about the ecosystem as the first step in collaborative learning. It paves the way for organizations to learn, act and reflect collectively on desirable future goals, based on learning that arises out of discussions using simple methods such as natural resource mapping and utilization trends designed by those involved.

The approach has been developed by International Support Group (ISG[1]) in collaboration with coalition learning groups in Tanzania, Kenya and Uganda since 1999 and proved useful tool for guiding participatory activities involving rural communities. Here in Tanzania it has been introduced in 10 districts[2] where it is currently being used to complement other planning tools and is proving very useful.

The effectiveness of the approach is centred in FOUR phases namely VISIONING (on future ecosystem management), PLANNING (community service needs matched with available services), NEGOTIATING (needed/new partnerships), ACTION (on planned projects, management activities) and REFLECTION (measuring performance after implementation). As learning has no end the process starts over again in a cycle, visioning any needed action for correction or new ways (Fig. 1).

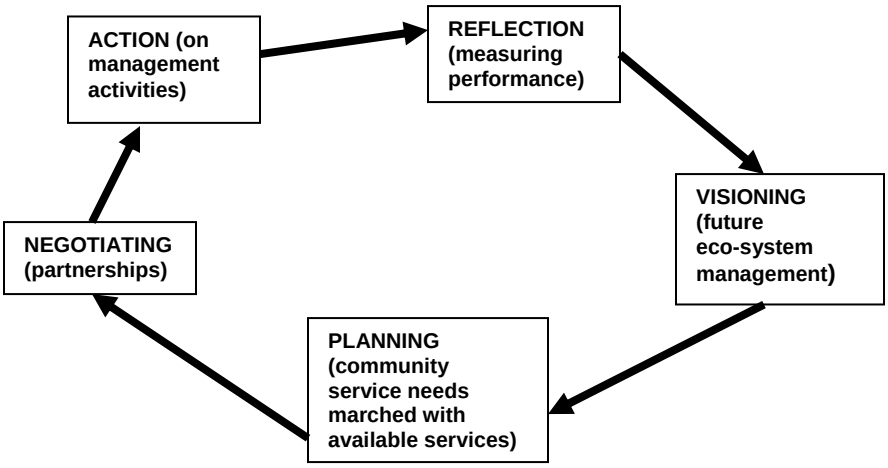
[1] *International Support Group (ISG) is a professional non-profit making NGO that supports the coming together of stakeholders for developing learning approaches to complex organisational changes associated with collaborative management of natural resources, decentralisation of government services and liberalisation of agricultural extension support.*

[2] *Districts using the MPLA include Kilosa, Lushoto, Iringa Rural, Mbeya Rural, Mbozi, Mbarali, Mufindi, Njombe, Kilolo and Bagamoyo*.

The approach differs from other approaches by:

- Use of soft system tools that enable stakeholders of diverse and level of knowledge to learn together.
- Emphasizes ownership of the learning process and the agreed actions to be taken
- Community members (villagers) actively participate in the entire analysis of their problems and solutions.
- Places particular emphasis on the importance of the natural resource base and must be maintained at all costs in order to sustain the ever increasing human needs.

Fig.3. The MPLA Learning Cycle




*(Adopted from Learning Our Way Ahead, Clive Lightfoot et al, iied; 2003)*

### *2.1.2.3.2 Adoption of MPLA to the study*

The Terms of Reference for the study required the consultant to adopt a participatory approach that would eneble stakeholders, particularly the vulnerable community groups to share their experiences on the management of their natural resource base and their understanding of how these resources can mitigate or reduce the the severerity of damage in the wake of natural disasters associated with coastal environments.

The purpose of these workshops were to

- Complement information from satakeholders; compilation of information that had been digested in group discussins as opposed to individual interviews.
- Sensitise stakeholders at district and community levels (village/shehia/mitaa) on the likelihood of natural disasters on coastal environments and the increasing rate of occurances in recent years, hance the need to take actions towards preparedness.

- Learn together with garassroot communities existing but fragile coastal natural resource base, their importance to the livelihoods of the people and the urgent need to conserve them for development and future generations.
- Bring up policy issues that relate to management of the coastal resources in relation to ownership, utilization and governance and visioning actions needed to sulvage the threatened resouces before extinction.
- Formation of local reference groups among coastal communities who will sperhead sensitization of other members on the need to take collective action to save the dwindling natural resouce base.
- Facilitate active client participation (CARE) in the study on the one part as stakeholder.

MPLA has about 10 tools that are used in the learning process. These have been developed in collaboration with stakeholders at various levels from grassroot to regional (East Africa). These tools are listed elsewhere (Appendix 1 - Workahop proceedings). As mentioned above these tools are soft and simple for easy understanding and use. They were developed to cater for learning management of agro-ecosystems, but flexible enough to allow adoption and use in other ecological systems. Most coastal communities earn their livelihoods from fishing, agriculture or other activities (trade and the like) but which have some close relationship with the two major ones. (1. J. C. Horrill; …Yr; 2. Monica Gorman, 1995). With this in mind it was possible to adopt some of these tools to be used in this study.

### *2.1.2.3.3 Development of tools*

Due to time cnstraint 7 out of the 10 tools were adopted, combined or modified to facilitate proper coverage of the important contents of the study. The sample of tools used and outputs are recorded elsewhere (Appendix 1 – Wokshop proceedings). The tools used include:

1). (a) The importance of adopting participatory approach in planning community development activities;
(b) Multi-stakeholder Participatory Learning Approach defined and its use as tool to facilitate leaning among community groups. Experiences of its use elsewhere in Tanzania.

- Other Participatory Approaches used in Tanzania

2) (a) Importance of Natural Resources as the basis of rural livelihoods
(b) Past and Present management of resources (natural resources and others) in 8 sites on the coast of Tanzania (Mainland and the Islands of Zanzibar)- How they were 30 –40 years ago and their present state.

3) Role of natural resources in mitigating natural disasters in coastal environments

4) (a) Policies and guidelines directing (governing) management and sustainable utilization of coastal natural resources
(b) Identification of existing gaps / problems against proper management and sustainable utilization of shared coastal natural resources and importance of good governance and rights use issues for conservation of these resources.

5) Visioning future plans; Changes and actions required to improve the management of existing resources and identification of services needed to achieve those future visions

6). Disaster management to reduce effects, need for preparedness and rehabilitation activities after occurrence

7) Formation of reference (sensitisation groups) to spearhead participatory learning and advocacy for proper management of shared coastal natural resources.

### *2.1.2.3.4 Selection of Participants*

Participants were selected from the same study sites (8) (districts and Shehia/Mitaa/Village) where the interviews were conducted. At the community level about 10 – 12 representatives were identified in collaboration with the community government leaders. Criteria used included

a) Kitongoji representation (depending on the number).
b) Main sources of livelihood (fishermen, farmers, fish traders, etc
c) Gender (sea grass farming is done by women; they also engage in fish frying and marketing, shell collection and near shore fishing).
d) Age (fishing is carried out by the younger groups; the older group have knowledge about the past).
e) Level of education (at least the participant should be able to read and write).
f) Presence of extension staff (fisheries, agriculture/livestock, forestry, community development, teachers, and others).
g) Village Government representation (sheha, chairman, village and/or ward secretary).
h) Community based organizations (CBOs and NGOs in the area in question).

At the district level technical staff working with the management of natural resources (forestry, fisheries, agriculture, and others) were identified and appointed by the district authorities. In fewer cases senior administrative staff were appointed to lead the district staff.

#### *2.1.2.3.5 MPLA workshop organisation and facilitation*

Four workshops were carried out each lasting for two days. Prior to each arrangement was made for a central venue place where participants could easily access from their domicile.

One or two days before the workshop date the identified community level representatives were facilitated to prepare present and past resource maps of their locality, and described how they use them, trends from the past to present and causes of the eminent changes indicated. This step was very important as it stimulated learning by doing and created awareness. These preparations formed the basis for the workshops.

During each workshop the facilitators presented a brief overview of the subjects to be discussed and allowing participants to deliberate on the issues coming out of these discussions. Participants spent time to discuss in groups and documented their opinion on flip charts and later presented that in the next plenary session for discussion by all. Community members prepared their vision plans as long term direction of actions they intend to take after they were sensitised on the role and importance of natural resources and the threat to their livelihoods should these continue diminishing and neglected.

As discussed under Section 4.3.2 seven tools were developed and used to describe the various subjects covered during each workshop and the outputs shared among the groups. All were recorded as in Appendix 1.

### 2.1.2.4 National Stakeholders Workshop

In order to finalize the assignment, CARE International in Tanzania organized a National Stakeholders workshop involving participants from national to community levels, held at the Peacock Hotel in Dar es Salaam. Representatives included stakeholders who participated in the field work study and others from different sectors who have a stake in the management of coastal natural resources and natural disaster mitigation. The draft report was presented and discussed by the participants and their comments incorporated in the final report. The list of participants to the workshop is shown in Appendix 9.

# 3.0 FINDINGS

## *3.1 Review of Policies, Guidelines and Strategies*

In both mainland Tanzania and Zanzibar various sector policies and guidelines address the management of specific coastal resources and activities. Some strategies have also been developed to address the complex multi-sectoral issues that occur in the coastal zone. The main sector policies and strategies that have been reviewed are:

**Mainland Tanzania - Policies**

The National Disasters Management Policy and Guidelines (2004), The National Fisheries Sector Policy and Strategy Statement (1997), The National Environment Management Policy (1997), The National Agriculture and Livestock Development Policy (1997), The National Mineral Policy (1997), The National Natural Resources and Tourism Policy (1998) and The National Wildlife Policy (1998).

**Strategies**

The National Conservation Strategy for Sustainable Development (1995),The National Poverty Reduction Strategy (1998), The National Vision 2025, The National Strategy for Growth and Reduction of Poverty (NSGRP) (June 2005) and The National Integrated Coastal Environment Management Strategy (2003).

**Zanzibar – Policies**

The National Forest Policy, the National Fisheries Policy (2000) and the National Tourism Policy (2004).

Generally, these policies and strategies have identified clear goals and objectives in management of natural resources. However, in some of the policies, there are some weaknesses in the course of implementation. These are discussed under the findings.

### 3.1.1 The National Disaster Management Policy

A comprehensive national disaster management policy and guidelines have been developed for mainland Tanzania in 2004. Some of the main strengths of the policy are that it recognizes the importance of environmental conservation in minimizing the impact of natural disasters and encourages capacity building to create awareness on the importance of environment management among the local communities. The policy has developed a good governance system from national to village levels in the process of implementation. This involves disaster management committees at each level and it clarifies the roles and responsibilities at each level up to individual household. It also sets clear responsibilities for other stakeholders including civil society, non-governmental organizations, media and the International Red Cross/ Crescent.

However, there are a few weaknesses in the policy related to its implementation. It was noted that there is rather low awareness of the policy to other sectors and stakeholders and the implementation structures in districts are not in place. As a result, the Disaster Management Department is sometimes forced to implement the policy instead of coordinating the implementation and there are no joint governance initiatives to manage the coastal natural resources that assist to reduce impacts from natural disasters, and other benefits. The policy puts no emphasize on disaster preparedness.

Zanzibar does not have a national disaster management policy in place but it has a section dealing with disasters in the Chief Ministers Office and a national committee on disasters management involving relevant sector cabinet ministers, regional heads and experts.

### 3.1.2 The National Fisheries Policy

Both Mainland Tanzania and Zanzibar have developed their national fishery sector policies. For Mainland Tanzania the current policy was developed in 1997 with the overall goal to promote conservation, development and sustainable management of the fisheries resources for the benefit of the present and future generations. The policy emphasizes sustainable management and utilization rather than development. It highlights on improving involvement of the fisher communities in planning, development and management of the fisheries resources, Sustainable utilization of the fisheries resource by the communities to improve their economy and livelihood; prevention of environmental degradation, habitat destruction, pollution and over exploitation of the fisheries and coastal natural resources; and strengthen collaboration and cross-sectoral issues between the fisheries sector and other sectors.

On the other hand, there are some weaknesses that were identified during this study: Inadequate staff in the implementation of the policy, resulting in the absence of fisheries officers in some fisheries landing stations; although fishers are highly vulnerable to natural disasters when fishing, the policy does not mention anything on disaster management (e.g. preparedness to combat disasters); and the free access to the ocean for fishing activities tempts some unfaithful fishers to use unsustainable fishing methods (e.g. use of dynamite for fishing), making management of fishing areas difficult.

In Zanzibar, the fisheries policy of 2000 recognizes that fishing is an important economic activity for the people and puts emphasize to increase awareness of the need for sustainable fishing practices and on the harmful impacts of destructive fishing gear and techniques in the aquatic environment. It also addresses issues that cause conflicts among fishers and plan to involve community groups and fisher associations to enforce relevant laws and regulations. The issue of degradation of marine and fresh-water environmental quality is addressed through strategies of environmental conservation education,

community participation in managing and conserving aquatic resources and legislation against activities leading to degradation of the quality of the aquatic environment.

Like in the case of mainland Tanzania, the policy does not mention disaster management despite the fact that fishers are even more prone to natural disasters while in the sea.

### 3.1.3 National Tourism Policy

Tanzania Mainland and Zanzibar have national tourism policies of 1998 and 2004 respectively. The National Tourism Policy for the mainland has a clear goal and objectives aiming to improve the livelihoods of local communities. The policy advocates community participation in the management and utilization of the common coastal resources. It also requires investors in the tourism industry to make sure they share benefit with the surrounding communities. The policy calls for good governance in the tourism industry.

Some of the important issues highlighted in the policy are: Sensitization on environment management and the surrounding natural resources; awareness raising to the local communities to appreciate and value the environment. It requires tourism investor to enter agreement with the communities on how each is going to benefit from the investment; requires the investors to invest in the allocated and agreed area for that purpose. It also emphasizes that investors should respect: the surrounding communities, their rights and their culture and involve them in the management of the attraction and in decision making on issues that affect their development. They should set the environment for the legally agreed investment so that they do not constrain the daily activities of the surrounding communities and the investment should follow the laws and regulations on the use of coastal lands (along the sea, lakes and rivers). The policy provides a good distribution of roles and responsibilities for other sectors; and the local government has the role of preparing the land use plans, supervise its distribution and monitor its use.

The policy does not mention anywhere about disaster management; there seems to be a lack of implementation plan and stakeholders do not understand the tourism policy and therefore it becomes difficult to implementing it. There is also a problem of overlapping roles and activities, e.g. between Ministry of Lands and Human Settlements Development (MLHSD) and Ministry of Natural Resources and Tourism (MNRT) in allocation of investment areas especially along the coast and approval of investment plans and monitoring. This may lead to violation of rules and regulations concerning location of investments in the beach.

The National Tourism Policy for Zanzibar incorporates tourism policy on disaster management involving disaster prevention, preparedness and mitigation. It also recognizes the importance of natural resources and their management. The following are some of the issues highlighted by the policy: it give emphasis on the

prevention, preparedness to combat disasters, and restoration of the condition to its original state; it insists on the involvement of various institutions e.g. insurance, community organizations, social security, scientific institutions, and non-governmental organizations; it recognizes the importance of sustainable use of natural resources for tourism; recognizes the importance of environmental conservation in tourism development especially conservation of ecologically sensitive areas; aims to improve the communities livelihoods; insist on conducting Environmental Impact Assessment (EIA) in all tourism development activities; ensure that relevant sectors enforce laws and rights to reduce impacts resulting from construction activities; ensure law compliance on the setbacks in beach plots, to control vegetation clearing, to establish regulation for waste management, and establishing conservation areas; aim to construct infrastructure such as roads to tourism areas; and put priority to employment of local community in tourism industry so that they benefit from the industry.

Despite the comprehensive issues raised above, this study identified some weakness in implementation of the policy. The main weakness is the lack of awareness on the Tourism Policy, as a result of inadequate awareness raising campaigns to the communities.

### 3.1.4 National Environment Management Policy

The National Environmental Management Policy (Mainland) calls for participation of other sectors in environment and natural resources management. To a large extent, the environmental issues have been mainstreamed by the relevant sectors, and the policy has been implemented using sectoral laws e.g. by the Ministry of Local Government and Regional Administration and other sectors. However, the recently approved National Integrated Coastal Environment Management Strategy calls for participation of all relevant stakeholders in issues from planning to implementation of environmental plans.

The National Environment Management Policy provides general explanation on the management of the environment and natural resources. It also recognized other sectors contribution and their roles in the management of the environment. It clarifies on the governance and rights issues as they relate to other sectors and their involvement. The policy insists on the establishment of environmental committees from the national to village level. Some of the issues that are highlighted by the policy are: to ensure sustainability, safety, and balance in the utilization of natural resources for the current and future generation, without affecting the environmental condition; to prevent degradation of land, water, vegetations, and air, which supports our lives; to allocate resources in poverty issues that are associated with environment problems; to direct resources for eradication of communicable diseases, food security, and poverty reduction; emphasizes participation of all people in conservation of environment and sustainable development; control of settlement in areas prone to disasters like floods, erosion of beaches, and land slides; to balance between the use of forest

resources and its replanting; law enforcement and management of public land; to involve communities and other stakeholders in tree planting; to prevent illegal fishing and processing that lead to environmental degradation and to take precaution on possible environmental impacts.

Major weaknesses with the policy are in implementation: They include low level of awareness by most of the people on the environmental policy and lack of legal framework (until 2004) for enforcement of the environmental regulations. The Environmental Act (2004) which provides the legal framework is also unknown to most of the stakeholders.

In Zanzibar, environmental issues are mainstreamed in the relevant natural resources sector ministries and implemented according to the sector policies and laws.

### 3.1.5 The National Agriculture and Livestock Policy

The National Agriculture and Livestock Policy recognises the importance preparedness on various natural disasters such as famine, drought, and other environmental disasters. The policy also insists on preparedness for combating the natural disasters such as famine resulting from drought and pests by having food reserve. Among other important issues in the policy are: requires the people in semi desert areas to cultivate drought resistant crops; emphasis on having food reserve for use during disaster; to improve the village communities livelihood through agriculture; observe natural resources management practices e.g. land, water, and vegetation, for environmental conservation; to control the standard and quality; to control agricultural diseases and pests, through quarantine; it reminds that all citizen have right to possess land; the government will identify special areas and allocate for investment; with the assistance from extension officers, the villagers will prepare land use plan; and the policy also insists on involvement of other sector in planning to reduce negative agricultural impacts.

Although the Agricultural and Livestock Policy mentions a number of agricultural related natural disasters, it does not show the necessary linkages/coordination with other sectors for their management.

### 3.1.6 The National Forest Policy

Both Mainland Tanzania and Zanzibar have national forest policies. The mainland forest policy was developed with the goal to enhance the contribution of the forest sector to sustainable development of Tanzania and conservation and management of her natural resources for the benefit of the present and future generations. The main policy objectives are: to ensure sustainable supply of forest products and services, increased employment and foreign exchange earnings, ensure ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility

The National Forest Policy for Zanzibar is one of the very recent policies (2004). The policy is participatory, therefore aiming to involve communities in its implementation. It aims at people's participation in forest management and benefit from it. The policy has set a good governance system, which empowers the communities in the management of the forest resources, for their own benefit. Some of the important issues in the context of this study are: to use forest for poverty reduction; to increase the equity in forest management and utilization; to improve the economic development through increased revenue collected from forest products; to protect and conserve forest resources such as wildlife and vegetation, and to increase the importance of forest in conserving land, water sources and other environmental benefits; it emphasizes community participation in preparation and implementation of forest development plans for the benefit of local communities and the country in general; It aims to build the community's capacity so that they benefit from forest management; recognizes and assist the communities that are managing the neighbouring forests; aim to improve the participation of women in management of forest since they use it daily; help in the resolution of conflicts on forest resource use among communities; to train farmers in fire fighting techniques, to discourage the use of fire in agricultural activities; to involve communities in the management, protection and sustainable utilization of mangroves according to community's forest policy; and to prevent beach erosion by controlling vegetation clearing.

However, the policy is not well known to stakeholders, especially the rural communities in the village. Also, the policy did not clarify on the link between natural disasters and natural resources degradation.

### 3.1.7 Discussion and conclusion

Although Tanzania has developed good policies on natural resources management, there are some weaknesses in their implementation. There is a general lack of awareness of the policies by most stakeholders. This may be due to inadequate financial resources to involve all key stakeholders at the formulation stage and inadequate human and financial resources to sensitize the public in the implementation the policies. Either, following the decentralization and implementation of the local government reform, there is lack of direct linkages between sector Ministries and their staff in the districts under the sector. This creates communication and command chain breakdown between the district level and the ministries in the implementation of policies.

With the exception of the National Disaster Management Policy and the National Agriculture, the Livestock Policy of Tanzania Mainland, and the National Tourism Policy of Zanzibar other policies did not mention anything on the management of disasters such as preparedness, mitigation of impacts, and rehabilitation of impacted areas.

The National Disaster Management Policy requires other sectors to mainstream relevant activities in their policies. Since this policy is still new, it may take time

for the mainstreaming to take place. The exercise requires planning as it has financial implications.

The National Environment Management Policy calls for participation of other sectors in environment and natural resources management. To a large extent, the environmental issues have been mainstreamed to the relevant sectors, and the policy has been implemented using sectoral laws including the local government and other sectors. However, the recently adopted National Integrated Coastal Environment Management Strategy calls for participation of all relevant stakeholders from planning to implementation of environment management programmes.

## *3.2 Field Survey*

### 3.2.1 Questionnaire survey

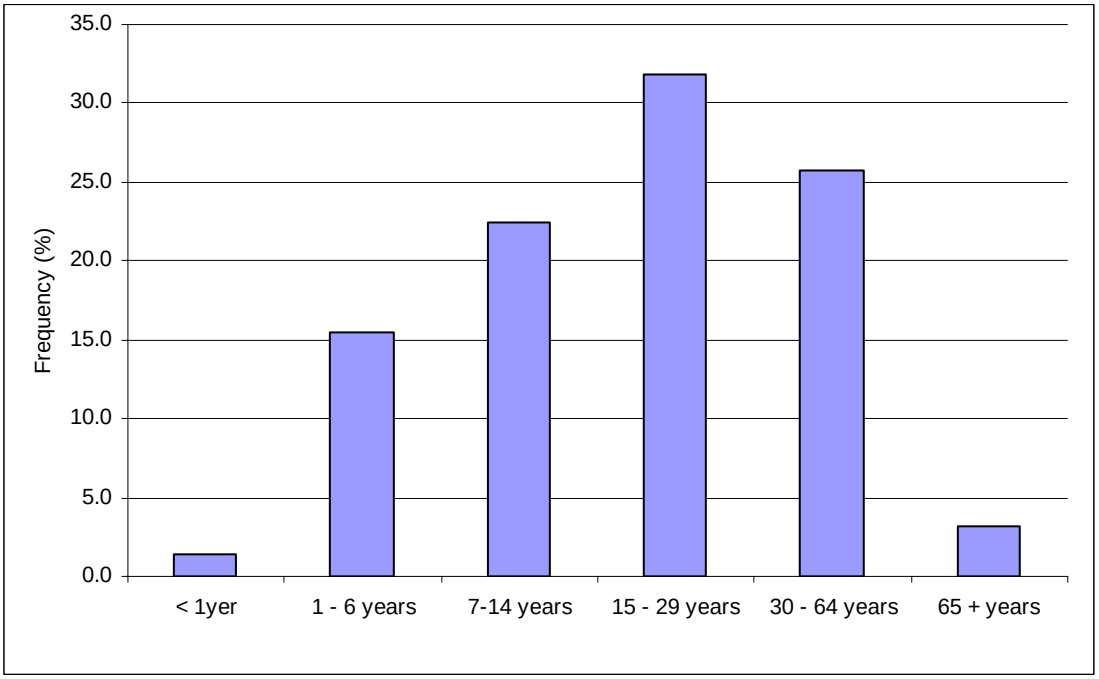
#### 3.2.1.1 Findings from the Questionnaire survey

**Respondents**
In this study, a total of 160 heads of households were interviewed of whom 75% were male and 25% were female. The age range of interviewees was from 22 to 85 years.

**Household Composition**
The average household size was 6.8. The total population covered in the study was 1055, of whom 505 were male and 550 were female. 45.6 percent of households had family size of 1 to 5 members, followed by households with 6 to 10 members, which accounted for 45%. 8% of the households had 11-15people while the last group of households with 16 to 20 members accounted for 0.6 percent.

The largest age group ranged between 15 to 64 years old (57.6%) which is the productive group, followed by the dependant groups 7 to 14 years old (22.7 %), 1 to 6 years old (15.4 %), below 1 year (1.23%) and those who are 65 and above years old (0.47 %); as shown in Figure 4 below.

Figure 4: *Age groups and percentage of the population covered in the study*




**Categorization of houses**

Categorization of houses was done by considering the walls, roofs and ownership of houses. On the wall types, majority (43 %) had houses with walls made of wooden polls and mud, followed by sand or cement brick (41.1 %), sand or cement bricks and steel reinforced concrete (11.4 %), and walls with grass (1.3 %).

Regarding roof types, majority (44.3%) had corrugated iron sheets in good condition, followed by thatched roofs in good condition (24.2 %) and thatched roofs in bad condition. Majority, (91.1 %) of the families are living in their own houses while only 8.9 % are renting houses. Two interviewees did not respond to this question.

**Household economy**

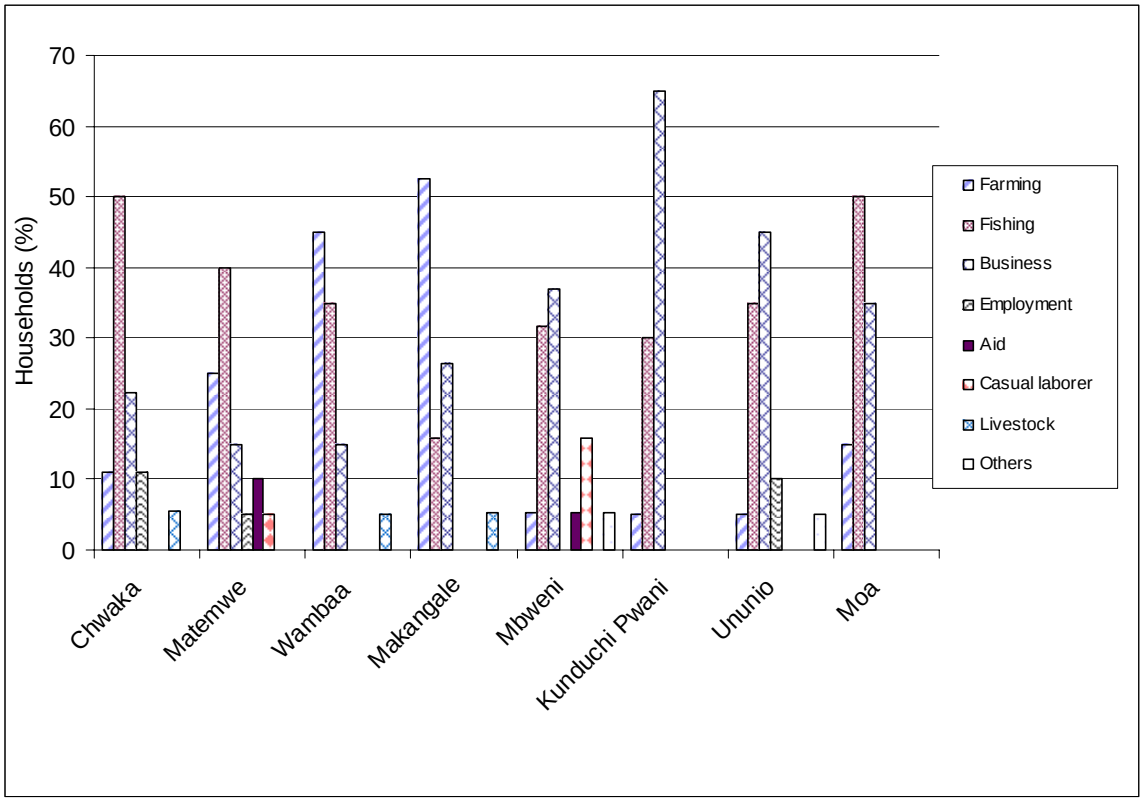
The main occupations of heads of households interviewed in the different study areas were fishers (33.1%), farmers (21.3%), business (20 %), charcoal makers (6.3%), food vendors (5%) and employment (3.1%). Others were artisans, seaweed farmers, livestock keepers, casual labourers and fish net makers.

The major sources of household income were fishing (33.3%), farming (13.5%), business (16.7%), and fish vending (7%) (Figure 5).

When individual sites were examined, it was found that in Kunduchi Pwani, Ununio, and Mbweni a large percentage of households were doing business, while fishing was the main source of livelihood in Chwaka, Moa, and Matemwe.

Farming was the main livelihood activity at Wambaa and Makangale (Figure 5 also illustrates the situation).

*Figure 5: Main Sources of Livelihood for the Different Study Areas*




Responses to second major sources of income were farming (32.4%), fishing (13.7%) and seaweed farming (8.8%). The least contributors to the household income were fish vending, tourism support activities and artisans. 17.6% of respondents were housewives with no defined economic activity.

**Household Income Trends**

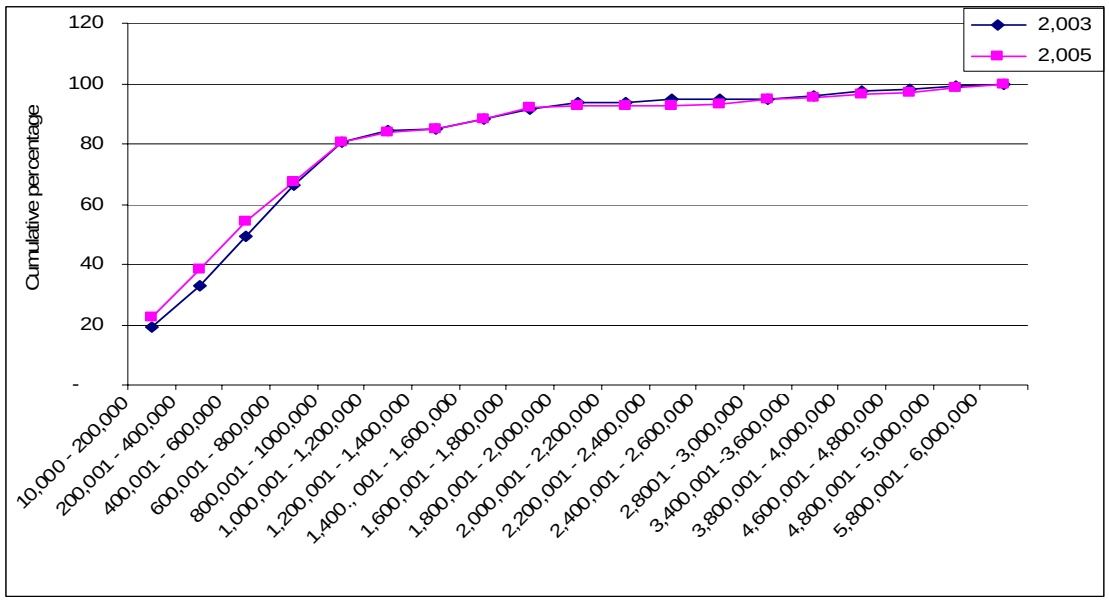
Generally about 40% of the respondents earned between Tshs 10,000/= to 400,000/= a year which is about $0.03 to $0.91 a day, implying it is the poorest group living on less than a dollar per day (1 $ = Tshs 1,200/=). Others (40%) earn between Tshs 400,001/= and Tsha 1,000,000/= per year and the rest 20% earn between 1,100,001/= and 6,000,000/= a year (Figure 6).

The overall income trend did not change significantly between 2003 and 2005. In 2003 the average household income was about Tanzanian shillings 871,780, while in 2005 it was 897,660/=.

However respondents in the vulnerable group had noticeable increased income from 2003 to 2005. The reasons for this were mentioned as favourable conditions for their activities (38%), increased labour force in their families (14%), good prices for their agricultural products (9%) and availability of reliable markets for their products (2 %).

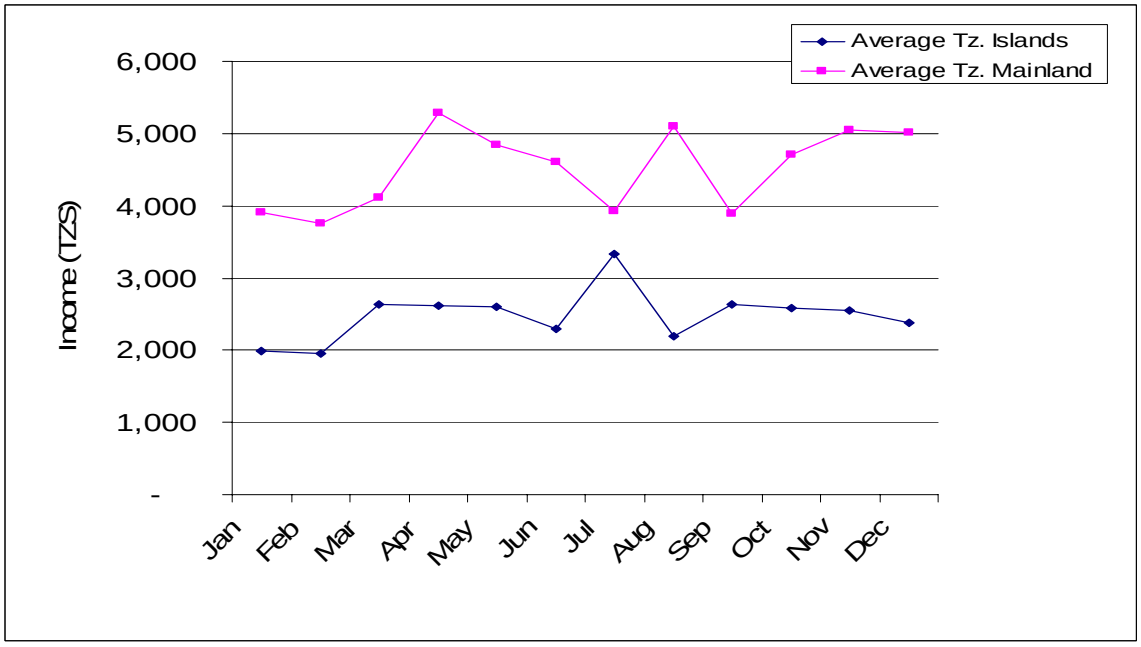
Respondents in high income group had a slight decrease in income from 2003 to 2005 as seen in Figure 4. Reasons pointed out as major causes of reduced incomes were bad weather (24.6%), drought (16.7%), poor working equipment (12.3%), illness and diseases (11.3%), unreliable markets (10.3%), decline in the prices of crops (6.9%) and exodus of income earning relatives (1%).

*Figure 6: Household income groups for 2003 and 2005*



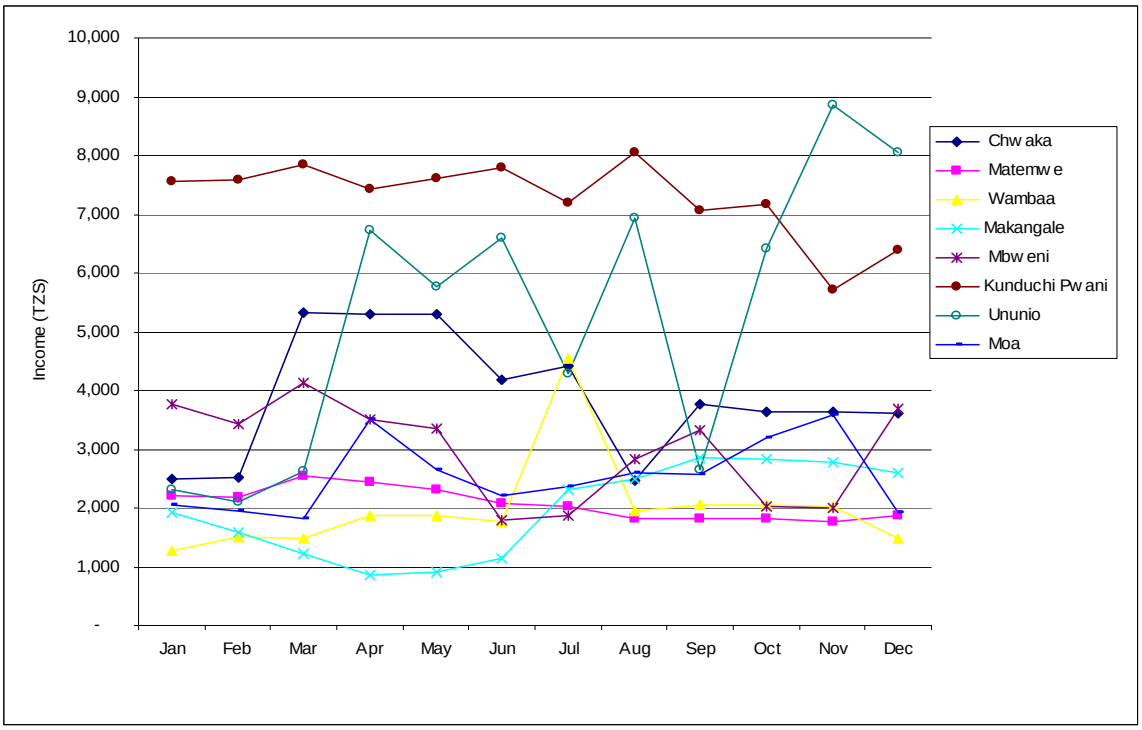

Average daily household incomes were significantly higher for mainland Tanzania with lowest figure of 3,764/= and highest figure of 5,290/= while for Zanzibar it was 1,951/= and 3,324/= per day (Figure 7)

*Figure7: Average Daily Incomes for Tanzania mainland and Zanzibar*



In the individual study areas, the highest average income per day was Tzs 8,867 at Ununio in November while the lowest was Tzs. 859 at Makangale- Pemba, in April. The highest fluctuation was found at Ununio, where the average daily income peaked to about Tzs. 8,867 in November, and the lowest was Tzs. 2,111/= in February. The site with highest average income was Kunduchi Pwani with an average income of Tzs. 7,367 per day throughout the year, with the lowest average daily income of Tzs. 5,726/= and the highest of Tzs 8,050/= observed in November and August respectively. With exception of Kunduchi Pwani, the average income per day in year 2005 at all the other sites were below Tzs. 2,900/= (Figure 8).

*Figure 8: Average Daily Household Incomes for the Different Study areas*




**Food Security for the Household**

On the main staple for the household majority of interviewees (63.3 %), indicated rice as their main staple, 20.3 % use maize, 15.2 % use cassava and only a small percentage (1.3 %) eat sorghum as their main staple food.

On food security the respondents indicated that the main source of income for the household food were earnings from fishing (34.5%); earnings from business (32.3%) and earnings from farming activities (20.3%). Others are casual labour, formal employment, aid from various sources, livestock and other activities.

Regarding food shortage for the past 5 years, 58.2 % responded that there has been food shortage, 34.8 % said there had not been any food shortage, while 7 % said they were not sure.

Several strategies were used to cope with situations of food shortages which included reduced number of meals (22.1%) of which 20 % reduced from 3 to 2 meals a day and 17.9% reduced amount of food per meal. Still others had to cope by reduced number of meals from 2 to 1 (4.2%), skipping meals in some days and reducing meals from 3 to 1 per day. Other strategies mentioned were borrowed money or food from other people (14.7%), took porridge instead of eating foods like rice (6.3%), got assistance from other people (5.3%), and others sold their properties to buy food (4.2%). None of the households got food aid from government or other community organizations; all got food from relatives.

**Reasons for inadequate food security within households**

The main reasons for inadequate food security at the household level were: Tanzania mainland - low income (21.7%), (drought 15.0%) and poor weather (15.0%). In the case of Zanzibar reasons were drought (42.5%), pests and diseases (17.2%) and low income/poverty (12.6%).

Overall, drought ranked first (31.3%), followed by low income/poverty (16.3%), pests and diseases (12.2%) and poor weather at sea (10.9%)

***Table 1: Distribution of responses on reasons for inadequate food security within households by Shehia /villages/mitaa***

| Reason | Zanzibar (%) | Tanzania Mainland (%) | Overall (%) |
|---|---|---|---|
| Fields turned to plots | 0.0 | 3.3 | 1.4 |
| Drought | 42.5 | 15.0 | 31.3 |
| Environment Destruction | 1.1 | 0.0 | 0.7 |
| Poor weather - sea, tsunami | 8.0 | 15.0 | 10.9 |
| Insecure economy | 1.1 | 3.3 | 2.0 |
| Sickness and deaths | 2.3 | 5.0 | 3.4 |
| Pests / diseases | 17.2 | 5.0 | 12.2 |
| Vermin | 1.1 | 1.7 | 1.4 |
| Low income poverty | 12.6 | 21.7 | 16.3 |
| Old age | 1.1 | 0.0 | 0.7 |
| Poor technology | 2.3 | 0.0 | 1.4 |
| Low soil fertility | 5.7 | 0.0 | 3.4 |
| Low acreage | 1.1 | 0.0 | 0.7 |
| Low capital | 1.1 | 1.7 | 1.4 |
| Low prices / bad business | 2.3 | 6.7 | 4.1 |
| High prices for consumer goods/food | 0.0 | 15.0 | 6.1 |
| Lack of employment | 0.0 | 6.7 | 2.7 |
| **Total** | **100.0** | **100.0** | **100.0** |

**Natural resources and environmental policies, laws and bylaws**

The resources that were listed to be found in the study areas included mangroves, fish, coastal forests, sea-grasses, coral reefs, land, sea, rivers, limestone, and beautiful beaches.

The rights of ownership and utilization of these resources between male and female were as follows: all respondents (male and female) said they have the right of owning the coastal resources. Slight differences were observed on the right to own land, inland limestone and coastal forests.

Although a similar trend was observed on the right of utilization of these resources, there was a wider gap between male and female. This was observed in inland limestone, coastal forest, and mangroves although the difference was also small (figures 9 and 10 below).

***Figure 9: Response on the right of ownership of coastal natural resources***

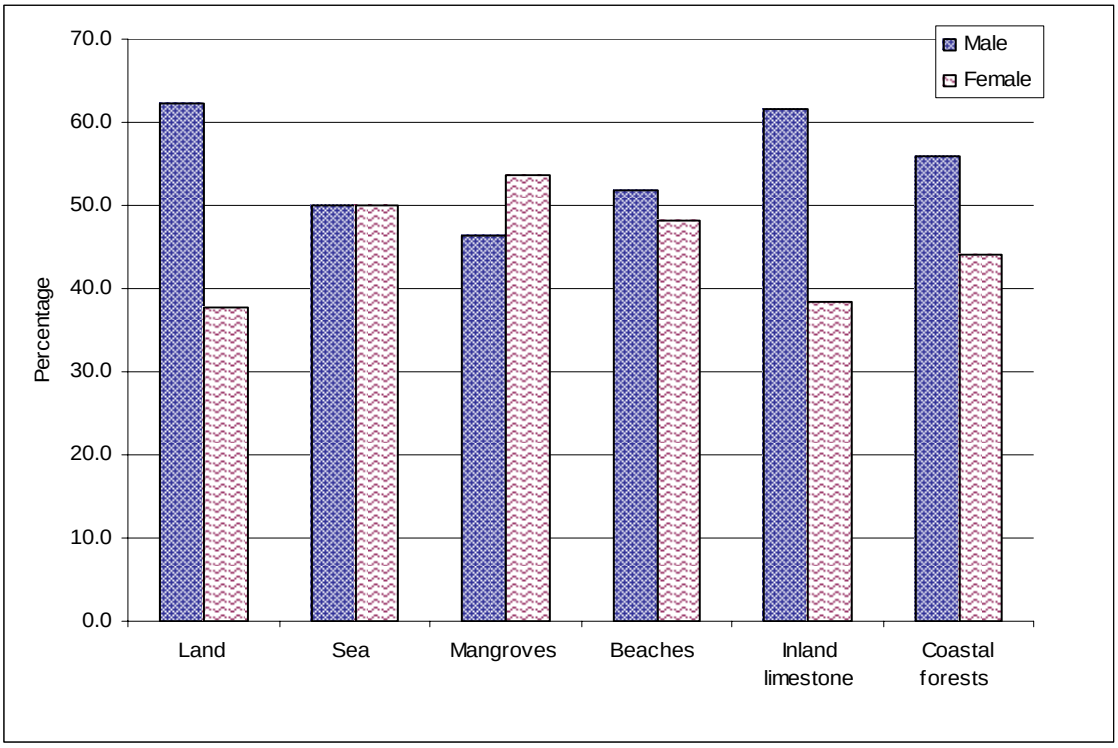
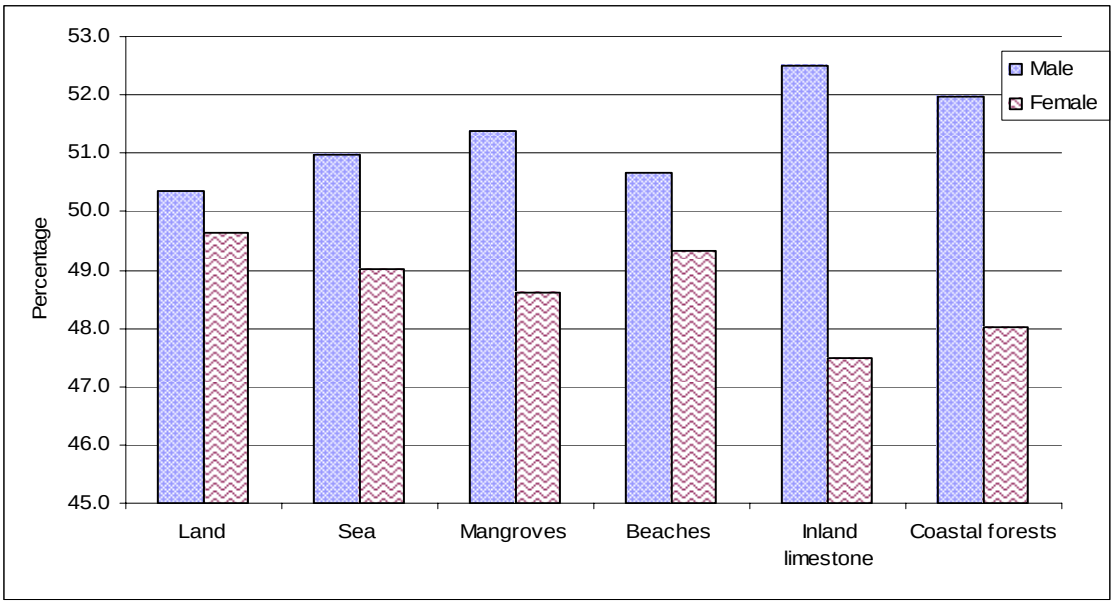


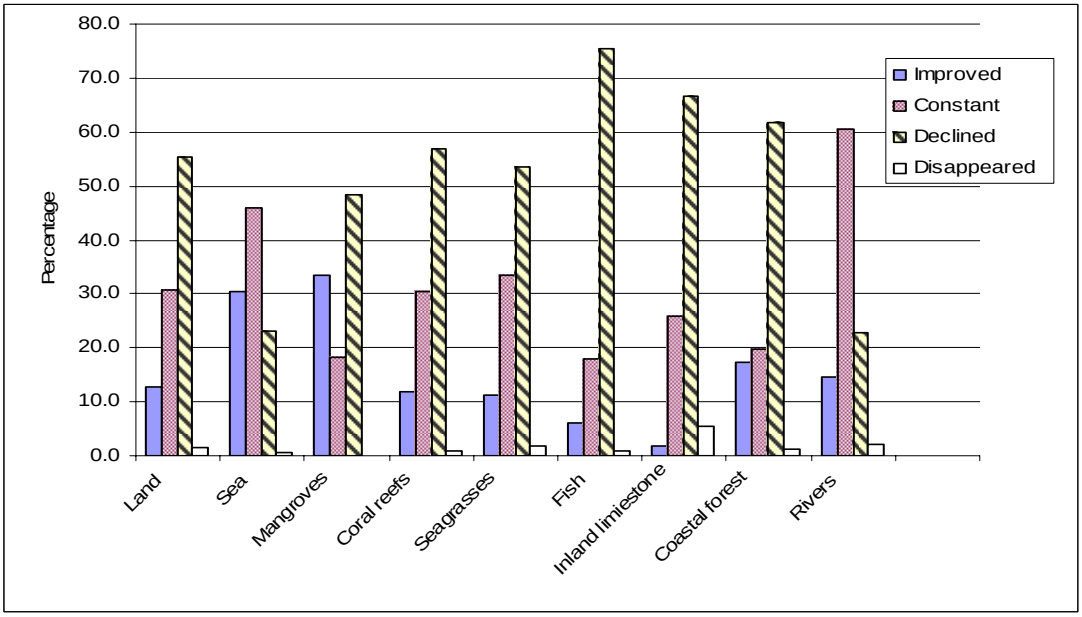
*Figure 10: Response on right of utilization of natural resources*




**Status of the coastal natural resources**

On the status of the resources for the past 15 years, most resources were reported to have declined including fish catch (75%), inland limestone (66%), coastal forests (64%), land (55%), sea grass (54%), coral reefs (57%), and mangroves (48%). Few others commented the resources have remained constant. A small number of respondents said the resources have improved. A small percentage said notable resources had disappeared in some places. These resources included inland limestone, rivers, sea grass, coastal forests, and fish (Figure 11).

*Figure 11: The Status of Coastal Natural Resources from 1990 to 2005*



**Reasons for the decline of coastal natural resources**

The interviewees pointed out several reasons for decline of coastal natural resources (i.e. resources decline of availability of land, sea water quality, mangrove coverage, health of coral reefs, availability of inland limestone rocks, status of forest coverage, rivers and river banks). The details on the causes of the decline are presented in Table 2 below.

***Table 2: Response on reasons for the decline of coastal natural resources***

| Type of natural resources and reasons for decline/degradation | Zanzibar (%) | Tanzania Mainland (%) | Overall (%) |
|---|---|---|---|
| **A. Land** | | | |
| Population increase | 26.2 | 22.2 | 25.0 |
| Construction | 19.0 | 16.7 | 18.3 |
| Drought | 10.7 | 0 | 7.5 |
| Poor agricultural practices | 8.3 | 0 | 5.8 |
| Encroachment of inland by the sea | 19.0 | 22.2 | 20.0 |
| Low soil fertility | 3.6 | 2.8 | 3.3 |
| Cutting of trees hence soil erosion | 2.4 | 11.1 | 5.0 |
| Appropriation of community land by the government | 0 | 19.4 | 5.8 |
| Increased agriculture | 8.3 | 2.8 | 6.7 |
| Increased livestock keeping | 0 | 2.8 | 0.8 |
| Don't know | 2.4 | 0 | 1.7 |
| **Total** | **100** | **100** | **100** |
| | | | |
| **B. Sea water** | | | |
| Mangrove cutting hence beach erosion | 44.4 | 0 | 36.0 |
| Pollution by human excrete | 55.6 | 100 | 64.0 |
| **Total** | **100.0** | **100.0** | **100.0** |
| | | | |
| **C. Mangroves** | | | |
| Uncontrolled mangrove cutting | 53.1 | 93.9 | 69.5 |
| Increased demand for mangroves | 44.9 | 0 | 26.8 |
| Lack of mangrove planting programmes | 0 | 0 | 0 |
| Demarcation of plots in mangrove areas | 2.0 | 6.1 | 3.7 |
| **Total** | **100** | **100** | **100** |
| | | | |
| **D. Coral reefs** | | | |
| Anchoring of boats | 35.5 | 0 | 20.4 |
| Sediments from the beach | 16.1 | 0 | 9.3 |
| Illegal fishing (use of dynamite for fishing) | 19.4 | 100 | 53.5 |
| Natural forces | 3.2 | 0 | 1.9 |
| Making lime | 16.1 | 0 | 9.3 |
| Strong waves | 9.7 | 0 | 5.6 |
| **Total** | **100** | **100** | **100** |
| | | | |
| **E. Inland limestone rocks** | | | |
| Increased use for construction | 77.7 | 100 | 80.5 |
| Burning for making lime | 22.3 | 0 | 19.5 |
| **Total** | **100** | **100** | **100** |
| | | | |

| | | | |
|---|---|---|---|
| **F. Coastal forests** | | | |
| Careless cutting of forests | 33.9 | 65.0 | 42.1 |
| Increased agricultural activities | 23.2 | 5.0 | 18.4 |
| Increased use of trees for buildings | 33.9 | 25.0 | 31.6 |
| Increased demand of fuel wood | 5.4 | 5.0 | 5.3 |
| Drought | 3.6 | 0 | 2.6 |
| **Total** | **100** | **100** | **100** |
| | | | |
| **G. Rivers and river banks** | | | |
| Erosion | 16.7 | 0 | 7.7 |
| Climate change | 50.0 | 57.1 | 53.7 |
| Digging of sand | 33.3 | 42.9 | 38.6 |
| **Total** | **100** | **100** | **100** |

**Community based conservation of environment and natural resources**

On community conservation practices 59.4% of the respondents indicated that they have some agreed practices, 36.2% did not have any practices and 4.4% did not respond. The interviewees listed community based environment and natural resources conservation initiatives on minerals, land, water use, fisheries, and mangroves. On the mining activities, the communities conduct patrol in the sea to protect corals from miners in the sea and from destruction by dynamite fishers. Further, the communities undertake mining practices selectively to avoid land and environmental degradation. In addition, the communities practice land conservation practices after preparing land use plans and granting land ownership rights.

Fisheries activities are managed through community sensitization, licensing of fishing vessels and refraining from bad/illegal fishing practices. There are also mangrove management initiatives which provide education to the communities on the importance of mangrove conservation, mangrove planting, and establishing harvesting quarters through issuance of permits.

**Roles of households on conserving natural resources**

In responding to the roles of individuals in conserving natural resources, for Zanzibar the main roles mentioned were raised public awareness (25%), abiding by the laws (15.4%), conserving the environment (14.4%), taking no steps (14.4 %) and sustainable use of natural resources (11.5%). 2.9% said they did not know the household roles in conserving natural resources. In the case of Tanzania mainland the most common role mentioned was conserving the environment (19.2%), followed by public education (15.4%), sustainable use of resources (9%) and planting of trees and coral reefs (12.8%). About 14 percent of the responses indicated ignorance on the roles of households to conserve natural resources.

Overall, public awareness ranked high, followed by conserving the environment and abiding by the law and/or making laws. About 17 percent of the responses indicated ignorance or not taking any step to conserve the environment.

***Table 3: Roles of individual households in conserving natural resources***

| Type of Role | Zanzibar % | Tz Mainland % | Overall% |
|---|---|---|---|
| Don't know | 2.9 | 14.1 | 7.7 |
| Planting trees/coral reefs | 1.9 | 12.9 | 6.6 |
| Public education | 25.0 | 15.4 | 20.9 |
| Coop* with gov* in abiding/making laws | 15.4 | 7.7 | 12.1 |
| Conserving the environment | 14.4 | 19.2 | 16.5 |
| Sustainable use of resources | 11.5 | 8.9 | 10.4 |
| Informing relevant authorities | 4.8 | 7.7 | 6.0 |
| Destruction of/fighting illegal fishing | 0.0 | 3.8 | 1.6 |
| No steps taken | 14.4 | 2.6 | 9.3 |
| Use of alternative livelihood earning activities | 6.7 | 0.0 | 0.0 |
| Use of alternative energy sources | 2.9 | 1.3 | 2.2 |
| Listening to advice | 0.0 | 3.8 | .1.8 |
| Participate in taking security measures | 0.0 | 2.6 | 1.1 |
| **Total responses** | **100.0** | **100.0** | **100.0** |

*Cooperate with government

## Relationship between resource depletion and disaster mitigation

In the case of Zanzibar Islands the most common responses were Mangrove/forest clearing causes increased wind speed (31.6%), natural resources are interdependent thus destruction of one affects the other (13.1%) and disaster occurrences have negative effects (destroy) natural resources (10.3%).

In the case of Mainland Tanzania 20 percent indicated mangrove clearing leads to beach erosion and flooding of property and 17.8 percent mentioned natural resource destruction leads to drought.

On the overall the highest interrelationship between natural resources and disaster mitigation were mangrove/forest clearing resulting into increased wind speeds (25%) as there is nothing to defuse the wind power and drought being a result of deforestation (11.2%). Other responses are presented in Table 4 below.

*Table 4: Responses to role of natural resources in disaster mitigation*

| Natural resources and disaster mitigation | Zanzibar % | Tz Mainland % | Overall % |
|---|---|---|---|
| Clearing trees/mangroves increases wind speed and destroys property | 31.6 | 8.9 | 25.0 |
| Natural resources destruction reduces fish availability leading to increased poverty | 4.7 | 2.2 | 3.9 |
| Deforestation leads to drought | 8.4 | 17.8 | 11.2 |
| Natural disasters cause natural resource degradation | 10.3 | 2.2 | 7.9 |
| Sea water level rise causes coastal environment degradation | 6.5 | 0.0 | 4.8 |
| Clearing mangroves and coastal forests increases the rate of sea water rise | 6.5 | 0.0 | 4.6 |
| Tsunami/bad weather reduced availability of fish in the regular fishing areas | 0.9 | 8.9 | 3.3 |
| Natural resource depletion increases land erosion | 2.8 | 0.0 | 2.0 |
| Natural resources are interlinked (interdependent), destruction of one affects the other | 13.1 | 0.0 | 9.2 |

| | | | |
|---|---|---|---|
| Natural resource depletion increases poverty/ reduced income | 4.7 | 0.0 | 3.3 |
| Natural resource destruction causes sea water level flooding | 2.8 | 0.0 | 2.0 |
| Sand mining shore/ river causes beach degradation | 1.9 | 2.2 | 2.0 |
| Mangrove clearing leads to beach erosion and flooding of property | 0.0 | 20.0 | 5.9 |
| No relationship | 0.0 | 6.7 | 2.0 |
| Don't know | 5.6 | 31.1 | 13.2 |
| **Total** | **100.0** | **100.0** | **100.0** |

## Conflicts on resource ownership and utilization

The response on conflicts over resource ownership and utilization including land, sea, beaches and mangroves varied from one station to another. For Zanzibar, the main conflicts were between groups/clans on the ownership of the sea (21.2% of the respondents), land rights conflicts between neighbouring villages and individuals (12.9%) and conflict on fishing rights in the sea between institutions/groups (10.6%).

On the Mainland, leading conflict were on land use between individual and individual or village and village (23.7%), utilisation of farmlands between villagers 15.8% and use of beach between hotel investors and the communities and conflicts on use of sea for fishing between institutions and villagers (10.5%).

The three most common conflicts in the Tanzania mainland and Island on resource use and ownership were land use between individuals and villages, (18.7%) and the conflict on use of beach between hotel investor and the communities (11.2%) See Table 5)

***Table 5: Distribution of Responses on Conflicts on ownership and use of natural resources***

| Type of conflict | Zanzibar (%) | Tanzania Mainland (%) | Overall (%) |
|---|---|---|---|
| Boarder conflicts between shehias/villages/Mitaa | 1.2 | 0.0 | 0.5 |
| Beach use rights (community and beach hotel investors) | 5.9 | 15.8 | 11.2 |
| Hotel investors assuming ownership of sea front | 5.9 | 0.0 | 2.7 |
| Conflicts on fishing rights on the sea (institutions/groups) | 10.6 | 10.5 | 10.6 |
| Conflicts on use of the ocean (between/ groups/clans) | 21.2 | 0.0 | 9.7 |
| Conflicts on utilization of forests/mangroves | 10.6 | 5.3 | 7.7 |
| Government allocation of plots in mangrove and beach areas | 0.0 | 2.6 | 1.4 |
| Cutting mangroves while its prohibited | 2.4 | 2.6 | 2.5 |
| Legal actions against those practicing illegal fishing methods | 8.2 | 5.3 | 6.6 |
| Conflicts on utilisation of farmlands (between villagers) | 5.9 | 15.8 | 11.2 |

| | | | |
|---|---|---|---|
| Conflicts on utilisation of farmlands (villagers and outsiders) | 8.2 | 0.0 | 3.8 |
| Land right conflicts between neighbours individuals/villages | 12.9 | 23.7 | 18.7 |
| Actions of investors to protect own land affect the poor | 0.0 | 5.3 | 2.8 |
| Land/plot (double allocation) | 0.0 | 5.3 | 2.8 |
| Government land reallocation | 0.0 | 5.3 | 2.8 |
| Strained relations (institutions Vs villagers) | 0.0 | 2.6 | 1.4 |
| None | 7.1 | 0.0 | 3.2 |
| **Total** | **100.0** | **100.0** | **100.0** |

## Conflict Resolution

The above conflicts are resolved mainly at the local level, involving the Sheha in Zanzibar (57.1%) and village/mtaa chairmen and ward development committees on the mainland (53.6%). Others are the Forest and Fisheries Departments, Regional and District Administrations and Central Government on the Zanzibar side. On the Tanzania Mainland side, the Forest and Fisheries Departments, Regional Administrations, District Councils and Central Government are involved.

## Knowledge of policies laws and bylaws

On the knowledge of policies laws and bylaws for conserving natural resources and environment, there is very limited awareness of the policies. Out of 80 respondents on the mainland, only 11.3 % were aware of the policy for conserving the environment and 7.5% acknowledged the fisheries and forest policies. 66.2% of the respondents had no knowledge of these policies.

The trend was better in Zanzibar where out of 80 respondents 15% were aware of the forest policy, 13.8 % the fisheries policy, 12.5% the environmental policy and 11.3% the Water policy. 42.5% of the respondents had no knowledge of the policies. Overall only 47.5% of the respondents from mainland Tanzania and Zanzibar are aware of the policies (table 6).

***Table 6: Awareness on Policies for Conservation of Environment and Natural Resources***

| Policies | Zanzibar % | Mainland % | Overall % |
|---|---|---|---|
| 1. National Environment Policy | 12.5 | 11.3 | 13.3 |
| 2. National Minerals Policy | 1.3 | 0.0 | 0.6 |
| 3. National Land Policy | 0.0 | 0.0 | 0.0 |
| 4. National Water Policy | 11.3 | 2.5 | 7.2 |
| 5. Fisheries Policy Statement | 13.8 | 7.5 | 11.6 |
| 6. National Forest Policy | 15.0 | 7.5 | 12.2 |
| 7. Mangrove Conservation Policy | 2.5 | 1.3 | 2.0 |
| 8. National Wildlife Conservation Policy | 0.0 | 0.0 | 0.0 |
| 9. National Agriculture and Livestock Policy | 1.3 | 0.0 | 0.6 |
| 10. Other Policies | 0.0 | 0.0 | 0.0 |
| **Total** | **57.5** | **30.0** | **47.5** |

The situation was much better with the laws. In Zanzibar 98.8% of the respondents were aware of laws while on the Mainland only 48.8% said they knew about the laws governing conservation of natural resources and environment. Overall 79.8% of the 160 respondents from Zanzibar and mainland Tanzania are aware of the laws.

On the Islands (Unguja and Pemba), 18.8% knew about the fisheries law, 17.5% were aware of the laws governing conservation of mangroves, 16.3% the laws for conservation of the environment, 15% the wildlife law and 13.8% the forest laws. On the mainland, out of 80 respondents, 17.2% knew about the fisheries laws, 13.9% the forest law, 13.4% the laws for conserving the mangroves and 12.8% the law for conserving the environment (Table 7)

***Table 7: Laws related to conservation of the environment and natural resources***

| Laws | Zanzibar (%) | Tanzania Mainland (%) | Overall (%) |
|---|---|---|---|
| 1. The Environment Law | 16.3 | 7.5 | 12.8 |
| 2. The Minerals law | 3.8 | 3.8 | 4.2 |
| 3. The Land Law | 6.3 | 3.8 | 5.5 |
| 4. The Water Use Law | 6.3 | 2.5 | 4.7 |
| 5. The Fisheries Law | 18.8 | 12.5 | 17.2 |
| 6. The Forest Law | 13.8 | 11.3 | 13.9 |
| 7. The Mangroves Conservation Law | 17.5 | 7.5 | 13.4 |
| 8. The Wildlife Law | 15.0 | 0.0 | 7.5 |
| 9. The Agriculture and Livestock law | 1.3 | 0.0 | 0.6 |
| 10. Other Laws related to Natural resources | - | 0.0 | 0.0 |
| **Total** | **98.8** | **48.8** | **79.8** |

**Bylaws for conserving environment and natural resources**

Overall, 88.1% of interviewees acknowledged the presence of bylaws for conserving the natural resources and the environment. The awareness of the presence of bylaws in the various natural resources sectors in Zanzibar and Tanzania mainland is presented in table 2 below. While on the Tanzania Mainland 102.5%* of the respondents acknowledged the presence of bylaws in their villages, in Zanzibar 73.8% said there are bylaws for conserving the environment and natural resources in their shehia.

Greater awareness of the presence of bylaws in Zanzibar was observed in the areas of forest conservation (21.3%), fisheries and water use 13.8% each and land 12.5%. On the Tanzania Mainland Fisheries bylaws received greatest awareness (26.3%), followed by mangroves bylaws (22.5%) and forest and land (15.0%) each. Details are presented on Table 8.

***Table 8: Bylaws for Conservation of Environment and Natural Resources***

| Bylaw | Zanzibar % | Mainland % | Overall % |
|---|---|---|---|
| 1. The Environment bylaw | 3.8 | 7.5 | 6.6 |
| 2. The Minerals bylaw | 3.8 | 7.5 | 5.6 |
| 3. The Land bylaw | 12.5 | 15.0 | 13.8 |
| 4. The Water use bylaw | 13.8 | 8.8 | 11.3 |
| 5. The Fisheries bylaw | 13.8 | 26.3 | 20.0 |
| 6. The Forest bylaw | 21.3 | 15.0 | 18.1 |
| 7. The Mangrove Conservation bylaw | 5.0 | 22.5 | 13.8 |
| 8. The Wildlife bylaw | 0.0 | 0.0 | 0.0 |
| 9. The Agriculture and Livestock bylaw | 0.0 | 0.0 | 0.0 |
| 10. Bylaws related to natural resources | 0.0 | 0.0 | 0.0 |
| **Total** | **73.8** | *** 102.5** | **88.1** |

* Other respondents had knowledge of a number of bylaws.

**Communication Channels on disasters**

As regards communication channels on disaster, for Zanzibar the main means of communication were between individuals (55.7%), through Shehia leadership (19.8%), telephones (15.1%) and TV and radio (9.4%). For Tanzania Mainland the main means of communication were between individuals (38.9%), sounding alarms (15.8%), telephones (13.7%), Mtaa/Village leadership (12.6%), and announcements in Mosques (19. 5%). Others included TV/Radio and sounding signals (Table 9).

***Table 9: Responses on communication channels during disasters***

| Type of channel | Zanzibar | | Tanzania Mainland | |
|---|---|---|---|---|
| | No | % | No | % |
| Between individuals | 59 | 55.7 | 37 | 38.9 |
| Through Shehia/Mtaa/Village leadership | 21 | 19.8 | 12 | 12.6 |
| Phones | 16 | 15.1 | 13 | 13.7 |
| TV/Radio | 10 | 9.4 | 2 | 2.1 |
| Sounding an alarm | 0 | 0.0 | 15 | 15.8 |
| Announcements in Mosques | 0 | 0.0 | 10 | 10.5 |
| Beating drums | 0 | 0.0 | 5 | 5.3 |
| Signals | 0 | 0.0 | 1 | 1.1 |
| **Total responses** | **105** | **100,0** | **95** | **100.0** |

For Zanzibar the main means of communication were between individuals (55.7%), through Shehia leadership (19.8%), phones (15.1%) and TV and radio (9.4%) in that order, while for Tanzania Mainland the main means of communication were between individuals (38.9%), sounding alarms (15.8%), telephones (13.7%), Mtaa/Village leadership (12.6%), and announcements in Mosques (19. 5%). Others included TV/Radio and sounding signals,

**Communication Channels on Disaster Occurrences While at Work on Land**

Most respondents in Zanzibar indicated the main communication channels were communicating with each other (55.5%), radio/TV (16.7%), observing signals

(13.9%) and telephones (9.3%). The other means mentioned was sounding an alarm (3.7%). About one percent of the responses indicated ignorance.
For Tanzania Mainland the most reported communication means were passing on from one person to another (38.9%), radio/TV (24.7%), sounding an alarm (15.6%) and through announcements from the mtaa/village government (9.1%). Others were announcements in mosques (5.2%), phones (3.9%), and seeing signs (2.6%). Overall 48.6 percent responses indicated communication with each other, radio/TV 20.0%, observing signs 9.2%, sounding an alarm 8.6% and telephones 7.0 %. Other channels are presented in Table 10.

***Table 10: Responses on communication channels during disaster occurrences while at work on land***

| Means of communication | Zanzibar % | Tz mainland % | Overall % |
|---|---|---|---|
| Communicating with each other | 55.5 | 38.9 | 48.6 |
| Shehia/mtaa/village government | 0.0 | 9.1 | 3.8 |
| Phones | 9.3 | 3.9 | 7.0 |
| Radio/TV | 16.7 | 27.7 | 20.0 |
| Seeing signs | 13.9 | 2.6 | 9.2 |
| Sounding an alarm | 3.7 | 15.6 | 8.6 |
| Announcements in mosques | 0.0 | 5.2 | 2.7 |
| Don't know | 0.9 | 0.0 | 0.5 |
| **Total responses** | **100.0** | **100.0** | **100.0** |

**Communication channels about disaster occurrences while in open sea**
For Zanzibar Islands the most mentioned channels were shehia/mtaa/village government announcements (40.9%), Seeing signs (29.0%), and radio (16.1%). About 3 percent of the responses did not mention any type of communication.
In the case of Tanzania Mainland main responses were shehia/mtaa/village (50.0%) and seeing signs (40.0%).

Overall the most mentioned were Shehia/mtaa/village government (43.1%), radio (13.0%) and signals by other vessels (8.1%). Others responses are presented in Table 11 below.

***Table 11: Responses on communication channels when in open sea***

| Type of Channel mentioned | Zanzibar % | Mainland % | Overall % |
|---|---|---|---|
| By radio | 16.1 | 3.3 | 13.0 |
| Shehia/mtaa/village government | 40.9 | 50 | 43.1 |
| Seeing signs | 29.0 | 40 | 31.7 |
| Signals by other vessels | 10.8 | 0 | 8.1 |
| Signals from shore (on land) | 0.0 | 0 | 0.8 |
| Seeing a flag on vessels | 0.0 | 3.3 | 0.8 |
| Hearing the noise of the sea water | 3.2 | 3.3 | 2.4 |
| **Total responses** | **100.0** | **100.0** | **100.0** |

**Response to a Warning of an Impending Disaster When in Open Sea**

In Zanzibar, the main actions mentioned were to offer the necessary support to the affected (38.9%), locating the vessel and return to shore (30.0%) and report to rescue/support/information institutions (KMKM, media and others) (12.9%).

On the part of Tanzania Mainland main responses were: giving the necessary support to the affected and running for safety in shallow waters, which rated (41.9%). The overall responses indicated that the most common actions are: offering the necessary support to the affected (39.6%), locating the affected vessel and return to shore (21.8%) and running for safety in shallow waters (13.8%). Other activities are as presented in Table 12 below.

***Table 12: Responses on steps taken when getting a warning of an impending disaster while in the open sea***

| Steps Taken | Zanzibar % | Mainland% | Overall % |
|---|---|---|---|
| Locate vessel and return on shore | 30.0 | 3.2 | 21.8 |
| Give necessary support to affected | 38.6 | 41.9 | 39.6 |
| Request for support from nearby vessel | 8.6 | 3.2 | 6.9 |
| Reports to the Sheha | 5.7 | 0.0 | 4.0 |
| Report to KMKM, media and other institutions | 12.9 | 0.0 | 8.9 |
| Runs for shallow water/safety | 1.4 | 41.9 | 13.8 |
| Heed to signals | 1.4 | 0.0 | 1.0 |
| Not going to work | 1.4 | 0.0 | 1.0 |
| Hoisting a signal flag | 0.0 | 6.5 | 2.0 |
| Disengage/drop dhow cloth (“Kushusha tanga”) | 0.0 | 3.2 | 1.0 |
| **Total responses** | **100.0** | **100.0** | **100.0** |

**Human activities contributing to increased natural disasters**

The interviewees pointed out the following human activities contributing to increased natural disasters: Zanzibar side said unorganized tree cutting (for charcoal making and other uses) is the major activity contributing to increased disasters (26.4%), while Tanzania Mainland attributed it to the same activity (34.8), making unorganized tree cutting to be the leading activity contributing to natural disasters for both mainland and Zanzibar. Other human activities are as listed in the Table 13 below:

***Table 13: Response on human activities contributing to increase natural disasters***

| Activities | Zanzibar (%) | Tz. Mainland (%) | Overall (%) |
|---|---|---|---|
| Unorganized trees cutting (for charcoal making etc) | 26.4 | 34.8 | 29.5 |
| Not cooperating with govt. on environmental conservation | 2.5 | 1.1 | 2.0 |
| Destroying coral reefs | 3.8 | 0.0 | 2.4 |
| Using dynamite in fishing | 2.5 | 1.1 | 2.0 |
| Environmental Destruction | 3.1 | 0.0 | 2.0 |
| Destruction of infrastructure | 6.3 | 0.0 | 4.0 |
| Don't know | 10.7 | 17.4 | 13.1 |
| Digging out sand /stones on beaches, etc. | 5.7 | 9.8 | 7.2 |
| Construction & Agric. Activities | 6.3 | 10.9 | 8.0 |
| Illegal fishing (dynamite beach seine). | 7.5 | 19.6 | 12.0 |
| Fires | 1.9 | 1.1 | 1.6 |
| None | 2.5 | 2.2 | 2.4 |
| Farming around water sources | 8.8 | 1.1 | 6.0 |
| Destruction of coral reefs | 1.9 | 0.0 | 1.2 |
| Bad livestock keeping | 0.6 | 1.1 | 0.8 |
| Shifting cultivation | 1.3 | 0.0 | 0.8 |
| Not obeying Government | 1.9 | 0.0 | 1.2 |
| Destroying environ. Natural resources | 5.0 | 0.0 | 3.2 |
| God's will | 0.0 | 0.0 | 0.0 |
| Sea weed farming | 1.3 | 0.0 | 0.8 |
| **TOTAL** | **100.0** | **100.0** | **100.0** |

**The state of the sea during the Indian Ocean tsunami**

Several observations were put forward as the state of the sea during the Indian Ocean tsunami of 26 December 2004. These varied between Tanzania mainland and Zanzibar as can see in the Table 12 below. Overall, both Zanzibar and Tanzania Mainland observed unusual frequency of high and low tide 37.6% or strong waves with increased water speed (34.5%). Other observations are as presented in Table 14 below.

***Table 14: Response on the state of the sea during the Indian ocean tsunami by Shehia/villages/mitaa***

| State of the sea | Zanzibar (%) | Tz. Mainland (%) | Overall (%) |
|---|---|---|---|
| Earthquake | 15.1 | 0.0 | 6.7 |
| Unusual frequency of high / low tide | 53.4 | 31.5 | 37.6 |
| Strong waves with increased water speed | 30.1 | 47.9 | 34.5 |
| Don't know | 4.1 | 0.0 | 1.8 |
| Same unusual strong winds and sound | 5.5 | 16.4 | 9.7 |
| Water level rise surrounding houses and farms | 16.4 | 4.1 | 9.1 |
| Vessels almost sank | 1.4 | 0.0 | 0.6 |
| **TOTAL** | **100.0** | **100.0** | **100.0** |

**Steps taken on the occurrence of the Indian Ocean tsunami**

During the tsunami incidence different steps were taken. Most of the people in Zanzibar did not take any action (42.9%), while most of people on the mainland stayed calm looking at the event (34.9%). Overall, most of the people did not take any steps (31.1%) or just stayed calm and watched the event 26.4%. Other steps taken are as presented in Table 15 below.

**Table 15: Response on steps taken on occurrence of tsunami by shehia, mtaa and village**

| Steps taken | Zanzibar (%) | Tz. Mainland (%) | Overall (%) |
|---|---|---|---|
| Just stayed calm and looked at the event | 20.6 | 34.9 | 26.4 |
| Did not go fishing till the sea calmed down | 12.7 | 4.7 | 9.4 |
| Didn't take any step | 42.9 | 14.0 | 31.1 |
| Ran for the beach | 11.1 | 11.6 | 11.3 |
| Discussed with others the even | 3.2 | 0.0 | 1.9 |
| Reported and sought for explanation | 4.8 | 0.0 | 2.8 |
| Run away from the beach | 1.6 | 4.7 | 2.8 |
| Dug ridges to prevent water getting into the fields | 3.2 | 0.0 | 1.9 |
| Went to look at the event and try to save the boats | 0.0 | 7.0 | 2.8 |
| Moved the boats to safety | 0.0 | 11.6 | 4.7 |
| Phoned Zanzibar to check on the event | 0.0 | 2.3 | 0.9 |
| Participated in saving people and vessels | 0.0 | 4.7 | 1.9 |
| Final sacks with sand protect residence | 0.0 | 2.3 | 0.9 |
| The losses calculated and looked for support | 0.0 | 2.3 | 0.9 |
| **TOTAL** | **100.0** | **100.0** | **100.0** |

**Reasons for settling or living in disaster prone areas**

In responding to the reasons which lead to households living or settling in areas prone to natural disasters, for Zanzibar the main reasons mentioned were low incomes/poverty (16.0%), within or near livelihood earning locations/farms (16.0%), lack of knowledge on disasters likely to occur in such areas (12.0%), lack of improved, better or safe accommodation (12.0 %) and increased population in the settlement area (10.4%). Other reasons mentioned were only land owned by the household, inherited settlements or land, scarcity of land, lack or expensive surveyed safe plots, less cost of living in such places and individual greed in that order (Table 16). 14.4% of the respondents said they did not know why some households decide to live in areas prone to disasters

.

In the case of Tanzania Mainland the most common reasons mentioned were low incomes/poverty (26.1%), only option near or where the household earns their livelihoods (15.7%), lack of knowledge of natural disasters that may occur in such

areas (13.0%) and lack of or expensive surveyed safe plots (12.2%). Other reasons given were people wanting to stay in towns rather than in rural areas, lack of improved safe settlements, negligence despite knowledge of flooded areas, individual geed, weak enforcement of the law prohibiting living in dangerous places, cheaper to live in such areas and only option available for the household. Few others said they were forced to stay in such places due to increased population, drought has forced them to move to wetter areas and land scarcity. About 9 percent of the responses indicated they did not know why (Table 16).

Overall, poverty ranked high (about 21%), followed only settlement option at or near livelihood earning areas (15.8) and lack of knowledge on disasters prone to these areas (12.5%). About 12 percent of the responses indicated ignorance.

***Table 16: Response on reasons for settling/living in disaster prone areas***

| **Reasons for households living in disaster prone areas** | **Zanzibar (%)** | **Tanzania Mainland (%)** | **Overall (%)** |
|---|---|---|---|
| We are used to staying there/ Inherited land/settlement | 4.8 | 0.9 | 2.9 |
| Poverty/Low income/Unable to purchase better locations | 16.0 | 26.1 | 20.8 |
| Lack of knowledge on disasters prone in such places | 12.0 | 13.0 | 12.5 |
| Land scarcity | 2.4 | 0.9 | 1.7 |
| Lack of improved settlements/improved houses | 12.0 | 1.7 | 7.1 |
| Lack of surveyed and safe/cheap plots for building/settling | 3.2 | 12.2 | 7.5 |
| Increased population in Villages/Towns | 10.4 | 0.9 | 5.8 |
| Only land owned by the household/for decades, no alternative | 6.4 | 2.6 | 4.6 |
| Only land/settlement option near/at livelihood earning locations/farms | 16.0 | 15.7 | 15.8 |
| Greed/Just build for renting to others | 0.8 | 1.7 | 1.3 |
| People wanting to stay in towns rather than in rural areas | 0.0 | 7.8 | 3.8 |
| Drought has forced moving into wetter areas | 0.0 | 0.9 | 0.4 |
| Weak enforcement of the law prohibiting living in dangerous places | 0.0 | 1.7 | 0.8 |
| Cheap accommodation in such areas | 1.6 | 1.7 | 1.7 |
| Negligence despite knowledge of flooded areas | 0.0 | 3.5 | 1.7 |
| Don't know | 14.4 | 8.7 | 11.7 |
| **Total** | **100.0** | **100.0** | **100.0** |

### 3.2.1.2 Discussion and conclusion

Based on the findings from the field questionnaire survey, the average family size of 7 people may include father, mother and five children. However, there are cases where the head of household was a woman and/or single parent with six household members. Almost half of the interviewed households (45%) had the family size of 6 to 10 people.

There is a big group of people who need assistance in the case of a disaster i.e. children below 14 years of age and old people above 65 years of age, constituting 42.4 % of the sampled population. These and the large family sizes, coupled with poverty which affects almost 40% of the households makes the communities highly vulnerable to disasters. However, children below 6 years of age who formed 16.7% of the population are the most vulnerable to disasters, since they are too young to make decision on what to do in case a disaster occurs. Those of age 7-14 who constitute about 22% of the population are vulnerable but if educated and can take the necessary actions to save their lives. Therefore the household family structure does contribute to family vulnerability to natural disasters.

Although most of the people (91.1%) were staying in their own houses, a large percentage of houses (43%) were built of wooden polls and mud, while others were of grass walls and grass thatched roofs and in bad condition. This makes them more vulnerable to disasters such as floods or fire and strong winds.

Regarding occupation, a large percentage (57%) of interviewees were depending on the coastal natural resources for their livelihoods such as the sea for fishing and seaweed farming, land for farming and livestock keeping. Others were depending on the sea products for retailing of fish including fish vending, fish frying and other activities using the coastal natural resources such as cutting tree for business. A small percentage of people were employed, others were casual labourers and a good number of women were housewives who had no defined occupation. This makes the issue of sustainable management and utilization of the coastal natural resources very important since they directly support a large percentage of the coastal population for their livelihoods. At the same time when well managed they can help the coastal communities to mitigate the impacts of coastal natural disasters such as strong winds, cyclones and tsunamis.

The incomes of the respective communities varied according to occupation. Villages whose main livelihood activity is business seem to have better incomes, followed by fishers while farming communities were the poorest. Kunduchi Pwani in Kinondoni Dar es Salaam has the highest average daily income while Makangale Shehia in Pemba has the lowest daily income. In contrast with the above mentioned areas, the coastal communities in Chwaka, Moa, and Matemwe were mainly depending on fishing activities which also expose them to

more coastal natural disasters like cyclone, tsunami, sea accidents and others. Their income was also affected by weather in the sea and the lunar circle.
In Wambaa and Makangale shehias where a large percentage of the community was depending on agriculture, and on seasonal crops, were earning less than the fishers. These are also more affected by weather conditions such as the amount and availability of rains, pests, diseases and vermin and availability of reliable markets and prices of crops. Their income is also affected by seasons of the year in contrast to fishers who go for fishing almost daily. However, in some areas like Wambaa and Mbweni there were some households who were totally depending on support from relatives, therefore making them more vulnerable to disasters such famine as they could not manage it. Overall, the main sources of income for food security were fishing (34.5%), business (32.3%) and farming (20.3%), and the overall, average daily incomes were higher for mainland Tanzania than for Zanzibar Isands.

It was also observed that there was no significant difference in average income between the years 2003 and 2005. The study also found that 40% of the respondents earn between Tanzanian shillings 10,000/= and 400,000/= a year which is about $0.02 to $0.91 a day (! US $ = Tshs 1,200/=). Another 40% earn between 400,001/= and 1,000,000/= which is $0.91 to $2.28. The rest 20% earn between 1,000,001/= and 6,000,000/= a year which is $2.28 and $ 13.70 a day. This implies that a large proportion of the people are poor, the poorest (40%) earning less than a dollar a day, which make them vulnerable, unable to manage even minor disasters. The incomes differed significantly between Tanzania Mainland and Zanzibar and the lowest average income was in Makangale in Micheweni Pemba.

Generally, the income was almost the same throughout the year but slight exceptions which show decline of income from June to August. This coincides with the South East Monsoon winds when fishing is affected by rough sea due to strong winds. This is also the time when crops like maize are still in the farm drying, before being harvested for food or selling. The dependence on many uncontrollable factors for the livelihood activities affected earnings, consequently accounts for the poor economy of the households. The poor economy has a significant contribution to the vulnerability of the households to natural disasters since they can not manage even a modest hazard.

It was observed that majority of the communities were depending on rice and maize as the main source of food. This is a threat to the food security of the coastal community since these crops are susceptible to drought and are being produced under rain-fed conditions, if there is less or no rain in the season it is easy for the household to face hunger. Slight climate variability may significantly affect the food security of the communities. Nevertheless, some households were also cultivating cassava and sorghum which are drought resistant. Slightly higher than half of interviewees said they have experienced food shortages in the past five years.

There is evidence from the tsunami affected countries and even from Tanzania that from previous disasters, the poor are more vulnerable and thus bear the brutality of the disasters the most. This makes a strong case for formulating policies, strategies and programs that will protect the poor against natural disasters as part of the national development strategy. These may include awareness creation and education especially to children in primary schools

The coastal communities, both male and female claim the right to own and utilize the coastal natural resources in the study area which include mangroves, fish, coastal forests, sea grass, coral reefs, land, sea, rivers, limestone and beautiful beaches. However, most of the resources are reported to have declined especially the coastal forests, fish, sea grass, coral reefs and mangroves. Some of the major causes for the decline of these resources included increased use pressure due to increased population and mismanagement. However, most of the communities have some conservation practices mostly linked to on going projects or programmes such as the Kinondoni Integrated Coastal Area Management programme and the Tanga Coastal Zone Conservation and Development Programme. Despite these initiatives, there are also cases of mismanagement practices such as dynamite fishing, mangrove cutting and beach pollution which make them more vulnerable to disasters.

Individual households seem to play limited roles in conserving the natural resources in both Zanzibar Islands and Tanzania Mainland, specifically in raising public awareness, abiding by the laws and conserving the environment. Conflicts on the ownership and utilization of the coastal natural resources especially the land, beaches and mangroves are also common, involving groups or clans on the ownership of the sea, villages and individuals or villages and villages over land and hotel investors and communities over use of the beach. In both Tanzania Mainland and Zanzibar Islands conflicts are mostly resolved at the local level involving the Sheha in the islands and Village or Mtaa chairmen on the mainland.

On the knowledge of policies, laws and bylaws there seem to be very limited knowledge or even awareness of the policies on the conservation of the natural resources and environment. As already mentioned this may be due to low level of participatory formulation and implementation of the policies and awareness creation. Overall, Zanzibar Islands seem to be more aware of the policies than Tanzania Mainland, which may be caused by the presence of relatively larger number of conservation programmes in the islands.

The laws and bylaws on conservation of natural resources are better known especially in Zanzibar Islands. This is partly because there is more awareness creation in the process of enforcing the laws and bylaws and the communities are involved in formulating bylaws. Knowledge of the policies, laws and bylaws on the conservation of the coastal natural resources and their observation is highly desirable for sustainable management and utilization of these resources

by the coastal communities. These are supposed to guide in the protection of the resources against destructive activities such as destroying coastal mangroves, mining coral reefs and dynamite fishing, practices which render them to be more vulnerable to coastal natural disasters.

Communication channels on impending disasters are limited to individuals or through local leaderships. On land, the communications are through person to person, radio or television, and signals or alarms. In the open sea, signs and signals from other vessels, and radio are the main communication channels in both Mainland and Zanzibar.

The main step or action taken as a response to a warning of impending disaster in an open sea were to offer necessary support to the affected (39.6%) and locating the vessel and returning to shore 21.8% or run to safety in shallow waters 13.8%. From these responses, it appears that there are no effective early warning systems from the communities or even service providers in both Mainland Tanzania and Zanzibar. Such a system would be achieved when all the people in vulnerable coastal areas are prepared and act properly in a timely manner upon recognition that there is a potential disaster coming such as a tsunami.

It came out clearly that natural resources play a major role in disaster mitigation. Unorganized tree cutting especially mangroves was identified as the leading activity contributing to severity of coastal natural disasters. In both Zanzibar Islands and Tanzania Mainland the highest interrelationship between natural resources and disaster mitigation was quoted in mangrove/forest clearing resulting into increased wind speeds (25%) as there is nothing to defuse the wind power and drought as a result of deforestation (11.2%). It was also indicated that mangrove clearing leads to beach erosion and flooding of property.

From the tsunami disaster there are some important lessons in the area of natural resources management. There are some evidences of the importance of the coastal ecosystem in mitigating the impact of tsunami in a number of the badly affected areas. For instance, mangroves in a region in southern India acted like a shield, protecting around 1700 people living in hamlets built inside between 100 to 1000 meters from the mangroves; and in Indonesia's Simeuleu Island the death toll was relatively low, partly due to mangrove forests that surround the island. On the contrary, uprooting and snapping off at mid-trunk of mangroves caused extensive property damage in Thailand. (Athukorala and Resosudarmo (March 2005)

The study confirmed that the Indian Ocean tsunami of 26$^{th}$ December 2004 was a unique phenomenon in the United Republic of Tanzania. In both Zanzibar Islands and Tanzania Mainland it was observed as an unusual frequency of high and low tides (37.6%) or strong waves with increased water speed (34.5%). Most people in both Mainland and Islands did not take any action (31.1%) or stayed

calm and looked at the event. This is a result of low or lack of awareness on this type of disasters, and therefore did not know what they should do to save their lives. Fortunately the tsunami waves came in during low tide. Had the tsunami waves come in during high tide these people could have been badly affected. This type of reaction was also observed in some coastal towns and tourist resorts in India where many people were reported to have watched the prior receding of the sea with curiosity or took the opportunity to collect stranded fish and thus easily succumbed to the waves which came with ferocity within 10 to 15 minutes (Athukorala and Resosudarmo 2005). This calls for the need to educate the people about simple precautions that can be taken to save their lives during tsunami and other national disasters. For example prior understanding by the communities that a receding sea is an early warning for an impending killer waves and people should run to high ground for safety.

In the case of households living in areas known to be prone to natural disasters the responses indicated various reasons as to why. The most common reasons given are related to poverty, cost of living and the need to stay in a place where one can earn a living through farming, fishing or easy reach to work places. In some cases people settle in places without knowing these are subject to disasters like floods. Within the coastal districts such areas are common due to the low-lying nature of the coastal belt. In this context those who have settled in the lower areas of Chwaka and Matemwe (in Unguja), Wambaa (in Pemba), Mbweni Ununio, Kunduchi Pwani and Moa on the Mainland and other similar places are highly vulnerable to flooding due to sea rise and or a tsunami like the 26$^{th}$ December 2004 occurrence. These communities need to scale up conservation programmes that include forest tree planting, mangroves and coral reef conservation to reduce the impact of any ocean associated natural disasters and increase their knowledge on preparedness.

### 3.2.2 Key informant interviews

The Key Informant Interviews was one of the three approaches used in the study. These interviews covered the national level, institutions/programmes, district and community levels in Tanzania Mainland and Zanzibar Islands.

Information collected covered the institutional set ups of the responding agencies, the general and specific roles relating to disaster management; the historical perspective including experienced disasters, their efforts in mitigation and management; tsunami experience, effects and lessons learnt, awareness of related policies, laws and regulations and their implementation. Information was also collected on the existing natural resources, their status and awareness on their management requirements and their role in disasters mitigation and management and conflicts related natural resources management and their resolution and the strategy in MKUKUTA/MKUZA for addressing disaster preparedness and management of natural resources.

In conclusion, general recommendations were solicited from the informants for improvement of performance in the management of natural resources and mitigation of coastal natural disasters.

### 3.2.2.1 Findings from the Key Informants

The findings from key informant interviews are summarized in Table 16 below.

**Table 17: Coverage of Key Informant Interviews at various levels, Tanzania Mainland and Zanzibar Islands**

| Tanzania Mainland | Zanzibar Islands (Unguja and Pemba) |
|---|---|
| **A Disaster Management at National Level**<br>▪ Prime Minister's Office (PMO), Dar es Salaam Office<br>▪ Department of Forestry, Ministry of Natural Resources and Tourism(MNRT)<br>▪ Tanzania Meteorological Agency (TMA)<br>▪ National Environmental Management Council(NEMC) | **A. Disaster Management at National Level**<br>▪ Chief Minister's Office<br>▪ Departments of Forestry and Fisheries (Pemba)<br>▪ Tanzania Meteorological Agency (TMA) |
| **B. Regional Programmes/Projects**<br>▪ Kinondoni coastal Area Management Programme (KICAMP)<br>▪ Tanga Coastal Zone Conservation and Development Programme (TCZCDP) | **B. Regional Programmes/Projects**<br>▪ Marine Coastal Environment Management Program (MACEMP)<br>▪ Mnemba Island Marine Conservation Area Project.<br>▪ Pemba Channel Conservation Area (PECCA) project |
| | |
| **C. District Level**<br>▪ Kinondoni Municipal Council<br>▪ Muheza District Council | **C. District Level**<br>▪ Wilaya ya Kati (Central District Unguja)<br>▪ Wilaya ya Mkoani (Mkoani District Pemba) |
| **D. Village/ Mtaa Governments**<br>▪ Ununio (Kinondoni, Dar es Salaam)<br>▪ Mbweni (Kinondoni, Dar es Salaam)<br>▪ Kunduchi Pwani (Sub-village, Kunduchi Mtongani, Kinondoni Dar es Salaam)<br>▪ Moa (Muheza, Tanga) | **D. Shehias**<br>▪ Chwaka (Wilaya ya Kati, Unguja<br>▪ Matemwe (Wilaya ya Kaskazini "A" Unguja)<br>▪ Makangale (Wilaya ya Micheweni, Pemba)<br>▪ Wambaa (Wilaya ya Mkoani, Pemba) |
| **E. Community Based Organization (CBOs)**<br>▪ Mbwedefu (Mbweni, Kinondoni Dar es Salaam)<br>▪ Mwambao (Kunduchi Pwani, Kinondoni Dar es Salaam) | **E. Community Based Organization (CBOs)**<br>▪ Jozani (Chwaka, Unguja)<br>▪ JOZANI<br>▪ MICA<br>▪ MEMA |

## Disaster Management at National level

| Aspect under consideration | Tanzania Mainland | Zanzibar Islands (Unguja + Pemba) |
|---|---|---|
| Organizational set up | ▪ Established disaster management structure from National to village level (See Appendix 5: Disaster Management Structure for Tanzania Mainland). | ▪ Disaster Management Department established in 2002<br>▪ Proposed administrative structure and implementation se-up being finalized under the Chief Minister's Office. |
| Awareness on natural disasters | ▪ Considerably high among key national actors but relatively low at district and community levels. Needs to be improved at both levels to specifically address preparedness and disaster management in general | ▪ Considerably high among key actors at this level but relatively low at community level. Require improvement to cover aspects of disaster preparedness and general management |
| Capacity | ▪ Human, financial and material capacities limited at all levels. | ▪ Human, financial and material capacities limited at all levels. |
| Disaster occurrence | ▪ Narrated occurrences of recorded disasters along the coast including floods, drought, cyclones, sea accidents, fire outbreaks and disease outbreaks.<br>▪ Require dissemination of the Vulnerability Assessment Study Report (VA 11) by the PM's Office. | ▪ Narrated disaster occurrences including floods, drought, disease outbreaks, strong winds/cyclones and fire outbreaks in urban areas.<br>▪ Most affected the "poor" living in disaster prone areas.<br>▪ Need to sensitize preparedness and research on alternative sources of income. |
| Disaster Management | ▪ Organizational set up is well articulated in the policy and guidelines. Also key elements of disaster management (prevention and mitigation, preparedness, response, recovery, post recovery review) and the roles and responsibilities at various levels. Implementation is not fully operational.<br>▪ Preparedness in terms of conservation of natural resources that are known to mitigate natural disasters should be incorporated in the management of disasters policy. | ▪ Currently the organizational set up, basic elements, roles and responsibilities are endorsed.<br>▪ Previously, management on ad hoc basis.<br>▪ Disaster management needs to be improved, particularly in the area of preparedness. |
| Roles in disaster management | ▪ Roles and responsibilities at various levels well stipulated in the policy and guidelines.<br>▪ Role of coordination and capacity building stand out clearly | ▪ Well stipulated in the set up. Currently endorsed but yet to be operational.<br>▪ Mentioned roles include coordination, capacity building provision of equipment, awareness creation amongst the public and protection of natural resources (laws, enhanced security). |

| | | |
|---|---|---|
| Linkages with other related Sectors, Departments and Institutions | ▪ Linkages well articulated in the policy/guidelines.<br>▪ Linkages between different other sectors, NGOs, CBOs, UN Agencies and FBOs need to be strengthened on ground. | ▪ Linkages well articulated in the proposed organizational set up but not yet operational<br>▪ Evidence of linkages with various related departments in the public sector exists. |
| Tsunami experience and lessons learnt | ▪ Acknowledged that "Tsunami" is a new vocabulary in their inventory.<br>▪ Effects were mild but involved ten deaths (people swimming in the ocean), oil spills from unloading docked ship and damage of an unknown number of fishing boats.<br>▪ Lessons learnt<br>- Need for awareness creation amongst the public.<br>- Need for capacity building and enhanced disaster preparedness.<br>- Acknowledged that human beings are the key resource which needs to be motivated to better manage the natural resources. | ▪ Effects mild, including increased frequencies of water movement, damage of some boats.<br>▪ Need for enhanced awareness and preparedness for such disasters through education and better management of coastal natural resources especially mangrove, forests and sea rocks. |
| Conflict on natural resources management and their resolution | ▪ No comment given | ▪ Admitted existence of conflicts related to utilization of beaches and disposal of garbage among others.<br>▪ The resolution of the conflicts is as per laid down procedures and machinery at all levels |
| Constraints | ▪ Inadequate awareness among communities.<br>▪ Inadequate human capacity at all levels<br>▪ Weak linkage between key actors<br>▪ Lack of specific action plans to implement policies and related policy guideline. | ▪ Inadequate awareness among communities<br>▪ Limited institutional capacity:<br>- Inadequate human capacity at all levels<br>- Inadequate physical resources support especially equipments and transport<br>▪ Weak information/reporting system |
| General recommendations | ▪ Increase awareness amongst communities<br>▪ Develop capacity at various levels (human, financial, physical)<br>▪ Strengthen linkages between key actors.<br>▪ Develop action plans for disaster management at various levels.<br>▪ Strengthen coordination | ▪ Awareness creation amongst key actors at various levels<br>▪ Strengthen institutional capacity:<br>- Capacity development<br>- Physical resources support (transport, equipments, etc.)<br>- Strengthen information dissemination and reporting system. |

**ROLES OF GOVERNMENT DEPARTMENTS**

| Aspect under consideration | Tanzania Mainland | Zanzibar Islands (Unguja + Pemba) |
|---|---|---|
| Government Departments, Tanzania Mainland and Zanzibar | **Forestry Department**<br><br>Organizational set up:<br>▪ Department under Ministry of Natural Resources and Tourism (MNRT).<br>▪ Department with four sections; Forest Development, Bee-keeping Development, Research, Statistics and Training and Forest Utilization, and Extension.<br><br>**Role:**<br>▪ Conserving and developing forestry in the country<br><br>**Approach:**<br>▪ Participatory management e.g. In Wetland management and bee-keeping.<br>▪ Involvement of various stakeholders (Department of minerals, urban planning development, lands, local government, fisheries and hoteliers).<br>▪ Team coordination through meetings and memorandum of understanding.<br><br>**Disaster Management:**<br>• Establishment and management of mangrove forests (e.g in Tanga) and promotion of research. | **Departments of Forestry and Fisheries, Pemba**<br><br>Organizational set up<br>▪ The departments fall under the Ministry of Agriculture, Natural Resources, Environment and Cooperatives<br>**Role*:***<br>▪ Departments overseeing management of natural resources in specific areas of forestry and fisheries. Coverage includes forest reserves of Ngezi, Vunawimbi, Ras Kiuyu and Msitu Mkuu.<br><br>**Approach used:**<br>▪ Community participation e.g. Ngezi forest conservation programme involving 10 villages.<br><br>**Key elements of Programme:**<br>▪ Awareness creation<br>▪ Establishment of relevant conservation committees, developing land management plans, promotion of agriculture, establishment of SACCOs, promoting keeping of diary cattle and restoration of degraded forests.<br>▪ Use of facilitative bylaws relating to forestry, livestock and environmental conservation, data collection, processing and utilization<br>▪ Responsibilities of Conservation Committees: Basically Management of natural resources. At Ras Kiuyu and Msitu Mkuu the respective comities using meetings and informal arrangements like setting of days for fuel wood collection, prohibiting use of destructive tools, banning of fuel wood collection for sometime when state of forests is bad and apprehending culprits before courts of law.<br>▪ Law/guidelines underway to reward communities involved in conservation and development of forests. |

| | | |
|---|---|---|
| | | ▪ In Ras Kiuyu, there was an attempt to implement a tourism plan which the respective communities were not in agreement with. They were in favour of a zoning wall.<br>▪ In Ngezi, a tourist hotel was constructed in the area. Stakeholders including ZIPA, Ministries of Tourism and Lands, Forestry Department, investors and hopefully respective communities favour tourism zoning plan. |
| | **Tsunami experience and effects:**<br>▪ The department referred the study team to the Disaster Management Department of the PM's office<br>▪ On lessons learnt, the importance of mangroves in reducing effects and addressing degradation of the coastline was acknowledged.<br><br>**Implementation of disaster management policy:**<br>▪ Department involved in disaster relief.<br>▪ Level of awareness on disaster preparedness and response amongst communities considered to be quite low.<br><br>**Natural Resources management:**<br>▪ Natural resources management committee used to raise awareness<br>▪ Promotion of relevant education for primary school children.<br>▪ Establishment and enforcement of by-laws.<br>▪ Natural resources considered crucial in reducing coastal disasters include mangroves, coral reefs and coastal forests.<br>▪ Laws in enforcement and supervision of natural resources along the coast include Marine Park and Reserves, Forest, Wildlife and Fisheries Acts.<br>▪ Fisheries department working closely with forestry department on awareness creation. Also planting of mangroves in several places like in Pangani. | **Relationship between natural resources and disasters**<br>▪ Mangroves are helping to reduce the effects of sea related disasters in Misali Island conservation area.<br>▪ MICA is an umbrella NGO concerned with planting and maintenance of mangroves in Misali area. They advocate collective management of mangrove conservation in collaboration with district authorities and if need be issuing a ban on harvesting mangroves temporarily.<br>▪ In "Misitu ya Juu" cutting of mangroves is allowed on specific permits to avoid excessive utilization.<br><br>**Constraint:**<br>▪ Limited resources (transport and working equipment) to monitor use and apprehend defaulters<br>▪ Negative effects of mismanagement of natural resources include drying of rivers in the dry season, increased distances to fuel wood collection areas, and disappearance of fish species like shell fish (crabs).<br>▪ Under Fisheries three protection law systems established involving mangroves ("misitu ya Kisheria"), coral reefs and the open sea.<br>▪ Coral reefs considered to be in good shape while mangroves are in bad shape, resulting in decreased fish catch. Using common emblem depicting mangroves, coral reefs, seagrass and limestone rock among promotional tools.<br>▪ Primitive fishing gear related to depletion of fish and risk of capsizing.<br><br>**Remedial actions**<br>▪ Pemba Channel Conservation Area (PECCA) programme |

| | | |
|---|---|---|
| | **Recommendation:**<br>▪ Need for coastal area management policy and identification of issues and strategies for better management. | supporting development of natural resources conservation activities.<br>▪ PECCA aiming at improving livelihoods of fishermen by promoting deep sea fishing through availing capable boats and engines and supporting their involvement in promoting tourism. Also providing grants to small groups involved in natural resources conservation to be used for promoting protection of endangered species. The association works through established local committees.<br>▪ In implementing the programme PECCA is facing difficulties as a result of lack of a speed boat and other working equipment to monitor deep sea activities. World Bank support is expected in this area..<br><br>**Tsunami experience:**<br>▪ Acknowledged that effects were minimal, mangroves and coral reefs helped to minimize effects.<br><br>**Right of ownership and use of natural resources:**<br>▪ Government has the sole ownership rights while communities have the right to use. |

**ROLES OF REGIONAL PROJECTS AND PROGRAMMES**

| Aspect under consideration | Tanzania Mainland | Zanzibar Islands (Unguja + Pemba) |
|---|---|---|
| Project and Programmes Tanzania Mainland and Zanzibar | **1. Kinondoni Integrated Coastal Area Management Programme (KICAMP)**<br><br>**Background**<br>▪ The programme is being implemented under the Kinondoni Municipal Council through technical and financial support from SIDA<br>▪ The pilot programme covered Mbweni and Kunduchi comities and plans are under way to include Ununio.<br>▪ Four main programme components:<br>(i) Sustainable land and water use planning through participatory approach;<br>(ii) Improvement of social and economic welfare/livelihoods of respective communities including provision of loans in a revolving fund scheme arrangement managed by CBOs;<br>(iii) Research, survey and assessment;<br>(iv) Information Education and Communication (IECO).<br><br>**Approach used**<br>In an effort to improve community livelihoods KICAMP<br>▪ Facilitates funds through CBOs accounts and is involved in the screening the beneficiaries. The funds are used for providing loans to support alternative livelihood earning activities to reduce dependency on coastal resources.<br>- Income generating activities include food vending, art craft, fish vending;<br>- In Mbweni promotion of beekeeping within mangroves is part of sustainable utilization;<br>- Loan beneficiaries have to form Production Groups to qualify for loans.<br><br>**Research, survey and assessment component**<br>▪ Responsible for ecological mapping, description of economic | **1. Misali Island Conservation and Development Programme (MICODEP)/Misali Island Marine conservation Area (MIMCA)**<br><br>**Goal:** To improve income and food security of fishing communities in Misali Island though sustainable fishing practices thus maintaining the Misali ecosystem and its productivity.<br><br>**Background:**<br>▪ Misali Island a small island (90 hectares) off the SW coast of Pemba which is used by fishers from all districts of Pemba.<br>▪ CARE International in Tanzania has been working in Pemba since 1998 to promote community based management of marine resources within the Misali Island Marine Conservation Area (MIMCA). The aim is to maintain sustained marine resource base and future resource availability.<br>▪ Ford Foundation supports MICODEP to facilitate advancement of community initiatives in the management of MIMCA as well as improving the livelihood of fishing families throughout the Pemba coast.<br>▪ MICODEP managed in partnership between CARE International in Tanzania, the Department of Commercial Crops, Fruits and Forestry, and the Department of Fisheries and Marine Resources. In this arrangement the fishing community is represented through the umbrella of the NGO named Misali Island Conservation Association (MICA).<br><br>**Achievements** |

| | | |
|---|---|---|
| | zones and monitoring and management of marine resources including mangroves, coral reefs, terrestrial plants and sea grass.<br><br>**IECO component:**<br>▪ Covers awareness creation and publicity through workshops, seminars, meetings, video shows and printed materials.<br><br>**Linkages**<br>▪ Programme working closely with extension staff at ward level and leadership at various levels. | ▪ Management of Misali as self-sustaining conservation area, with involvement of fishing communities and other key stakeholders;<br>▪ Savings and credit scheme established as part of capacity building for community and projects staff; Committees to manage CBOs and SACCOs in place.<br>▪ Alternative livelihood scheme for fishing communities include ecotourism road maintenance and safe water sourcing.<br>▪ Awareness creation through schools, mosques and Misali Information Centre.<br>▪ Efforts to establish pilot collaborative community fisheries resource management system in villages being pursued. |
| | **2. Tanga Coastal Zone Conservation and Development Programme**<br><br>**Background**<br>▪ Programme initiated in 1994, to address the serious decline of reefs and coastal resources in the area.<br>**Aim**<br>▪ To improve the wellbeing of coastal communities in three districts of Tanga region and management of coral reefs and mangroves and other coastal resources on which they depend. These resources were threatened (declining rapidly). Decline attributed to destructive fishing such as beach seining and poison fishing (mismanagement).<br><br>**Coverage**<br>▪ Muheza and Pangani Districts and Tanga Municipality.<br><br>**Main programmes focus areas**<br>▪ Putting in place collaborative management plans for coastal natural resources.<br>▪ Capacity building (district and village levels) to manage and monitor their coastal resources; | |

| | | |
|---|---|---|
| | ▪ Raising awareness on the importance of sustainable management of these resources<br><br>**Basic programme focus and achievements**<br>▪ Collaborative management plans;<br>- Six collaborative fisheries management plans drawn up and implemented.<br>- Plans contributing to increased fish catch, improved live coral cover and reduced dynamite fishing.<br>▪ Capacity Building;<br>- Villagers and government staff trained (mostly on the job).<br>▪ Monitoring reefs and fisheries; includes<br>- Monitoring of the health of the reefs and amount of fish catch on regular basis;<br>- Tracking reef spot damages and monitor positive trends<br>- Village Monitoring Teams (VMTs) and district staff participating in the monitoring of fish catches.<br>▪ Additional Sources of Income for the participating communities:<br>- In order to reduce destructive fishing practices and fishing pressure on the reefs other activities promoted include exchange of beach seines with non damaging gear (gill nets, traps and ring nets) or assistance to seaweed farming and agriculture through provision of technical support and vermin control.<br>▪ Awareness and Education; achieved through<br>- Introducing environmental management syllabus in primary schools, meetings, video shows and disseminating printed materials I youth clubs and participating in World Environmental Day.<br>- Organising educational visits for local leaders and government/ programmes staff to relevant areas like Pemba, Malindi, Mombasa and Mtwara.<br><br>**Approach**<br>▪ Enhanced community participation in the implementation of the programme; this is being achieved through initiating environmental conservation committee in every participating village and appointing village representatives to sit in the | |

| | | |
|---|---|---|
| | programme Conservation Central Committee (CCC) meetings<br>▪ Villages represented on the Conservation Central Committee (CCC) meetings<br>▪ Every village with an environmental conservation committee.<br><br>**Linkages**<br>▪ With the Institute of Marine Science (IMS) who are involved in data analysis and quality control.<br>▪ With other related programmes within the coastal zone (share experiences and carry out collaborative activities).. | |

**ROLES OF NATIONAL INSTITUTIONS,**

| **Aspect Under consideration** | **National Environment Management Council (NEMC) (Tanzania Mainland)** | **Tanzania Meteorological Agency, (TMA) (Tanzania Mainland and Zanzibar)** |
|---|---|---|
| Background | ▪ NEMC was established under the 2004 Environmental Management Act. Their mandate is to coordinate all environmental management activities in the country. The act empowers NEMC to take control and act on any environmental issues to protect the environment for national interest.<br>▪ Its operations are guided by the National Environment Management Policy. | ▪ Delivery of meteorological services date back as far as 1921, through the colonial rule in the 1930s, and continued to operate after independence (1961).<br>▪ From 1967 these services were managed under the East African Meteorological Department till TMA was formed.<br>▪ TMA took over management of the meteorological services from 1999 to date. |
| Roles | These include:<br>▪ Coordination of environmental planning<br>▪ Technical arbitration in environment – related conflicts.<br>▪ Awareness creation amongst key actors;<br>▪ Facilitation of environmental management issues in the districts and regions;<br>▪ To facilitate coordination of the implementation of the National Environment Strategic Plan a strategic plan (still a draft).<br>▪ Research on sea level rise due to climatic change and organization of scientific conferences on climatic change. | These include:<br>▪ Provision of agro-meteorological, hydrometeorology, environment and research services;<br>▪ Remote sensing and geographical Info- systems (GIS) services,<br>▪ Monitors rainfall, crop and livestock performance, offer weather advisory service to farming communities and issue early warning on food security, jointly with MAFSC;<br>▪ Forecasting of water resources and floods, jointly with the Ministry of water;<br>▪ Participates in national environmental management issues including air pollution, climatic change and global warning studies. |

| | | |
|---|---|---|
| | | ▪ Participates in monitoring and prediction of state of behaviour of the atmosphere over land, ocean and inland waters in order to contribute effectively to the protection of life and property.<br>▪ Engaged in partnership to monitor, understand, predict and protect the global environment in the interest of humanity. |
| Vision | ▪ To have NEMC as an agency providing sound technical leadership in environmental management. | ▪ To stand out as a centre of excellence in accelerating the national development vision through provision of world class meteorological services by year 2015. |
| Mision | ▪ | ▪ To provide quality, reliable and cost-effective meteorological services that meet stakeholders' expectations thereby contributing to the safety of life and property and to the national poverty eradication goal. |
| Linkages | ▪ The National Integrated Coastal Environment Management Strategy focuses on improving livelihoods of coastal communities through sustainable management and utilization of available natural resources.<br>- Links with the National Climate Change Programme, with main interest in flooding.<br>- Links to UNEP on environmental impact assessment of tsunami. | ▪ To relate to relevant sectors including MAFSC, Ministry of water.<br>▪ To relate to World Meteorological Organization in monitoring predicting and protecting the global environment for the interest of all humanity.<br>▪ To relate to World Meteorological Organization (WMO), World Weather Watch (WWW), Global Climate Observing System (GCOS) and the Global Atmospheric Watch (GAW)<br>▪ Link with SADC and EAC. |
| Disaster Management | ▪ The National Environment Management Policy is implemented in line with specific sectoral acts e.g. forestry, fisheries, marine parks and reserves and agriculture in the context of disaster management.<br>▪ Collaborates with the National Climatic Change Programme which monitors effects of floods and mitigation; Interest in environmental impact assessment of tsunami;<br>▪ Efforts to conserve the coastal beaches; considers set back limit of 30 metres too low and advocating uplift to 100m or more to protect the beautiful beaches.<br>▪ Established mechanism for monitoring of ICM issues. Follow up through meetings with directors of related sectors. | ▪ This is the responsibility of the forecasting division, on daily basis, seasonal forecasting on three monthly basis, applied research, and climateorology<br>▪ Also agro meteorology relating to agriculture, hydrometeology, dealing with river flows and dam levels.<br><br>NB: All departments working in collaboration with the Prime Minister's office, MAFSC and MW. |

| | | |
|---|---|---|
| Disaster Occurrence | ▪ Referred to tsunami and floods occurrences.<br>▪ Awareness on tsunami for most Tanzanians is low hence the need for increased awareness creation.<br>▪ Environmental Management Act outlines aspects of coastal resources management including safety of beaches. Privatization of beaches need discouragement | ▪ Disaster reported include floods due to el-nino of 1997/98; cyclones of 1951 (Mtwara) and 1989/90 Dar es Salaam (Alberta TC over the ocean 1995) causing heavy rains and land slides in Mtwara.<br>▪ Tsunami considered as a geological occurrence rather than an ecological phenomenon which they could not forecast, but felt the need to be linked to the global warming centres to be able to receive and send out warning signals immediately for action in the country.<br>▪ Effects of tsunami included increased wave activity for 3 days and deaths of 8 people.<br>▪ Efforts underway to establish an emergency operations centre under PM's Office through which warnings can be disseminated fast and more efficiently. |
| Natural resources management and disasters. | | ▪ Natural resources regarded as useful in reducing effects of disaster in coastal areas especially mangroves and limestone rocks; helps to prevent soil erosion, breaks wind and wave strength, and also brings rain.<br>▪ TMA shares role of sensitizing the public to conserve and develop natural resource along the coast. |
| General recommendations | | ▪ Need for conservation and restoration of natural resources along the coast;<br>▪ Need for improved coordination of activities and implementation of programmes carried out by different sector ministries and institutions.<br>▪ Need for enforcement/implementation of common laws and regulations that cater across.<br>▪ Need to strengthen the Emergency Operations Centre and the Early Warming Division for improved and effective/fast dissemination of early warnings.<br>▪ Need to improve telecommunication on emergencies and impending disasters. |

**DISASTER MANAGEMENT AT DISTRICT LEVEL**

| **Aspect under consideration** | **Tanzania Mainland** | **Zanzibar Islands (Unguja + Pemba)** |
|---|---|---|
| Coverage | **Kinondoni Municipal council and Muheza District Council** | **Wilaya ya Kati (Unguja) and Wilaya ya Mkoani (Pemba)** |
| Organizational set up | ▪ District Commissioner's offices have administrative and political roles.<br>▪ Most implementation is managed under the DED's office<br><br>**Muheza District Council**:<br>▪ Disaster Management Committee in place.<br>▪ DED operates through Councillors, Ward Development Committees (WDCs) and village/mtaa governments at local level;<br>▪ Department of natural resources responsible for overseeing fishing, forestry and environment.<br><br>**Kinondoni Municipality**:<br>▪ Department of Natural Resources responsible for the management of coastal natural resources. | ▪ District Commissioners' Office links to communities through Shehas and Shehia committees.<br>▪ Within the DC's office are departments responsible for the different sectors.<br><br>**Wilaya ya Kati**<br>▪ Departments mentioned include Fisheries, Forestry, Agriculture, Water, Livestock, Education, Social Welfare and Women and Children Affairs.<br>▪ No specific committee responsible for disaster management, but the departments of Agriculture, Forestry, Fisheries and Environment oversee natural resources management while the DC oversee disaster management through mobilization of the different departments.<br>▪ Departments responsible for environment and natural resources include those of Agriculture, Forestry and Fisheries. |
| Roles in disaster management | ▪ Identification of disaster prone areas;<br>▪ Putting in place disaster preventive measures;<br>▪ Defining responsibilities and strategies;<br>▪ Sourcing and mobilizing working tools and other supplies and their distribution to respective areas<br>▪ Providing necessary aid and consolation<br>▪ Facilitation of information dissemination and feedback at different levels<br>▪ Preparation of reports and their distribution to different levels.<br>▪ Social mobilization<br>▪ Coordination and supervision | ▪ Awareness creation;<br>▪ Social mobilization<br>▪ Material support<br>▪ Saving of lives;<br>▪ Data collection (M & E)<br>▪ Consoling the affected<br>▪ Coordination and supervision |

| | | |
|---|---|---|
| Disaster Occurrence | **Muheza District**<br>▪ Listed disasters as shown in Appendix 8<br><br>**Kinondoni Municipal Council's Office**<br>▪ Mentioned the Ubungo TANESCO oil leakage which inflamed; and the 26th December 2004 tsunami which caused deaths of two children. | **Wilaya ya Kati**<br>▪ Mentioneds the floods of 2005 affecting coastal Shehias of Urowa and Kiboje.<br>**Mkoani District**<br>▪ Listed the occurrence of floods; and outbreak of cholera. |
| Strategies to mitigate disasters | **Muheza District**<br>▪ Has a district environmental conservation plan and tree planting programme in place;<br>▪ Has completed an assessment of water sources and prepared the respective conservation maps.<br>▪ Has a plan for conserving and developing the coast that include agricultural strategies with environmental considerations and defined livestock routes in villages;<br>▪ Offers technical advice on the construction of improved houses and latrines. | ▪ Sound strategies for mitigation of disasters which need to be formalized and implemented. So far measures taken on ad hoc basis when they occur.<br>▪ Various departments and existing committees mobilized by the DC's office to take necessary actions to address disaster occurrences. |
| Chain of command in disaster management | ▪ Village/Mtaa Government - Ward/WDC - DED's / DC's Office – Regional Secretariat - National level/(PM's Office); and vice versa. | ▪ Shehia/Sheha – District Commissioner's Office - Regional Commissioner's Office - National level/(Chief Minister's Office); and vice versa. |
| Constraints to implementation | ▪ Limited knowledge and skills<br>▪ Limited capacity (human, physical and financial) | ▪ Limited capacity in terms of human skills and physical resources;<br>▪ Lack of established committees specific for disaster management. |
| Tsunami experience | ▪ Reported mild effects (increased frequency of strong waves) | ▪ Reported mild effects |
| Lesson Learnt from tsunami | ▪ Meteorological Department not well equipped to forecast occurrences early enough to minimize effects;<br>▪ Need for enhanced awareness creation amongst communities on coastal disaster occurrences and management at all levels. Make available and disseminate leaflets, posters, radio and TV programmes to schools, workshops and seminars;<br>▪ Need for more careful management of beaches. | ▪ Need to enhance disaster preparedness<br>▪ Need to prioritize natural resources management along the coast including mangrove forests and limestone rocks. |

| | | |
|---|---|---|
| Linkage of natural resources to reduction of impact of disasters | ▪ Effect of coral reefs/limestone rocks against strong waves;<br>▪ Linkage well articulated e.g. effect of mangroves in guarding beaches against strong waves, strong winds and beach erosion | ▪ Linkage well articulated e.g. effect of mangroves against strong winds; also effect of coral reefs and limestone rocks on strong waves. |
| Conflicts on ownership/use of natural resources along coastal areas | ▪ Conflicts between fishers who use inappropriate fishing gear and those the right ones<br>▪ Fishing site conflicts between normal fishers against prawn fishers who use beach seine in wrong fishing sites;<br>▪ Fishers using dynamite versus Council officials/ village authorities;<br>▪ Site conflicts between seaweed farmers and fishers.<br>▪ Conflicts between those who clear/cut mangroves versus conservationists. | ▪ District authorities versus rock miners along beaches;<br>▪ Fishermen using inappropriate gear versus individuals/shehia committees;<br>▪ Shehia committees, individuals/community members versus investors along beach sites (mostly hoteliers);<br>▪ Investors/hoteliers vs local sellers of carvings (Chiraka);<br>▪ Those cutting mangrove trees and sand miners versus conservationists. |
| Conflict resolution machinery | ▪ Village/Mtaa Government and chairpersons, WEO/WDC, respective district departments, and other government machinery including the police and courts. Relevant laws used in resolving conflicts. | ▪ Shehas or shehia committees, the DC's office and respective departments; and other government machinery including the police, courts. Relevant laws used in resolving conflicts. |

**ROLES OF COMMUNITY LEVEL VILLAGE/MTAA GOVERNMENTS AND SHEHIA COMMITTEES)**

| **Aspect under consideration** | **Tanzania Mainland** | **Zanzibar Islands (Unguja + Pemba)** |
|---|---|---|
| Organizational set up | ▪ Administrative set up is as follows: Household - Village/Mtaa - Ward – Division - District – Region - National level;<br>▪ Village Government has 25 members while the mtaa government has 7 members<br>▪ Village/government working through main committees and sub-committees;<br>▪ Main committees:<br>(i) Security and Public Safety;<br>(ii) Finance, Planning and Economic Affairs;<br>(iii) Social welfare; and<br>(iv) HIV/AIDS. | ▪ Administrative set up is sa follows: Household - Sheha/ Shehia – District - Region - National level.<br>▪ Shehia committee is the local administrative unit under the Sheha; has 11 members;<br>▪ Shehia committee supported by sub-committees for development, environment, health, REDET, fishermen, seaweed farmers, leadership and security. |

| | | |
|---|---|---|
| | Sub-committees<br>▪ Responsible for environmental conservation, natural resources, education, land and water use.<br><br>Moa village government has three main committees:<br>- Social welfare<br>- Security and public safety<br>- Finance and planning<br>- Sub-committee for environment. | |
| Economy | ▪ Reported economic activities include fishing, agriculture, petty business, horticulture, livestock keeping, artisanship (various trades). | ▪ Economic activities include fishing, sea weed farming, petty business, livestock keeping, artisanship (various trades like carpentry, masonry, net mending and others) |
| Disaster experience | ▪ Disasters experienced include floods, drowning of fishermen, drought and strong winds. | ▪ Disasters experienced identified as strong wind, drowning of fishermen and sea weed farmers and floods. |
| Natural resources and Disaster Management | ▪ Mtaa/Village government with overall responsibility for overseeing natural resources and disaster management at community level;.<br>▪ The sub-committee for environment responsible for natural resources management.<br>▪ The committee for social welfare responsible for overseeing disaster management. | ▪ The Shehia committee<br>- Has overall responsibility for natural resources and disaster management.<br>- A number of shehias have disaster management sub-committees. |
| Policies, policy guidelines, laws and bylaws governing disaster management. | ▪ The national policy and policy guidelines in place but limited circulation hence low awareness among committees.<br>▪ A number of villages/mitaa have bylaws some of which have been endorsed by the respective district/municipal councils as required and became effective. | ▪ No national policy/guidelines on disaster management in place but there are related laws.<br>▪ Few shehias have drafted bylaws which need to be passé by the respective district authorities or Central Government. |
| Ownership and use of natural resources along the coast. | ▪ Government overall owner but communities/individuals have right of utilization and can make transactions as per laid down procedures.<br>▪ Generally committees/individual members have user rights. | ▪ Government overall owner as is the case for Tanzania mainland, but individuals/commmnities have right of occupancy or use. |
| Conflicts | Conflicts between:<br>▪ Village/ mtaa governments/ individuals community members versus investors | Conflicts between:<br>▪ Shehia committee/community versus investors<br>▪ Shehia community members versus illegal fishers using |

| | | |
|---|---|---|
| | ▪ Village/mtaa governments vs illegal fishermen/those cutting mangrove trees/mining sand along beaches. | illegal fishing gear;<br>▪ Shehia community versus those cutting mangroves or mining sand on the beach. |
| Tsunami experience | ▪ The effects were considered minimal, though it was clear that people were caught un aware.<br>▪ Lesson learnt: that with such phenomena a disaster is likely hence the need for preparedness in terms of:<br>- Early warnings/improved meteorological data circulation/dissemination;<br>- Enhanced rescue operations<br>- Acquisition of better fishing gear and boats;<br>- Need for conservation of natural resources along the coast (mangroves, coral reefs and limestone rocks);<br>- Required in place guidelines for management of such disasters;<br>- Public awareness creation and education. | ▪ The effects were considered mild, with the water hitting the beach to and fro several times, for about 2-7 minutes. Also reduced fish catch for several weeks after;<br>▪ Here too, people were caught unaware.<br>▪ The occurrence is a reminder that "tsunami" is a possibility, hence the need for preparedness in terms of:<br>- Awareness creation<br>- Capacity building<br>- Conservation of natural resources along the coast. |
| Linkage of natural resources to reduction of impact of disasters | ▪ Awareness of the link quite high, but unsustainable use of resources such as mangroves, coral reefs, limestone rock and other natural resources do not support this view. | ▪ Awareness of the link between the two quite high, but unsustainable use of natural resources like mangroves, limestone mining under live corals, dynamite fishing, sand mining on the beaches and such actions do not support this view. |
| General recommendations on natural resources and disaster mitigation | ▪ Increased public awareness required<br>▪ Capacity building<br>▪ Sustainable utilisation of natural resources<br>▪ Improved fishing boats and gear and patrol equipment<br>▪ Enhanced rescue operations<br>▪ Dissemination of policies and related guidelines.<br>▪ Promoting alternative means of livelihood. | ▪ Public awareness creation;<br>▪ Sustainable utilisation of natural resources;<br>▪ Improved accessibility to proper fishing gear, fishing boats and rescue equipment;<br>▪ Dissemination of policies/guidelines;<br>▪ Endorsement of bylaws formulated at community level so that they are officially effective;<br>▪ Promoting alternative means of livelihood<br>▪ Improved community economic gains from investor operations along beaches. |

**ROLES OF COMMUNITY BASED ORGANIZATIONS (CBOs)**

| Aspect under consideration | Tanzania Mainland | Zanzibar Islands (Unguja + Pemba) |
|---|---|---|
| Information about respective CBOs | **Mbweni Development Fund (MBWEDEFU)**<br><br>**Background:**<br>▪ The CBO consists of 40 group memberships, each with 5 members<br>▪ Membership requires entry fee of 5,000/= and annual subscription fee of 6,000/=<br>▪ Operates on a revolving fund supported by SIDA through KICAMP<br>▪ Members receive loans through group identity which they have to pay back after 6 months.<br><br>**Objective**:<br>▪ Enhanced community participation in natural resources management and improved economic well being.<br><br>. | **Jozani Environnent Conservation Association (JECA)**<br><br>**Background:**<br>▪ Established in 1998 and registered in 1999 as a Civil Society Organization to enhance community participation in conservation of natural resources and economic development.<br><br>**Membership:** 500 members todate<br><br>**Coverage:** 9 shehias from Bwejioni, Chwaka, Charawe, Cefu, Kitogani, Michawi, Pete, Ukongoroni and Unguja Juu.<br><br>**Mission:** To enhance community participation in the conservation of natural resources and improvement of their livelihoods through sustainable utilization.<br><br>**Goal:** To raise incomes of women groups around and near Jozani- Chwaka Bay National Park while protecting biodiversity.<br><br>**Objectives:** Involvement of communities in management of natural resources around Jozani and Chwaka Bay for social and economic development.<br><br>**Support:** By Mc Kuight Foundation to improve sustainable agriculture, small scale enterprises hand craft and marketing of products. Also support batik, tie and dye, bee-keeping, tailoring, mushroom production, horticulture/irrigation, sea-weed farming and tomato paste processing.<br><br>**Organizational set up:**<br>▪ There are conservation committees in all 9 villages.<br>▪ Participatory activities linked to Resource Use |

| | | |
|---|---|---|
| | | Management Agreement under the Department of Forestry;<br>▪ Works in collaboration with the Government and NGOs that are involved in enhancing sustainable and local community empowerment. |
| | **Mwambao CBO:**<br><br>**Background:**<br>▪ The CBO is an umbrella organization established under KICAMP with members contributing 5,000/= annually.<br>▪ To be a member one has to be resident in the area, has to have referees and has to belong to a team of five people.<br><br>**Objective:** To address environmental conservation and economic empowerment for members.<br><br>**Support for alternative livelihoods:** Loans given within a range of 100,000/= to 300,000/=; Interest rate 10 percent and loan to be repaid in 6 months; Support used for economic activities such as food vending, fishing and petty business.<br><br>**Focus:** Enhanced environmental conservation and improved livelihoods. | **Misali Island Conservation Association (MICA)**<br><br>▪ Established in 1998 to implement MICODEP.<br>▪ Main objective is to safeguard the interests of Pemba fishermen against threat of destructive tourism on Misali Island.<br>▪ Facilitating conservation of ecological resources in and around Misali while enhancing livelihoods and community development programmes.<br>▪ Supporting conservation awareness creation among stakeholders.<br>▪ Advocating government to manage MICA on behalf of the community.<br><br>**Planned future activities**<br>▪ Consolidation of the initiatives implemented under MICODEP |

### 3.2.2.2 Discussion and conclusions on key informants interviews

From the key informant interviews, it is apparent that at national level disaster management in Tanzania Mainland is well planned, and an elaborate policy and guidelines for managing disasters exist. The policy and guidelines provide well articulated instructions or directives on how disasters are supposed to be managed. However, the necessary mechanisms for their implementation are yet to be operational and mainstreamed in the respective sectors. Although at district level there are committees dealing with disasters, they are constrained with resources. At village level, the disaster management committees are not in place. Here, the committee dealing with social welfare handles all disaster management issues.

Due to lack of clear implementation plan and the needed resources within the implementing sectors, the Disaster Management Department is sometimes forced to implement the policy instead of coordinating. For better implementation of the policy and mainstreaming the disaster management component there is need to build the human and financial capacity at all levels in all implementing sectors. Other sectors and their committees responsible for disaster management are not aware of the policy. The committees have to be sensitised on disaster vulnerability, awareness and management, which are important for proper actions in the wake of a disasters in their respective areas.
It was acknowledged by all key informants in all sectors that natural resources have a role in mitigating impacts of natural disasters.

The National Environment Management Council (NEMC) has been striving to prevent mismanagement of natural resources and the environment in general. Apart from supporting human beings and the other diverse lives, they also prevent slow and quick disasters in the short and long-term. In an effort to address this problem NEMC has prepared the National Integrated Coastal Environment Management Strategy which directs integrated management of the coastal natural resources and the environment in general. The strategy directs involvement of the communities in the process in order to reduce conflicts, enhance sustainability of the resources and improve livelihoods.

In collaboration with other sectors, NEMC insists in observing the environmental law and other related laws and regulations including the set back line of 60 meters from the highest water mark in constructions on the beaches. The setback line is meant to save investments from being washed away by sea waves through erosion and minimize impacts of other natural disaster such as the tsunami.

Since the environment is a cross cutting issues, NEMC is working with other sectors such as the forest sector (which is mandated to oversee all the forests in the country, including inland forests, coastal and mangroves forests), sectors dealing with mining, agriculture, industries, fisheries, land and others. However

there is inadequate co-ordination with these other sectors particularly on issues related to disasters.

Through these key informant interviews a number of lessons were learnt. These include:

- Natural resources along the coast which are crucial in reducing the effects of disasters are mangroves, coral reefs and coastal forests.
- It was concluded that the level of awareness on disaster preparedness and the necessary response required amongst the communities is quite low.
- Regarding the event of the tsunami, a number of lessons were learnt through what happened in the most affected areas of South East Asia. These lessons have been discussed elsewhere in the report but it is worth stressing the fact that mangrove forests are important in reducing the effects of a tsunami and are effective in reducing coastal land erosion.

Co-ordinated efforts from various sectors and institutions such as use of information from the Tanzania Meteorology Authority (TMA) are crucial in managing disasters. TMA collects data such as information on rainfall, crop and livestock performance and others using ground observations and satellite remote sensing which enables the authority to give advice on farming and early warning for food security. This is being done jointly with the Ministry of Agriculture Cooperatives and Food Security (MACFS). These data are important for sensitising communities and need to be on the alert (preparedness) at all levels in order to reduce the impact of natural disasters such as floods, drought and pests and diseases if such indications are predicted through the collected information.

In the Islands of Zanzibar there is a lot of initiatives for conserving natural resources. However, their disaster management policy is not yet in place. The Chief Ministers Office coordinates disaster management activities and the policy is under preparation.

The fisheries and forest departments oversee the management of natural resources along the coast, specifically relating to forestry and fishing. The discussions indicate that they are aware of the relationship between forests and disasters. This should be passed on to the communities to enhance their actions on the management of these resources for improved livelihoods and disaster mitigation.

At the local level, for both Tanzania Mainland and Zanzibar the ownership of natural resources such as mangroves were not clear to the communities, this is due to low awareness on the policies and laws that protect the coastal natural resources.
At the district level and local levels there are a number of projects and programmes dealing with natural resources management such as KICAMP and TCZCDP. There are also a number of NGOs and Civil Societies such as MICA

and JECA in Zanzibar. These are playing a major role in the management of the coastal natural resources. They could have a role in sensitizing the coastal communities on the role of the coastal natural resources in mitigating the impact of coastal natural disasters.

### 3.2.3 MPLA workshops

The workshops were conducted to solicit additional and/or complimentary information on various aspects. In order to get the information, the following topics were covered: Importance of participatory approaches to community planning and how Multi-sector Learning Approach (MPLA) can be used efficiently to facilitate local level planning process, alone or complementary to other approaches; plenary presentations on the importance of natural resources as an overview of the different types of coastal natural resources which are basic to rural livelihoods, their limited scope under ever-expanding use demand, their threat from a range of unsustainable human activities and need to ensure their proper management for the current and future generations. Other topics covered included the contribution of natural resources to the livelihoods of the coastal communities; trends of the coastal natural resources; the role of natural resources in mitigating impacts of natural disasters; policy issues, laws, rights on resource use and ownership; community visioning on future management of their natural resources in order to meet their needs and future generations; steps in disaster management; and formation of sensitization groups.

#### 3.2.3.1 Findings from the MPLA workshops

Regarding the importance and trends of natural resources in the eight study sites, the findings are summarised in Table 17 below:

*Table 18: Use patterns/importance and trends of coastal natural resources in eight coastal communities of Mainland Tanzania and the Islands of Zanzibar*

| Natural resource | Use pattern/importance | Trends | Reasons leading to current situation |
|---|---|---|---|
| 1. Land | ▪ Buildings; Farming; Forestry; Livestock keeping, Burial sites; Mining (quarry) (All sites)<br>▪ Play grounds – Moa<br>▪ Infrastructure/Utilities – (Moa)<br>▪ Industry – Ununio<br>▪ Salt pans –Ununio<br>▪ Water sources Underground (Matemwe) | ▪ Getting scarce (less land per household)<br>▪ Value increasing<br>▪ Competition for sea front plots All sites except (Moa)<br>▪ Low fertility in farm lands | ▪ Population increase(natural and migration)<br>▪ Expansion of tourism<br>▪ (Moa have more land due to closure of neighbouring sisal estate)<br>▪ Mismanagement (bad farming methods)<br>▪ Salinity as sea water spills over farm lands |
| 2. (a) Coastal forests | ▪ Source of fuel, building materials and medicine<br>▪ Special wood types (for curving, and boat | ▪ Very small pockets of forests remaining | ▪ Unsustainable utilization (over harvesting)<br>▪ Mismanagement<br>▪ Clearing for other uses |

| | | | |
|---|---|---|---|
| | building)<br>▪ Carbon dioxide recycle<br>▪ Erosion control<br>▪ Protection from strong winds (All stations) | | (agriculture, mining and settlements) |
| 2. (b) Forest crops | ▪ Income;<br>▪ Source of food; medicine<br>▪ Source of fuel and building materials<br>▪ Carbon dioxide recycle<br>▪ Erosion control<br>▪ Protection from strong winds (Wambaa) | ▪ Clove trees widespread in Pemba (Wambaa) but many trees dying<br>▪ Cashew and fruit trees scattered in few areas (Ununio, Mbweni and Moa)<br>▪ Coconut trees dyin in large numbers (Moa) | ▪ Effect of disease and/or old age and poor soil fertility<br>▪ Many trees being cleared to give way for buildings (settlements)<br>▪ Effect of disease now spreading through out the coastal zone |
| 3. Beaches | ▪ Recreation (residents and tourists)<br>▪ Provide vessel repair/ maintenance and construction sites<br>▪ Anchoring of fishing and transport vessels<br>▪ Mining ocean treasures shells collection (women) for sale to tourists)<br>▪ Harvesting natural seaweed (Chwaka) | ▪ Attractive beaches<br>▪ Presently fewer treasures mined<br>▪ Beach pollution increasing<br>▪ Artisanal fishers/local communities in conflict with hotel developers<br>▪ Increased beach erosion | ▪ White sand resulting from coral deposits washed on shore<br>▪ Increasing/high number of collectors (lack of alternative employment)<br>▪ Disposal of hard waste and human excreta<br>▪ Denied access to beaches fronting the hotels and limited employment and income to local communities<br>▪ Mangroves being cleared for better views from hotels |
| 4. Mangroves | ▪ Source of fuel, building materials (houses and boats) and medicine;<br>▪ Fish breeding grounds<br>▪ Carbon dioxide recycling<br>▪ Protection against beach erosion and coastal settlements in case of strong tides, storms and winds | ▪ Small areas remain covered with mangroves<br>▪ Current efforts to conserve existing areas are showing positive signs on the increase, but slow (Chwaka and Moa) | ▪ Over utilization<br>▪ Clearing for sea-front hotels and settlements<br>▪ Clearing for salt pans<br>▪ NGO and CBO programmes support (JECA in Unguja, KICAMP in Kinondoni; MICA – in Pemba and TCZCDP in Tanga |
| 5. Rivers (on land) | ▪ Water source for domestic water (Moa)<br>▪ Improved mangrove ecosystem (salt/fresh water interface) | ▪ Very limited flow in dry season<br>▪ Basically seasonal except Moa<br>▪ Low lying settlements prone to river flooding | ▪ Deforestation of the river catchments<br>▪ Limited catchments areas<br>▪ Heavy rains in wet season<br>▪ Cleared vegetation cover |
| 6. Ocean water | ▪ Supports life for ocean organisms<br>▪ Transport media<br>▪ Resource for making salt (salt water)<br>▪ Farming of seaweed (*mwani*) | ▪ Increased marine pollution<br>▪ Sea water encroaching into coastal lands | ▪ Disposal of hard waste and human excreta<br>▪ Oils and industrial material spills from vessels<br>▪ Dumping of by-catch from unfaithful commercial fishers |

| | | | |
|---|---|---|---|
| 7. Seagrasses and Seaweed | ▪ Food for sea creatures<br>▪ Stabilize/protection of sand dunes and coral reefs.<br>▪ Carbon dioxide recycling in the ocean<br>▪ Provide habitat to some sea creatures<br>▪ Source of medicine and cosmetics (seaweed) | ▪ Amount of seagrasses in the sea is on the decrease<br>▪ Seaweed is on the increase in Chwaka and Matemwe after propagation | ▪ Trawling by large commercial fishing boats on shallow waters<br>▪ Bad fishing methods<br>▪ Increased seaweed farming particularly by women (in Chwaka natural seaweed being harvested in plenty |
| 8. Fish | ▪ Important source of protein for coastal communities<br>▪ Income source for fishermen and fishery associated business operators | ▪ Amount and types of fish catch is on the decline | ▪ Fishing pressure in the shallow coastal waters more frequented by the increasing number of artisanal fishers<br>▪ Use of bad/destructive fishing methods<br>▪ Use of poor fishing gear limiting venture into deeper waters |
| 9. Limestone rock on shore | ▪ Building materials (stone, crushed stone, gravel, limestone paint)<br>▪ Protection of land and property against strong tides. (Near shore rocks outcrop in scattered locations along the coast broken by estuaries and beaches) | ▪ Demand for building materials increasing<br>▪ Causing land degradation at production site and excessive use of firewood | ▪ Bad location of quarries/ limestone paint production sites<br>▪ limestone paint production process requires large amounts of wood fuel<br>▪ Burnt stone has negative effects on farm land |
| 10. Coral reefs | ▪ Fish breeding grounds,<br>▪ Protection against strong tides,<br>▪ Medicine and valuables (shells)<br>▪ Offers habitat for many sea creatures.<br>▪ Has been used as source of building material (limestone paint, building blocks, and cementing materials) | ▪ Many have been destroyed in the 30 – 40 years | ▪ Destructive fishing methods and lime harvesting have reduced the areas covered with coral reefs considerably |
| 11. Sand dunes | ▪ Anchor for sea creatures (grass/fish)<br>▪ Slowing down tides before reaching shore<br>▪ Resting grounds for coastal/sea birds<br>▪ Signal to fishermen (position/location, areas of fishing, anchor sites in case of emergence)<br>▪ Used as ritual sites by | ▪ Some have been eroded and disappeared. | ▪ Strong tides sweeping away the sand.<br>▪ Frequent anchor of vessels and human activity (tourism) increasing erosion |

| | | | |
|---|---|---|---|
| | local communities<br>▪ Tourist attraction sites | | |
| 12. Raised ground/hills | ▪ Sanctuary in the wake of floods<br>▪ Convenient location of towers for communication and signals<br>▪ Natural vegetation cover (forests) strive on hill sides | ▪ The few raised grounds have been encroached for farming activities (Chwaka, Matemwe)<br>▪ Some are being used mined (quarry sites) | ▪ Conflict/competition for farm land<br>▪ High demand for building materials<br>▪ Increased transport costs forcing builders to resort to nearby site sources |
| 13. Migratory birds | ▪ Distribution of plant seed<br>▪ Signal to fishermen (white types)<br>▪ Some hunted for food<br>▪ Tourist attraction<br>▪ (Of recent they are a threat: Spread of Asian Bird Flue) | ▪ Some of the beneficial types have disappeared or their numbers greatly reduced<br>▪ The population of Indian house craw increasing very rapidly along the coast and inland. | ▪ The beneficial ones are being hunted;<br>▪ Others their environment has been destabilized, hence running away<br>▪ The Indian house craw which originated from India have strived so well (may be a result of unlimited food supply, not being hunted and suitable breeding environment). |
| 14. Wild life | ▪ Hunted for meat<br>▪ Tourist attraction<br>▪ Plant seed dispersal<br>▪ Some have behaviours that signal certain occurrences like onset of rain, approaching tide, earthquakes, etc.<br>▪ Wild animals destroy farms and compete for land/pastures | ▪ Most wild life in settlement areas along the coast have disappeared<br>▪ Few in scattered locations (monkeys, wild pigs, etc. which strive in the small pockets of coastal forests left) | ▪ Land clearing has destroyed their environment<br>▪ In Moa there has been an increase in the population of wild pigs and monkeys after the nearby sisal estate was abandoned and reverted to bush. |
| 15. Domestic animals and birds | ▪ Meat, milk, eggs<br>▪ Draft animals<br>▪ Plant seed dispersal | ▪ Few larger animals (cows/bulls) found in Chwaka and Matemwe; number is increasing and used extensively for transport<br>▪ Moa had larger heads in the past and even built a wall across their boarder to keep away cattle rustlers | ▪ Increasing demand for meat, milk and eggs<br>▪ Draft animals reduce drudgery<br>▪ Many owners operate oxcarts for business (Unguja and Pemba) |

The participants discussed the role of the various coastal natural resources in mitigating natural disasters and the need to ensure they remain in proper condition. The more frequent occurrences of natural disasters were stressed and

the vulnerability of coastal communities to ocean related disasters was brought on board.

Participants prepared vision plans on actions needed to address the problems as an effort to salvage deterioration of the natural resources. They also brainstormed what services they would need to achieve their objectives. Service providers on their part suggested ways to improve delivery of appropriate service through participatory approaches. They used the past and present illustrations/sketch maps to plan the future actions and prepared the future vision maps of their areas. The preparations were presented in the following plenary session. Suggestions and comments to improve the plans were noted.

Gaps on policies and related guidelines and programmes were discussed. Then participants discussed roles and involvement in the management of disasters and the need for preparedness. Disaster management cycle and needed actions in dealing with the effects were brought to light.

At the end of the workshop participants proposed Multi-stakeholder Participatory Learning Groups for each site to sensitize their fellow community members on the learning process and need to conserve the existing resources through collective actions.

The following were general findings and observations from the workshops:

I. Despite the realization of the many uses of the coastal natural resources to meet the needs of the communities, over-utilization and mismanagement ware reported. Reasons given for the over-utilisation include population increase sharing same resource(s), lack of alternative employment opportunities, and competition for alternative natural resources use (tourism, industry, housing estates, and construction materials) and selfish individual actions (such as use of dynamite to blow coral reefs for fish or lime mining).
II. Unclear governance and rights of use of existing natural resources. This includes government owning most of the shared natural resources without clear description of the role of communities on ownership, utilization and/or conservation; conflicting role play by different sector ministries (like sector ministries allocating seaside plots, salt pans or industry on mangrove reserved areas or issuing permits for harvesting resources being conserved by communities without them being consulted); and outdated laws that impose unrealistic (low) penalties or weak implementation of the natural resources protection laws.
III. There have been appreciable efforts and actions through various projects to sensitize and assist local actions by the communities in the study sites about sustainable natural resource use and conservation. This has been done through adoption of the rights based approach assisting communities to act from bottom up so that these resources which are basic to their livelihood security are not wasted away by irresponsible selfish stakeholders. It was found out that these community based groups to spearhead conservation of

the existing natural resources have been initiated in Chwaka, Wambaa and Kunduchi Pwani, and others are in the making.

IV. Less awareness creation has been done on the role of the natural resource base to reduce the effects of natural disasters. Linked to this are the slow effects of resource destruction which are not easily noticeable right away but take cumulative process and in most cases are realised when situations have reached critical stages. Only the elderly participants were able to narrate the past disaster situations and when the resources were prime.

### 3.2.3.2 Discussion and Conclusions from the MPLA workshops

As summarised in Table 17 above, on the utilization and trends, the most important resources associated with disaster mitigation and critical to the livelihoods of the poor are discussed in more detail below.

**Land**

Land is an important resource to all human beings anywhere. Most livelihood earning activities are based on some type of investment on the available land. During the workshops participants shared experiences about their available land becoming scarce as days go by and population increasing rapidly. The land space remains constant or is getting smaller due to erosion.

Participants shared experiences on their land near the shore being eroded and/or submerged under water. Mushala H.M., (1983) reported that processes of erosion, sediment transportation and accretion on the coast and its environment are common and are threatening a lot of private and public property along the shore in Kunduchi area Dar es Salaam. Francis *et al* (1997) reported estimated extent of beach erosion of up to 5 m/year over 12 years in front of Silver-sands and Kunduchi Beach Hotels, 5m over previous years at Mikindani Township and 2.5m/year at Unguja Ukuu beach (Unguja). This situation is threatening the properties of most people living along the beaches, and others have lost their farms, houses and even roads.

Participants reflecting on what used to be in the past concluded that much as their previous actions have accelerated degradation of the existing natural resources including land, there is the urgent need to seriously conserve and take actions to scale down erosion processes and support all the ongoing programmes aimed at salvaging the situation. Francis J. *et al.,* 1997 concluded that coastal erosion in Tanzania is a serious problem affecting all types of shorelines and recommends campaigns to raise public awareness on the causes of coastal erosion and undertake detailed studies, monitor causes and embark on mitigation options to address the problem.

Participants were also concerned on their land being bought away by investors leaving the poor community groups with less per household. The value of land is also getting higher as demand for seaside plots is increasing but without any proportionate economic gains on the part of the communities. The situation is

also threatening the future of the fishers since they may end up with no access to the sea. This is probably being aggravated by policy gaps/enforcement and governance issues related to utilization and management of this important resource as discussed elsewhere in the report. The fertility of existing farmland is low due to bad farming practices and/or bad alternative use practice such as on site lime production. These have made the coastal communities more vulnerable to disasters due to low income.

Different methods of conservation measures to stop sea encroachment have been proposed which include replanting mangroves where they strive well, increase the current set back line of 60m from the highest watermark and explore alternative cheap building materials to limestone and alternative sources of energy against wood fuel (Francis J. *et al*., 1997) and construction of sea walls. (Mushala H.M., 1983), However Mushala points out that measures devised to combat the situation but directed to only particular sites like walls and or stone rip rap as it was done at Kunduchi Beach Hotel and Africana Hotel do not generally solve the problem since long shore drift is not confined to small locations but to the entire expanse of the beach. Such isolated actions are affecting the unprotected areas of the poor community members.

In Kunduchi Pwani participants complained of their beach being severely eroded and houses close to the beach severely damaged as a result of construction of sea walls and rock (riprap) deposited at the end of the beach by the owners of adjacent hotels to stop tides encroaching their respective areas. As a result the unprotected beach and settlement in the fishing village is now being eroded fast and houses collapsing under water. (Figures12)

***Figure 12: Effects of wall construction and stone riprap by Kunduchi Hotel on Kunduchi Pwani Fishing Village***

**Ocean outcrops: (islands, coral reefs, and sand dunes)**
Participating artisanal fishers were able to identify location of ocean feature such as islands, rock outcrops, coral reefs and small islands that exist in the areas they frequent for fishing activities. Close to the shores (mainland and the Islands) there are small islands, raised coral reefs and reef rocks in the ocean. According to Dubi *et al*, 1999 these shelf features, particularly submarine depressions, banks, and reefs are important features that influence coastal processes. In the case of ocean currents and tides these features help to diffuse the strength and speed before reaching the shore. Participants shared experiences and importance of these features in the wake of a tsunami, hence the need to avoid dynamiting them for short-term gains and long-term detriment.

Natural processes leading to disappearances of ocean features exist. An example is the disappearance of Maziwi Island in Pangani. Originally the Island (500 to 600m diameter) was elevated about 2m above maximum high tide level and vegetated up to 25m trees and shrubs. At the time of a study in 1992 the largest part of Maziwi Island was a shallow coral reef flat reaching the sea level only during low tides. According to Fay (1992) the submergence of the island

could have been caused by erosion due to extraordinary heavy storm events, wave erosion due to higher sea level or significantly changed long term wave climate or a combination of the above events or a rapid subsidence caused by an earthquake.

Coral reefs form an important environment for fish and other invertebrates. They are known to be the home of about 4,000 fish species and a variety of spongy molluscs and other invertebrates (Shao, F.M., *et al.,* 2003). In Tanzania coral reefs and the surrounding waters provide habitats for many important fish species that are hunted for the market. Some animals which typically live in other coastal habitats such as the open sea and sea grass beds are associated with coral reefs only during certain life phases or activities like reproduction, nursery or feeding. Thus coral reefs form a very important fishing ground for artisanal fishers. Reefs also act as shelter to many sea creatures and reduce the strength of ocean currents before reaching the shore that could cause erosion.

Fisher participants to the workshop shared their experiences of fish catch in the past compared to the present. They reported increasing scarcity of fish as days go by. Some of the most commonly hunted ones are becoming extremely rare. Among the reasons pointed out include over fishing in the same sports, increased number of fishers and illegal fishing methods particularly dynamite fishing and use of beach seine.

Dynamite fishing has been practiced in Tanzania since 1960s. Due to its wide spread and common use virtually all coral reefs along the Tanzanian Coast have been badly damaged. (Guard, and Masaiganah, 1997). This method is by far the most destructive ever. Each blast kills all fish and most other living organism within a 15 to 20 meter radius and completely destroys the reef habitat itself within several meters (Wagner 1997). The reef will not recover for many years. Therefore, bad fishing practice does not only lead to unsustainable income to fishers, but also destroys the environment of economically important marine organisms.

Another reef destruction human activity is coral mining (Solandt and Ball 1999). It is said that limestone originating from live coral is of higher quality. Coral bleaching is mentioned as another cause of reef degradation. Bleaching is a result of seawater pollution and erosion by strong ocean currents. Boat grounding and anchoring also cause considerable damage to coral reefs (Wagner, 1999). Improper use of seine nets (beach seine) when dragged on the bottom they capture the juveniles and damage the coral and sea grass areas disturbing the spawning ground environment. (Shao *et al*. 2003 and Wagner 1999). The suggest that severely degraded reefs require more than protection. Deliberate human intervention is required in order to accelerate recovery of coral reef ecosystems. Recovery methods such removal of sediments and rubble resulting from blasts and/or coral planting on damaged coral reefs are possible options.

Efforts to restore coral reefs are being done in few places like off the coast of Kunduchi Beach and Mbudya Island. The Marine Parks and Reserve Unit, Kinondoni Integrated Coastal Area Management Programme and local community organizations are doing this through collaborative efforts.

**Mangroves**

Participants presented and discussed the many uses of mangroves in their area. They include supply of local needs for fuel wood, charcoal making, fences, house construction boat building, fish traps making and medicine. Traditionally mangroves were harvested without causing serious damage. Later commercial harvesting increased the pressure on these forests coupled with clearing to open the land for other uses resulting in the current pathetic situation. Semesi 1988 found out that all villages along the /…?of Tanga utilize mangroves and that the rate of cutting had increased over the years and that in most places natural vegetation was sufficient for the re-establishment of the forest, provided that the level of harvesting was regulated.

The mangrove ecosystem provide protection to many fish species, molluscs, crabs and prawns in addition to being an important breeding ground for many fish species including some deep sea types. It provides protection to spawning fish species from predators and currents. Land protection against erosion by strong tides has been mentioned.

Discussing the mangrove trends participants were concerned about the over utilization of the resource and were very bitter about recent clearance of mangrove land in some sites to give way for beach front hotels and residential houses (Kunduchi Beach, Mbweni, Ununio, Wambaa and Matemwe).

After clearing mangroves some of the beach hotels are now faced with sea water washing away the beach and are forced to construct stone walls (Africana Hotel). The walls are also diverting the sea water currents causing intrusion into unprotected settlements in the oposite fishing village (Figure13)

***Figure 13: Effects of Mangrove clearing and efforts to construct walls by African Hotel***

Mangrove restoration programmes are underway in Chwaka, Kunduchi Pwani and Moa with support from various NGOs and donors in collaboration with the local communities. In Tanga the programme under the Tanga Coastal Zone Conservation and Development Programme financed by The Irish Government has done a commendable job in restoring mangroves in the area. Participants from Moa reported improved mangrove vegetation cover and increased fish catch in resent years after conservation efforts in the last decade. This may also serve as protective resource against disasters that may be caused by strong winds, cyclones, tsunami and beach erosion.

**Coastal forests**

The lowland coastal forests of the coast have a high level of species richness and are important to local people as resource base. Participants discussed the uses of coastal forests including source of high value forest products important to the livelihoods of the poor and watershed protection. These forests are under threat from a range of unsustainable human activities such as shifting cultivation, charcoal production, fuel wood collection and pole cutting. As human population expands agricultural areas continue to expand into forest areas. In the study areas most of these forests have disappeared except Mwakangale (Ngezi Forest

in Pemba). Only small-scattered pockets are left. Near Dar es Salaam charcoal production, timber extraction and mining are additional problems. Deforestation may lead to drought, consequently hunger.

Showing the importance of community participation, the representative from the communities were able to prepare sketch maps of their Shehia/Mtaa/Village and identify the available natural resources surrounding their areas that they use as their main resource base for their livelihoods. In the course of this activity and the surveys during the study they became even more sensitized on the role of natural resources in mitigating impact of natural disaster occurrences associated with coastal environments.

**General**

In the course of preparing sketch maps of their Shehia/Mtaa/Village and sharing experiences in the participatory learning workshops participants identified the available natural resources surrounding their areas which they use as their main resource base for their livelihoods. They were also sensitized on the role of natural resources in the mitigation of natural disasters in the coastal environment. There have been appreciable efforts and actions through various projects to sensitize the communities in the study sites about natural resource conservation and awareness creation on the declining resource base. It was found out that community based groups to spearhead conservation of natural resources have been initiated in Chwaka, Wambaa and Kunduchi Pwani, and others are in the making. These efforts need to be scaled up. Whereas they are operative they need resources to push forward this noble cause. The coalition-learning groups formed to sensitize others on the need for sustainable utilization and conservation of the vital resource base need to share experiences (where they exist) to widen the stakeholder involvement in the process, which is vital for common resource utilization and conservation. These learning groups will need financial, moral and logistical support to get started and move on.

The MPLA methodology as used in this study is a useful tool to enable communities sit together to share accumulated knowledge and learn how to manage their common natural resources sustainably for their livelihoods and reduced vulnerability to coastal natural disasters. The importance of participatory approaches in community activities and the resource mapping helps them to brainstorm where they went wrong and what collective actions are needed to improve the situation. Further more the tool on the role of natural resources in mitigating the impact of disasters is important, as it stresses the need to conserve the existing natural resources as part of their preparedness against natural disasters.

### 3.2.4 Findings form the National Stakeholders Workshop

The workshop agreed with the major findings of the field survey that policies, regulations and laws regarding conservation of the coastal natural resources have not been implemented and or enforced, resulting in misuse/overuse of the

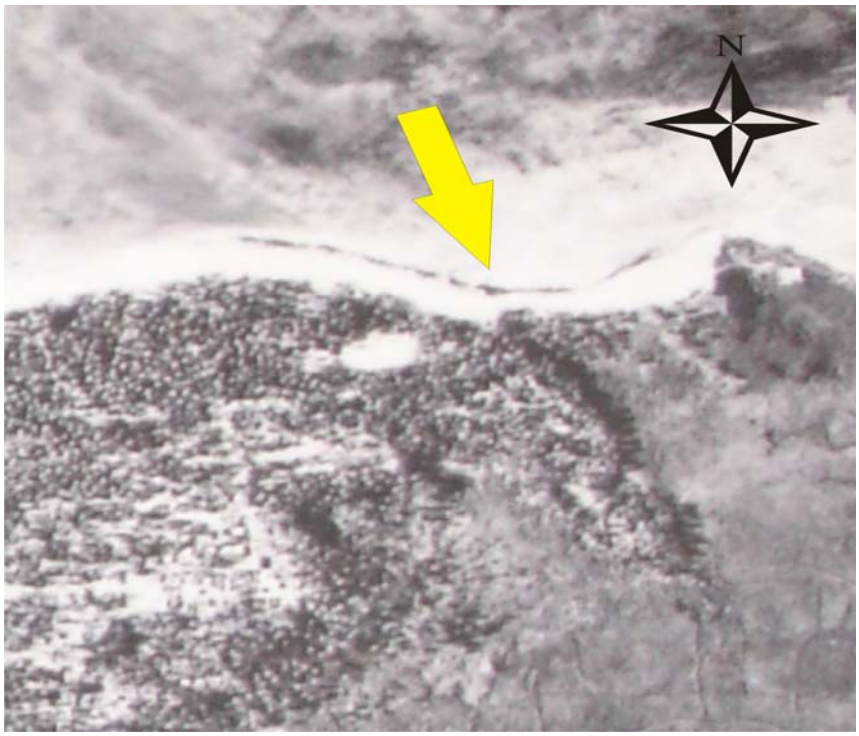
resources. This has caused serious land degradation/erosion and disappearance of some of the important coastal natural resources such as mangroves fish species and coral reeves. This has in turn made the certain areas highly vulnerable to coastal natural disasters.

On coastal land erosion the workshop emphasized the need for action to address the serious coastal erosion which to a large extent has been caused by indiscriminate clearing of mangroves to establish ocean front buildings and settlements along the coast. They observed that the speed of erosion is serious in many areas. In Nungwi Unguja aerial photo observations revealed noticeable erosion of the coastline between 1977 (A) and 2006 (B) (Figure 14). Linked to the erosion problem are the effects of sediment transportation and deposition on to coral reefs and other fish breeding sites which are slow but take cumulative process and in the end cause serious negative effects on the ocean ecosystem and current flow.

**Figure 14: Coastline erosion at Nungwi in Unguja**

*(Cutesy of Department of Lands and Registration Zanzibar)*

A




***Nungwi in 1977***

B


***Nungwi in 2006***

# 4. OVERALL DISCUSSION AND CONCLUSIONS

Overall, the three approaches used in this study which involved review of literature and policies, field surveys using questionnaire and key informant interviews and MPLA workshops have brought to light the status of coastal natural resources and their role in mitigating the impact of coastal natural disasters and identified the policy, governance and rights issues underlying vulnerability to coastal natural disasters. These have been discussed in the relevant chapters. Strategies have also been proposed for strengthening the community preparedness, capacity to reduce vulnerability and mitigate impact. The multi-stakeholder participatory learning approach (MPLA) workshops and other participatory discussions helped to create awareness and education among the stakeholders involved.

As most of the coastal natural resources are shared (sea, fish, forests, mangroves, land etc) the policy, governance and rights issues that affect their management and the underlying community vulnerability to natural disasters were explored. Lack of awareness of the policies by the communities, lack of clarification on the governance and rights of ownership, management and utilization of the resources and limited knowledge of the governing regulations on their use are some of the causes for their mismanagement, overexploitation and in some cases destruction.

Through the multi-stakeholder participatory learning workshops awareness was created among the target communities on the link between sound natural resources management and disaster preparedness and mitigation. Participants to these learning workshops are considered sensitised groups and back to their respective communities will sensitize the rest of the communities on the approach and learn together how to manage their natural resources for improving their livelihoods and disaster mitigation. At the same time learn what needs to be done in the case of disasters. However these groups need support to get started.

Based on the lessons learned from the Indian Ocean tsunami regarding the link between coastal natural resources and preparedness and mitigation of impacts of natural disasters, programs of education and awareness creation among coastal communities is crucial. Such learning can be achieved through school programmes and MPLA learning groups when they are fully established.

Early warning information though institutions such as TMA is very important to sensitize preparedness and take necessary steps when there are indications for an impending disaster. It is time communities learn how to act and pass on such warnings when received. At the same time responsible institutions (DMD and TMA) need to strengthen the means of transmitting emergency warnings with increased efficiency so that it reaches the actors on time.

Efforts being done through projects and programmes to manage the coastal natural resources need to assist communities to understand related policies, laws, bylaws and regulations and their enforcement to ensure sustainable management and utilization. Through learning what their rights are on use of these resources (rights based approach) and their roles in making sure they are managed in a sustainable manner, they will be able to avoid conflicts over their use, ensure they are in reasonably sound condition and therefore reduce their vulnerability to coastal natural disasters.

There is lack of effective early warning set up among the communities or even service providers in both Mainland Tanzania and the Islands. Local knowledge on how to sense an impending disaster is not there or if any it is not clearly understood by many. In most cases past knowledge has been lost. There is need to recollect such accumulated knowledge and have it published for distribution. Such material will be useful to train communities in different places on how to act if they see any signs of an impending disaster. This is important in terms of preparedness and reducing vulnerability when one knows how to act properly before the danger sets in.

Lack of or poor enforcement of policies, laws and regulations regarding beach houses construction including observing the set back line of 60 meters from the highest water mark in constructions on the beaches and construction of walls has resulted in beach erosion and some houses and structures especially for the poor being washed away by sea walls. The setback line is meant to save investments from being washed away by sea waves through erosion and minimize impacts of other natural disaster such as the tsunami. It is proposed that the setback line is increased to 100 meters or more. Programmes to establish natural barriers such as mangroves involving all beach dwellers should be instituted to avoid construction of walls by a few capable property owners seriously affecting those who can not afford walls.

## *6. RECOMMENDATIONS*

The ICM and the national sectoral policies (land, fisheries, forestry, environment, tourism, agriculture and others) while they support an integrated and participatory natural resources management approach to resolve cross cutting issues, it is recommended that they also be streamlined to adopt aspects of disaster management.

The National Strategy for Growth and Reduction of Poverty (NSGRP) recognizes the need for national economic growth and development to withstand shocks due to natural and man made disasters causing losses of life and property as well as destruction of environment and calls for definitive policy and resources for disaster management (preparedness, mitigation and response). It also recognizes that poor section of the population rely heavily on natural resources and are most vulnerable to natural disasters. This study found that most of the people in the study areas are poor fishers or farmers. This makes a strong case for formulating policies, strategies and programs that will protect the poor against these natural disasters as part of the national development strategy.

The coastal communities, both male and female claim the right to own and utilize the coastal natural resources in the study area which include mangroves, fish, coastal forests, sea grass, coral reefs, land, sea, rivers, limestone and beautiful beaches. Most of these resources are reported to have declined or disappeared in some places. The reduction has been linked to mismanagement by the same communities due to unclear rights of ownership and use. There is need for government to clarify on the ownership, management and utilization of the coastal natural resources in order to ensure their sustainability. At the same time those communities who have started taking actions on conserving these resources, particularly the mangroves and coral reef; they should be supported to strengthen these efforts. The actions have been linked to on going projects or programmes such as the Kinondoni Integrated Coastal Area Management Programme and the Tanga Coastal Zone Conservation and Development Programme. The excellent participatory and co-management initiatives should be extended to all coastal communities.

Due to lack of clear implementation plans and the needed resources within the other implementing sectors, the Disaster Management Department is sometimes forced to implement the policy instead of coordinating. For better implementation of the policy and mainstreaming the disaster management component there is need to build the human and financial capacity at all levels in the other sectors.

There is lack of effective early warning set up among the communities or even service providers in both Mainland Tanzania and the Islands. Local knowledge on how to sense an impending disaster is not there or if any it is not clearly understood by many. In most cases past knowledge has been lost. There is need to recollect such accumulated knowledge and have it published for distribution.

Such materials will be useful to train communities in different places on how to act if they see any signs of an impending disaster. This is important in terms of preparedness and reducing vulnerability when one knows how to act properly before the danger sets in.

Early warning information though institutions such as TMA is very important to sensitize preparedness and take necessary steps when there are indications for an impending disaster. The Tanzania Meteorological Agency and The Disaster Management Department should improve facilities for early warnings of severe weather and extreme climate events such as heavy rains, floods, tropical cyclones, strong winds and tsunami. It is also time communities learn how to act and pass on warnings information to others when received.

Knowledge of the policies, laws and bylaws on the conservation of the coastal natural resources and their observation is highly desirable for sustainable management and utilization of these resources. They are supposed to protect resources against destructive actions. Lessons from some of the worst tsunami affected countries indicate that the laws and rules and regulation on the coastal resource management had been ignored. Some of the laws are outdated. Proper enforcement and updating these laws or amend some of the rules will help to protect the resources.
In particular there is need to increase the current set back line of 60m from the highest watermark to say 100 to 300 meters in view of the speed with which the beaches are being eroded when the mangroves are cleared for tourist activities and seaside house.

It is also important to explore alternative cheap building materials to mangrove poles and limestone and alternative sources of energy against wood fuel.

In both Zanzibar and Tanzania Mainland the tsunami was observed as an unusual frequency of high and low tides or strong waves with increased water speed. Most people did not take any action or stayed calm and looked at the event. This was a result of low or lack of awareness on this type of disasters, and therefore did not know what they should do to save their lives should the situation became worse. There is lack of effective early warning set up among the communities or even service providers. Local knowledge on how to sense impending disaster has been lost. There is need to recollect such accumulated knowledge and have it published for distribution. Such material will be useful to train communities in different places on how to act if they see any sign of an impending disaster.

Low-lying areas are common in the coastal belt. Such areas are prone to coastal natural disasters. Those who have settled in lower areas of Chwaka, Matemwe (in Unguja), Wambaa (in Pemba), Mbweni Ununio, Kunduchi Pwani and Moa on the Mainland and other similar places are highly vulnerable to flooding due to sea rise and or a tsunami like the 26$^{th}$ December 2004 occurrence. These places

require scaling up conservation programmes such as forest and mangroves planting and conservation, coral reef conservation and other natural resource management actions to reduce the impact of any ocean associated natural disaster. Increased knowledge on preparedness is also important.

Education is fundamental to building an informed community and to ensure that future generations are equally prepared. Public awareness should be an integral part of school education system. The MPLA methodology as used in this study is a useful tool to enable communities to share accumulated knowledge and learn together how to manage their common natural resources sustainably for better livelihoods and reduced vulnerability to coastal natural disasters. All these require political support, laws and regulations as well as institutional responsibilities.

.

## 7. REFERENCES


Clarke, Sir Arthur C. (2005) The Day after Tsunami: New Waves os Human Spirit and Perseverance in Sri Lanka, Daily Mirror (Colombo), January 15, 2005

Clive Lightfoot, Ricacardo Ramirez, Annemarie Groot, Reg Noble, Carine Alders, Francis Shao, Dan Kisauzi and Isaac Bekalo, (2003): Learning our way Ahead: Navigating institutional Change and Agricultural decentralization. International Institute for Environment and Development (*iied),* Sustainable Agriculture and Rural Livelihoods Programme

De Satge et al, (2002) Learning about Livelihoods, Insights from Southern Africa, Peripri and Oxfarm , Southern Africa

Dubi, A.M. and Nyandwi N. (1999): Preliminary studies for the mitigation and control of coastal erosion at Kunduchi Beach, Dar es Salaam. Institute of Marine Sciences Report No IMS/1999/01).

Fay, M.B. (1992): Maziwi Island off Pangani (Tanzania): History of its destruction and possible causes. UNEP Regional Seas Reports and Studies No. 139.

Francis J., Nyandwi J., and F.E. Msuya (1997): Interdisciplinary survey on the status and socio-economic impacts of coastal erosion along the Tanzanian coastline and Islands. Institute of Marine Sciences, Zanzibar. Report commissioned by UNESCO, Nairobi.

J. C. Horrill: Collaborative Fisheries Management in the Tanga Region; IUCN Tanga Coastal Management Project.

Kompas, 2005. Simeulue Ternyata Belum Tersenthuh. April 01, 2005. http://www.kompas.com/kompas-cetak/0504/01/UTAMA/1656882.htm

Monica Gorman (1995): Report on Socio-economic Study / Participatory Rural Appraisal; Tanga Coastal Zone Conservation and Development Programme; March/April 1995.

Mushala H.M. (1983): Beach Process and Coastal Landform Evaluation around Da es Salaam. In (J.R. Maine, P.O.J. Bwathondi and H.B. Pratap, eds.) *Proceedings of the workshop on the current state and development of Marine Sciences in Tanzania*. Zanzibar. 2-8 April 1982 pp. 55-65.

Peter Sumbi (2002): Conservation of lowland coastal forests in Tanzania by developing alternative to forest overexploitation. http://www.earthwarch.org/europe/upcom.html.

Prem Chandra Athukorala and Budy Resosu darma, (2005): The Indian Ocean Tsunami; Economic Impact. Disaster Management and Lessons Learned. *In* Asian Economic Papers.

Revolutionary Government of Zanzibar, Ministry of Agriculture, Livestock and Natural resources Zanzibar ( ): National Forest Policy for Zanzibar 18p

Revolutionary Government of Zanzibar, Ministry of Trade, Industry, Marketing and Tourism, (2004): Zanzibar Tourism Policy 43p

Revolutionary Government of Zanzibar, Ministry of Agriculture, Natural Resources, Environment and Cooperatives, (2000): Department of Fisheries and Marine Resources, Fisheries Policy for Zanzibar.

Shao, F.M., Bisanda, S., Lamosai. (2003): Proceedings of the Multi-stakeholder Participatory Learning Sensitization Workshop – Mbeya and Iringa Regions, Tanzania; Baptist Center Iringa; 16th -18th September 2003.

Shao, F.M., Mlay, E.E. and Mushi, V. (2003): Understanding Fisheries Livelihoods and constraints to their Development: Review of Marine Fisheries for Tanzania. DFID Project report. (April 2003).

Semesi A.K. (1988): Status of Utilization of mangroves along the coast of Tanga, Tanzania. *In* Ecology and Bio-productivity of the Marine Coastal Waters of Eastern Africa. Proceedings of a workshop jointly organized by the University of Dar es Salaam and UNESCO/ROSTA. Dar es Salaam, Tanzania, January 18 – 20.

Solandt, J.L. and Ball, R. (1999): Coral mining in Mikindani Bay: Frontier – Tanzania Marine Research Programme. The Society of Environmental Exploration and the University of Dar es Salaam. 6pp. (3).

Tata Institute of social Sciences (2005): The State and Civil Society in Disaster Response – An analysis of the Tamil Nadu Tsunami experience.

UNESCO-IOC; UN-ISDR/PPEW, WHO Expert Mission to Indian Ocean Countries to Assess Requirements and Capacity for an Effective and Durable National Tsunami Warning and Mitigation System, Tanzania, Dar es Salaam, 16-17 June 2005. Paris. UNESCO 2005. IOC Mission Report No. 26.

University College of Lands and Architectural Studies, John Hopkins University and Disaster management of Prime Minister's Office (2005): Disaster Vulnerability Assessment Phase II Study.

UNDP (1992): An Overview of Disaster Management , Second Edition

United Nations Disaster Relief Organisation (1990)

United Republic of Tanzania, Ministry of Natural Resources and Tourism (1997): National Fisheries Sector Policy and Strategy Statement 24p

United Republic of Tanzania, Ministry of Natural resources and Tourism (2005): National Tourism policy

United Republic of Tanzania, Vice President's Office, (2005); National Strategy for Growth and Reduction of Poverty (NSGRP) 73p

United Republic of Tanzania, Ministry of Agriculture and Cooperatives (1997): Agriculture and Livestock Policy 155p

United Republic of Tanzania, Prime Minister's Office, (2004): National Disaster Management Policy and Guidelines

United Republic Tanzania, Vice President's Office, (2003); National Integrated Coastal Environment Management Strategy 52p

United Republic of Tanzania, Vice President's Office (1998); The National Poverty Eradication Strategy 58p

Wagner, G.M. (1997): Impact of fishing including dynamite fishing) on coral reefs. *In* Johnstone, R.W., Francis, J., and Muhando, C.A. (eds.), Coral reefs: Values, Threats and Solutions. Proceedings of the National Conference on Coral Reefs, Zanzibar, Tanzania. 2 – 4. Institute of Marine Sciences, Zanzibar: 38 – 44.).

Wagner, G.M. (1999): Coral reefs: Importance, threats, conservation and restoration. *In* Howell, K.M. and Semesi, A.K. (eds), Coastal resources of Bagamoyo District, Tanzania. Proceedings of a workshop on coastal resources of Bagamoyo. 18 – 19 December 1007, Bagamoyo. Faculty of Science, University of Dar es Salaam: 27 – 32).

Wetlands International-Indonesia Programme 2005. Tsunami of Aceh and North Sumatra 26 December 2004. (http:www.wetlands.or.id )

World Bank (2001): Country study. Tanzania at the turn of the Century; From Reforms to Sustained Growth and Poverty Reduction

.

# 8. APPENDICES

## *Appendix 1: Detailed Terms of Reference for the Assignment*

**TERMS OF REFERENCE FOR THE ASSIGNMENT TO ASSESS VULNERABILITY TO AND PLAN TO MITIGATE IMPACT OF NATURAL DISASTERS IN THE COASTAL AREAS OF MAINLAND TANZANIA AND THE ISLANDS OF ZANZIBAR**

**Background**
CARE Tanzania has been strengthening capacity of communities in Tanzania to manage their natural resources and improve livelihoods since 1995. CARE's work around peripheral forests of Dar es Salaam, and coastal communities of Jozani Chwaka Bay Conservation Area (now a National Park) on Zanzibar, and Misali Island in Pemba has been undertaken within the context of integrated conservation and development models, which seek to help communities balance their needs for resources with biodiversity interests, with the overall aim of improved livelihood security. While traditionally CARE's approach to strengthening natural resources management and livelihoods security has not emphasized disaster preparedness, the Tsunami of Dec. 26, 2004 served as a reminder to the world about the need for such preparedness, as well as the vital role sound natural resources management and intact ecosystems play in mitigating impacts of coastal storms, cyclones and tsunamis. Tsunami therefore highlighted the importance of integrating concepts of disaster preparedness into conservation and development programs; and provided valuable opportunity for raising awareness and stimulating actions on the links between natural resources management and natural disaster impact mitigation in coastal communities.

At this point, CARE Tanzania is engaging a consultant to carryout participatory research process in coastal communities to identify the policy, governance and rights issues affecting the management of mangroves and other natural resources that result in their and community vulnerability to natural disasters. While the research will be limited to specific communities of Tanzania mainland and Zanzibar, it is anticipated that the issues identified will be pertinent to other East African coastal community contexts, and lessons learned will be of use to other CARE Country Offices and organizations

Reporting to the RNE Sector Coordinator, the consultant therefore will work with CARE according to plan of activities to be agreed on the inception of the assignment described below.

**Overall objective**
To identify policy, governance and rights issues underlying vulnerability to natural disasters and develop strategies for strengthening community preparedness capacity to reduce vulnerability and mitigate impact.

**Specific objectives**
- To develop a methodology for examining land and resources related governance, rights and policy issues as relate to community preparedness and response to natural disasters and livelihood security.

- To explore and document policy, governance and rights issues that affect the management of shared coastal natural resources and the underlying community vulnerability to natural disasters in the coastal areas of mainland Tanzania and Zanzibar Islands.

- To raise awareness about the linkages between sound natural resources management and disaster preparedness in target communities.

- To inform the development of program of action to assist communities to improve governance, reduce conflicts over mangrove and other vegetation areas and reduce their vulnerability to natural disasters. *(To be undertaken as potential follow-on work to this research supported by additional funding)*

**Expected Outcomes**

- Methodology developed for examining land and natural resources related policy, governance and rights issues as they relate to community preparedness and response to natural disasters and livelihood security

- Relevant policy and legislation issues including weaknesses and opportunities regarding natural resources and natural disaster management both on mainland Tanzania and Zanzibar Islands identified and documented

- Increased community, district and national level awareness on disaster preparedness

- Specific strategies for tackling policy, governance and rights issues affecting mangroves and coastal thicket management and vulnerability to natural disasters identified and documents

**Proposed study sites**
The study will cover four sites altogether and involve up to 8 villages. The two sites proposed for Tanzania Mainland are Dares Salaam (Mbweni, Ununio and Kunduchi Fishing Villages) and Tanga (Moa, Muheza). For Zanzibar Islands, the

proposed sites are the Jozani – Chwaka Bay National Park in Unguja and Misali Marine Conservation Area in Pemba.

**Timeframe**
The exercise shall be undertaken for 75 days spread within a period of 4 months from February 2006 to end of May 2006.

***Appendix 2: Implementation Plan***

| S/N | Main activity | Sub-activity | Inputs | Responsible | Location | Period of implementation | Expected outputs |
|---|---|---|---|---|---|---|---|
| L1 | Contract protocol | Contract signing | - | CARE / FANRM | Dar | 4th wk of February | ▪ A signed contract |
| L2 | Project briefing | Laying out implementation groundwork | -Man-day inputs<br>-Joint meeting | FANRM<br><br>CARE | Dar | 1st wk of March | ▪ Work plan document<br>▪ Overview project outline |
| 1 | Literature review | 1.1 Sourcing and review of general information, policies and strategies, documents regarding natural disasters | -Man day inputs | -Consultants | Dar | 1st wk of March | ▪ -Compiled and reviewed literature |
| | | 1.2 Compilation of literature search information | -Man day input | -Consultants | Dar | 2nd and 3rd wks of March | |
| | | 1.3 Analysis of National Policies and Strategies and identification of gaps regarding natural disasters | -Man day inputs | -Consultants | Dar | 1st and 2nd wks of April | ▪ Gaps and weaknesses identified |
| 2 | Data collection | Questionnaire design and testing | -Man day inputs | -Consultants | Dar | 2nd wk of March | ▪ Final version of questionnaire |
| | | 2.2 Field data collection | -Man day inputs | -Consultants<br>-Field Assistants | Unguja<br>Pemba<br>Dar<br>Tanga | 3rd wk of March<br>4th wk of March<br>5th wk of March<br>3rd wk of April | ▪ Data collected |
| | | 2.3 Site data analysis | -Man day inputs | Consultants<br>CARE staff | Dar | 1st and 2nd wks of April | ▪ Analyzed data on specific sites |
| 3 | MPLA workshops | 3.1 MPLA | -Man day | Consultants | Unguja | 3rd wk of March | ▪ Problems associated with |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | workshops 1 – 4 | input | CARE staff | Pemba<br>Dar<br>Tanga | 4th wk of March<br>5th wk of March<br>3rd wk of April | natural disasters in Tanzania coastal environment identified<br>▪ Coastal natural resources that reduce the effects of natural disasters and others mapped<br>▪ Increased awareness on disaster occurrence and preparedness<br>▪ Resources management problems identified<br>▪ Established link between natural resources and disaster management<br>▪ Community vision plans on resources management to mitigate natural disasters<br>▪ Sensitization groups formed |
| | | 3.2 Workshop proceedings compilation | Man day input | -Consultants | Dar | 4th wk of April | ▪ Workshop proceedings document |
| 4 | Report preparation | 4.1 Overall data analysis | Man day input | -Consultants | Dar | 1st wk of May | ▪ Analyzed data |
| | | 4.2 Draft report preparation | Man day input | -Consultants | Dar | 2nd and 3rd wks of May | ▪ Draft report |
| | | 4.3 Draft report submission/review | Man day input | -Consultants<br>-CARE | Dar | 4th wk of May | ▪ Reviewed report |
| | | 4.4 Dissemination of results at National level | Man day input | -Consultants<br>-CARE | Dar | 4th wk of May | ▪ Increased community, district and national level awareness on natural disasters and preparedness<br>▪ Shared information and experiences on disaster management |
| | | 4.5Final report preparation and submission | -Man day input | -Consultants | Dar | 1st and 2nd wk of June | ▪ Final report and submitted |

## Appendix 2a: Schedule of activities

| A/N | | Months/Weeks/Days[1] (in the form of Bar Chart) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Feb 06 | | March 06 | | | | April 06 | | | | May 06 | | | | June 06 | M'day |
| | | Wk4/Wk1 | | Wk2 | Wk3 | Wk4 | Wk5 | Wk1 | Wk2 | Wk3 | Wk4 | Wk1 | Wk2 | Wk3 | Wk4 | Wk1&2 | Total |
| L1 | **CP** | | | | | | | | | | | | | | | | 0.5 |
| L2 | **PB** | | | | | | | | | | | | | | | | |
| 1 | **LR** | | | | | | | | | | | | | | | | 3.5 |
| 2a | **QDT** | | | | | | | | | | | | | | | | 3.0 |
| 2b | **FI/PWT** | | | | | | | | | | | | | | | | 18.0 |
| 2c | **DA** | | | | | | | | | | | | | | | | 4.0 |
| 3a | **WS1** | | | | | | | | | | | | | | | | 8.0 |
| 3b | **WS2** | | | | | | | | | | | | | | | | 8.0 |
| 3c | **WS3** | | | | | | | | | | | | | | | | 8.0 |
| 3d | **WS4** | | | | | | | | | | | | | | | | 8.0 |
| 3e | **WSPC** | | | | | | | | | | | | | | | | 4.0 |
| 4a | **DRP** | | | | | | | | | | | | | | | | 6.0 |
| 4b | **DRS/R** | | | | | | | | | | | | | | | | |
| 4c | **FRP** | | | | | | | | | | | | | | | | 4.0 |
| | Total | | | 7.0 | | | | | | 54.0 | | | 10.0 | | | 4.0 | **75.0** |

**Key**

L = Logistics activities
CP = Contract protocol
PB = Project briefing
LR = Literature review
QD = Questionnaire design and testing
FI = Field investigations/ Preparation of workshop tools
DA = Data analysis
WS1 = Workshop 1
WS2 = Workshop 2
WS3 = Workshop 3
WS2 = Workshop 4
WSPC = Workshop proceedings compilation
DRP = Draft report preparation
DRS/R = Draft Report submission/Review
FRP = Final report preparation

## *Appendix 3 : Questionnaire for village/shehia communities*

**ASSESSMENT OF IMPACTS AND MITIGATION**
**PLAN FOR NATURAL DISASTERS MANAGEMENT**
**IN COASTAL AREAS OF TANZANIA MAINLAND AND ZANZIBAR**

### A: INTRODUCTION:

1. Name of head of household:
_____

| | | | |
|---|---|---|---|
| 2. | Sex of head of household | 1=M 2=F | |
| 3. | Age of head of household | (Year) | |
| 4 | Number of household | ……Number | |
| 5 | Name of Village/ Shehia: | ……Number | |
| 6 | Name of Ward: | ……...Number | |
| 7 | Name of District | … ……..Number | |

8. Name of interviewer: _____

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 9. | Date of interview | Day | | | Month | | | Year | 2006 |

### B: HOUSEHOLD STRUCTURE:

| | | | | | |
|---|---|---|---|---|---|
| 10. | Number of household member: | M | | F | |

(List /explore family members starting with the head of household)

| **Na** | **Jinsia** | | **Relationship with the head of household** | **Age, precise years (children below a year, put in exact months)** |
|---|---|---|---|---|
| | **1=M** | **2=F** | | |
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |

| | | | | |
|---|---|---|---|---|
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. | | | | |

**C: OWNERSHIP OF RESOURCES:**

11. (a) What type of house the family is leaving?

| | |
|---|---|
| 1 = Thatched camp and /or tents (temporary settlement) | |
| 2 = House built with mud with tree posts | |
| 3 = House built with muddy bricks | |
| 4 = House built with cement bricks | |
| 5 = House built with cement bricks, reinforced with iron bars | |

.

(b) Type of roof

| | |
|---|---|
| 1 = Thatch – in bad condition | |
| 2 = Thatch – in good condition | |
| 3 = Iron sheets – in bad condition | |
| 4 = Iron sheet – in good condition | |
| 5 = Asbestos | |
| 6 = Tiles | |

. (c) Who own the house?

| | |
|---|---|
| 1 = Head of household's family | |
| 2 = Renting | |
| 3 = Relative or friend | |

.

**D: ECONOMICAL STATUS:**

12 What is the occupation of the head of household? (Fill two options) fill the respective serial number)

| | |
|---|---|
| 1 = Peasant/farmer | |
| 2 = Livestock keeper | |
| 3 = Employed | |
| 4 = House wife | |
| 5 = Business | |
| 6 = Casual labourer | |
| 7 = Fisher | |
| 8 = Artisan (list) | |
| 9 = Fish vendor | |
| 10 = Charcoal maker | |
| 11 = Food vendor | |
| 12 = Seaweed farmer | |

| | |
|---|---|
| 13 = Fish net maker | |
| 14 = Tree cutting for business | |
| 15 = Tourism support activities | |
| 16 = Others (list) | |

13. What are three major sources of household income? There might be many answers – fill number in the respective box. (Fill number 1 for priority number one – most important; 2 for priority number two – second in importance; and 3 for priority number three – third in importance)

| | |
|---|---|
| 1 = Agriculture | |
| 2 = Livestock | |
| 3 = Formal employment | |
| 4 = Business | |
| 6 = Casual labour | |
| 7 = Fishing | |
| 7 = Artisan (list) | |
| 9 = Fish vending | |
| 10 = Charcoal making | |
| 11 = Food vending | |
| 12 = Seaweed farming | |
| 13 = Fish net making | |
| 14 = Tree cutting for business purposes | |
| 15 = Tourism supporting activities | |
| 16 = Others (list) | |

14 (a) How was the income situation in your household in years 2003 and 2005?

| **Years** | **Annual income (in Tshs)** |
|---|---|
| 2003 | |
| 2005 | |

(b) Which months of the year do you earn more than other months in your activities? (List the months and amount)

| **Months** | **Amount (T. shilling per day)** |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

( C ) Which months of the year do you earn less than other months in your activities? (List the months and amount)

| **Months** | **Amount (T. shilling per day)** |
|---|---|
| | |
| | |

| | |
|---|---|
| | |
| | |
| | |

If there is increase of income, go to question number 16.
If there is decline of income continue with the next question (No. 15)

(d) How does your household survive during months with low income?
……
……
……
……

15. What was the cause of low income? (refer the data of year 2003 and 2005 above)

| | |
|---|---|
| 1 = Drought | |
| 2 = Diseases | |
| 3 = Death of productive member(s) of household | |
| 4 = Migrating of members of household to other places | |
| 5 = Drop of price of crops | |
| 6 = Unreliable market | |
| 7 = Use of poor production tools | |
| 8 = Bad weather | |

9 = other causes (list) _____

16. What were the causes for increased income of the household? (Put number 1 for the most important cause; number 2 for the intermediate cause; and number 3 for least important cause in the respective box).

| | |
|---|---|
| 1 = Increase of manpower | |
| 2 = Secured a loan | |
| 3 = Presence of good weather for agriculture | |
| 4 = Good price for the products | |
| 5 = Reliable market for the products | |
| 6 = Increased use of better working tools/gear | |
| 7 = Good weather for fishing | |

8 = Other causes (list) _____

**E: FOOD SECURITY IOF THE HOUSEHOLD:**

17. (a) What is the household's staple food?
1 =Maize; 2 =Sorgam; 3 =Millet; 4 =Rice; 5 =Banana; 6 =Cassava

7 = other types (list) _____

(b) Which foods are eaten when there is adequate food? (Put a tick)

| **Meal** | **Mark** |
|---|---|
| 1 = Ugali | |
| 2 = Rice | |
| 3 = Meat | |

| | |
|---|---|
| 4 = Fish | |
| 5 = Chapati | |
| 6 = Pilau | |
| 7 = Biriani | |
| 8 = Cassava | |
| 9 = Bananas | |

( c) How frequent are the meals taken when there is plenty of food.

| **Frequency** | **Type of meal** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Ugali** | **Rice** | **Meat** | **Fish** | **Chapati** | **Pilau** | **biriani** | **Cassava** | **Bananas** |
| More than once a week | | | | | | | | | |
| Once a week | | | | | | | | | |
| Twice a month | | | | | | | | | |
| Once in two months | | | | | | | | | |
| One to five times a year | | | | | | | | | |
| Not at all | | | | | | | | | |
| Daily | | | | | | | | | |

18. What is the common source of income for food of the household?

1 = Agricultural activities; 2 = Fishing activities;
3 = Business; 4 = Employment; 5 = Aid;
6 = Casual labourer; 7 = Livestock

8 = others (list) _____

19. Has there been food scarcity in the past five years (2000 – 2005)?

Yes = 1 No = 2

(If the answer is yes, continue with question number 20, and if No go to question number 23)

20. If the answer is Yes, give causes for the scarcity.

1)……

2)……..

3) ……

21. (a) How did you tackle the food scarcity problem?

| | |
|---|---|
| 1 = By taking porrige | |
| 2 = Reducing the number of meal per day | |
| 3 = Borrowing food/money | |
| 4 = Reducing the ration of food per meal | |

| | |
|---|---|
| 5 = Selling household or personal commodities | |
| 6 = Seeking aid | |
| 7 = Skipping meal in some days | |

22. If the household got food aid, where did the aid came from?

| | |
|---|---|
| 1 = Relative or friend | |
| 2 = Government or religious institution | |
| 3 = Corporations and other community organisations | |
| 4 = Government | |
| 5 = Non – governmental organisation | |

6 = Others (list)_____

**F: NATURAL RESOURCES AND ENVIRONMENT:**

23. (a) What natural resources do you have in your area?

| | |
|---|---|
| 1 = Land | |
| 2 = Sea | |
| 3 = Mangroves | |
| 4 = Coral reefs | |
| 5 = Sea grasses | |
| 6 = Fish | |
| 7 = Inland limestone rocks | |
| 8 = Coastal forest | |
| 9 = Rivers | |
| 10 = Beaches | |

11 = Others (list) _____

(b) Right of ownership and utilization of natural resources

| Type of natural resource | Ownership | | Utilization | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Land | | | | |
| Sea | | | | |
| Mangroves | | | | |
| Beaches | | | | |
| Inland limestone rocks | | | | |
| Coastal forests | | | | |

24. What is your comment on the status of natural resources compared to the past 15 years
(1990-2005)

1 = Improved; 2 =Remained the same; 3 =Declined;
4 =Disappeared

| | Resources | Status/trend of natural resources |
|---|---|---|
| 1 | Land | |
| 2 | Sea | |
| 3 | Mangroves | |
| 4 | Coral reef | |
| 5 | Sea grasses | |
| 6 | Fish | |
| 7 | Inland limestone rocks | |
| 8 | Coastal forest | |
| 9 | Rivers | |

25 (a) Give reasons for degradation/decline of natural resources

| | Resources | Reasons for depletion/degradation |
|---|---|---|
| 1 | Land | |
| 2 | Sea | |
| 3 | Mangroves | |
| 4 | Coral reef | |
| 5 | Sea grasses | |
| 6 | Fish | |
| 7 | Inland limestone rocks | |
| 8 | Coastal forest | |
| 9 | Rivers | |

(b) What is the relationship between the degradation of natural resources and occurrence of disasters?

……

26. What steps should be taken to rescue the resources?

.....

27. What are the roles of household in rescuing the resources?

.....

28. (a) Who are you in this area? (put a tick in the correct box):

| | |
|---|---|
| 1 = Native | |
| 2 = Immigrant | |
| 3 = Refugee | |

29. (a) Has there been any kind of natural disaster along the coast in the past 15 years (1990 –
2005) e.g. floods, drought, strong winds, tsunami?

Yes = 1 No = 2 ☐

(b) If the answer is yes, list them, year of occurrence and its impacts at the household level

| Disaster | Year | Impacts |
|---|---|---|
| | | |
| | | |

(c ) Do you have anywhere to go if a disaster happens at your place?

Yes = 1 No = 2 ☐

(d) If the answer is yes, where will you go?……

(e) What steps should be taken to combat disasters?

| Household level | Village level | District level |
|---|---|---|
| | | |
| | | |

(f) What steps should be done to reduce the impacts of natural disasters in future? (at various levels)

| Household level | Village level | District level |
|---|---|---|
| | | |
| | | |

30. (a) What human activities increase the impacts of disasters? (If you do no know say so)

.....……..

(b) What steps should be taken so that human activities do not increase the impacts of disasters? (If you do no know say so)

.....……..

(c ) What do you think are reasons that make some people to settle in areas that are prone to disasters? (If you do no know say so)

.....……..

31. (a) Normally how do you get disaster information when you are in the village/at home?

| | |
|---|---|
| 1 = By seeing the signs | |
| 2 = Hearing from neighbours | |
| 3 = Announcement through the village council | |
| 4 = Communicated in public gathering areas | |
| 5 = Radio / Television | |

6 = Others (List) _____

(b) How do you inform each other (circulate information) when a disaster occur? (Explain)

.....

If you are a fisher, how do you get information of disaster when you are at work in the sea?

| | |
|---|---|
| 1. = Visual observation by fishers | |
| 2 = Through radio | |
| 3 = By looking the sea and other vessels in the sea | |
| 4 = Signals in the land | |

5 = Others (List) _____

(c) If your activities are land based, how do you get informed when a disaster occur? Explain

……

(e) Do you have any signal used to communicate disasters while in the sea?

Yes = 1 No = 2 ☐

(f) If the answer is yes, list the signals and give the meaning:

| **Signal** | **Meaning of signal** |
|---|---|
| | |
| | |

(f) What steps will you take if you are informed of a disaster while you in the sea? (Explain)

.....

(g) Did a disaster (tsunami) occurred on 26th December 2004 touched your area?

Yes = 1 No = 2 ☐

(h) Can you explain what happened in the sea?

……..

……..

(i) If the answer is yes, what step did you?

.....

(i) What was the impact of tsunami?

.....

32. (a) Do you know any policy for environment and natural resources conservation?

Yes = 1 No = 2 ☐

If the answer is no, continue with question number 33

(b) If the answer is yes, list the policies:

.....

33. (a) Do you know any law for environment and natural resources conservation?

Yes = 1 No = 2 ☐

(b) If the answer is yes, list those laws:

.....

(c) Is there any by-law in the village to conserve environment and natural resources?

Yes = 1 No = 2 ☐

(d) If yes, mention.

| | **Type of resource** | **By-laws** |
|---|---|---|
| 1 | Land | |
| 2 | Sea | |
| 3 | Mangroves | |
| 4 | Coral reef | |
| 5 | Sea grasses | |
| 6 | Fish | |
| 7 | Inland limestone rock | |
| 8 | Coastal forest | |
| 9 | Rivers | |

34. (a) Are there any community based environment and natural resources conservation initiatives?

Yes = 1 No = 2 ☐

If the answer is no, continue with question number 35

(b) If the answer is yes, explain the initiatives

| | **Type of resource** | **Conservation initiatives** |
|---|---|---|
| 1 | Land | |
| 2 | Sea | |
| 3 | Mangroves | |
| 4 | Coral reef | |
| 5 | Sea grasses | |

| | | |
|---|---|---|
| 6 | Fish | |
| 7 | Inland limestone rock | |
| 8 | Coastal forest | |
| 9 | Rivers | |

35 (a) Are there any conflicts on the ownership and utilization of natural resources e.g. land, sea, beaches, mangroves?

Yes = 1 No = 2 ☐

(b) If the answer is yes, mention the existing conflicts:

.....

(c ) Which institution deals with conflict resolution?

.....

(d ) What should be done to improve the conflict resolution system?

| **Household level** | **Village/shehia level** |
|---|---|
| 1. | 1. |
| 2. | 2. |
| 3. | 3. |

(b) What steps should be done at District and National levels to improve the environment and natural resources?

| **District** | **National** |
|---|---|
| 1. | 1. |
| 2. | 2. |
| 3. | 3. |

36. (a) Does your family own any livestock?

Yes = 1 No = 2 ☐

(b) List the types of livestock you own?

| **Type of livestock** | **Tick the correct answer** |
|---|---|
| 1 = Chicken/duck/guinea pea 1 - 10 | |
| 2 = Chicken – more than 11 | |
| 3 = Goat – 1 - 5 | |
| 4 = Goats – more than 6 | |
| 5 = Cow 1 - 5 | |

| | |
|---|---|
| 6 = Cow – more than 6 | |

(c) Do you own any means of transport?

Yes = 1 No = 2 ☐

(d) List types of transport means you own

| Type of transport means | Mark |
|---|---|
| 1 = Bicycle | |
| 2 = Cart | |
| 3 = Canoe | |
| 4 = Sailing boat (ngalawa) | |
| 5 = Boat | |
| 6 = Motor cycle | |
| 7 = Motor vehicle | |

(e) Do you own any fishing gear e.g. fishing net, fish traps, hook and lines?
Yes = 1 No = 2 ☐

(f) If the answer is yes, list the gear:
.....……

**H: WATER SERVICE:**

37. Explain on how you get water for your use:

| Source of water | Put a tick |
|---|---|
| 1 = River, deep or shallow well, public tape (Free) | |
| 2 = Buying | |
| 3 = Harvested and stored rain water | |
| 4 = I am connected with water supply system | |
| 5 = Private deep well | |

**I: GENERAL EXPLANATION:**

38. How prepared are you to combat disasters such flood, sea level rise, strong winds if it happens?

……

39. What are your comments about this discussion on disaster?

……

## *Appendix 4: Checklist for key informants*

**CHECKLIST FOR KEY INFORMANTS**

**A. National level checklist**

1. (a) Is the national set up for disaster management in place?
   (b) If in place, is it working as stipulated in the National Policy for Disaster Management
   (c) If not, when will it be operational?
   (d) If the set up is in place,
      i. Explain the set up
      ii. How may members does the disaster management committee have?
      iii. What are the roles of the committees
      iv. What is the relationship between the national disaster management committee and other sectoral committees units?
2. (a) Are there any records of natural disasters occurring along coastal area?
   (b) If yes, what were the disasters, when did they occur and what were the steps taken nationally?

| **Type of disaster and year of occurrence** | **Measures taken** |
|---|---|
| | |
| | |

   (c) What were the effect of the disasters?

3. (a) Is there a national policy for disaster management?
   (b) Are there any shortcomings in the implementation of the National Policy for Disasters Management?
   (c) If there are shortcomings, what are they?

4. (a) what elements of disasters and their effect are addressed by MKUKUTA/MKUZA?
   (b) Are there any strategies put in place for addressing disasters and their effect?
   (c) If there are, please mentioned them.

5. On the 26th of December 2004, "tsunami" a disaster which was caused by an earthquake occurring beneath the sea in Asia resulted into peering of water on coastal areas accompanied by strong winds, also affecting East Africa.
   (a) Was the impact felt in this area?
   (b) If yes, what were the effects?
   (c) What were the lessons learnt?
   (d) What is the level of awareness of the communities on disaster preparedness and response?
   (e) What are the strategies used for awareness creation?

6. Natural resources have a role to play in reducing the effects of disasters.
   (a) What are the related natural resources available in coastal areas?
   (b) What are the other natural resources found in coastal areas which help reduce the effects of disasters?
   (c) Are there any laws related to use of natural and other resources along the coastal area?

**B. District level checklist**

1. Name of district_____
2. (a) Number of registered villages_____
   (b) Number of villages situated along the coast_____
3. (a) What are the departments working at this level?
   (b) What are the departments dealing with natural resources situated in coastal areas?
4. What is the role of the district in the management of natural disasters?
5. (a) What are the natural disasters which occurred in this district and what were the steps taken in their management?

| **Type of disaster and year when occurred** | **Effects** | **Steps taken** |
|---|---|---|
| | | |
| | | |

6. (a) What is the organizational set up for disaster management?
   (b) How are the other sectoral units/departments linked the disaster
   (c) Which sector is responsible for disaster management?
7. What are the measures taken for natural disaster preparedness?
8. What are the constraints facing the disaster management committee?
9. What are the reasons which lead communities to build in disaster prone areas? E.g. constructing houses in valleys?
10. What is the chain of command form community level to the national level and vice versa?
11. On December 26, 2004, the tsunami disaster, which was caused by an earthquake beneath the sea occurred in parts of Asia, resulting into the sea pouring water along the coast which was accompanied by strong winds, whose impact was felt in East Africa also.
    (a) Were the effects of tsunami felt in this area?
    (b) If yes, what were the effects?
    (c) What were the lessons learnt?

12. (a) What are the conflicts related to use of natural resources in coastal areas? And how are these conflicts resolved?

| **Type of Conflict** | **Resolution** |
|---|---|
| | |
| | |

13. Natural resources contribute to a great extent in reducing the effects of natural disasters.
    (a) What are the related natural resources in coastal areas?
    (b) What are the other natural resources found in the coastal area which help reduce effects of disasters?

(c) What are the laws dealing with the use of natural and other resources along coastal areas?

## B. INSTITUTIONAL KEY INFORMANTS INTERVIEW CHECKLIST

1. Name of the institution……..
2. When was it started?.....
3. What is its vision?.....
   ……..
4. What is its mission and objectives?.....
   ……..
5. (a) What is the organizational set up of the institution?.....
   ……...
   (b) In the organizational set up, is there any unit/department dealing with disaster management?

   (c) If yes, which department/unit is responsible……..
6. (a) What is the stand of the institution environmental and natural resources conservation along the coast? Especially:

   Mangroves:……
   Coral reeves:……
   Limestone rocks:…….
   Coastal forests:…….
   Sea grass:…….....
   Others……

   (b) In conserving the natural resources along the coast, how are the other institutions/department of the related sectors involved? (mention the departments/institutions and their roles.
   ……
7. (a) What is the role of the institution in a national disasters mitigation and management? ……

   (b) What is the linkage between this institution and other departments/institutions in disaster management e.g. the link with the Disaster Management committee under the Prime Minister's Office? ……

8 (a) Are there any records of natural disasters occurrence along the coast?

(b) If yes, what are the disaster, when did they occur and what were the effects and the steps taken?

| **Type of disaster and year of occurrence** | **Effects** | **Steps taken** |
|---|---|---|
| | | |
| | | |

9. (a) Are you aware of the existence of the National Policy on Disaster Management?.....

(b) How does your institution participate in its implementation?.....

(c) Are there any shortcomings in the implementation of the policy?.....

(d) If yes, what are the shortcomings? ……

10. What are the directives/guidance given by MKUKUTA/MKUZA (national strategies for economic growth and poverty reduction for Tanzania Mainland and Zanzibar) on disaster management (if any?) ……
11. December 26, 2004 tsunami disaster occurred mainly in Asia causing strong winds and outpour of sea water which affected parts of East African Coast.

(a) What were its effects for Tanzania? ……

(b) What were the lesson learnt from such a disaster?.....

(c) What is the level of awareness amongst communities on such a disaster and on the aspect of preparedness?.....

(d) What are the strategies in place for awareness creation amongst communities on such disasters and on the aspect of preparedness?.....

12. Usually, natural resources help reduce the effect of disaster.

(a) What are such resources along the coastal area?.....
What are the other resources which help reduce the effects of natural disasters?

…….....

(b) What are the laws and regulations governing management of natural and other related resources along the coast?.....

12. What are your general comments opinions on:
    (a) Improvement of management of natural resources along coastal areas? ……
    (b) On management of disasters and their effects?.....

## C. INSTITUTIONAL KEY INFORMANTS INTERVIEW CHECKLIST

1. Name of the institution……..

3. When was it started?.....

4. What is its vision?.....

5. What is its mission and objectives?.....

6. (a) What is the organizational set up of the institution?.....

   (b) In the organizational set up, is there any unit/department dealing with disaster management?

   (d) If yes, which department/unit is responsible……..

7. (a) What is the stand of the institution environmental and natural resources conservation along the coast? Especially:

   Mangroves:……

   Coral reeves:……

   Limestone rocks:…….

   Coastal forests:…….

   Sea grass:…….....

   Others…….

   In conserving the natural resources along the coast, how are the other institutions/department of the related sectors involved? (mention the departments/institutions and their roles. ……

8. (a) What is the role of the institution in a national disasters mitigation and management? ……

   (c) What is the linkage between this institution and other departments/institutions in disaster management e.g. the link with the Disaster Management committee under the Prime Minister's Office? ……

9. (a) Are there any records of natural disasters occurrence along the coast?

   (b) If yes, what are the disaster, when did they occur and what were the effects and the steps taken?

| **Type of disaster and year of occurrence** | **Effects** | **Steps taken** |
|---|---|---|
| | | |
| | | |

10. (a) Are you aware of the existence of the National Policy on Disaster

Management?.....

a. How does your institution participate in its implementation?.....

( c) Are there any shortcomings in the implementation of the policy?.....

(d) If yes, what are the shortcomings? ……

13. What are the directives/guidance given by MKUKUTA/MKUZA (national strategies for economic growth and poverty reduction for Tanzania Mainland and Zanzibar) on disaster management (if any?) ……
14. December 26, 2004 tsunami disaster occurred mainly in Asia causing strong winds and outpour of sea water which affected parts of East African Coast

.(a) What were its effects for Tanzania? ……

(b) What were the lesson learnt from such a disaster?.....

(c) What is the level of awareness amongst communities on such a disaster and on the aspect of preparedness?.....

(d) What are the strategies in place for awareness creation amongst communities on such disasters and on the aspect of preparedness?.....

12. Usually, natural resources help reduce the effect of disaster.
    (a) What are such resources along the coastal area?.....
    (b) What are the other resources which help reduce the effects of natural disasters?

    ……

    (c) What are the laws and regulations governing management of natural and other related resources along the coast?.....
15. What are your general comments opinions on:
    (a) Improvement of management of natural resources along coastal areas?

    ……

    ……

    (c) On management of disasters and their effects?.....

**D. VILLAGE/MTAA GOVERNMENT AND SHEHIA COMMITTEE CHECKLIST**

1. Name of the ward……..

2. Name of Village / Mtaa / Shehia……..

3. Village/ Mtaa/ Shehia population:

   - Number of residents……
   - Total number of households……
   - Distribution of the population

| **Category** | **Men** | **Women** |
|---|---|---|
| Adults | | |
| Elderly | | |
| Children | | |
| **Total** | | |

4. Main economic activities undertaken by the communities……

5. The Village / Mtaa governments / shehia committee

   (a) Members of the village / Mtaa government: Males_____ Females_____

   (b) Members of the shehia committee: Males_____ Females____ _____

   (c) What are the roles of the shehia committee?

……

   (d) What are the other shehia committees (if any)?

   (e) What are the main village /mtaa committee, members and roles?

   (f) What are the village sub-committees (if any)?

6.. What village / mtaa/shehia committees/sub-committees responsible for environment and natural resources? ……

7. a) Which committee is responsible for disaster management? …….

   b) How many members does it have? Males_____ Females_____

   c) What are its' roles? …….

8. a) Are you aware of the existence of the policy and the related guidelines?

b) If aware, mention activities undertaken in their implementation……

9. a) What is the chain of command as regards disaster management (from the community level to the top most level and vice versa?).

b) How is the implementation of the directives?

10. a) How is the ownership of the natural resources along the coast? (eg Mangroves, beaches, coral reefs, limestone rocks and fish).

b) Are there any laws governing ownership and utilization of such resources? If yes specify…….

11. a) Are there any conflicts related to ownership of natural resources along the coast within the village / mtaa/ shehia?

b) If there are, please mention them……..

c) Please discuss the conflict resolution/management mechanism in the village/mtaa/shehia …….

d) How does the village / mtaa government or shehia committee involved in supervision of the available natural resources along the coast?

12. What are the disasters that have occurred in the village / mtaa / shehia that you can recall of?…….

13. What are the roles of the village / mtaa government / shehia committee in natural disasters' management? ……

14. In 2004, December 26, tsunami occurred as a result of an earthquake originating in the Asian Seas, resulting into strong sea waves and pouring of water over the coast, resulting into a Disaster

(a) was the shehia/village / mtaa affected by tsunami? …….

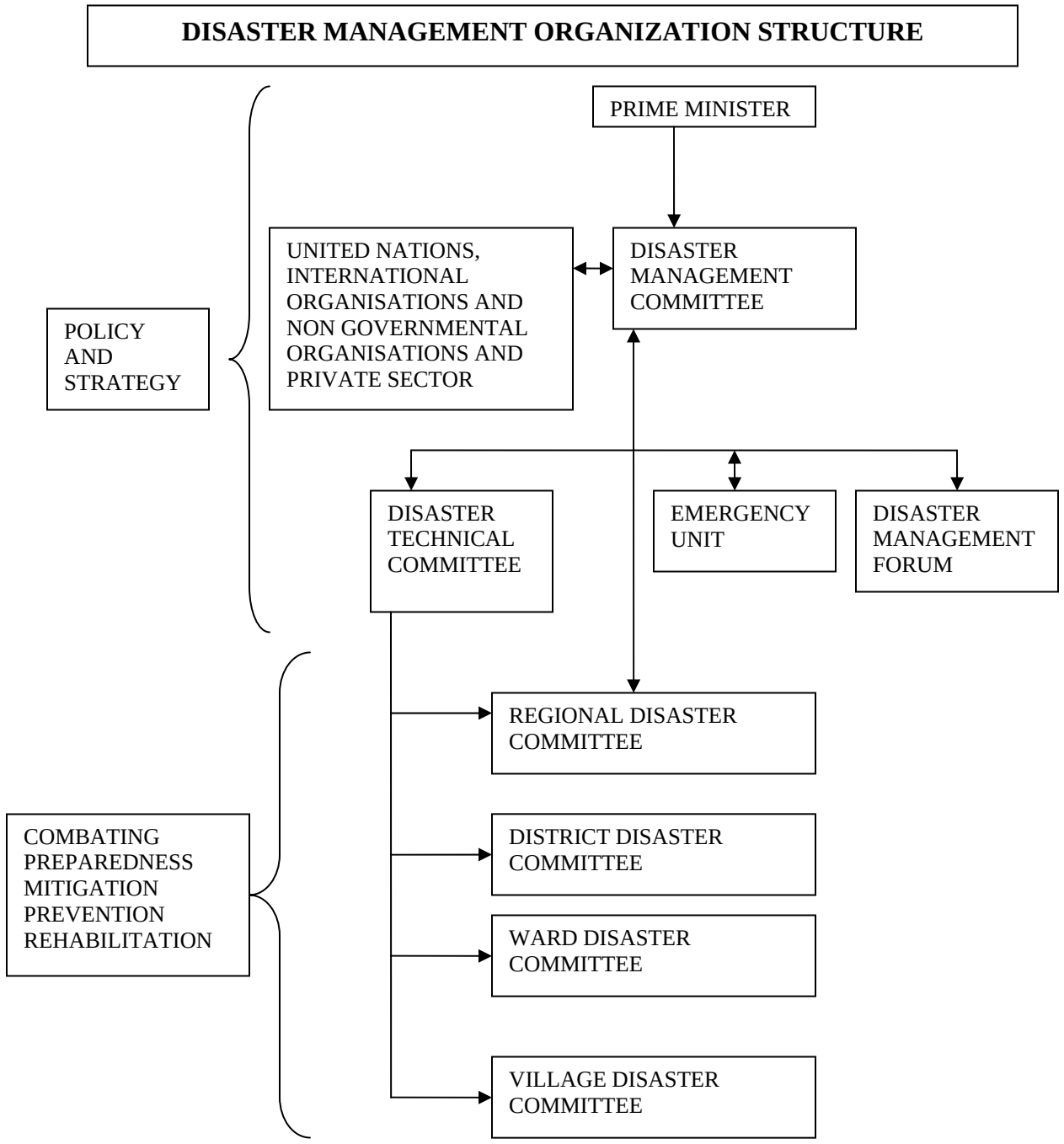
(b) If yes, what were the effects? ……

(c) What were the lessons learnt? ……

15. Is there a relationship between the condition of natural resources along the coast and natural disasters in the area" please explain? ……

16. What are your general opinions on natural disasters along the coast? ……

***Appendix 5: Disaster management structure for Tanzania Mainland***



***Appendix 6: List of people consulted***

| S/N | Name | Organization and Position Held |
|---|---|---|
| 1 | Theonestina Kaiza-Boshe | CARE International – Dar es Salaam |
| 2 | Thabit S. Masoud | CARE International – Zanzibar |
| 3 | C. Kassase | CARE International – Dar es Salaam |
| 4 | Edgar Mloba Mgeta | CARE International (EMPAFORM Programme) – Dar es Salaam |
| 5 | Joseph P. Shiyo | Assistant Director Disaster, Disaster Management Department, Prime Minister's Office, Dar es Salaam |
| 6 | Ali Rajabu Juma | Director of Planning, Chief Minister's Office Zanzibar |
| 7 | Talib Ali Hassan | Administrative Officer, Wilaya ya Kati Unguja |
| 8 | Hon. Ms. Mwanajuma Magid Abbdalla | District Commissioner Mkoani District, Pemba |
| 9 | Salim Hamad Ali | Administrative Officer Mkoani District, Pemba |
| 10 | Sharif Haji Hamis | Acting Planning Officer Mkoani District Pemba |
| 11 | Omar Ali Mbarawa | Sheha Wambaa, Mkoani District Pemba |
| 12 | Mohamed Abdalla Haji | Member Sheha Committee, Wambaa Shehia, Mkoani District, Pemba |
| 13 | Salum Hamis Mlangi | Member of Sheha Committee, Wambaa Shehia, Mkoani District, Pemba |
| 14 | Said Juma Ali | Department of Commercial Crops and Forestry Pemba |
| 15 | Ali Said | Department of Fisheries and Sea Products Pemba |
| 16 | Mr. Sharif | Department of Fisheries and Sea Products Pemba |
| 17 | Khatib Ali Khatibu | Sheha, Makangale Shehia, Micheweni District Pemba |
| 18 | Maua Malyabwana | Deputy Sheha, Makangale Shehia, Micheweni District, Pemba |
| 19 | Shabani Kisene Ngasa | Member of Sheha Committee, Makangale Shehia, Micheweni District, Pemba |
| 20 | Simaimu Msalaka Pinja | Sheha, Chwaka Shehia, Wilaya ya Kati Unguja |
| 21 | Ally Yusuf Mkanga | Member of Sheha Committee, Chwaka Shehia, Wilaya ya Kati, |

| | | |
|---|---|---|
| | | Unguja |
| 22 | Amour Bakari | Manager, MEMA –Ngezi Vumawimbi Forest Reserve Pemba |
| 23 | Mbaruku Salum | Co-Manager, MEMA Ngezi Vumawimbi Forest Reserve, Pemba |
| 24 | H. A. Kattanga | Municipal Director, Kinondoni DaresSalaam |
| 25 | Deodatus Mapunda | Assistant Personnel Officer Kinondoni Municipal office |
| 26 | Daniel Sabai | Kinondononi Integrated Coastal Area Management Programme Manager |
| 27 | Richard Joseph Rusisye | Mtaa Chairperson Mtongani, Kinondoni DSM |
| 28 | Fatuma Nassir | Mtaa Executive Officer Mtongani Kinondoni Dar es Salaam |
| 29 | Mossi Khamis | Chairperson, Kunduchi Pwani MWAMBAO CBO |
| 30 | Abdallah R. Mkumbo | Member, Mtaa government Kunduchi Pwani |
| 31 | Shabani Zuberi | Treasurer, Kunduchi Pwani MWAMBAO CBO. |
| 32 | Mwadawa Massanga | Deputy secretary, KunduchipPwani MWAMBAO CBO. |
| 33 | Hamisi Mng'agi | Member, Kunduchi Pwani Mtaa government. |
| 34 | Mariam Gumbo | Member, Kunduchi Pwani Mtaa government. |
| 35 | Kessy Rashid Mlewa | Mtaa Executive Officer, Mbweni |
| 36 | Akili Mwinyihija Pembe | Chairperson MBWEDEFU CBO, Mbweni |
| 37 | Said Kibwana Amiri | Chairperson Mtaa Government Mbweni |
| 38 | Sarah Mbonde | Secretary MBWEDEFU CBO, Mbweni |
| 39 | Fadhila Mtoro | Chairperson Mtaa Government Ununio |
| 40 | Mwinyimbegu Noti | Member, Ununio Mtaa Government |
| 41 | Hon. Joyce W. Mgana | District Commissioner - Muheza |
| 42 | E. W. Kalimalwendo | District Executive Director Muheza |
| 43 | Faustin Makumba | District Natural Resources Officer Muheza |
| 44 | Lawrence Michael Kuzilwa | Coordinator Tanga Costal Zone Conservation and Development Programme Muheza |
| 45 | Hassan Kalombo | Acting Programme Manager Tanga |

| | | |
|---|---|---|
| | | Coastal Conservation and Development Programme |
| 46 | John Alfred Kabamba | Coordinator Mangrove Management Muheza |
| 47 | Rambazo Abdi | Village Chairperson Moa, Muheza |
| 48 | Zairini Mohamed Omar | Chairperson Environment Committee Moa, Muheza |
| 49 | Masoud Yunus | Member, Environment Management Committee Moa |
| 50 | Thabit Omari | Fisheries Officer Moa Muheza |
| 51 | Deus Kashasha | Director of Research, Tanzania Meteorological Agency |
| 52 | Augustine Kanemba | Manager, Public Weather Forecasting Division, Tanzania Meteorological Agency |
| 53 | Ruzika N. Muheto | Director Research and Planning National Environmental Management Council (NEMC) |
| 54 | Evarist Nashandi | Department of Forestry, Ministry of Natural Resources and Tourism |

## *Appendix 7: List of enumerators*

**Unguja**

1. Asha A. Abeid
2. Ali Juma Ali
3. Mohammed A. Mwalim

**Pemaba**

1. Mussa Said Bakari
2. Mbarouk Mussa
3. Hidaya Khamis Hamad
4. Khalfan Amour Juma

**Dar es Salaam**

1. Yohana Mtoni
2. Nezia Christopher
3. Elizabeth Kiyenze
4. Rebecca S. P. Gyumi

**Tanga**

1. Thabit Omari
2. Masoud Yunus
3. Idrisa Daudi

## *Appendix 8: Disaster occurrence in Muheza District*

| Year of Occurrence | Type of disaster | Effects | Steps taken |
|---|---|---|---|
| 1998 | Floods | Air Shengena bus fell into Msangazi river, killing over 70 people. | Rescue of passengers and provision of medical care to survivors |
| 1997/98 | Heavy rains | 217 houses destroyed in Mtibwani, Kwale, Mkinga, Duga, Kigombe and Gombelo wards, in Mkinga, Mgomeni and Maramba divisions. | Not indicated |
| 1999 | Fire | 11 houses burnt in Monga vyeru village, Mkinga division. | Not indicated. |
| 2000 | A cyclone | 56 houses at Kibaoni / pande darajani had roofs blown away. Cost around 10 million Tshillings | Youths in the ward helped with supplying of poles for reconstruction. |
| 2000 | Fire incidences | 15 houses burnt in Kwezitu<br><br>Houses burnt in Maramba Division as follows: Kiumbo 45; Jele 3, Maramba 39, Bosha 2 and Kichangani 10 | Clothes supplied by the then first lady, Mama Mkapa<br><br>Maize 6.2 tons supplied to Kiumbo and 1.9 tons to Jele. |
| 2001 | Fire | 13 houses burnt at Misalai village, Magogoni sub-village. | Facilitated provision of shelter by neighbours. |
| 2002 | Heavy rains accompanied by strong winds | 2 classes and office roofs blown off at Kiwand village, Mangubu sub-village | Not indicated |
| 2002/03 | Hunger | 5 wards affected | Food aid distributed to the affected |
| 2003/04 | Hunger | 5 wards affected | Food aid provided |
| 2005/06 | Hunger | 5 wards affected | Food aid provided |
| 2004 | A cyclone<br><br>Heavy rains accompanied by strong winds | 76 houses roofs blown off at Mkanyageni, Bagamoyo sub-village.<br><br>9 houses in Maramba “B” village. | Facilitated provision of shelter in the neighbourhood.<br><br>Not indicated. |

Source: DED’s office, Muheza District.

## Appendix 9: List of Participants to the National Stakeholders Workshop

| S/N | Name of Participant | Name of Organization |
|---|---|---|
| 1 | Ali R. Juma | Chief Minister's Office Zanzibar |
| 2 | Hamza Rijal | Department of Environment Zanzibar |
| 3 | Amour B. Amour | CARE Tanzania - Pemba |
| 4 | Said Omar Fakih | Department of Lands and Registration Zanzibar |
| 5 | Ali Abdallah Mbarouk | CARE Tanzania MICODEP |
| 6 | Denge Khamis Silima | Sheha Mwatemwe Shehia Zanzibar |
| 7 | Simai Msaraka Pinja | Sheha Chwaka Shehia Zanzibar |
| 8 | Mohamed A Mwalim | Dept. of Fisheries and Natural Resources Zanzibar |
| 9 | Faustin G. Makumba | Muheza District Council Tanga |
| 10 | Yusuf Mdoe | Muheza District Council Tanga |
| 11 | John Kabamba | Tanga Coastal Zone Conservation Development Program |
| 12 | Ahmed Abdallah | Photo Journalist Dar es Salaam |
| 13 | Edward Lyawere | Muheza District Council Tanga |
| 14 | Ahamadi Sendi | Photo Journalist Dar es Salaam |
| 15 | Fadhila Mtoro | Ununi Mtaa Chairperson Kinondoni Dares Salaam |
| 15 | Salum Msimbwa | Photo Journalist Dar es Salaam |
| 16 | Dr. Bakari Asseid | DCCFF Zanzibar |
| 17 | Makame Salum Nassor | Department of Fisheries, Box 774 Zanzibar |
| 18 | Mwanajuma Majid Abdullah | District Commissioner Mkoani - Pemba |
| 19 | Nicodemus J. Shirima | District Commissioner's Office Kinondoni |
| 20 | Felix B. Ndebarika | Kinondoni Municipal Council, Dar es Salaam |
| 21 | Mchome Magreth | MPRU Dar es Salaam |
| 22 | Judica Losai | JET Dar es Salaam |
| 23 | Christopher Mtayoba | Kinondoni Mayor |
| 24 | Marzuk M. Marzuk | Diwani |
| 25 | Deme Malyabwana | Makangale Ngezi Pemba |
| 26 | Thabit S. Masoud | CARE Tanzania Zanzibar |
| 27 | Tatu Chima | Maliasili Kinondoni (DNRO) |
| 28 | Mussa Magoti | TAZAMA |
| 29 | Yuda Nsolo | Business Times |
| 30 | Emanuel Chenge | ITV Camera Mobile 0744-806939 |
| 31 | Frank Godfrey | Radio Tumaini |
| 32 | John Lugendo | ITV/VPO Mobile 0741-608891 |
| 33 | Faith Magambo | TFNC/FANRM Research Consultants Dar es Salaam |
| 34 | Francis Shao | FANRM Research Consultants Dar es Salaam |
| 35 | Lewis Nzali | NEMC, Box 63154 Dar es Salaam |
| 36 | Erasto E. Mlay | FANRM Research Consultants Dar es Salaam |

**Appendix 10: Proceedings of the MPLA workshops**
(Separate document)