CONFLICTS IN THE MANAGEMENT AND CONSERVATION OF THE MANGROVE ECOSYSTEM OF KWALE DISTRICT, KENYA

BY

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A THESIS SUBMITTED TO INSTITUTE OF AFRICAN STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN ANTHROPOLOGY OF THE UNIVERSITY OF NAIROBI

MAY 2001

DECLARATION

This thesis is my original work and it has not been presented for a degree in any other University.

Kizito W. Mukhwana — Date. 2/05/2001

This thesis has been submitted for examination with my approval as the University Supervisor.

Dr. S.M. Nangendo — Date 9/5/01

DEDICATION

To my son Eugene (Junior) and daughter Phoebe. Also to my late father Gabriel Mukhwana who sacrificed much for my education but whom death robbed before he could share in the joy of this work. Lastly to all my family members and relatives whose inspiration and encouragement propelled me to where I am now.

ACKNOWLEDGEMENTS

This thesis could not have been completed without contributions from other people. However, only a few will be mentioned.

First, I express my sincere gratitude to the University of Nairobi for granting me a scholarship to pursue my M.A. degree. I also thank the Swedish International Development Agency in their programme focusing on the East African coastal Region (Sida/SAREC) for funding my fieldwork. Particularly I owe invaluable gratitude to Dr. Eva Tobison and Prudence Woodford-Berger both of the Department of Social Anthropology, Development Studies Unit Stockholm University for coordinating the funding of my fieldwork and organizing for the seminar in Zanzibar where the preliminary findings of this thesis were presented.

Second, my special thanks go to my Supervisor, Dr. Stevie Nangendo for his patience, guidance and pertinent criticisms which shapped this work. I also thank Professor Simiyu Wandibba, Dr. Leunita Muruli both of the Institute of African Studies, University of Nairobi, Dr. Bawa Yamba of the Nordic Institute, Uppsala, Sweden for devoting their time on reading and commenting on the first draft of this work.

Third, to all my colleagues whose input saw the completion of this thesis, notably Denis Khamadi, Okwaro Moyi, Kennedy Wanjala, Scholastic Juma and Mary Nyikuri and to those who contributed in one way or another in the production of this work. I cannot mention each one of you by name, but accept my appreciation and gratitude.

Fourth, I wish to thank my respondents, the people of Kwale District for providing information without which this thesis could not have been written.

Lastly, special thanks also go to my family and relatives for their constant support throughout my studies. I wish to thank especially my brothers Kresent and Joseph for their material and moral support during my fieldwork.

ABSTRACT

The purpose of this study is to investigate the nature and sources of conflicts between the parties interested in the exploitation, management and conservation of the mangrove ecosystem. The study also strives to identify the strategies of resolving the conflicts that characterize mangrove management. The study was carried out between early February and March 1999 in Kwale District, Kenya.

To achieve these aims, the methodology employed used both primary and secondary sources of information in data collection. Secondary data were obtained from library research while primary data was collected from selected respondents through survey interviews, informal interviews, life histories and focus group discussions. Because of the nature of the data we collected, both qualitative and quantitative techniques were used in the data analysis.

The research findings reveal that although the local people understand their environment (mangrove ecosystem) very well, they do not participate as true partners in designing, planning and managing conservation programmes. The findings also indicate that many people are unable to exploit the mangroves or go fishing due to expensive licenses, poor transport, low business, long procedures in acquiring licenses and/or permits and lack of capital and credit facilities.

It is generally observed that there is poor information flow to and from the local populations and that there is lack of coordination between the management organizations. The conflicting roles between the resource users themselves and between resource users and protectors can be discerned. Furthermore, the roles of the management organizations also conflict.

This study, therefore, recommends that the authorities concerned should sensitize those interested in the mangrove ecosystem on the need to ensure that the local people participate as true partners in designing, managing and in conservation programmes and propose ways of resolving the prevailing conflicts. The study also suggests ways of fostering community understanding, as this is one way of making participation and management easier.

Finally, the study calls for more social science research on the mangrove ecosystem, as most works have been done by natural scientists who are interested in the biological structure and ecological factors of mangroves rather than the socio-economic perceptions of those living close to the ecosystem. It is recommended that researchers should also focus on the people living around the mangrove ecosystem rather than concentrating on the resources only.

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CHAPTER ONE

INTRODUCTION AND THE STATEMENT OF PROBLEM

1.0 Introduction

There has always been relative scarcity of resources for a particular group of people somewhere on earth. The perception of scarcity grew in the1970's when there was a realization that the world was running quickly out of much needed and vital resources due to diminishing reserves and an increasing population (Mendel, 1988). This has provoked the management of resources for sustainable use. For instance, historically, indigenous coastal communities developed complex regimes to govern their relations with respect to resource use and rights. However, those who came later, superimposed modern notions on tenure and resource use and thereby exacerbated the potential for conflict within societies which were carefully regulated and had well articulated conflict resolution mechanisms (UNESCO, 1995).

This study investigated the conflicts that arise in the management of the mangrove ecosystem in Kwale District, Kenya. Mangroves are one of the unique plant communities which grow at the intertidal zones and river mouths in most coastal regions of the world (Rao, 1991). This ecosystem is a reservoir of many plant and animal species that have been together over long periods of time. According to Deshmukh (1991), mangroves dominate the coastal habitat and, thus, they define an economic resource which is widely and variously used by coastal peoples of the tropics. In addition, mangrove forests play a vital role in stabilizing the shoreline by preventing soil erosion and the encroachment by the sea on the interior (Semesi and Howell, 1992; Wass, 1995; UNEP, 1998).

Despite their roles and benefits, mangrove forests are threatened by over-exploitation, deforestation and land-based sources of pollution. Consequently, the stocks of fish and prawns that use the mangroves as nursery areas are also threatened. This over-exploitation could be attributed to the pressure of population increase in the coastal

regions in many areas of the world (UNEP, 1989; 1998).

However, it is encouraging to note that there is a growing concern all over the world about the continuing over-exploitation of mangroves and other coastal resources. For example, during the last decade, a considerable number of researches have been published arising from various international meetings and workshops on the methods for the proper management and sustainable utilization of the mangroves (Kenchington, 1990; Aksornkoae, 1989; Rao, 1991; Gibbon, 1996; UNEP, 1988). In Kenya, for instance, forest management policies, which hitherto concentrated on industrial plantations mainly in the highlands, have changed the trend and now similarly focus on the management and conservation of indigenous forests as well (Kigomo, 1991). Furthermore, the Kenya government's ban on the cutting of mangrove poles for export in 1982 (Kigomo, 1991) is a pointer of its commitment to conservation. Although the ban was lifted in 1996, there is still restriction on the cutting of juvenile mangroves locally known as *fito.*

However, a ban on the cutting of juvenile mangroves and other legislative regulations on the utilization of the entire mangrove ecosystem has meant that the local people who depend on this resource cannot adequately meet their daily needs. Thus, in spite of all commendable efforts and renewed interest in the management of the mangrove ecosystem on the part of government agencies, the local people are forced to overlook the regulations regarding the exploitation of the ecosystem.

The interaction between the government-created organs and the local community in their exploitation and management activities normally results in various kinds of conflicts. This could be because the modern management organizations carry with them their own set of values and it is when such differing value systems clash that conflicts are most likely to result between them and the local community (UNESCO, 1995). Examples of conflicts from the Kenyan coast include those between the Kenyan Wildlife Service (KWS) and the local community concerning the creation of a Marine Park and reserve by the former at Mida Creek on the north coast. The park was created with the aim of

conserving nature and promoting tourism but the local community, on the other hand, would wish to maximize their fishing activities in the same region. The local people, therefore, perceive the park as a hindrance towards this goal. Conflicts also arise in the conservation of mangroves by government agencies, on the one hand, and the high demand for firewood from the same forests by the local community, on the other hand. It is also apparent that the restriction of the local communities from utilizing the mangrove ecosystem would meet resistance since they do not have an alternative source of livelihood (Ochiewo, 1998).

1.1 Statement of the Problem

Coastal regions are of vital importance since they are a home to more than half of the world's population and are focal points for economic activities of all types (CRM Annual Report, 1998). In many areas of the world, a high population growth, combined with increased poverty in some regions, and increased consumption in others, has led to large-scale deterioration of coastal environments and conflicts over a failing resource base (UNEP, 1998; CRM II Annual Report, 1998). These problems pose major challenges to governments at all levels. This study examines conflicts in the management and conservation of the mangrove ecosystem in Kwale District. Conflicts in this study will be taken to mean competition, struggle and disagreements between the parties interested in the ecosystem. Management, on the other hand, encompasses both exploitation and protection of the resources in the mangrove ecosystem.

Mangrove forests represent a complex renewable resource which is important in the economies of different peoples as well as constituting a refuge for many unique flora and fauna (Hamilton and Snedaker, 1984). In fact, Ramdial (1991) compares mangroves with large factories capable of producing large quantities of food, employment and recreational opportunities on a sustainable basis. However, this production can only be achieved by minimizing the stresses to which mangroves are subjected.

Conversely, UNEP (1998) has observed that the current increase in population on the Kenyan coast has led to the dwindling of the mangrove ecosystem. This increase has been attributed to the recent shift from trade-oriented activities to service-oriented ones that focus on the tourism industry. These changes have placed heavy demands on the coastal habitats and ecological resources and have often resulted in natural resource depletion, environmental degradation and conflicts over the use of these resources. There is, therefore, a need for the best management strategies and tools to ensure that there is a sustainability of these resources.

In addition, Wass (1995) observes that the pressure on the mangroves near Mombasa and Kilifi has resulted in the felling of nearly all the large trees. This pressure is as a result of population increase and unemployment. The problem of unemployment was even worsened in Kwale District when Ramisi Sugar Factory was closed. The people who were rendered jobless resorted to harvesting mangrove wood to supply the industrial market. Landlessness, lack of capital, education, and training are other factors cited for the over-exploitation of mangroves as people in the above categories, after failing to find jobs, always resort to cutting mangrove to earn a livelihood (Wass, 1995).

The problems facing the mangrove ecosystem in Kenya have prompted the government to put in place strategies to ensure a proper management and conservation of the ecosystem. For instance, Ochiewo (1998) notes that the Forest Department is undertaking the control of mangrove cutting to enhance sustainable exploitation. This is done in collaboration with the Kenya Wildlife Service (KWS). In addition, the Forest Department employs the licensing system in its control of the use of this ecosystem. Moreover, attempts are being made by the coastal community to venture into the mangrove re-forestation program. For instance, there are registered local resource conservation groups which have started mangrove tree nurseries aimed at conserving the resource. It is, however, unfortunate that despite these efforts the mangrove ecosystem still remains as threatened as ever. This is because the situation at the Kenyan coast indicates that the local people continue to cut trees especially at night (Ochiewo, 1998). This continued cutting of trees in spite of the

ban has led to conflicting interactions between the government agencies and the local community. There is, therefore, a need to find ways through which the parties interested in the ecosystem can manage and exploit it amicably. Besides, there is also need to investigate the conflicts that arise between the parties in their activities, as these could be some of the obstacles to the proper management and conservation of the mangrove ecosystem.

This study was, therefore, designed to find answers to the following questions:

1. To what extent do the government agencies collaborate with the local community in managing and conserving the mangrove ecosystem?
2. Are there conflicts between the parties interested in the management and conservation of the mangrove ecosystem?
3. What appropriate strategies are there for solving the conflicts between the parties?

1.2 Objectives of the Study

1.2.1 General Objective

The general objective of this study was to investigate the nature and sources of conflicts in the management and conservation of the mangrove ecosystem in Kwale District.

1.2.2 Specific Objectives

The specific objectives of this study were to:

1. Describe the roles played by the environmental management agencies and the local community in the management and conservation of the mangrove ecosystem.
2. Investigate the conflicts which arise between the parties interested in the management and conservation of the mangrove ecosystem.
3. Identify the strategies of resolving the conflicts that characterize mangrove management.

1.3 Rationale of the Study

The population at the Kenyan coast has been growing at a very high rate in the resent past. There is, therefore, an urgent need for planning and management strategies to ensure a sustainable exploitation of mangrove resources. The findings from this study were aimed at contributing to the accomplishment of the above management priorities.

It is argued by Crafter *et al*. (1992) that although the world literature on mangroves is overwhelming, only a little has been written about the Kenyan mangroves. Interestingly, the little that is available is mostly the work of natural scientists that are interested in the structure and ecological factors of mangroves rather than the socio-economic perspectives of the ecosystem. There are, therefore, gaps in the social science research which this study attempted to address.

Experiences in coastal management worldwide demonstrate that the chances for sustained management efforts are significantly increased by the repeated and meaningful participation of communities and economic interests affected by the programs (Ramdial, 1991). The study, therefore, suggests a framework to serve as a guideline to policy decisions and to ensure that the decisions and legislative laws concerning the management and conservation of the mangrove ecosystem incorporates the local community. This is important because the involvement and active participation of the users of the ecosystem in the development of legislation in most cases ensures the success of the programme.

Finally, the study exposes various sources of conflicts between the parties interested in the mangrove ecosystem and recommends possible solutions for them. This information, if adopted by the authorities concerned, is likely to enhance good relationships between the parties and this will ensure a better management for the deteriorating ecosystem.

1.4 Scope and Limitations

There are several kinds of conflicts along the Kenyan coast. These include conflicts between the parties interested in mangrove ecosystem, conflicts between coastal and upcountry people and conflicts over land allocation. Due to the limited time and funds, this study only concentrated on the first category. The research site was also narrowed down to the four villages of Gazi, Bodo, Shirazi and Vanga for convenience and efficiency in data acquisition.

The research concentrated on the south coast because it is in this region that there is a high rate of mangrove depletion. Thus, there is a likelihood of conflicts between the parties involved. Another reason for selecting the south coast as a research site is because of its better transport network compared to the neighboring mangrove regions such as Lamu and Kilifi Districts. It is even safe to argue that a good transport network has accelerated the depletion of mangroves along the southern coast of Kenya.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction

This chapter is divided into two parts, namely, literature review and theoretical framework. The first part, which is the literature review, is concerned with a general overview of the status and distribution of mangrove ecosystems all over the world. This is followed by a look at the importance of, and threats to, mangrove ecosystems. Further, the management considerations, existing legislation and administrative practices are examined. Lastly, reviews of the conflicts over the world's resources that have a bearing on the current study are made. The second part of the chapter focuses on the theoretical framework that informs the study.

2.1 Status and Distribution of Mangrove Ecosystems

Mangroves are salt-tolerant forest ecosystems of tropical and subtropical intertidal regions of the world. Where conditions are suitable, mangroves may form extensive and productive forests in the sheltered coastlines (Deshmukh, 1991; Wass, 1995). Generally, their growth is favoured by tidal flux, fresh water supplies, river sediments, protection from strong wave action and by gradual shelving of the shore line (Ramdial, 1991). The mangrove areas occur in an environment which supports hordes of mosquitoes and sandflies. This leads many people to believe that they are nothing but wastelands and suitable waste depositories and should be reclaimed for agriculture, residential purposes, port and industrial development (Hamilton and Snedaker, 1984; Ramdial, 1991). This approach of utilisation, apparently, fails to recognise the natural values of the mangrove ecosystem that are expressed in the form of a variety of products and services.

World wide, there are about forty species of mangroves, but in the new world there are nine species representing four genera; namely, Rhizophora (*mkoko*), Avicenia (*mchu*),

Laguneularia (*mkandaa*) Conocarpus (*mkomafi*) (Ramdial, 1991). These species are widely and variously distributed all over the world, but two broad well-defined areas are distinguishable. These are the eastern area embracing East Africa, Asia and the Polynesian islands down to Australia and a western area comprising the coasts of America and West Africa (Deshmukh, 1991).

On the Kenyan coast, mangrove forests border the Indian Ocean from Kiunga in the north to Vanga in the south. They are found around the offshore islands and along the banks of coastal rivers and creeks (Wass, 1995).

2.2 Importance of and Threats to Mangrove Ecosystems

Mangrove forests are rich and diverse resources. Over the years, they have been important in the subsistence of a large percentage of the world's population. For the last two decades, they have attained great economic significance because of their direct resource utilisation in forestry and fisheries production and in view of their potential in protecting coastlines and maintaining the estuarine ecological balance (Hamilton and Snedaker, 1984; Aksornkoae, 1989; Semesi and Howell, 1992; UNEP, 1998). In addition, both the direct and indirect harvests of products from mangroves are renewable provided the ecological processes governing the system are maintained (Hamilton and Snedaker, 1984).

The coastal people in different parts of the world have traditionally exploited the rich natural products of the mangrove swamps as well as various parts of the trees themselves (UNEP, 1998). From the trees, wood products such as timber, firewood, medicines as well as honey are extracted. Marine products are also extracted from the mangrove ecosystem (Wass, 1995). Mangrove poles are preferred for building due to their resistance to termite attack. For instance, at the Kenyan coast, they are used for building houses. Of late, the demand for these poles has increased due to increasing tourism and the expansion of the hotel industry (Wass, 1995; UNEP, 1998).

Similarly, mangrove wood has a very high calorific value and given its low cost, it is preferred for wood fuel by the local people. It is also used in the same way in salt extraction from brine and in the smoking of fish. In the industrial sector, industries and factories such as the calcium products industry and tile factories consume almost all the licensed industrial consumption of fuel wood (Wass, 1995). The other uses of mangrove wood around the coastal region include the manufacture of dug-out canoes, furniture, beds, fence posts, fishing traps, net supports, and floats for fishing nets (Semesi and Howell, 1992; Wass, 1995; UNEP, 1998).

Mangrove ecosystems are also appropriate sites where teaching, observations and research programmes are made as well as scientific experiments carried out by schools and universities (Semesi and Howell, 1992). Regarding religious significance, Wass (1995) observes that the forest on Chale Island has traditionally been a sacred kaya, the only one remaining on the coast after others were cleared. The *kaya* have been conserved by the Mijikenda over the centuries for spiritual uses (GOK, 1996). However, Wass (1995) asserts that with the recent construction of a tourist hotel at the entrance to Chale Island and the consequent use of the forest by tourists, the forest is losing its cultural importance to the local people.

Mangroves also provide many indirect and intangible benefits to the coastal inhabitants. For example, mangrove forests are an important habitat for a variety of terrestrial and aquatic plants and animals which play an important role in the people's economic pursuits (UNEP, 1998).

Mangroves are also important land builders. For example, apart from being natural barriers against sea intrusion, they also break up storm surges and strong tidal currents. They, therefore, protect the coast from erosion and pollution. This is accomplished by influencing the deposition of mud and silt as well as filtering sediments and toxic waste originating from land, respectively. Their flowers are a good source of honey while the

leaves, on the other hand, form the basis of the food chain in surrounding waters. Finally, during storm periods, mangrove forests provide relatively safe moorings for small boats (Ramdial, 1991; UNEP, 1998).

However, despite the important roles played by the mangroves, they are threatened with a variety of predicaments. The most pronounced ones include pollution, over-exploitation and alienation, particularly of estuarine, coastal and shallow sea habitats (Kenchington, 1990). Traditional users and large-scale commercial extractors are equally threatening to the shrinking ecosystem. The mangroves are also under danger from conversion activities such as agriculture, fishponds, and residential development which are increasing at a very high rate (Hamilton and Snedaker, 1984). All these activities can result in severe socio-economic consequences for the coastal people who rely on these resources for their livelihood. Similarly, the effects on the ecosystem directly and/or indirectly pose a danger to the fragile flora and fauna which inhabit it.

Other threats include natural processes such as sediment deposition and newly formed dunes which are burying the mangrove forest on the seaward edge and killing it (Wass, 1995). Lastly, pests have also not spared the forests.

2.3 Management Considerations, Existing Legislation and Administrative Practices

As long as people have lived adjacent to the shore and used coastal and marine resources, there has been some form of coastal management, even if by default. (Ruddle and Johannes, 1983; 1989). These scholars also argue that traditional societies that depended on coastal resources often had elaborate management systems that sustained the people and resources for generations, although they were not always consciously planned or intended as management regimes.

It is further argued by Ruddle and Johannes (1983, 1989) that in the nineteenth and twentieth centuries, populations increased while technologies changed. This forced

governments to extend their reach over resources and, thus, the responsibility for management moved away from resource users to governments. For coastal and marine areas this typically meant either neglect or sectoral management of individual resources like fisheries, or activities like transport, which often resulted in degradation of resources, lost opportunities and intense user conflicts (Hale *et al*, 1999).

In many countries, marine environment management strategies include the establishment of protected areas to serve as sanctuaries for flora and fauna and to provide opportunities for scientific and non-extractive recreation or tourism. Similarly, in most countries there are institutions and mechanisms which can address each of the components of marine environment management, but they are generally scattered among agencies at different levels of government and community administration (Kenchington, 1990). This has sometimes meant that there is often inadequate communication and at times there is mutual hostility and obstruction between such agencies (Kenchington, 1990).

Kenchington (1990:60), therefore, suggests that "converting an awareness of need into action to manage marine resources generally involves detailed consultation and planning. Such a process is futile if not matched with a long-term commitment of people, equipment and finances to ensure that the exercise is more than just a matter of creating plans or statements of intend". The involvement and active participation of the users of marine environments in the development of legislation, in establishing, maintaining, monitoring and implementing the management of marine areas are also emphasised. Also, consideration should be given where local rights and priorities are firmly established so that arrangements are made for specific benefits to local inhabitants. This could be in terms of employment in the management or compensation for lost rights (Kenchington, 1990).

Unfortunately, there is no sufficient evidence to verify the attainment of the above objectives on the Kenyan coast. The literature by Semesi and Howell (1992), Kigomo (1991), Wass, (1995), Ochiewo, (1998), and UNEP (1998) indicates that the Forest

Department employs the licensing system in its control of the cutting of mangroves. Other conservation strategies put in place includes privatization, imposition of user fees and legislative levels of use. However, Semesi and Howell (1992) observe that there are many flaws in the system. For instance, the license in most cases is issued to an individual but he/she has a number of mangrove cutters. This has meant that in spite of the regulation, the over-exploitation continues unabated.

Traditional management strategies are based on concepts of ownership and control by individuals or communities of areas where resources abound. Modern concerns, on the other hand, take cognisance of the inter- linked problems developing on land through the growth of human population. The capacity of the global landmass to support continuing population and impacts on human actions upon terrestrial ecosystem are also taken into consideration (Kenchington, 1990). However, Kenchington (1990) observes that the modern management strategies have not been any better since mangrove over-exploitation all over the world is still very high. This is attributed to the increased human populations and new applications of technology in the use of resources (Kenchington, 1990). Therefore, the basic requirement for marine environment and resource protection is the management of human uses and impacts.

In fact, Kenchington (1990) suggests that this requires first the understanding of uses as well as the historic and current extent and impact on each use. The extent and likely impact on future use on the basis of user expectation should also be put in mind. Other considerations include the interactions of the range of present and likely future uses and the options for management of each use. Also, it is important to persuade users that the management of the marine environment will serve their long-term interests and, thus, training the local people in conservation activities is paramount. Lastly, conservation methods which are used in forestry and agriculture can be adopted and applied to mangrove conservation (Kenchington, 1990).

Aksornkoae (1998) commends the growing awareness on the need to conserve and utilise

the ecosystem on a sustainable-yield basis. To attain this, Aksornkoae (1989) recommends mangrove land-use zoning which should be co-ordinated with socio-economic and coastal development plans. Here, mangrove zones should be outlined for conservation and management activities. These activities include the protection of the mangrove ecosystem from any disturbance, silvi-cultural systems for suitable yield of timber production as well as natural regeneration and management for suitable yield for fisheries. Aksornkoae (1989) also recommends the reforestation of mangroves as a conservation method and indicates that this should be planned, not only for degraded mangrove forests, but also on abandoned areas, particularly those left after tin mining or where fish or shrimp farming has been done. Mangroves can also be planted on mud flats.

Another strategy is the multiple-use management system approach which involves the integrated management system of mangrove plantation and aquaculture. This method has proved successful in Indonesia. In addition, management systems using mangrove forests for agriculture and salt ponds are other successful examples from both Indonesia and Thailand (Aksornkoae, 1989).

Mangroves can also be managed and conserved through habitation and sites for harbour and industrial complexes. This method is popular in Thailand where the government allows people to reside in the mangrove area but only in clusters, as they are easier to control than scattered habitations. To use mangrove areas for harbour facilities or industrial complexes in Thailand, entrepreneurs must submit a project proposal and an Environment Impact Assessment (E. I. A.) to the National Environment Board for analysis. Permission is granted on the basis of the weight of the adverse effects on the environment (Aksornkoae, 1989).

Generally, therefore, for an effective conservation and protection of mangrove forests, laws and regulations should be backed-up by an enforcement mechanism, with sufficient trained officers. Effective enforcement also requires support equipment, including vehicles and boats, to enable the officers to efficiently carry out their management and

conservation responsibilities (Aksornkoae, 1989; Beatley et al., 1994; IUCN, 1996). There is also a need to conduct impact assessments of projects in and adjacent to mangroves on the basis of the dynamic nature of this ecosystem. Here, particular emphasis should be laid on the vital "external" processes related to the supply of nutrients and the stabilising of the substrate (Hamillton and Snedaker, 1984).

Conversely, Wass (1995) has asserted that the Departments of Forestry and Fisheries have both had problems in their management activities on the Kenyan coast. First, law enforcement activities are limited due to a shortage of boats and vehicles. Second, with the gazettement of the marine reserves, the Kenya Wildlife Service became involved in the management of the mangroves and confusion arose because of the Forest Department's and KWS' conflicting policies on utilisation. At the moment, however the two departments are jointly managing all the mangroves in Kenya (Wass, 1995). This is a score towards the positive side. In fact, Wass (1995) calls for the involvement of other relevant organizations in the environmental conservation of the mangrove ecosystem.

Despite the stated limitations in its efforts to ensure sustainable utilization of mangroves, the Government of Kenya has been dedicated towards this end. For instance, a resolution was passed in 1993 by the Forestry Department and KWS to stop all clear- felling, uprooting and commercial cutting of poles (GOK, 1996). Wass (1995), however, argues that these resolutions have not yet been substantially implemented and where they have, there have been conflicts with the local communities who depend largely on the resource for their livelihood.

Wass (1995) observes that there are no current management plans for mangrove forests, however, he offers the following as future management actions: the production and promotion of multidisciplinary management plans for mangroves. Also, a set of optimum harvesting techniques is required. Equally important is training for cutters and foresters and searching for alternatives to products which are being over-exploited as well as rehabilitating the degraded areas. There is also a need for increased involvement of local

communities in mangrove conservation, including rehabilitation of clear-felled areas. Lastly, research results from Kenya and elsewhere should be drawn upon to improve the management of Kenya's mangroves.

However, it is instructive to note that there are legislations already in place concerning mangrove exploitation. These legislations are generally included with those for terrestrial forestry. For instance, there are a number of Kenyan statutes which impinge directly or indirectly on the coastal and marine environment, its resources and their management. Among those that affect the mangrove ecosystem is the Forestry Act (Cap 385) which is implemented by the Ministry of Environment and Natural Resources and has provisions for the establishment, control and regulation of all forests in Kenya (UNEP, 1998).

The Government Fisheries Protection Act (Cap 379), which is also implemented through the Ministry of Environment and Natural Resources, has provisions for the control and management of certain coastal and marine species and other resources which are threatened with depletion. Lastly, the Wildlife Conservation and Management Act (Cap 376) is implemented by the government through the same ministry in conjunction with the Kenya Wildlife Service and has provisions for the preservation and control of wild fauna and flora. In fact, various marine and other national parks apply the act in protecting flora and fauna in their jurisdictions (UNEP, 1998).

In spite of the above legislative and regulatory mechanisms, the complexity of the mangrove ecosystem makes attempts to manage its sustainability extremely challenging. For instance, it is relatively simple to appreciate the wood product values of the mangroves, but it is more difficult to include in national legislation and to administer controls on the use of the related mineral, fishing and other uses (Semesi and Howell, 1992). This has made the management of coastal resources in Kenya difficult (Kagwi and Mwanguni, 1996). The findings from the study are, therefore, likely to help in understanding the complexity of the mangrove ecosystem and in this way, enhance proper management and conservation of the ecosystem.

2.4 Sources Of Conflicts

Given the richness and diversity of coastal resources, it is not surprising that there are many conflicting claimants. Within the framework of socio-economic analysis, resource use conflicts arise from a number of reasons. These include the nature of common property resources, poorly defined property rights, the existence of economic externalities and the presence of non-marketed goods and services (Dixon, 1989). In this regard, communities may manage a common property resource, such as a mangrove forest, in a sustainable way for generations only to find that they have no legal title and can lose the use of it. Political factors may also play a role in assigning formal titles to valuable resources and this may result in social and economic conflicts.

It is also important to note that poorly defined property rights can lead to mismanagement, insufficient investment in maintaining productivity, collection of "political rents" and alienation of traditional resource users. It is usually the poorest members of society, such as those who do not have control over resources, who lose when property rights are changed (Dixon, 1989). Another source of conflict, as noted by Dixon (1989) is the overlooking of the non-marketed goods and services during valuation. Although non-marketed goods and services contribute to social welfare just as marketed ones do, they tend to be ignored in the analysis of options. For example, a mangrove forest ecosystem may be analysed in favour of a new construction site, such as an industrial development, if the "value" of the mangrove forest is calculated solely on the basis of poles and charcoal produced. It will have a low value per hectare in this case and, thus, an industrial construction is recommended at the site. However, the mangrove forest will have a high value per hectare if the other onsite and offsite benefits of the ecosystem are included. Other sites for industrial development may be found to be less costly than the initially chosen "worthless" mangrove (Dixon, 1989).

Whatever the reasons for conflict, coastal zone resources frequently require management

plans to guide the pattern and place of development. Dixon (1989) has shown that market signals and imperfections favour rapid development and over-exploitation of coastal resources. These patterns can result from very different reasons. This could include "poverty-driven over-exploitation by large numbers of coastal residents as well as greed-driven resource use by a handful of wealthy and powerful people" (Dixon, 1989:156). In this regard, therefore, management requires an identification of impacts, assessment of benefits and cost analysis of alternatives.

Semesi and Howell (1992) give an example from Tanzania which indicates that conflicts arose between the Forestry Department and the villagers following a ban on the cutting of mangroves by the former. Villagers found it difficult to accept the ban because mangrove felling was going on by commercial operators. The operators were granted licenses from the same authority which refused the villagers permission to cut even a single tree. Under such circumstances, it was not surprising that local residents were not co-operative in assisting the efforts of the government to prevent illegal commercial cutting of the mangroves.

Ochiewo (1998) also indicates that at the Kenyan coast, the Forestry department strives to limit the number of licenses to control the cutting of mangroves while the local community would wish to be given equal opportunities to cut mangrove for domestic and commercial purposes. The local community in most cases has continued with illegal cutting of mangroves especially at night. The reason for this could be because most members of the community fail to raise the required fee or fail to obtain a cutting license as they are given on a limited basis (Ochiewo, 1998).

As far as management is concerned, there are countries with well-developed conflict resolution mechanisms in place. In Ecuador, for example, there are active and permanent multi-stakeholder committees at local and national levels (the SAM Committees) which serve as the forum for conflict resolution. The capability of conflict resolution is, therefore, well developed at the local level (Hale et al, 1999).

In Australia, we have an integrated committee on Ecological Sustainable Development (ICESD) which is a major vehicle for mediating national conflicts over policy proposal. Unfortunately, the available literature on the Kenyan coastal management does not indicate the presence of such committees or conflict resolution mechanisms. Kenya should, therefore, borrow a leaf from the above mentioned countries.

2.5 Theoretical Framework

In this study, the interest was in the conflicts that prevail between the parties interested in the management and conservation of the mangrove ecosystem. The conflict theory has, therefore, been deemed appropriate as a guiding theoretical framework of the study.

2.5.1 Conflict Theory

Karl Marx advanced conflict theory, however, the German philosopher George Hegel who suggested that for every idea a counter-idea develops in conflict with it influenced Marx's thinking on conflict. Over time, the two ideas blended to produce a new idea or synthesis. It is believed that this pattern continually repeats itself. Marx's contribution was to apply this model of ideological change to change in economic and material systems. Basically, conflict theory addresses the points of stress and conflict in society and the ways they contribute to social change.

Conflict theorists contend that a full understanding of society requires a critical examination of the competition and conflict in society, especially of the processes by which some people are winners and others losers. Like structural functionalists, conflict theorists are interested in social structures. They try to identify how unequal access to scarce resources is built into our social structures. The theory is also concerned with the processes through which those with advantages manage to protect them.

Marx, like many of his contemporaries, also stressed the importance of the role of struggle in achieving cultural evolution and progress. All history, according to Marx, was the outcome of the struggle between social classes for control over the means of production.

Conflict theory has been utilised by several scholars, among them Boulding (1963), Lewis (1967), Mafunga (1988), as well as Bercovith, (1984). Bercovith (1984) defines conflict as a situation that involves at least two parties so that the first concept must be that of party. A party is a behaviour unit, that is, some aggregate or organization that is capable of assuming a number of different positions while retaining a common identity or boundary. A behaviour unit may be a person, a family or a social organization such as a nation and it becomes a party when it involves in conflict with another behaviour unit. A party is something that cannot actually exist in the singular, it must come at least in pairs (Boulding, 1963).

Boulding (1963) also defines conflicts as a situation of competition in which the parties are aware of the incompatibility of potential future positions and in which each party wishes to occupy a position that is incompatible with the wishes of the other. He further observes that when two opposing statements or states of affairs confront each other, both of them cannot be true or false. In a nutshell, therefore, conflict theory is concerned with the stresses and conflicts that emerge in society because of competition over scarce resources.

2.5.2 Relevance of the Theory to the study

This theory is relevant to the study since it emphasises the stresses and conflict that emerge in society because of competition over scarce resources. The stress in the study is on the mangrove ecosystem which has prompted the government to put in place management strategies such as regulating its exploitation. This has further caused stress to the local community who relies on the ecosystem for its livelihood and was used to

free exploitation of the resources in the ecosystem.

The element of unequal access to scarce natural resources also fits in well with this study where the government agencies have converted the mangrove ecosystem into other uses, such as tourism, but the benefits derived from this do not benefit the local people. The local community is not adequately compensated for the converted mangrove land.

In this study, the behaviour units under analysis are the methods and processes of the management and conservation of the mangrove ecosystem. Members of the management and conservation processes in conflict are the government agencies such as the Forest Department and the local community.

Marxists' argument on the reordering of the means of production and distribution and the further suggestion that this transformation is characterised by conflicts is of relevance to the proposed study. The change in the management and conservation of mangroves from the local people to the government agencies has created a rift between the two parties. Conflict theory is, therefore, appropriate as a theoretical framework for the study.

2.5.3 Assumptions

In the light of the literature reviewed and the theoretical framework stated, the following assumptions were advanced for this study.

1. The role played by the local community and the environmental agencies in the management of the mangrove ecosystem is below the expectations.
2. The expectations of the mangrove ecosystem management by the parties interested in it conflict with each other.
3. The prevailing conflicts can be resolved by involving the local community in the management and conservation of the ecosystem.

2.2.4. Definition of terms

Conflict - This refers to a situation of competition struggle and disagreements between those interested in the ecosystem. It can also be taken to mean a struggle over values and claims to scarce status, power and resources in which the aim of the opponents is to neutralise, injure or eliminate their rivals. In this study both the government agencies and the local community are aware of the benefits of being managers of the mangrove ecosystem. The bone of contention in this case, therefore, is the management and exploitation of the resources in the ecosystem. One of the sources of conflicts between the two parties could be the restriction of the exploitation of the mangroves and fish. The restrictions are put in place by government agencies against the local people who do not have an alternative source of income.

Exploitation - This refers to the ways in which the mangrove habitat is transformed to provide for the livelihood of the people. The indicators are the use and possession of fishing nets traps and vessels. The number of local visitors and tourists could measure the aesthetic value of the mangroves to the areas.

Management - This refers to the balanced exploitation and control of the mangrove resource to provide for the present generation without compromising the needs of the future ones. Management involves such strategies as privatisation, imposition of user fees and training people on mangrove conservation and regeneration methods. The main indices of mangrove management strategies also include activities such as mangrove land-use zoning co-ordinated with socio-economic and coastal development plans, reforestation, and multiple potential of the mangrove ecosystem. The objectives, forms and number of formal and informal organisations indicate how those organisations manage their activities. The number of management committees and their respective composition show the level of community participation in the management of the mangrove habitat.

Conservation - This refers to the active management of biological resources so that they yield the greatest benefit to present generations while maintaining their potential to meet the needs of future generations. Unlike preservation, conservation provides for the long-term retention of natural communities under conditions that provide the potential for continuing evolution. The indices for resource conservation in this study include afforestation and allowing the regeneration of trees. How have they been extracting resources? Do they allow time for the regeneration of productive capacities?

Mangrove Ecosystem - This refers to the permanent evergreen marshy area with salty and brownish waters, whose depth at low tide does not exceed 6 metres, salt-tolerant wood shrubs, wild animals and various species of birdlife find solace here. The research was interested in the conflicts that arise between the parties interested in the exploitation and management activities of this ecosystem.

Resource- A valuable item or commodity valued for its various uses. In this case resources in the ecosystem are mangrove trees, fish, corals- valued for their physical and aesthetic values or uses.

Sustainable- Is a way of maintaining stability or use of something without jeopardising future needs.

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter discusses the methodological techniques used in the study. It defines the research site, population universe, study population and unit of analysis, selection technique, the research instruments and the problems encountered during the study. The chapter also has a section on ethical issues.

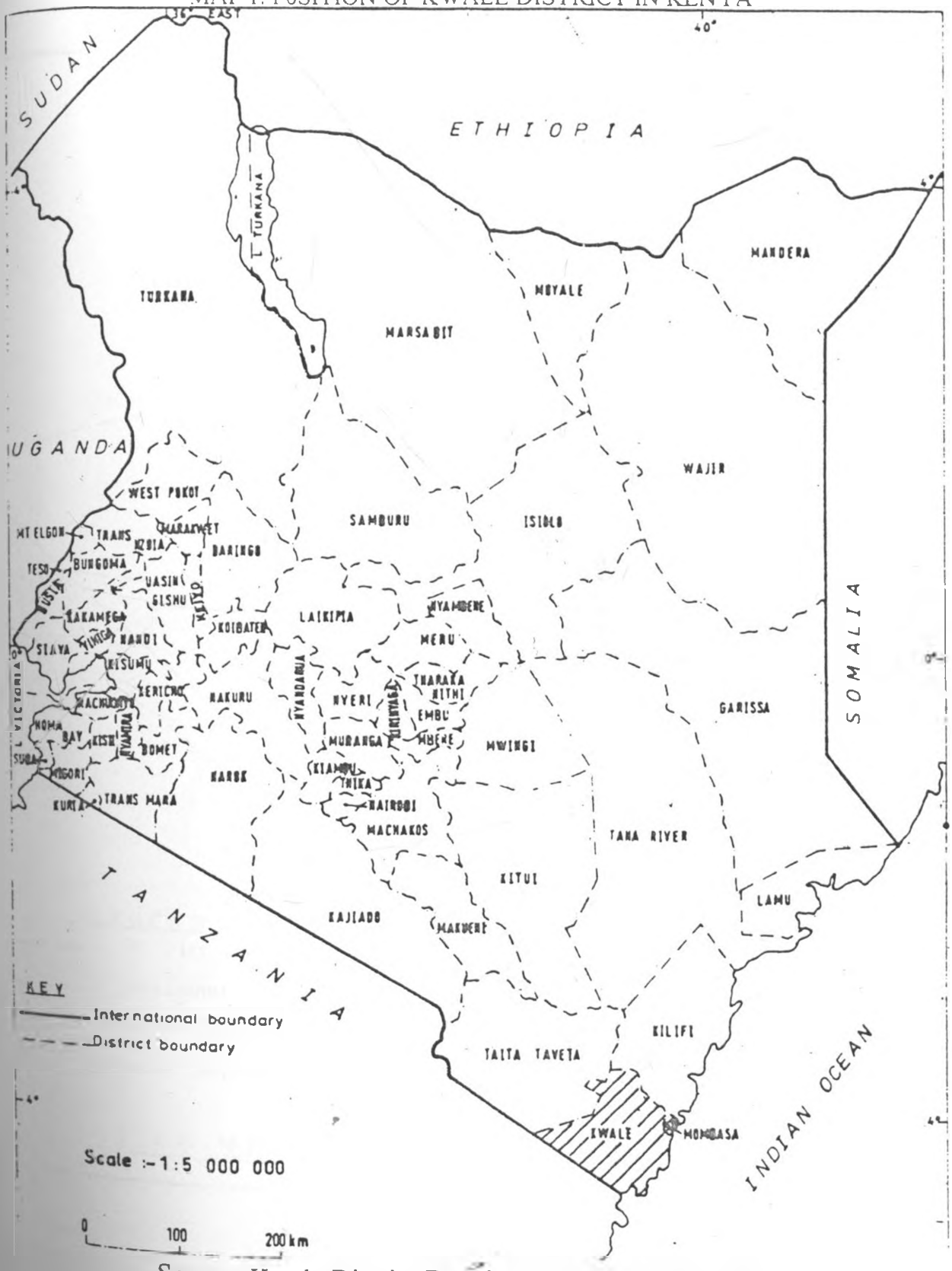
3.1 The Research Site

This study was carried out along the coast of Kwale District, Kenya. The district is situated at the south-most tip of Kenya and is bordered by Taita-Taveta District to the west, the Indian Ocean to the east, Kilifi District to the north and the Republic of Tanzania to the south. The district is the third smallest in the Coast Province after Mombasa and Lamu and it covers an area of 8,322 km^2, of which 8.275km^2 is land area and 65 km^2 is under water (GOK, 1996). The Digo, who are the majority of the nine subgroups of the larger Mijikenda community, are also the majority of the inhabitants of the district. Specifically, the study was carried out in Msambweni Division. The division has seven locations and twenty-two sub-locations. According to the 1989 census, Msambweni Division had a population of 157,400 people. It is, however, projected that by the end of 1999, the population will be 217,885 (GOK, 1997).

3.1.1 Physical Environment

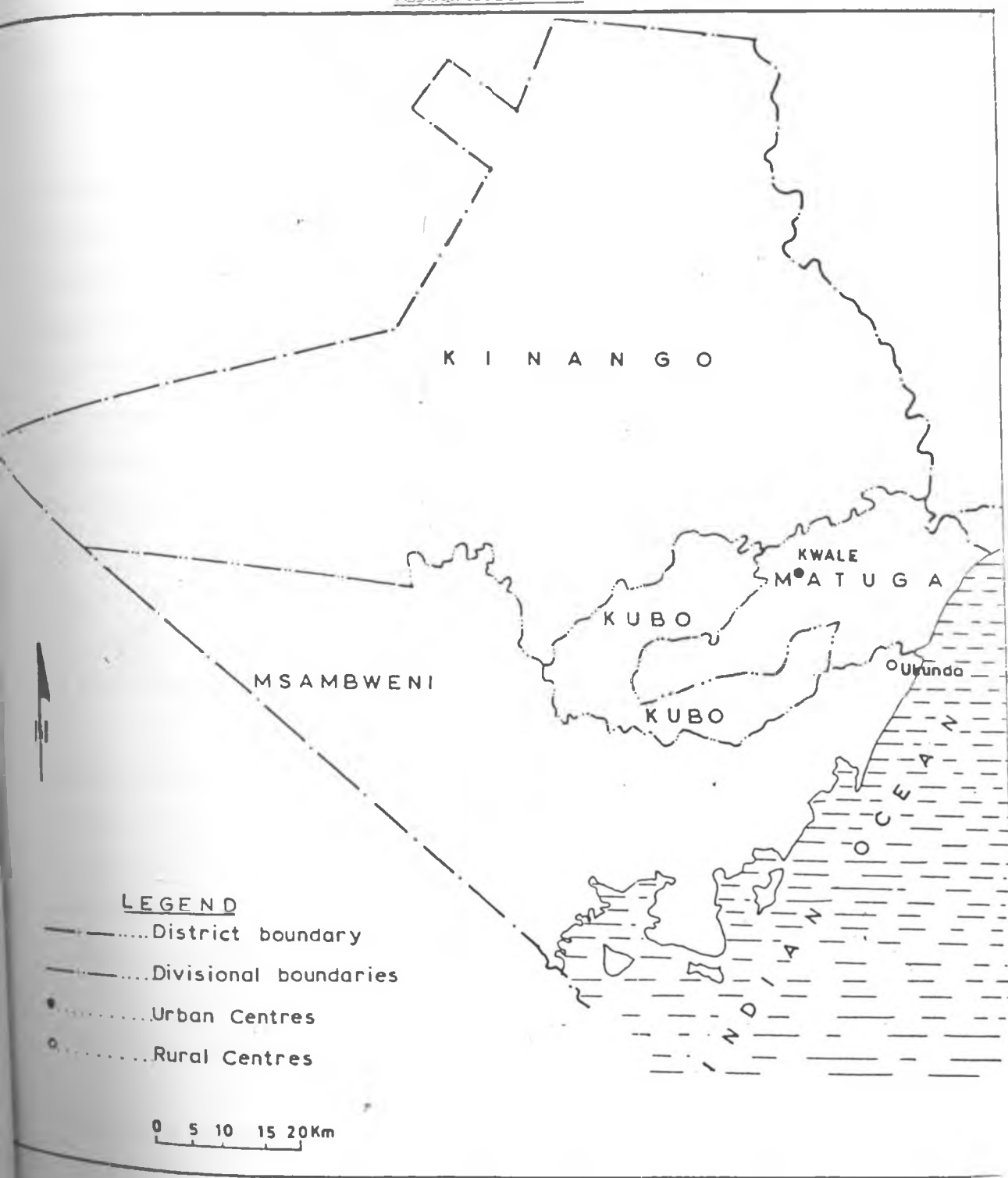
Kwale District can be divided into two major topographic zones, namely, the Coastal Plain and the Hinterland. The former is narrower particularly to the south of Mombasa and it is also generally low-lying with an altitude of 150 to 300 metres above sea level (GOK, 1996).

MAP 1. POSITION OF KWALE DISTRICT IN KENYA



Source: Kwale District Development plan 1997-2001

MAP 2. KWALE DISTRICT ADMINISTRATIVE BOUNDARIES AND THE RESEARCH SITE



Source: Kwale District Development Plan 1997-2001

From the Coastal Plain, the land rises steadily towards the Hinterland and reaches its peak in the Shimba Hills, Jombo and Mwele cliffs, at an altitude of 240 and 520 metres above sea level. Much of the Hinterland zone is characterised by rolling hills which are interjected by deep valleys (GOK, 1996).

The district has a number of permanent streams and springs which run at right angles to the coast. The more important of these are from north to south and they include Sigi, Umba, Ramisi, and Mwachi. These streams can become an important source of water for irrigation even in those areas that are adequately supplied by rainwater (GOK, 1996).

The vegetation varies from scattered coconut plantations along the coastal strip and a low, thorn-bush and scrub vegetation to terrestrial forests and open savannah in the hinterland. These are frequently cut into logs and sold for boat, dhow and even door making. These forests, especially kava duruma, are threatened with extinction and, thus, there is a need for their conservation (GOK, 1996).

3.1.2 Climate

Inadequacy and unreliability of rainfall is a major problem in the district. Less than 90% of the area receives below average rainfall indicating that the area is unsuitable for crop farming. Generally, the district has a monsoon type of climate which is hot and dry from January to May. The highest temperatures are recorded in November and April while the highest rains are recorded in May to August (GOK, 1996).

3.1.3 Demography

The district's population was 288,363 in the 1979 census, and rose to 383,053 people in the 1989 census, which represents a 2.8% growth rate. The district's population is given as 53 persons per square kilometre (GOK, 1996). The population of the whole Mijikenda people in the district is 1,007,371. Out of this, there are 492,971 males and 514,400

females (GOK, 1997-2001).

3.1.4 Economy

In some parts, especially along the coast and in the Shimba hills, the district has good potential for crop production. Agricultural land accounts for up-to 93% of the total district area. Fishing is also a source of livelihood. Of late, the beach hotels also provide employment to the people (GOK, 1996; UNEP, 1998).

Even though the district is endowed with beaches hosting several tourist class hotels and cottages, these tourism facilities have not generally helped to improve the welfare of the people of Kwale, apart from a few employed in these enterprises (GOK, 1996). However, the tourism facilities in the district generate some revenue to the county council and have led to the growth of informal business activities along the beaches (GOK, 1996).

In the district, the forestry area is about 35,000 hectares. The natural indigenous forests cover an area of 33,000 hectares, which includes 6,000 hectares of mangrove forest cover. Forests in Kwale are a major source of the valuable hardwood timber. Licensed saw millers obtain their raw materials on commercial basis from the forest. The trend of exploitation over the last five years indicates a decline in the availability of exploitable woods (GOK, 1996).

3.1.5 Social organization

The *ngambi* elders are the traditional government of the Digo and Duruma and they still wield considerable influence (GOK, 1996). This means that the effective participation of elders in development would be enhanced if they were exposed to development activities taking place in other parts of the country (GOK, 1987). Among other activities, *Wangambi* are responsible for the preservation of the *kaya* which are usually built in thickly, forested areas to keep away enemies. The preservation of the *kaya* would,

therefore, be in line with the present government policy of afforestation (GOK, 1996).

Among the Digo and the Duruma, land belongs to the clan *(mbari)*. Initially, land was sub-divided even though the situation has changed now. The clan exercises a lot of power in controlling land. Under *mbari* leadership, public land consists mostly of grazing land. This is set aside specifically for clan members' livestock.

Every clansman has a traditional right to occupy and use clan territory. This idea of common right and ownership stems from the belief that the earth is the mother of all clansmen. No child could, therefore, be refused the right to belong to its mother (GOK, 1996).

3.2 Population Universe

The population universe was the entire population of Msambweni division. The population universe was, therefore, 157,400 people which is the total population of Msambweni Division according to the 1989 census. From the population universe, the unit of analysis was derived.

3.3 Study Population and Unit of Analysis

The study population was derived from the population universe through purposive sampling. This was because the objectives of the study focussed on six target groups considered to be the key players. The groups include the local mangrove exploiters (local community), mangrove cutters, mangrove dealers/ agents, fishermen/ women, mangrove ecosystem management organisations and decision makers, who included the district officer, chiefs, assistant chiefs, community leaders and natural resources management staff in government and NGOs.

The financial and time constraints could not allow a study of all the locations in the district. The researcher also realised while in the field that in Kwale, especially on the shoreline, people live in clusters (natal villagers). Thus, a representative sample of four villages was selected, namely, Gazi, Bodo, Shirazi and Vanga. Gazi is in Kinondo location, Vanga in Vanga location while Bodo and Shirazi are both in Kingwede-Shirazi location. In each village there were interviews and observations on the general population by way of survey, informal interviews, in-depth interviews, key informants, life histories and focus group discussions. The unit of analysis was the household.

3.4 Sampling Procedure

In this study purposive sampling was used and only villages near the ecosystem and exploiters of the resources in the ecosystem were selected. The purposive method was also used in the selection of key informants, focus group discussions and life histories. However, for survey interviews, random sampling was used on the purposively selected categories, for example, fishermen, firewood collectors, mangrove cutters or mangrove dealers.

The researcher chose Msambweni Division as his research site because the division covers areas around the mangrove ecosystem. The research site was further narrowed down to three locations along the shoreline, namely, Kinondo, Kingwede-Shirazi and Vanga. With the help of chiefs and assistant chiefs, all the villages in each location were listed and we selected one village in each location where we believed there was a lot of Mangrove cutting activities. The first three villages to be selected were Gazi, Shirazi and Vanga. Bodo, which is in the same location as Shirazi, was also chosen because it is referred to as the headquarters of mangrove forests by the local people.

In the selected villages, respondents for survey interview were sampled by arbitrarily picking on any individual in the villages. Twenty individuals were interviewed from each village during the survey interview to bring the total number of respondents to eighty.

Key informants for in-depth interviews were also sampled purposively in the course of the fieldwork. The same method was used to select focus group discussions and life histories. In each village, there were two FGDs, and two life histories to bring the total number of both to eight, respectively.

3.5 Methods of Data Collection

The following sources of data were used in this study: secondary sources of data, non-standardised interviews, key informants, oral interviews, life histories and direct observation.

3.5.1 Secondary data

This method was used at the initial stages of the study. The method made use of ethnographic and secondary literature from libraries. The International Union for the Conservation of Nature (IUCN), the British Institute in East Africa (BIEA), UNEP, UNESCO, Forest Department as well as FAO libraries were consulted. The information obtained was used to strengthen that which was obtained from primary sources.

3.5.2 Primary data

These formed the core of the study and were obtained by the use of less structured open-ended interviews, key informants, life histories, focus group discussions as well as direct observation. Interviewing was the main method and three techniques, namely, the interview guide, standardized open-ended interviews, key informant interviews and focus group discussions were utilized. Observation was only used as a supplementary method.

i) The Interview Guide Approach

The guide contained questions or issues explored in the course of the interview. The researcher used the guide in order to make sure that the same information was obtained

from a number of people by simply covering a determined set of issues or questions. The guideline provided a framework within which the researcher pursued certain questions in greater depths. The guide had topics or issues such as management and conservation of mangrove ecosystem and the conflicts that arise in the process of carrying out these activities. An equal number of men and women were interviewed.

ii) **Key Informants**

This technique was used to provide additional information to that obtained through the interview schedule. In-depth interviews were carried out with old men and women, Forest Officer, forest guards, game warden, marine rangers, KEMFRI personnel , women group leaders and decision makers. Key informants provided in-depth information on the nature and ways of mangrove ecosystem management and conservation, the level of community involvement in the two activities and conflicts that arise in the process of carrying out the activities.

iii) **Focus Group Discussions**

These were organized in the form of a mini-symposium where the group to be interviewed sat together and discussed among themselves the specific topics of interest to the researcher. A focus group guide was used to facilitate the discussion. This method was very vital to the study since it enabled the researcher to compare the outcome of the discussions with the responses given in the questionnaire.

For the purpose of this study, eight FGDs were held two from each village, (one for cutters and another for firewood collectors). Each group consisted of a minimum of eight and a maximum of twelve people.

The discussions were generally conducted on Fridays since it is on this day of the week that most people keep indoors for the purpose of worship. Islam is the dominant religion

in the district and it was on Fridays that the researcher managed to capture fishermen, mangrove cutters and even firewood collectors because Muslims do not work on Fridays. In all the eight FGDs, the researcher made some short notes with the assistance of a field assistant. The assistant's notes were later compared and complemented by the researcher's. During the discussions, each member of the group was given chance to express his/her views. This way, additional and more reliable responses were obtained. The researcher moderated the discussions since language was not a problem.

iv) Life histories

Life histories, or personal biographies, were collected over a series of many lengthy interviews and presented as explanatory and illustration materials in connection with other kinds of data that have been collected in a representative manner.

v) Direct observation

Direct observation was used alongside the interview guide and standardised open-ended interviews. The researcher observed how the local people and management agencies carry out their activities and wrote short notes about the same later on.

3.6 Data Processing and Analysis

The data in this study were analysed through qualitative and quantitative techniques. The qualitative approach was used in discussing data collected through the informal interviews, focus group discussions, life histories, key informant interviews and direct observations. The information elicited by the above methods was arranged and categorised according to the major themes which were brought out in the course of the study. Qualitative data analysis also included presentation of quotes from different respondents.

Quantitative data on the other hand, were analysed using a computer. The responses given by the informants were cleaned, coded, keypunched into a computer and analysed. In this case, percentages and frequencies of various responses were calculated and information presented in the form of tables.

3.7 Problems Encountered In the Field and Their Solutions

In the course of this study, the researcher encountered some problems. In the first place the area under study had a very poor infrastructure network in which some areas were totally inaccessible. Scarcity of the means of transport was quite remarkable. Since the villages were selected randomly, some happened to be far from the main road, therefore, reaching some of them was cumbersome. The researcher overcame this problem by trekking and starting his work early enough to cover enough ground. In Vanga village, for, instance, the researcher hired a bicycle to Lunga Lunga to board a vehicle to his base of operation since the last vehicle leaves Vanga at exactly 1.00 p.m. It was difficult for the researcher to catch this vehicle because most of the FGDs were carried out in the afternoons, from 2.00 p.m. onwards.

Another problem was that during the research, there was an outbreak of cholera in the study villages, which claimed several lives. The scourge disrupted the researcher's schedules as some of the families he had fixed the appointments with were affected. All the hotels were closed down. The researcher was forced to carry packed food and water to the field, which in most cases went bad after a few hours because of the coastal hot temperatures. The researcher overcame this problem by fixing fresh appointments with the affected families. He also opted to take sodas to other food and drinks while in the field.

Getting respondents was another problem. In Kwale, because of hot weather, people leave their houses for work very early in the morning. It was therefore difficult to get fishermen, firewood collectors, and mangrove cutters. However, the researcher arranged a

meeting with them on Fridays because on this day of the week they do not go to work.

Suspicion, though not significant was a set back that deserves mention since it threatened the progress of the study. It revolved around one issue. Before the study, some CID officers had arrested some drug dealers in the villages of the research and investigations were still going on. Therefore, the presence of a researcher (stranger) in the villages raised eyebrows in the community. Through persistent assurance to the local community that the study was purely an academic exercise, and that their information was to be treated with a lot of confidentiality, the problem was solved.

There were some respondents who wanted payment. However, the researcher overcame the problem by explaining to them that he was a student and that the information given to him was for the benefit of future generations as it may improve the mangrove ecosystem management and conservation which is a source of livelihood for the coastal people. The same explanation was given to those who sought to know how they would benefit from the research findings.

In all, adaptation to the general conditions in the district was a great challenge to the researcher. During the entire period of study, it was not possible to get safe drinking water and green vegetables such as *sukuma wiki* kales. The only water available was from boreholes and it was very salty. The researcher had to feed on fish, meat and eggs throughout his fieldwork. However, irrespective of the above-mentioned hitches, the study was successful.

3.8 Ethical Issues

Being an anthropologist, the researcher handled the respondents as per the requirements of their culture. Where necessary, the researcher applied participant observation in data collection so that he did not seem to be a government spy or an agent of some dubious mission.

The researcher was also flexible enough in every aspect so as to establish rapport with the community. This way, he was able to get information from respondents without any difficult. The researcher also treated the information acquired with confidentiality in cases where the informants requested it that way. In some cases, the informants did not wish their names to be recorded down. Here the researcher used pseudonyms.

CHAPTER FOUR

EXPLOITATION, MANAGEMENT, AND CONSERVATION OF THE MANGROVE ECOSYSTEM

4.0 Introduction

This chapter deals with the research findings and an attempt is made to interpret the data and explain the findings. The chapter presents the findings in relation to the first objective of the study, namely, describing the role played by the environmental management agencies and the local community in the management and conservation of the mangrove ecosystem.

4.1 Sample Characteristics

There were more male than female informants in the sample because the target groups were mangrove cutters, fishermen, firewood collectors, government-created organs and NGO personnel. These are areas which are dominated mostly by men. The Islamic religion does not allow women to socialise freely with strangers and, thus, even in cases where women were to feature, Muslim men took over to represent them. It was, therefore, difficult to strike a gender balance and so the study proceeded with the sample as drawn. However, when it came to conflicts in the firewood collection, women featured most, as this is the area where they dominate. Women were also sampled purposively in focus group discussions, key informant and life history interviews.

The ages of informants ranged from 18 to 80 years. Most of them who are involved, or must have involved themselves, in any of the activities that result in conflicts. These activities include fishing, mangrove cutting and firewood collecting.

In terms of the sources of income, the responses are summarized in Table 4.1 below. The

sources of income varied but the majority of the respondents consisting of 32.5% and 30% practise farming and fishing, respectively. About 7.5% sew *makuti* for sale while only 2.5% involve in mangrove business. A negligible percentage of 2.5% again represented those who are formally employed while 5% represented a combination of *makuti* sewing and farming. Farming and fishing occupations were represented by 5% while the remainder 10 respondents (12.5%) were involved in other small-scale businesses.

Table 4.1: Distribution of Informants According To Income

Response	Frequency	%
Makuti sewing for sale	6	7.5
Farming	26	32.5
Collecting prawns	2	2.5
Fishing	24	30
Formal employment	2	2.5
Sewing *makuti* and farming	4	5
Farming and fishing	4	5
Mangrove business	2	2.5
Other businesses	10	12.5
Total	**80**	**100.0**

4.2 The status of knowledge on the mangrove ecosystem

Attempts were made in this study to investigate the general understanding of the mangrove ecosystem by the local people. The respondents were required to name some of the flora and fauna found in the mangrove ecosystem and how these are important to the people. A summary of the responses is printed in Tables 4.2 and 4.3, respectively.

According to the analysis in Tables 4.2 and 4.3 below, 95% of the respondents were able

to name some of the flora and fauna found in the mangrove ecosystem and their importance to the local people. A negligible 2 respondents (2.5%) were not conversant with the ecosystem and this could be because they were immigrants who had moved into the area recently. The impression created here is that the local people seem to understand the mangrove ecosystem very well.

Table 4.2: Flora and Fauna found in the Mangrove Ecosystem

Flora (mangrove Species)	Frequency	%	Fauna (animal Species)	Frequency	%
mkandaa, mkomafi, mtu, mbia, mkoko	78	97.5	*tondo, kaa, makonda, fish, kaya kaya, madumbwisi*	76	95
Don't know	2	2.5		4	5.0
Total	**80**	**100**		**80**	**100**

Table 4.3: Importance of Fauna and Flora

Flora (mangrove species)	**Frequency**	**%**	**Fauna (animal species)**	**Frequency**	**%**
Mkandaa, mkoko, mtu mbia, mkomafi-used for firewood, building,boat making and furniture making	78	97.5	*Kaa*-sold to tourists *Tondo* –used for fishing *Kaya kaya*-given to hens Fish –is eaten	76	95
Don't know	2	2.5		4	5
Total	**80**	**100**		**80**	**100**

The researcher also inquired about how the local people exploit the resources in the mangrove ecosystem. The respondents were asked whether or not they engage in commercial extraction of the mangroves. A vast majority (80%) of the respondents denied while only 20% accepted. When asked to give reasons for their respective answers, it was found out that 80% of those who engage in commercial extraction of mangroves are cutters registered under licensees, 15% have permits for firewood extraction while 5% have licenses for extraction of poles for commercial purposes. However, those who did not involve in the commercial extraction of mangroves had their own reasons for not doing so and the reasons are summarized in Table 4.4 below:

Table 4.4: Reasons for not involving in Commercial Extraction of Mangroves

Reason	Frequency	%
Licenses are expensive	50	62.5
Poor transport in the areas	4	5.0
Low business in mangroves	4	5.0
Licenses expensive, poor transport and low business in mangroves	2	2.5
Licenses expensive and low business in mangroves	4	5.0
No reason	10	12.5
Expensive license and transport	6	7.5
Total	**80**	**100**

From Table 4.4, a high percentage (62.5%) of the respondents said they did not involve in the commercial extraction of mangroves because the licenses are expensive. A small percentage (5%) gave poor transport and low businesses in mangroves as their reasons, respectively. Six respondents (7.5%) mentioned both expensive licenses and poor transport while 2.5% had a combination of the three reasons. The remainder (12.5%) did not give any reason as to why they do not involve in the commercial extraction of the

mangroves.

The picture portrayed here is that the majority of the respondents (62.5%) do not involve in the commercial extraction of mangroves because the licenses are expensive. During the focus group discussions, this aspect became even more evident when there were complains about the licensing system, especially the red tape involved and the high charges. The license costs Ksh. 10,000 plus an additional ksh.1000 registration fee. This is not all since the licensee is again required to pay a tax of Ksh. 5 per pole cut. Permits for firewood collecting, on the other hand, go for Ksh. 39 per month according to the government records, although on the ground the figures are different. The findings revealed that while people in Gazi paid Ksh 39 per month for their permits, their counterparts in Vanga paid as much as Ksh. 70 per month. An explanation was sought from the forest guards who indicated that the extra charge on Ksh. 39 catered for forest guards' bus fare to Kwale town where the permits are issued.

From the findings in Table 4.4 above, one could safely argue that the exploitation of the mangroves is sustainable because only (40%) of the respondents are involved in the commercial extraction of the resource. Indeed, it is what the researcher found out when he inquired as to whether the exploitation is sustainable or not. A vast majority (90%) of the respondents reported that the exploitation is sustainable while 10% observed that the exploitation is not sustainable. In all the focus group discussions, life histories and in-depth interviews, it was revealed that the current mangrove exploitation is sustainable. However, there was a discrepancy in the reasons given by the respondents who supported the idea of sustainability. Table 4.5 below summarizes the findings.

4.5: Reasons why mangrove exploitation is sustainable

Reason	Frequency	%
The Forestry Department is controlling the cutting	16	20
Forest still thick	14	17.5
Exploitation is minimal	16	20
Mangroves regenerate naturally	16	20
Clear felling was stopped	10	12.5
The Forestry Department controlling the cutting and exploitation is minimal	2	2.5
Forest still thick and natural regeneration of mangroves	4	5.0
Exploitation is minimal and clear-felling stopped	2	2.5
Total	**80**	**100**

Unlike the case of the focus group discussions, life histories and in-depth interviews, the key informants had a different perspective towards the issue of sustainability. Almost 95% of the key informants were of the opinion that the current rate of mangrove exploitation is not sustainable. They observed that "mangroves take as long as fifteen years to mature but a thick forest can be cleared in hours" (Personal Communication: Kodjo, 1999). However, it came out clearly during the interviews that the local community and fishermen base their knowledge on coastal and physical changes on observations and experience. In addition, they thought these changes, such as stunted mangroves, siltation and the disappearing of fish in shallow waters, are natural phenomena. Furthermore, they noted that foreigners and unscrupulous businessmen cause the destruction of the mangroves. The local people have been sustainably using mangroves from time immemorial and, therefore, there is a general belief that it was not until the coastal factories started using the resource for fuel wood that the deficit was realized.

A majority of the key informants, who included administrators, KEMFRI Staff, forest

guards, marine rangers, forest officers and other decision-makers in the community, appeared to rely on textbook explanations with regard to the causes of mangrove depletion. They lacked first hand experience. For instance, one of the key informants had the following to say when he was asked to comment on the causes of mangrove degradation in Tzunza:

> *Commercial cutters from Mombasa have been cutting down the mangrove forests at will. The major culprits are brick making industries and bakeries. Dumping of dredged material from the Kilindini harbor and pollution from industrial effluent, sewerage and hospital wastes have affected the ecology of the mangrove habitat. The use of inappropriate fishing gear and lack of law enforcement regulatory bodies have added to the depletion of mangrove in Tzunza. (Personal Communication: Majaliwa,, 1999).*

According to Mr. Majaliwa, the local community has embarked on a project for mangrove tree sites within the area and at the same time ensuring that no further degradation takes place. Majaliwa, who is the director of Tzunza coastal community conservation and development programme based in Kwale District, a community based organization (CBS), states the objectives of the project as: addressing environmental as well as socio-economic problems related to mangrove forest destruction. Other areas of concern of the project include "the depletion of fishery resources and marine water pollution since these have had adverse and negative impact leading to loss in mangrove forest habitat and marine diversity dwindling. Furthermore, it has also led to low income in fish sales, increase in poverty and general deterioration in quality of life for the area and inhabitants" (Personal Communication: Majaliwa Tedd, 1999). Generally, a majority of the key informants (95%) argued that the removal of mangroves destroys the spawning and nursery grounds for fish, crabs, molluscs and other marine life. The primary target groups of the project are the women groups, fishermen, mangrove cutters, youths, school children as well as local leaders.

Similarly, most of the key informants interviewed spoke in the same way as pertains to the issue of sustainability in the exploitation of the mangroves. For example, when a question such as: how do you enlighten the local people on the importance of conservation and management of the mangroves? Answers such as through community *baraza*, education and awareness campaigns were quick to come out. It is encouraging

from what they said but unfortunately this is not the reality on the ground. The local communities are languishing in poverty and this could be due to lack of suitable alternatives to mangrove extraction and fishing coupled with increasing population pressure.

These pertinent issues prompted the researcher to investigate what else the local people do for a living apart from mangrove exploitation. Table 4.6 below presents a summary of the findings and it can be discerned that most people combine farming and fishing to mangrove extraction, that is, 32.5% and 30.0%, respectively. It is also evident that small businesses such as operating hotels are common in the community as they are represented by 12.5%. It was generally observed that most people at the Kenyan coast eat in hotels or *kiosks* and not in their houses. Other sources of income include sewing *makuti* (7.5%), marketing mangrove poles (2.5%) and formal employment (2.5%). We also had combinations of the activities, for instance, sewing *makuti* and farming (2.5%) while farming and fishing had (5.0%). The remainder (2.5%) did not involve in any form of income generating activity.

Table 4.6: What People do for a Living

Activity	Frequency	%
Sewing *makuti* for sale	6	7.5
Farming	26	32.5
Collecting prawns	2	2.5
Fishing	24	30
Business-hotels and vegetable selling	10	12.5
Formal employment	2	2.5
Sewing *makuti* and farming	2	2.5
Farming and fishing	4	5.0
Mangrove business	2	2.5
Total	**80**	**100**

The picture portrayed here is that the majority (over 95%) of the respondents are not salaried and only 2.5% are employed. There are generally poor employment trends in the area of study. The focus group discussions revealed other occupations such as carpentry, boat making and traditional medicinemen.

In an attempt to establish whether or not enough food crops are produced in the area, a straightforward question to that effect was asked. Findings revealed that as many as 97.5% of the respondents were of the opinion that the food crops produced are not enough while about 2.5% believed that the food crops were enough. Although it appears that most of the respondents are of the opinion that the food crops produced are not enough, there was a discrepancy when required to state the reasons for not producing enough food. Some of the reasons given are the distance of the farms from the villages and, thus, difficult to access them. Other reasons include harsh environmental conditions, lack of sufficient capital, wild animals and lack of credit facilities. It is argued that the local people perceive farming as not profitable compared to other occupations such as fishing. There were others who thought that the food crops produced were not enough because of laziness among members of the society. Many scholars generally believe that most people at the coast fear hard work and are in most cases used to quick and daily money which farming cannot offer. This could be because of the influence of tourism, hot weather and the sea in the region. Other factors that could influence food production include Arab Swahili legacy and slavery, dignity and honour, fear of bewitchment, wild animals and crocodile menace, the harsh weather as well as the issue of squattership which make people not to grow permanent and more lucrative crops.

When the respondents were asked whether or not there were other organizations exploiting or interested in the exploitation of the mangrove ecosystem, about 82.5% denied while 17.5% accepted. When probed further even those who did exploit the ecosystem had knowledge that the Makandia Calcium Plant used to exploit the mangrove forest for fuel wood but it was stopped by the Forestry Department after there was an outcry from the environmental conservation organizations over the depletion of the

mangroves. This information was also reinforced during group discussions, key informant interviews, life histories and in-depth interviews. The argument is that the Makandia factory, which is popularly known on the south coast for extraction of mangroves for fuel wood, was not stopped by the Forestry Department but opted for cheap sources of fuel wood when the Forestry Department increased charges for licenses. "It was expensive for them to pay the licenses, pay tax per pole cut and hire cutters not to mention the transportation costs" (Personal Communication: Becha, 1999). It is also important to note that there are other small factories and bakeries that used to extract mangroves for fuel wood but have stopped. These factories extracted logs locally known as *koko* for fuel wood. There were contradicting reactions when the researcher sought to know whether their ways of mangrove exploitation were good or bad. Over 95% of the respondents were not happy with their ways of exploitation while 2.5% were happy. Each category was further required to give reasons for their answers. The first category claimed that the factories paid the local cutters well compared to the current payment by the dealers.

The second group, on the other hand, had its own reasons. First, it noted that the factories were licensed to cut huge logs and when the forests ran out of huge logs, it meant that the cutters were to venture deep into the forests to access the logs. This was expensive in terms of time and money; therefore, in most cases, they clear-felled anything they came across for fuel wood and bribed their way out. Second, when the large logs were felled, they destroyed the juveniles. Third, in most cases it was difficult to reach the logs in the midst of the forests and, thus, the cutters were forced to clear their ways into the forests, thereby destroying the unintended mangroves. Lastly, there is another lot who thought that "like the children, who need their parents to enjoy their lives, the juveniles also need the logs for nourishment and protection from strong winds" (Personal Communication: Mwamkuna, 1999). Therefore, logs should not be cut at all.

4.2.1 Causes of Mangrove Ecosystem Depletion

The research also investigated the causes of mangrove ecosystem resources depletion and there was a discrepancy in what the local people stated vis-à-vis conservation agencies' assessment of the situation. The local community and mostly fishermen argued that their ways of mangrove ecosystem utilization are sustainable and, therefore, the government is to blame for depletion. They mentioned corruption among government officials as the major contributing factor to mangrove depletion. The local community specifically noted that forest guards are allowing the dealers to evade tax and even to cut more poles per year other than the required 70 tones. In their defence, the guards complained about lack of working gears. "In most cases the illegal cutters are armed and you cannot face an armed person with "a *rungu*"! (Personal Communication: Rajabu, 1999). The guards also lack boats and bicycles to ensure regular patrols. The problem of understaffing also featured prominently. For instance, between Kinondo and Shimoni, an area covering villages such as Gazi, Msambweni, Sawasawa, Vingujini, Bodo and Shirazi, there are only four guards. The guards take care of both mangroves and terrestrial forests.

On its part, the Forestry Department believes that the depletion of the mangroves is through erosion, increase in population which has meant increase in demand for building materials and firewood and also land grabbing. The Forestry Officer was categorical when he said that some well-connected individuals in the government have acquired land along the shoreline and are clearing mangroves for construction purposes. Other contributing factors include lack of funds to increase Forest Department's personnel and lack of working gears such as bows and arrows, uniforms and even guns to ensure regular patrols. The officer indicated that at the moment, Msambweni Division has only two boats and one engine, which are not enough for effective patrols.

The KWS officials, on their part, attributed the state of affairs to the Forestry Department's ineffectiveness in the application of their laws. They claimed that most of

the Forestry Department officers are very corrupt and this has contributed to the depletion of the mangroves. The officials further observed that KWS has no laws on mangroves but since they need mangroves if at all the marine parks have to exist, there is a need to protect the mangroves in the marine parks. The key informants' information seemed to have been derived from textbooks rather than first hand experience. According to the key informants and focus group discussants, the main exploitation of the forest is the harvest of poles for house building. This is followed by firewood for households as well as fuel wood for industrial purposes. Other uses include medicinal value an attribute that missed out during survey interviews. Species like *Brugeira* are locally used as medicine for sore eyes, *Ceriops* is used for treatment of hemophiliac conditions while *Rhizophorous* barks cure diarrhoea. Another part of the *Rhizophorous* species with medicinal value is the seed ointment which cures insect bites. Other indirect uses of mangroves include serving as paradise for many animals which gather around mangroves for food. The thick mass of mangrove trunks and still roots are also a safe place for the birds and other animals to hide.

According to most key informants (95%), human activities cause mangrove ecosystem depletion. One of the key informants observed that "mangrove forests are not destroyed by natural calamities such as typhoons, diseases or insects but by people's actions" (Personal Communication: Ochiewo, 1999). According to this key informant, outstanding among the causes is the swelling population that has meant an increase in a demand for agricultural land as well as timber for houses, firewood and charcoal.

In an attempt to establish whether there were other uses of mangroves to the local people apart from being used for building, fuel wood, making furniture, boats and being sold to earn an income, a straightforward question to that effect was asked and Table 4.7 below summarizes the findings.

Table 4.7: Other ways of mangrove exploitation

Ways of exploitation	frequency	%
Treatment of ailments	20	25
Shrine(*musimuni*)	2	2.5
Tanning industries	2	2.5
Grazing	6	7.5
Treatment, Shrines and Tanning industries	2	2.5
Treatment and Grazing	2	2.5
No other ways	46	57.5
Total	**80**	**100**

The findings revealed that 25% of the respondents used mangroves also for treatment, 2.5% recognized the forests as places of worship (shrines), while an equal percentage of 2.5 were of the view that mangroves are used for tanning industries. Another 7.5% mentioned grazing as a way of exploiting the mangrove ecosystem while the rest of the group, which totaled 57.5%, did not know. The fact that many people (57.5%) did not know any other uses of the mangroves could indicate the change of attitude towards the mangroves by the local community. This could be because of the changing times where people do not fully exploit or identify with their ecosystems. This forced the researcher to test the respondents on whether there were any changes in the traditional exploitation of the mangrove ecosystem. Out of the 80 respondents served with questionnaires, 64 (80%) denied any changes while 16 (20%) agreed that there were changes. The researcher probed further to know from those who thought there were changes what the changes were and the findings revealed that 65.5% of the respondents observed the licensing of mangroves exploitation and use of mangroves for fencing as the observable changes. About 7.5% were of the view that the changes are in the increased rate of exploitation and cutting. Other combinations of mentioned changes were in controlled cutting, fencing and licensing where 2.5% and 15% represented them, respectively.

However, 40% of those who said that there were no changes insisted that there was no need for the changes, 25% said that changes have not been initiated while 17.5% believed that people's needs are still the same. The remaining group, which totalled 15 respondents (37.5%), did not know why there were no changes.

During the group discussions, key informant interviews, in-depth interviews and life histories, it came out clearly that fishermen had fairly different views on the causes of mangrove ecosystem degradation. First, there were those who thought that the Fisheries Department is hard on the local fishermen while licensing the foreign fishermen to fish in their region. The foreign fishermen, most of who come from Pemba, are said to use bad fishing methods such as small nets or even explosives which have reduced fish in the Kenyan waters. Conversely, there was a second group which claimed that the Kenyan fishermen lack equipment to venture into deep-sea fishing. They, therefore, concentrate in shallow waters, thereby, over-fishing in these areas. In fact, most of the fishermen have abandoned the business, all together and embarked on other businesses. Most of these people who have pulled out from fishing have found their way into mangrove extraction business a trend that has negatively impacted on the mangrove ecosystem.

Conversely, the foreign fishermen denied using unscrupulous methods of fishing and insisted that they do respect the local fishermen's traps. Similarly, they also complained of corruption at the Fisheries Department and the local leaders who have been siphoning the little money they get. This has forced them to do fishing day and night in order to make profit. They claimed that apart from the normal licenses, they have to pay extra to the Fisheries Department and bribe the local leaders so that they cannot be disturbed. "Even when we have paid everything, these people always conspire with the police to have us arrested when they notice that we have registered a high catch. At such a time, they know that we have money. Surprisingly, after our arrest, the same people organize for our release in pretence of assisting us only to turn around and demand compensation from us for their so-called assistance. We are really fed up with this habit". (Personal Communication: Rama, 1999).

During the focus group discussions and key informant interviews, there was a consensus that fishing is an important part of the coastal economy. Further, fishermen's families depend on sea produce for food. However, the fishing industry has been significantly affected by the depletion of mangroves that constitute the breeding grounds of a variety of fish.

The life histories also reinforced the fact that fishing is no longer taken serious as in the past. The findings revealed that there used to be a culture of fishermen insisting on non-collection of sand from beaches neighbouring their fishing grounds. However, this activity is becoming increasingly difficult to police now that beaches are managed by private developers. The policing was done on the collectors of beach sand because there was a general belief that such collectors could bewitch the fishing grounds to become less productive. Another observation that emerged through focus group discussions was that there used to be a ritual of the annual feasts in the month of September by most fishermen by the shoreline so as to enhance sea productivity. The fishermen interviewed observed that this ritual is becoming less significant. A majority of the fishermen (90%) said that the fishing culture has really changed and nowadays fishermen are fighting each other and do not even respect each other's traps, something that was highly regarded in the past. From the foregoing, it appears that the stress exerted on the indigenous economies of the local communities is enormous and perhaps it is responsible for the degradation of the mangrove ecosystem and the current conflicts witnessed.

4.3 Management and Conservation of the Mangrove Ecosystem

The management and conservation of the mangrove ecosystem on the south coast, like in other parts of the Kenyan coast, lies in the hands of the Forestry Department, Fisheries Department, Kenya Wildlife Service and, partially in the NGOs interested in the conservation of the ecosystem. The researcher found out through key informant interviews that the three organizations namely, KWS, Forestry Department and Fisheries

Department have formidable plans and legislations for the management and conservation of the mangrove ecosystem. Paradoxically, however, the depletion of mangrove ecosystem is increasing.

The legislations already in place include the Forestry Act (Cap 385), Fisheries Protection Act (cap 379), and Wildlife Conservation Management Act (Cap 376). Unfortunately, these acts are foreign to the local people who are the users of the environment. The study findings also revealed that most people are not conversant with the activities of the three organizations. The respondents were asked about who manages the resources in the mangrove ecosystem. More than half of respondents (57.5%) were of the opinion that the resources in the mangrove ecosystem are managed by the Forestry Department, 17.5% thought it was the Fisheries Department while another 2.5% cited the K.W.S. as the organization in charge of the ecosystem. The remainder 2.5% did not know. Table 4.8 below summarises the findings.

Table 4.8: Who Manages Resources in the Mangrove Ecosystem?

Value Label	Frequency	%
Forestry Department	46	57.5
Fisheries Department	14	17.5
Forestry Department and Fisheries Department	16	20
Kenya Wildlife Service	2	2.5
Do not know	2	2.5
Total	**80**	**100**

More than a half (57.5) of the respondents thought that the Forestry Department manages the mangrove ecosystem because of the frequent harassment of the local people by the forest guards. The guards operate from the villages and so their presence is realized compared to the personnel of other organizations who operate from their offices.

When the respondents were asked why the local community is not managing the ecosystem, there was a discrepancy in their answers. About 35% said that they are not

allowed to do so by the Forestry Department, 20% thought that the Forestry Department is doing a good job, while 10% were of the view that the local community has no facilities to manage the ecosystem. On the other hand, 12.5% believed that the community is managing the ecosystem through local organizations while the remaining group (22.5%) did not know why the local community is not managing the ecosystem. When probed further to know whether or not the respondents were happy with the management arrangements, as many as 58 respondents (72.5%) confirmed that they were happy while 22 respondents (27.5%) were unhappy. Each category was then asked to give reasons for their answers. A majority of the respondents (75%) who were happy with the management cited the good job of controlling the cutting of mangroves through licensing by the Forestry Department as their reason.

Conversely, those who were not happy with the management had various reasons. About 2.5% said the management does not involve the local people, 10% cited corruption in the management as their reason while 2.5% and 7.5% cited poor coordination and laxity in law enforcement agents, respectively. The remainder 2.5% did not have a reason for their answer. The issue of local community involvement in the management and conservation was brought to the fore and it is analyzed in section 4.3.2 of the thesis.

4.3.1 The Role Played by Government-created Organizations in the Management and Conservation of the Mangrove Ecosystem

From the foregoing, the role played by the government-created organizations in the management and conservation of the mangrove ecosystem is evident. The three organizations, namely, the Forestry Department, Fisheries Department and Kenya Wildlife Service are concerned with the management. Marine environment management strategies include the establishment of protected areas such as marine parks to serve as sanctuaries for flora and fauna, protect over-exploitation of mangroves and over-fishing through licensing and guarding. Regarding the administrative duties, the key informant interviews revealed that there is a lack of coordination between the management

organizations. The findings further revealed that there is mutual hostility and obstruction between the agencies. For instance, the Forestry Department blames the KWS for taking its boat in the guise of operating together in the management and protection of mangrove cutting but this has not been the case.

The KWS, on its part, blames the Forestry Department for the depletion of the mangroves, especially around Ramisi River. "The Forestry Department staff are very lax and corrupt in carrying out their duties" (Personal communication: Mwadzya). The Fisheries Department is not spared either and it is blamed for being dormant and operating strictly from its offices. "They do not know what is happening on the sea because they do not go there. They only wait for the fishermen to go to their offices may be when they are in need of permits then is when the fisheries officers are briefed of what happens at the sea" (Personal communication: Mwadzya).

The key informants from the concerned organizations pinpointed the roles played by the three organizations. Similarly, the role played by the NGOs also emerged. There was a general consensus that the KWS is responsible for protecting marine areas. According to one of the key informants, marine protected areas are primarily designed to conserve Kenya's coral reefs which run along most of the coast line. The larger protected areas also enclose important breeding sites for migratory marine birds, marine mammals and other animals.

When the Regional Coordinator, Coast Region, was asked to explain their activities in the nearest Kisite Marine National Park and Mapunguti Marine National Reserve he said:

> *Our major aim is to ensure that Fauna and Flora in the Marine National Parks are protected. In addition, we do not allow fishing in the reserves. We also promote ecotourism and income generating projects in the area. For instance, KWS, in conjunction with the Wasini Women Group, are coming up with a re-afforestation program* (Personal Communication: Mwadzya).

current charge for a license is Ksh. 10,000 while a permit for firewood collection is Ksh. 39.

Similarly, the Fisheries Department has regulations that prohibit discharge of toxic wastes, blast fishing, catch sizes and mesh sizes of the fishing nets. The department also applies the method of issuing permits and licenses to fishermen as a way of protecting over fishing. Other NGOs such as KEMFRI and SPEK are known to have initiated projects for mangrove tree rehabilitation as well as conservation and sustainable management of the mangrove ecosystem. KEMFRI, for example, has started a mangrove reforestation programme at Gazi Bay, which is doing very well. The research institute has also started an oyster farm in the same area " with over ten million oysters under culture" (Personal communication: Kodjo, 1999). In addition, the organization conducts research and survey work on various aspects of Aquatic Science. The institute also monitors pollution, investigates and promotes aquaculture and, lastly, carries out socio-economic research on topics related to fisheries and aquaculture.

The Coast Development Authority is another organization that is also involved in the management of the mangrove ecosystem. The Authority has as its prime as goal the improvement of the standard of living of all coastal people without impairment of the resource potential. It strives for self-sufficiency in food production for the coast, the creation of wealth from available resources, the provision of meaningful opportunities for public participation, and development on sustainable basis.

4.3.2

4.3.3 The role of the local community in the management and conservation of the mangrove ecosystem

The mangrove ecosystem management is a critical issue that requires involving the local communities who are the users of the resources. Unfortunately, the study revealed the absence of the critical role of the local community in the management and conservation of

the mangrove ecosystem in Kwale District. When asked whether or not the local community is involved in the management, only a negligible 12.5% felt that they are involved while the majority (87.5%) claimed that the local community is not involved. The two categories were then asked to give reasons for their positions. Those who thought that the local community is involved gave reasons such as, through local environmental organizations and management committees. Conversely, for those who felt that the local people are not involved had their reasons as summarized in Table 4.9.

Table 4.9: Reasons for not involving the local community

Reason	Frequency	%
Government has refused to involved the local people	30	37.5
The situation has always been like that	18	22.5
Local people lack skills	10	12.5
It is a waste of time	12	15
Don't know	10	12.5
Total	**80**	**100**

From the table above, it can be clearly discerned that 37.5% of the respondents thought that the government has refused to involve the local people in the management of the mangrove ecosystem. About 23.5% insisted that the situation has always been like that from time immemorial while 12.5% were of the opinion that the local people lacked the necessary skills to be involved in the management and conservation of the mangrove ecosystem. Another 15% thought that it is a waste of time to involve the local community while the remaining 12.5% did not have any reasons as to why the local people are not involved.

It was evident from group discussions, life histories and key informant interviews that there were no regular meetings between the mangrove ecosystem management agencies and the local community. In fact, the forestry officer, who was one of the key informants,

was categorical when he said: "These people are ignorant, therefore, it would be difficult to be consulting them every time. Sometimes we are forced to make decisions for them so that we avoid wasting time negotiating" (Personal communication: Kariuki). The Forestry Officer insisted that due to increased population and, thus, increased demand for building poles and firewood, there is a need for stringent conservation rules and legislation to save the ecosystem from degradation. Conversely, the local people argued that they understand their environment better than the so-called conservationists and so they should always be consulted so that they can effectively participate in the management activities.

In fact, one of the key informants pointed out at the recent increase in license charges from Ksh. 7,000 to 11,000 passed at Kwale District headquarters without the knowledge of even the local leaders. From the reactions of most leaders (70%), local support for conservation is critical and possible. This was discerned when the researcher sought to know whether or not the local people were against the ban on the cutting of juvenile mangroves locally thrown as *fito*. A majority of the respondents (62.5%) supported the ban. 32.5% opposed while the remaining 5% were non-committal. This was, however, not in line with what emerged from the focus group interviews and key informant interviews. The results from the above categories revealed that many respondents were against the ban and only suggested that the cutting be regulated. The overwhelming support of the ban could not be genuine, as most of them are involving in conflicts over the extraction of mangroves. Their answers may be were purposely given to please those interested in the conservation of the mangrove ecosystem.

Those who supported the ban had reasons such as to ensure the survival of the forest and the continued supply of firewood. They also cited poles, among other products, from the mangrove ecosystem as a reason for supporting the ban on *fito* cutting. Other reasons include ensuring income for those doing business in mangroves and that the food webs related to mangrove is maintained. Conversely, those who were against the ban felt that the local people depend on the *fito* for building houses, thus, imposing a ban means no

building houses because *fito* are necessary for building houses.

Regarding the role of the local community in the management and conservation activities, there were three organizations that were involved, namely, *Chama cha Mazingira* (Environmental Group) based at Vanga, Kiwambale *kaya* Group based at Kiwambale and Mwambao villages and, lastly, we had Shanza Women *Group* based at Shirazi village.

The environmental group (*Chama cha Mazingira*) was formed in 1995 under the chairmanship of Mzee Mwanzisa Shughuli, nicknamed Mandela. The group was basically formed to enlighten the local community on environmental matters and the conservation of the mangrove ecosystem at large. The organization has extended its areas of operations and even played a greater role in alerting the community on hygienic issues in the wake of the cholera scourge that swept Kwale District in March and April 1999. When the chairman was asked how they carry out their activities, he was categorical, "we request the chief to organize for the *baraza* because we do not have the powers to do so. It is during such *baraza* that we enlighten the public on our activities" (Personal communication: Shughuli). The group also claimed that it teaches people to maintain hygiene and on the ways of conserving the degrading mangrove ecosystem. However, the organization faces some shortcomings such as lack of funds to run its activities, powers to convene meetings or public *baraza* and also lack of autonomy to make its own decisions without going through the local administrators who, in most cases, interfere with their operations.

The *Kiwambale Kaya* Group, on the other hand, works in collaboration with KWS to conserve mangroves and birds on River Ramisi. The group has not yet picked up as it is still waiting for funding from donors. It, however, commented KWS for the continued assistance to the local communities around that area. The organization has taken the initiative to educate the members of *Kiwambale Kaya* about conservation issues. "We now know that the sap from cut mangrove trees is poisonous to the eggs and juvenile fish hence the need to discourage cutting mangroves around fish hatcheries"(Personal

communication: chairman KKG). The group is said to have requested five hundred acres of land from the government for mangrove reforestation.

Another local organization involved in the ecosystem conservation activities is the *Shanza Women Group* based in Shirazi village. The group started in 1994 with thirteen members under Somoe Muhammad as the chairperson. It started with poultry keeping project that did very well until 1995 when disease struck and killed the whole flock. The group then resorted to *makuti* sewing but the business was not promising as its customers would turn up only once or twice a month and they would buy its products at very low prices of Ksh 35 per dozen. Towards the end of 1996, the group decided to venture into other income generating activities With the guidance of KEMFRI and C.D.A, it started an oyster farm which had been doing well until 1998 when there was a drastic drop in the number of tourist that killed the demand for oysters. Most of the hotels that used to buy the groups' oysters have closed down. However, the situation is improving for the tourism industry is picking up once more. The Government of Belgium currently funds the group and it boasts of Shirazi Primary School as one of the fruits of their collaboration with the Belgiam government. The group has also been educated on conservation and hygiene, which it is passing down to illiterate members of the community.

We also have other small groups coming up in Kwale District. For instance, in Tzunza we have an up-coming mangrove tree rehabilitation, conservation and sustainable management group which is also involving the villagers in its activities. The group has foreseen the formation of Tzunz Coastal Community Conservation and Development Programme "a community Based Organization (C.B.O)" under the chairmanship of Mr. Tedd Majaliwa. The organization has so far replanted over 12 hectares with mangroves.

In Gazi Bay, KEMFRI has used the local community to replant mangroves under the guidance of a Mr. Kairo. The local people have also been employed in maintaining both the mangrove plantations and the oyster farm. It is encouraging to note the presence of

such an organization in the district, although the leaders of the organizations cite various problems. Outstanding among the problems is lack of funds to run their activities effectively and lack of support from other management bodies in the area. This has meant that the role of the local community in the management and conservation of the mangrove ecosystem remains minimal.

In summary, the findings reveal that the local people understand the mangrove ecosystem well but many of them do not involve in the commercial extraction of the mangroves because of expensive licences. Low technology and lack of modern fishing equipment have also hindered the fishermen from venturing into deep-sea fishing. The findings further reveal poor employment trends in the area of study, as a majority of the respondents are not salaried. Generally, the chapter has critically analysed the roles played by both the environmental management agencies and the local community in the management and conservation of the mangrove ecosystem. The roles of each party are evident, however, there are accusations and counter accusations between the parties interested in the ecosystem. It is also evident from the findings that the local community is not fully involved in management and conservation programmes.

CHAPTER FIVE

CONFLICTS OVER RESOURCES IN THE MANGROVE ECOSYSTEM

5 Introduction

This chapter presents the findings in relation to the second and third objectives of the study, namely, investigating the conflicts which arise in carrying out the management and conservation activities and lastly, identifying some strategies of resolving the conflicts which characterize mangrove management.

5.1 Conflicts and Their Sources

Attempts were made in this study to investigate the conflicts that exist in the management and conservation of the mangrove ecosystem. A straightforward question to that effect was asked. According to the analysis, 95% of the respondents thought that there were conflicts while only 5% thought otherwise. The researcher then sought to know from those who thought there were conflicts, the sources of conflict and the results are summarized in Table 5.1.

Table 5.1: Sources of Conflicts

Sources of Conflicts	Frequency	%
Illegal *fito* cutting	8	10.0
Illegal firewood collecting	18	22.5
Payment of cutters	6	7.5
Fishing (foreigners and local people)	4	5.0
Competition for resources	4	5.0
Fito cutting and payment of cutters	4	5.0
Fito cutting and fishing	2	2.5
Fito cutting, firewood collecting and fishing	2	2.5
Firewood extraction and *fito* cutting	30	37.5
Fito and firewood extraction and competition	2	2.5
Total	**80**	**100**

According to Table 5.1, 10% of the respondents believed that conflicts arise from illegal *fito* cutting, 22.5% cited firewood collecting while 7.5% thought conflicts arose from non-payment of cutters by dealers. Those who thought that conflicts emanate from fishing and competition for resources were represented by 5% each. Almost one third of the respondents (37.5%) cited a combination of *fito* cutting and illegal firewood collecting as sources of conflicts while those that cited *fito* cutting, illegal firewood collecting and fishing were represented by 2.5% each. A similar percentage (2.5%) represented those who thought competition for resources, *fito* cutting and illegal firewood collection were the sources of conflicts. Another 2.5% of the respondents thought that a combination of illegal cutting of poles and non-payment of cutters were the sources. The remainder (2.5%) cited a combination of fishing and *fito* cutting.

Table 5.2 below, on the other hand, gives the parties involved in the conflicts. From this table, 24 respondents (30%) indicated that the parties involved in the conflicts are the local community and the Forestry Department while 14 respondents (17.5%) named fishermen versus the Fisheries Department and firewood collectors versus Forestry

Department, respectively. A negligible 5% were of the opinion that the local fishermen versus foreign fishermen are the parties in conflicts while 10% of the respondents named cutters versus Forestry guards and firewood collectors versus Forestry department as parties in conflict, respectively. The remainder 12.5% were of the opinion that the parties involved in conflicts are the local community and mangrove ecosystem management agencies.

Table 5.2: Parties Involved in the Conflicts

Parties involved	Frequency	%
Local community versus Forestry Department	24	30
Cutters versus dealers	14	17.5
Local fishermen versus foreigners	4	5.0
Fishermen versus Fisheries Department	6	7.5
Firewood collectors versus Forestry Department	8	10.5
Cutters versus Kenya Navy	6	7.5
Cutters versus forest guards	8	10.5
Local community versus management agencies	10	12.5
Total	**80**	**100**

From Table 5.2, it can be clearly discerned that conflicts evolve around the exploitation of resources in the mangrove ecosystem and perhaps this could be because the local community depends entirely on mangrove ecosystem

Focus group discussions, life histories and key informant interviews revealed four categories of conflict in Kwale District; namely, conflicts among mangrove exploiters, conflicts in the fishing community, conflicts between the organizations and the local community and, lastly, conflicts between managing organizations themselves.

5.2 Conflict among mangrove exploiters

Conflicts arise at different levels and regions in Kwale District. The study revealed that the local people believe that mangrove depletion in their areas is done by foreigners who come via the sea. For instance, respondents in Vanga blamed their neighbours in Bodo and Shirazi for the depletion of their mangroves. The focus group discussants in Vanga did not mince words when they were asked about who depletes their mangroves:

> *Mangrove business has died out in our villages because of poor transport We are now forced to concentrate on fishing which is not paying either because we do not have equipment to venture into deep-sea fishing. Since all the people in this village are fishermen and women and none is selling mangroves, we would expect to have an extensive forest. Unfortunately, the illegal cutters from our neighboring villages have not spared* our *forest. Other illegal cutters come at night on dhows, they bribe the forestry guards and go on with their job. We have formed local groups to guard our forest but lack support from the Forestry Department because they are aware of what is going on* (Personal communication: Focus group discussion, Vanga 1999).

The discussants were also bitter that there were cases where the local fishermen arrested foreign illegal mangrove cutters and forwarded them to the Forestry Department for action but, to their surprise, the authorities concerned released the culprits the following day. It is alleged that the Forestry Officials received bribes from the illegal cutters.

In Gazi, Shirazi and Bodo villages, the cutters were up in arms against exploitation by the dealers. They complained that the dealers are making huge profits while the cutters are paid peanuts. The cutters also complained about lack job security and forum to champion their plight as the dealers keep on hiring and firing them at will. The cutters perceive dealers as greedy people who do not care about their welfare. They complain about the importation of mangrove poles from Tanzania which has killed the local mangrove market. They called upon the Forestry Department to stop the importation of poles as it has rendered local mangrove cutters jobless. In fact,one of the key informants, aged about 65 years, also complained about the dealers as follows:

I have three sons and one daughter. All my sons resorted to cutting mangroves to earn a living after the closure of Ramisi Sugar Factory. What they earn is not enough for our daily needs but it keeps us going since there is no alternative... The dealers are not fair to the cutters and this came out clearly recently when I lost one of my sons in an accident while cutting mangroves. He fell from a mangrove tree and landed on a sharp piece of wood that was lodged in his chest. He was admitted at Msambweni District Hospital but unfortunately he passed away after three days. During the funeral, his boss (the dealer) demanded from us Ksh. 300 the departed owed him. The mourners were angry with him to the extent of chasing him out of the funeral.... In many cases dealers focus on money more than on cutters' lives and these are some of the reasons why cutters need protection from the authorities concerned (Personal communication: Mama Salim, 1999).

The issue of the dealers exploiting cutters was sharply contested by the dealers who argued that they do not have a market for the mangrove poles due to the ailing tourist industry. They argued that the hotels that used to buy mangroves for construction purposes have closed down. "This is one of the reasons why dealers cannot employ cutters permanently. Another reason is that the buyers that we find do not pay us at once so this forces us to pay cutters also in instalments. Furthermore, the work depends on order and sometimes we go for even two months without an order hence it is expensive to employ cutters on a permanent basis"(Personal communication: Omari). Other dealers favoured the system of temporarily employing cutters because it makes sure that at least each and every person has a chance of earning something in this era of many people chasing a few jobs.

The dealers, however, shifted part of the blame to the Forestry Department. They complained about over-taxation by the department where apart from paying Ksh. 11,000 for the license, they are in addition required to pay Ksh. 5 per pole cut. On the issue of poor markets for mangroves, they observed that the Kenyan poles are not straight compared to those imported from Tanzania. The mangrove agents are, therefore, forced to import poles from Tanzania, which are marketed easily than the Kenyan short and crooked poles. The Forestry Department also supported this sentiment by confirming that the local mangrove poles are stunted and crooked due to siltation. The poles are, therefore, not

good for construction purposes and that is why most people and companies prefer imported poles from Tanzania that are long and straight. However, the department insists that it ensures that all the relevant duties on imported poles are paid, therefore, the local cutters should not complain. "In fact, we are encouraging the importation of poles from Tanzania as this allows our local depleted mangrove forests to regenerate"(Personal Communication: Forest Officer, Msambweni Division)

In Tsunza village of Gandini Location, there are also reported cases of conflict between the local community and the commercial cutters. Some of the villagers interviewed claimed that commercial cutters from Mombasa have been cutting down the mangrove forests at will yet the Forestry guards are hard on the local community. The respondents said that the major culprits are brick making industries and bakeries. The local community threatened that if the authorities concerned are not going to take action, they are ready to mobilize and stop the activity.

5.3 Conflicts In the Fishing Community

There has been fish depletion and increased pollution of the marine environment in Kwale District. These activities have affected the socio-economic conditions of many villages in the district. The study revealed that the use of inappropriate fishing gear and lack of law enforcement regulatory bodies were widespread. This has reduced fish catches and increased incidences of conflicts between the fishermen.

The fishermen in Vanga, for instance, accused their counterparts that come from Pemba for using wrong fishing equipment and methods. They are alleged to use small nets that catch even the young fish as well as explosives which apart from killing fish and their eggs also destroy fish hatcheries. The explosives also scare and chase away the survived fish rendering the neighbouring waters barren.

In Kiwambale, Vanga and Bodo villages, there were reported conflicts between the local

fishermen and foreigners. The local fishermen and women complained that the foreign fishermen from Pemba, who normally fish at night, do not respect their traps. The local people have been reporting such acts but they claimed that the authorities concerned have been reluctant to step up measures to curb the problem. The local fishermen cited laxity and corruption in the Fisheries Department as the cause of the continued depletion of fish in the neighbouring seawaters. Like in the case of Forestry Guards, they also claimed that in some instances they have arrested the Pemba fishermen who were handed over to the authorities concerned but were released after bribing the fisheries officials. Nevertheless, the majority of local fishermen and women believe that they own fish in the ocean and are determined to fight the intruders with or without the help of the Fisheries Department.

The Fisheries Department on its part observes that it has put in place stringent rules concerning fishing in Kenyan waters. The Fisheries personnel insisted that the department is efficient in issuing fishing licenses and its guards are always on the look out for those fishermen who break the rules. The fisheries officer accepted that there used to be some fishermen who were using small nets and explosives but the department came in to stop the practice. "We employ the Kenya Navy personnel to track down such unscrupulous fishermen. There are always regular patrols along-side the fishermen and those found guilty are arrested and prosecuted under the Fisheries Act" (Personal Communication: Sindani). The Fisheries Officer at Vanga denied any cases of corruption among his officers. He observed that the government heavily taxes the foreign fishermen from Pemba, and, therefore, there is no point of favouritism. He insisted that the local fishermen are lazy and, therefore, fear competition from their counterparts from Pemba. "In fact, the local fishermen are complaining but truly speaking, they depend on the Pemba fishermen for the supply of fish. The Pemba fishermen sell their catch to the local fish mongers at throw-away prices, taxes notwithstanding" (Personal Communication: Sindani).

Furthermore, the study revealed that many local people have abandoned fishing and resorted to small businesses. When they were asked why they decided to do so, reasons

such as lack of capital and lack of equipment to venture into deep sea fishing because the shallow waters have been exhausted were given. However, the local fishermen insisted that the foreigners are the source of their problems. They observed that they have always existed in harmony with the sea for decades without any problems. They were, therefore, of the opinion that their problems started recently when the fishermen from Pemba invaded their ocean. "Apart from being experienced fishermen, the Pemba have capital and advanced fishing equipment, therefore, we cannot compete favourably with them. There have also been reported cases of vandalism of the local fishermen's fishing vessels and gear" (Personal Communication: Mchambi, 1999).

There were also conflicts between the local fishermen themselves. The conflicts were hinged on the premise of payment. It is argued that there are some well-established fishermen in the community who own nets and boats. These people do lend their equipment to the upcoming fishermen at a fee. The terms of payment are as follows: "Nets are paid for the same amount as each fisherman's share. A hired boat, on the other hand, is paid for at Ksh. 2 for every Ksh. 100 made" (Personal Communication: Shikeli). The lenders of the equipment complain of mistrust on the part of the fishermen when it comes to payment.

The owners of boats and nets owners are at times forced to withdraw their equipment amid resistance from the borrowers who, in most cases, have no other ways of carrying out the fishing activity. This, therefore, leads to conflicts between the two groups. The owners of boats and nets, however, insist that the fishermen make a lot of money using their equipment but just default on the payment and, where there is payment, it is very little. Conversely, the lenders argue that the business of fishing is not profitable enough, therefore, they do not get enough to pay for their leased equipment. They also complain of competition from foreign fishermen and lack of storage facilities as some of their setbacks. A poor market for their small catch coupled with low prices were other hindrances to fishing as a source of income.

5.4 Conflicts among the managing organizations

The study revealed various conflicts that exist between the mangrove ecosystem management organizations. It was interesting to note the criticisms levelled against each organization by the others. For instance, KEMFRI was in conflict with SPEK over the management of the mangrove reforestation project in Gazi. Each organization is trying to incite the local community against the other. The Kenya Marine and Fisheries Research Institute blamed SPEK for making technical appearances in areas where they initiated projects, where photographs are taken and sent to donors to source funding. It is alleged that SPEK has received over 1.5 million from Netherlands purporting that it is the one running the reforestation project at Gazi (Personal Communication: Ombinga, 1999).

Members of the Forestry staff who were asked to comment on the above issue were categorical in dismissing the two organizations as opportunists who just use the local people as stepping-stones to get money from donors. "The money received in most cases is shared among the officials of the two organizations"(Personal communication: Rajab, 1999). Another Forestry guard, aged about 45 years, put it as follows:

> *Most of the projects purporting to be geared towards the mangrove ecosystem conservation in most cases end up benefiting a few people especially officials. The Forestry Department was against the idea of some NGOs using the local people to acquire funding that do not benefit the intended groups. Some of the organizations incite the local people against our department.... There is also tribalism in the operation of the NGOs. For instance, the Gazi reforestation and oyster projects which were initially supposed to involve and benefit the local community have been hijacked by KEMFRI personnel who are enjoying huge field allowances* (Personal Communication: Becha)

However the SPEK coordinator interviewed dismissed the claims and asserted that their organization has incorporated the local people in their conservation activities. "We also sensitize the public on the importance of mangrove ecosystem conservation" (Personal Communication: Mwangi). Similarly, the KEMFRI staff had the same sentiments about the claims. They insisted that their Institute organizes seminars and public *baraza* with the help of the local administrators to enlighten the community on the importance of

conserving the mangrove ecosystem. They, however, pointed an accusing finger at their counterparts in SPEK who are using the names of their projects to source funding abroad.

Surprisingly, the members of NGOs interviewed spoke in the same way indicating that they involve the local community in their activities, enlightening the community through seminars as well as public *baraza*. Paradoxically, for the whole period of two months the researcher was in the field no seminar or public *baraza* was ever witnessed or heard of.

The KWS blamed the Forestry Department for not fully protecting the depletion of the mangrove ecosystem. It was claimed by a senior staff member in KWS that most of the Forestry Department staff are corrupt and, therefore, responsible for the mangrove depletion in Kwale District.

> *What we are now doing is outside our objectives. We would want to protect the marine parks, but we cannot do that effectively when the Forestry Department does not protect the mangroves. Furthermore, people who rely on mangroves are not assisted to get other sources of livelihood* (Personal Communication: Mwadzaya).

It was evident from the interviews with the KWS staff that there are conflicts between their organization and other organizations. In fact, the KWS Regional partnership coordinator coast Region (R.P.C) narrated the following during a key informant interview:

> *We have always tried to work hand in hand with the FD but it has let us down in each case.... The Forestry Department is not effective in the discharge of its duties, thus, the KWS has decided to involve the local community in the conservation activities, as this is the only way out.... The KWS unfortunately has no authority on the protection of the mangroves; instead it has laws on the control of marine parks. The Fisheries Department would also want to increase the catch but it is not strict on the wrong fishing methods by unscrupulous fishermen. In short, the two organizations are not effective in their control practices. The mangrove ecosystems are directly inter-linked in that the changes in one affect the others. For instance, the destruction of mangroves directly affects the marine parks. The co-oporation between managing organization is, therefore, of paramount importance. We, the KWS staff, have initiated community-based*

projects (CBS) in our areas of operations to serve as alternative sources of income for the local community. It is illogical to tell someone, for instance, not to go fishing around the marine park when he/she has nothing else to do for a living. It is, therefore, a general obligation for an organization like us to give fishermen /women fishing nets, boats and other gears so that they can venture into the deep sea and compete favourably with the foreign fishermen (Personal Communication: RPC).

The KWS also claims to have problems with senior government officials and politicians. The informal interviews carried out with its staff revealed that there are some politicians who think that the organization has a lot of money which they should also have a share of. The staff complained that some politicians are making their operation difficult simply because the KWS has not given them money. "They demand for huge bribes forgetting that the projects we initiate benefit the local community" (Personal Communication: Rashid)

The KWS staff decried the ongoing fight for Wasini Island between their organization and land grabbers who happen to be senior government officers. The organization is initiating a re-afforestation programme in the areas where local women groups are involved but the grabbers, on the other hand, would like to put up hotels. The politicians and well-connected people in the government are against the idea of empowering the local people. They are aware that their activities are not sincere because when they realize that an NGO or any other organization for that matter is empowering people, they feel threatened (Personal Community: Zaidi Yousuf).

The Forestry Department also did not fall short of blaming other organizations for the mess in the ecosystem. The department blames the KWS for taking some of their boats in the guise of coordinating the patrols, something that has not been realized up to date. "The boat that was taken was smaller in size and, therefore, flexible enough when it came to patrols. It was possible to pass through even in crooked gangways unlike the current one which is big and has high rate of fuel consumption" (Personal Communication: Forestry Officer). The KWS in its defense blames the Forestry Department of laxity in the discharge of its duties. Corruption is also a vice that has eaten deep into the

department and these are the reasons for the depletion of mangroves around Ramisi River and other parts of the district.

The Fisheries Department is not spared either. The department is blamed for not carrying out effective patrols to stop the unscrupulous fishermen from using unwanted fishing methods. Instead, the Fisheries Officials are said to wait in their offices for bribes from foreign fishermen.

However, according to the Forestry Act and the Memorandum of Understanding (MoU) between the Kenya Wildlife Service (KWS) and the Forestry Department, the latter is the lead agency for managing the mangroves. The KWS is supposed to work closely with the Forestry Department in planning and implementing activities in the mangroves which are also part of the National Parks and Marine Parks. Indeed, this has not been possible as the study reveals conflicts between the two organizations. According to the Forestry Officer of Msambweni Division, there used to be joint patrols between the Forest guards and the KWS wardens but after sometime the Forestry guards refused to patrol because they were not paid field allowances while wardens were. The researcher was then prompted to seek clarity pertaining to this issue. The KWS staff members argued that their organization receives additional funding from donors and other income generating projects in addition to the usual government support. Unfortunately, the Forestry Department receives funding only from the government, hence, it would be difficult to pay the guards in the same way.

Generally, the study revealed that there is lack of coordination between the managing organizations and this could be the reason for conflicts between them. It is evident from the findings that the Forestry Department concentrates on forests, the Fisheries Department on fish, while KWS takes care of birds and other animals. These ecosystems are integrated and it, therefore, goes without saying that there is dire need for coordination between the organization to realize proper management and conservation of the mangrove ecosystem.

5.5 Conflicts Between the Users and Protectors

The mangrove exploitation, management and conservation in Kwale District are also characterized by various conflicts between the protectors and the users. Conflicts arise at different levels of carrying out the above mentioned activities. The Forestry Department, for instance, issues permits and licenses for mangrove extraction. The study revealed that the cost of a license for commercial extraction of mangroves is Ksh. 10,000 but there is an additional Ksh. 1,000 for the application form. Furthermore, the licensee is required to pay tax Ksh. 5 per every pole cut. All dealers interviewed were against the Forestry Department's system of licensing. They complained about high charges for licenses which have forced the local people to pull out of the mangrove business. "They are now licensing rich dealers from Mombasa and other places because the local people cannot raise the required fee. Indeed, this has increased illegal cutters and enhanced conflicts with Forestry guards" (Personal Communication: Abdalah).

The local community was also not comfortable with the charges for firewood permits that varied from village to village. The local community complained about discrepancy in the charges and the red tape involved in acquiring a permit that has forced many people to do without the document. This has increased the cases of illegal firewood collecting. Surprisingly, even those with firewood collecting permits in most cases find themselves in problems as the Forestry Department rules dictate that " The permit holder is only restricted to one head-load of fallen firewood per day for one month". The permit holders complained that this is a bottleneck because the one head-load of firewood per day is not enough for large households, not to mention those operating hotels or kiosks. Most people are, therefore, forced to collect more firewood and when caught by the forest guards conflicts erupt. The permit holders were also against the issue of collecting only fallen firewood. They argued that the Forestry Department should change the law so that even standing dry wood could be cut. The laws should also allow the collection of more than one head-load of firewood. A majority of the hotel operators (95%), of the 20 served

with questionnaires, suggested that the Forestry Department should allow some local people to obtain special permits to be collecting more firewood other than the recommended one head load for sell to hotel operators. They insisted that mangroves are the best firewood because the trees do not absorb a lot of water and their burning rate is also very low. Thus, with two head loads of mangroves, a hotel can go through one day without any problem. This could be the reason why the local people are not willing to exploit the terrestrial forests around.

Similarly, the licensees who extract mangroves for commercial purposes were not comfortable with the Forest Department. They complained that apart from the license charges being high, there is too much corruption in the department to the extent that even those without licenses also access the forests after bribing the Forestry guards. This has led to conflicts between licensees and the forest guards.

The Forest Department, on its part, insisted that some local people are "naturally thieves" and that is why they do not want to get licenses and permits to exploit the mangroves. The department's officials pointed out a case where there was a fluctuation in paying for permits. It was observed that during the rain season many people acquire license than when it is dry. The reason is that the mangrove trees do not absorb a lot of water and that is why they are preferred even in the rain season. This, therefore, means that people struggle to get mangrove firewood with or without permits. This has let to conflicts with the forest guards.

The forest guards interviewed complained about illegal firewood collectors and mangrove pole cutters who are armed and, therefore, dangerous. They cited lack of working gears and weapons as the major hindrance to the proper discharge of their duties.

Generally, the study reveals that there is hatred between the forestry officials and the local community. The local community complained about harassment from the department's personnel. "Anybody found in possession of mangrove wood without a permit/license is

arrested and fined heavily"(Personal Communication: Haji). The fishermen also complain about the department's hard stance on the local people. They argued that the department forces them to get permits to extract *matole* from the mangrove trees. *Matole* are small pieces of sticks used for making fishing traps locally known as *uzio*. Out of the 20 fishermen interviewed, 99% of them refused to get permits and this has led to conflicts with the forest guards. In most cases, they resisted arrest and even fought back. "The *Matole* are very small sticks that one should not bother to get a permit to pluck. We also fear the red tape involved in acquiring the document" (Personal Communication: Ibrahim. 1999). Similarly, we have some members of the community who usually collect pieces of wood on beaches for firewood. The pieces of wood are washed to the shore by sea currents. These people complain about harassment by forestry guards and yet their activities to some extent clean the beach (Personal Communication: Amina, 1999).

The Forestry Department has also banned the cutting of *fito*. Conflicts do arise in this case with the local community whose construction activities cannot be completed without the use of *fito*. The local people are, therefore, forced to overlook the restrictions and cut the '*fito*". In fact, the local people argue that the cutting of the mangroves is to some extent a way of spacing the forest. They have, therefore, insisted on the practices despite the restriction, hence conflicts with the guards.

The Fisheries Department is another organization whose laws and regulations concerning the management and conservation of the mangrove ecosystem conflict with the local people's activities. The Fisheries Department, like the Forestry Department, employs the licensing system in regulating the fishing activities. Conversely, the local community complains about corruption and ineffectiveness in the department's legislations. The community blames the department for licensing foreigners who have depleted the fish in the sea through their bad fishing methods. They also indicated that the licensed foreigners do not respect their traps and when they complain to the department, no action is taken. The foreigners, on the other hand, contested the allegation and argued that the authorities concerned in fact over-tax them. One foreign fisherman aged about 45 years

old narrated:

> *When the catch increases, the village elders organize with the police for our arrest mostly on filth grounds such as identity cards or lack of fishing license. Once we are thrown behind bars, the same elders organize for our release only to ask for huge compensations for their so-called assistance afterwards. We are really against this and we ask the Kenya government to step in and assist us. Everybody right from the village leaders to the senior administrative officers is harassing us....*

The local fishermen indicated that fishing is like gambling, that is, one can get more than enough today and miss to get even a single fish tomorrow. Therefore, the Fisheries Department is required to reduce the charges for the fishing licenses.

Other conflicts are between the KWS and the local community. The KWS protects marine parks from unscrupulous fishermen and also takes care of all birds and animals found in the mangrove ecosystem. There are some conflicts that have come up between the two parties in the course of carrying out their daily activities. First, the fishermen have been forced to invade the marine parks after fish were depleted in other parts of the sea. Another reason for invading the marine parks is lack of technology and equipment to venture into deep-sea fishing. The marine rangers are, therefore, always on the look out and it was discovered that they not only arrest the fishermen but also mangrove cutters. Second, there is conflict between the organization and the local farmers. The farmers complain that wild animals have discouraged them from agriculture because they normally clear all the crops planted. They alleged to have been reporting their cases to the KWS but it seems the department does not care. This has forced most people to rely on fishing and mangrove cutting as their sources of income. The KWS on its part blames the local community of laziness:

> *We have been telling these people to clear the bushes that attract wild animals but nothing is done. We have time and again told them to practise agriculture in large numbers so that we can be able to protect wild animals. You see we cannot fence one or two farms when the rest of land is bushy! Furthermore, if these people can clear bushes, cultivate their farms in large numbers and plant crops at*

once, the impact of wild animals will reduce (Personal Communication: KWS Warden).

However, the KWS has tried to assist the local people to reduce conflicts. The organization boasts of building schools for the local communities. It has also dug boreholes that have ensured a continued supply of water to the local people. The organization has not just stopped fishermen from fishing around marine parks but has given them fishing boats and nets so that they can venture into the deep sea.

In their opinion, 55% of the 37 respondents issued with questionnaires thought that they receive little benefits from tourism. They feel resentful that the Marine Park authorities appear to manage the park merely for national and foreign tourists rather than for the local people. Conversely, the remainder (45%) commended KWS for its continued assistance to the local community. They, however, had reservations with some marine rangers who disrupt their fishing activities around the marine parks.

5.6 Other Sources of Conflicts

There are other conflicts revealed by the study that do not fall in any of the above categories. It was realized that tourism had dropped drastically on the Kenyan coast and many local people have been rendered jobless. It is, therefore, evident from the current situation at the Kenyan coast that very little revenue is collected from tourism. Many people have resorted to mangrove cutting, fishing and small businesses. In fact, conflicts have already arisen between tourist hotel developers and artisan fishermen. The latter are denied access to the beaches fronting the hotels while the former does not offer any alternative to the activity.

The hotel developers have also problems with the Forestry Department. The department would like to protect the mangroves that are cleared by hotel developers for construction purposes but the Forestry Department, on the other hand, does not allow the cutting of mangroves without a license or permit.

Land grabbing has not spared the Kenyan coast and indeed the mangrove ecosystem. The Forestry Department complains about the continued issuing of title deeds to land grabbers by the Ministry of Lands and Settlement. The grabbers in most cases, clear the mangroves to give way for construction. They also cut mangrove poles without licenses and this has in many cases resulted in conflicts. The conflicts extend even to the local people that inhabit the sold land as the case of Funzi Island below illustrates:

> *The former Member of Parliament for Msambweni a MR.* ***M.****, who then was a powerful Minister, sold the Island to a white man a Mr.* ***T.*** *There were people who had lived on the Island from time immemorial but their plight was ignored. These people, therefore, resisted the white man's efforts of putting up structures on the Island. The Forestry Department joined hands with the local people after realizing that Mr.* ***T.*** *was cutting mangroves without a permit. When* ***T.*** *realized that he was losing the battle he decided to employ almost all the local people. Surprisingly, the local people changed their mind and started defending* ***T.*** *from what they referred to as aggression from the Forestry Department. The Department almost gave in; however, it insisted that for* ***T.*** *to cut mangroves he needs a permit/license because* ***T.*** *bought the land and not mangroves.* ***T.*** *was fixed and since he had a lot of money, he decided to bribe his way out. He is said to have befriended a Forestry Officer* ***K*** *who later allowed him to go on with the business even without a license. Unfortunately for the local people, after* ***T*** *realized that he had won the support of the Forestry Department, he terminated all the local people he had employed. Many people are now stranded because they cannot go back to the Forestry Department for assistance again because they have been fighting the department. The current situation, therefore, is that many local people have been displaced from their land which is now fenced and under tight security. Mr.* ***T*** *cuts mangroves at will because all those who are charged with the responsibility of licensing and protecting the mangroves have been bribed (*Personal communication: Rajab, 1999).

The above case clearly indicates that there is corruption in the mangrove business and only those who are rich can access the ecosystem easily. It also comes out clearly that the poor people are not in position to take any stand. They are used and dumped by the rich in the society.

Land conflicts were also reported in Kiwambale village. The local people claimed that surveyors have allocated the land to foreigners. They further claimed that the few who

were allocated land were shifted from their home areas to other places such as Shimoni. This was done purposively to weaken the coordination of the indigenous members of the area so that they are unable to champion their rights. "Those of us who have been dislocated are not moving until their allocation is revoked and done once more" (Personal Communication: Bakari 1999). During the study, it came out vividly that hundreds of thousands of the coast people have been disposed of their ancestral land and have long been reduced to the status of squatters on what they believe to be the land of their forefathers. The fact that the quiet but very strong wind of *majimboism* is sweeping the coast region cannot be denied. The study revealed that since the first multiparty politics in 1992 and the ethnic clashes elsewhere in Kenya in 1993, things have not been the same in Kwale District and other parts of the Coast Province. Things even became worse with the ethnic clashes in 1992 and the 1998 massacre. There have been conflicts between the coastal and the upcountry people. The coastal people claim that those from upcountry have taken most of the senior positions in parastatals and other organizations in the regions, which they feel, should be taken over by the indigenous people. These tensions between the local and upcountry people have not only affected tourism and other businesses but also academic standards in the Coast Province and, more so, the mangrove ecosystem management and conservation efforts.

5.7 Causes of Conflicts

From the research findings, the most common cause of conflicts between the parties interested in the conservation and exploitation of the mangrove ecosystem is competition for the scarce resources. The mangroves have drastically reduced on the Kenyan coast and the profits, therefore, may depend on having access to sufficient mangroves.

Anger and conflicts are also caused by mistrust of parties involved in the management and conservation activities. The majority of these stakeholders are not transparent in their activities and this makes the local people lose confidence in them.

Corruption, though denounced by each and everybody, has taken root in the Kenyan society. The vice has caused conflicts in that even those without license exploit the mangroves at will after bribing the forest guards. This demoralizes others who would have wanted to obtain the document.

To find out the causes of conflicts from the people concerned themselves, the researcher asked the informants to cite the issues or incidences they thought caused conflicts. About 20% of the respondents thought that conflicts are caused by high charges for permits and licenses, therefore, the local people who are poor are forced to exploit the ecosystem despite the rules and regulations. About 17.5% claimed that conflicts are as a result of poverty since the majority of the local people are not employed and for the few who are employed their meagre income cannot meet their household demands. Poverty is also as a result of a lack of market for the fish and mangrove poles. On the other hand, 15% mentioned the influx of foreigners to their areas as the cause of conflicts while 12.5% cited lack of trust, greed and/or corruption as the cause. Another 10% named poor fishing methods, 7.5% diminishing resources and increasing population while12.5% represented those who thought that conflicts are caused by lack of strict rules to check foreigners from encroaching on the mangrove ecosystem and poor coordination among the mangrove ecosystem managers. The remainder 5% maintained that there are no conflicts at all (See Table 5.3).

Table 5.3: Causes of Conflicts

Causes of conflicts	Frequency	%
High charges for licenses and permits	16	20
Poverty, low income, lack of market for fish and mangroves	14	17.5
Influx of foreigners and licensing of the same	12	15
Lack of trust, greed and corruption	10	12.5
Poor fishing methods	8	10
Diminishing resources and increasing population	10	12.5
Lack of strict rules on the part of the managers, poor coordination between management organs	6	7.5
No conflicts-no cause given	4	5
Total	**80**	**100**

From the table above it can be clearly discerned that 20% and 17.5%, of the respondents link the causes of conflicts to poverty. The local people, therefore, illegally exploit the ecosystem because they are poor and cannot manage to pay for the expensive permits and licenses. For those who are employed, their income is below average and poor markets for their commodities and lack of storage and credit facilities hinder those who are engaged in mangrove exploitation and fishing activities.

5.8 Strategies for the Resolution of the Conflicts

Attempts were also made in this study to establish what the respondents thought were the ways of resolving the conflicts. The respondents were asked whether or not the conflicts could be solved. Out of the 80 respondents, 72 respondents (90%) thought that the conflicts can be resolved, 4 respondents (5.0%) believed that it was impossible to resolve the conflicts while 4 (5%) were non-committal.

When probed further, those who said that it was impossible to resolve the conflicts did

not have any reasons for their answer. However, for those who thought that conflicts can be resolved offered the suggestions summarized in Table 5.4 below. What emerges from the table is that almost half the respondents (45%) believed that the conflicts can be resolved by reducing charges for permits and licenses and by stopping the licensing of foreigners to exploit their mangrove ecosystem. However, 10% were of the view that conflicts can only be resolved by abolishing the licensing system and allowing free access to mangroves by the local people. A similar percentage (10%) thought that peace can be realized only if the stakeholders establish alternative sources to the mangroves. Another 7.5% were of the opinion that there would be no conflicts if there was transparency in all the deeds of the people concerned with the management and conservation of the mangrove ecosystem. The respondents, therefore, suggested that the services of all corrupt officials should be terminated. Other reasons included promoting farming and livestock keeping, capacity building of the local people and initiating re-afforestation programmes that were represented by 5% each. A negligible 2.5% thought that the price of mangrove poles should be made public to end conflicts while 10% cited a combination of reduction in charges for permits/licenses, non-licensing of foreigners and establishing alternative sources of income to mangroves as their suggestions to end conflicts (Table 5.4).

Table 5.4: Suggestions for Conflict Resolution

Suggestion	Frequency	%
Reduce charges for permits and licenses	18	22.5
Stop licensing foreigners	18	22.5
Abolish the licensing system	8	10.0
Establish alternative sources of income	8	10.0
Terminate services of all corrupt officials	6	7.5
Capacity building	4	5.0
Initiate re-afforestation programmes	4	5.0
Make public the prices of mangrove poles	2	2.5
Reduce charges for licenses, stop licensing foreigners and establish alternative sources of income	8	10.0
Promote farming and livestock keeping	4	5.0
Total	**80**	**100**

During the focus group discussions and key informant interviews, it came out clearly that there has not been any attempt by the government of the day to resolve the on-going conflicts. There was no attempt even on the part of the NGOs present in the research areas to allow for and encourage local initiatives in which local communities could articulate their own solutions to resource management and conflict resolution.

Generally speaking, therefore, the research findings revealed that the mangrove ecosystem-related conflicts impact negatively on local people's livelihoods, as they do not have alternative resources in the mangrove ecosystem.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter summarizes the major findings of the study according to the stated objectives and assumptions. Conclusions are then drawn basing on the summary and lastly the recommendations are made.

6.1. Summary

From the findings presented in the previous chapters, it came out clearly that the local people understand their mangrove ecosystem environment well because as many as 95% of the respondents were able to mention the fauna and flora found in the ecosystem. However, there is unawareness among the local people on the linkages between the various coastal ecosystems. This notwithstanding, they do have vast traditional knowledge on the resources in the ecosystem and various ways of exploitation such as when to go cut the trees, fish and which kind of fishing methods to apply at a particular time/period of the year. However, it was observed that many people were unable to exploit the mangroves or go fishing due to expensive licenses, poor communication, low business and lack of capital. Other reasons included lack of credit facilities and the long procedures of acquiring licenses and permits. It is, therefore, evident from the findings that most people (80%) were not involved in the extraction of mangroves.

The study also revealed that there are poor employment trends in the study area. Many people are poor and even the literacy level is low. The reasons for poverty as revealed by the study could be over reliance on one resource, lack of capital to venture in agriculture, over-population, lack of alternatives to fishing and mangroves, laziness, witchcraft and poor education and employment trends. There are, however, some NGOs and

government-created organizations that have come up with projects aimed at assisting the local people. Examples of such organizations include KEMFRI, Forestry Department, KWS, Fishery Department and the Coast Development Authority (CDA). It is, however, alleged that some organizations are not genuine in their activities. It is claimed that most projects are initiated with very good objectives but unfortunately in most cases do not benefit the local people.

Kwale District is faced with several problems such that if the local community and the organizations interested in the mangrove ecosystem do not come together for a common goal, the management and conservation of the ecosystem will be futile. Unfortunately, this goal remains elusive up to now. Instead, the local people blame the government-created organizations for their problems while the latter blame the former for the degradation of the ecosystem. In addition, the organizations attribute their inefficiency in the discharge of their duties to lack of working gears such as uniforms, boats, bicycles and weapons. Poor remuneration and understaffing were other reasons given for inefficiency in the discharge of their duties. Furthermore, the lack of transport and general infrastructure greatly hampers patrols and management efforts. Nevertheless, it is important to note that the demand for the mangrove ecosystem resources is expected to continue to increase due to population growth and poverty. The findings concurs with Semesi's (1998) argument that the devaluation of currencies, retrenchment of workers and removal of subsidies forces people to revert to fuelwood, fishing, farming and other activities based on natural resources for survival. It is further observed that the current globalization trends will fuel exploitation pressure even further. In addition, as long as poverty increases in population and inequitable terms of trade are not solved, the pressure on mangrove resources will continue to grow. (Semesi, 1998). Thus, conflicts in the management and conservation of the mangrove ecosystem are likely to intensify.

Over-fishing is another problem in the mangrove ecosystem that needs attention. The fishermen blame each other for poor fishing methods in their areas. The study revealed that there is hate campaign against the foreign fishermen from Pemba.

Transport is a major bottleneck for the supply of inputs for the production and marketing of products from villages. In Vanga, for example, the transportion of mangrove poles and fish was cut off for a whole year following the *El-nino* rains of 1998. It is also not easy to transport fish and mangrove poles from villages such as Bodo, Shirazi and Shimoni during the rain season. Electricity is also important for storage facilities, for example, freezers for fish.

6.1.1 Management and conservation priorities of the mangrove ecosystem

The management of the mangrove ecosystem rests with the Forestry Department, Fisheries Department and the Kenya Wildlife Service. The study revealed that the organizations have formidable plans and legislations for the management and conservation of the ecosystem but there must be something wrong in their application since the depletion of the mangroves has been going on throughout. It is evident that the legislations are foreign to the local people who are the users of the environment. People are not conversant with the activities of the organizations.

The roles of NGOs and government-created organizations in the management and conservation of the mangrove ecosystem are evident. However, there is a lack of coordination hence conflicting interests. Thus, this calls for a lead agency to implement the management plans. Michel *et al.* (1977:124) also suggested that:

> *A key factor in effective coastal management is having a lead agency to implement the management plans. This agency may have a variety of responsibilities, including planning and coordination, establishing standards, developing regulations, issuing licenses and permits, surveillance and enforcement. Responsibilities may be restricted to a centralized national agency or shared between national and local administrative bodies. To operate successfully, agencies must be staffed by trained personnel and adequately funded. In situations where responsibilities for coastal resource management are fragmented, a coordinating board consisting of representatives from different agencies may be required.*

Semesi (1998) while commenting on the issue of a lead agency observes that in Kenya, according to the Forest Act and the Memorandum of Understanding (MOU) between Kenya Wildlife Service and Forestry Department, the Forestry Department is the lead

agency for managing the mangroves. The KWS is supposed to work closely with the Forestry Department in planning and implementing its activities but this has not been possible. Since the MOU between KWS and Forestry Department was drawn-up in the head offices in Nairobi, it was reported by, the Divisional Forest Officer that field officers tend to interpret the MOU differently because they were not involved in its formulation. This indicates that MOUs are effective only if the partners have equal opportunities, resources, and incentives which is not the case between K.W.S and the Forestry Department (Semesi, 1998).

In Kwale District there is mutual hostility and obstruction between the management agencies. However, K.W.S should be commended for its continued support to the local community. The organization has built schools, constructed boreholes, given bursaries to poor students and has also started income generating projects for the local people.

Another problem facing Kwale District is limited capacity to enforce regulations. The management of mangroves, coral reefs and other ecosystems of Kwale, as currently practised, is not effective. Michel *et al. (1977) indicate* that the effectiveness of regulation is largely dependent on surveillance, the enforcement of penalties (fines, loss of license, confiscation of equipment and imprisonment) and on public acceptance and support. From the findings, it is clear that establishing a coherent legal basis for coastal management and can be extremely difficult. The study has also revealed that in their administrative responsibilities the NGOs and government created organizations involved in management and conservation of the mangrove ecosystem have had more often than not, their mandates overlapping or conflicting.

From the findings the role-played by the local community in the management and conservation of the mangrove ecosystem is minimal. Even though there are local committees, they lack powers to carry out their activities independently. They also lack funds and moral support from NGOs and government organizations. However, it should be noted that local support is fundamental to the long-term conservation and sustainable

exploitation of the mangrove ecosystem. It is generally observed that protected areas in Kwale District do not create new economic opportunities, thus, local people have little incentive to respect the protectors and the users. Thus, local support for management and conservation is critical.

In fact, the chief of Vanga Location complained that those people living around the National Parks in other parts of the country are always compensated but those living around the mangrove ecosystem are not. "In fact we are harassed for even collecting pieces of wood washed to the shore by currents or for plucking *matole* for our fish traps "(personal communication: Chief Vanga location). The Nation Coast Wednesday, March 10, 1999 II reinforces this issue when it reports:

Taita-Taveta District has earned Kshs 49 million from Kenya Wildlife Services under its revenue-sharing program in the past six years. The organization's Deputy Director of biodiversity, Dr. John Waithaka said several community projects in the area have been implemented through the assistance of the organization. The organization, he added, will continue rewarding local communities living along the national parks and who actively assist in wildlife conservation efforts. Dr. Waithaka said KWS was determined to offer incentives to residents of the district for control and profitable exploitation of wildlife resources found in the area. Some of the projects that have already been completed under the program are the conservation of a 60-kilometer electric fence to curb elephant invasion on farmlands, Ikanga water projects, Ndovu clinic, training of game scouts and bursaries for bright children from poor families among others. The official said KWS will continue financing viable social projects and wildlife based enterprises in areas bordering gameparks as part of human-wildlife conflict resolution.

Such kind of news pains the communities around the sea who claim to be over-taxed to exploit their ecosystem and to have no special consideration whatsoever. The community leaders also raised alarm that their area is experiencing the worst human-wildlife conflict and it, therefore, deserves a lot of assistance if the residents are to feel comfortable in supporting the conservation of wildlife and resources in the mangrove ecosystem.

Generally, the findings show that local participation in management is paramount. These concurs with Semesi's (1998) argument that the changes for sustained management efforts are significantly increased by the repeated and meaningful participation of the

communities and economic interests affected by programs. Semesi (1998) adds that participation is both a process and an end in itself. It is the process through which people with interest in an area or topic (stakeholders) contribute to, influence and manage efforts. It is an end because participation builds capacity and results in the empowerment of individuals and communities to manage their coastal environments.

Also affecting the role of the local people in the management and conservation of the mangrove ecosystem is the competing interests and lack of linkages among the interested parties. For instance, the Forestry Department is not happy with the KEMFRI and KWS activities, therefore, it incites the local people against the two organizations and vice versa. Lack of skills, education and information has also contributed to the local people's dismal participation in the management and conservation of the mangrove ecosystem. In some cases, however, the local committees' efforts have been dwindled by the conservation agencies for fear of competition.

6.1.2 Conflict and their possible Resolutions

The research findings reveal that there are conflicts in the management and conservation of the mangrove ecosystem. As many as 95% of the respondents admitted that there are conflicts. The findings reveal that conflicts arise when carrying out the following activities: *fito* cutting, fishing, firewood collecting, transportation of the mangrove poles and cultivation of the abandoned Ramisi sugar farm. Other sources of conflicts include competition for limited resources, payment of cutters by dealers and competition among the mangrove ecosystem management organizations.

From the research findings, conflicts have been grouped into five major categories. First, there are conflicts among mangrove exploiters. These in most cases are the local cutters, community and foreigners because most factories and bakeries have resorted to other sources of energy other than mangrove fuelwood. It is evident from the findings that the local community is united by traditions and Islamic religion and this could be one of the

reasons why they believe that mangrove degradation and poor fishing methods are done by foreigners and not members of their communities.

Another category of conflicts is that between cutters and dealers. The major cause of conflict in this category is payment and the alleged exploitation of cutters by the dealers. Cutters complain that they toil very much only to earn peanuts at the end of the day. They also complain about delay in payment and believe that dealers sell mangrove poles on a cash basis and pay them in instalments. The dealers had a different story to give. They cited lack of market for Kenyan poles because of their poor quality and the ailing tourism industry as the major set backs on their side.

Nonetheless, the situation on the ground shows that what the dealers are paying cutters is not commensurate with their work. The dealers have the advantage of exploiting the local people since the license is expensive (Kshs 10,000) and the local people cannot raise the amount. The local people who may want to construct any structure have no option but to buy mangrove poles from the dealers at exorbitant prices. This has forced many people to either bribe the forest guards to obtain the poles or cut them at night. When such illegal cutters are confronted with Forestry Guards, conflicts erupt.

The third category of conflicts is in the fishing community. The research findings reveal that conflicts in the fishing community come up as a result of the use of inappropriate fishing gear and lack of law enforcement regulatory bodies. Fishermen and women also accuse their counterparts from Pemba for all their problems as far as fishing is concerned. They also accuse the Fishiries Department for laxity and corruption. Conversely, the Fisheries Department insisted that all is well as pertains to the management of fisheries. However, the situation on the ground shows that people are abandoning fishing due to lack of capital and equipment to venture into deep-sea fishing as the shallow waters have been over fished and, therefore, they are barren of fish. It is, however, observed that the local fishermen are not as aggressive as their counterparts from Pemba. Even most of those with modern fishing equipment do not use them effectively.

The fourth category of conflicts is that between the users in general and the protectors. The protectors are the three main organizations concerned with the management and conservation of the mangrove ecosystem. The users on the other hand are the local people. The local people complain about the licensing system that is alleged to have flaws. They particularly accuse the Forestry and Fisheries Departments for licensing foreigners who are depleting their ecosystems. The mangrove dealers also accuse the Forestry Department for over-taxing them. Bribery and harassment are other accusations labelled against the department. The study findings also indicate that the long procedures involved in acquiring permits and licenses could be one of the reasons discouraging the indigenous people from obtaining the documents. Unfortunately, the Forestry Department personnel perceive most local people as "naturally thieves". They, however, attribute their inefficiency in the discharge of duties in some areas to lack of working gears, enough personnel and funds.

The Fisheries Department is blamed for employing a licensing system that has flaws. The fishermen are against fishing permits because fishing is not a reliable activity. It is argued that one can go for even three or so days without a single catch. The foreign fishermen also complain of harassment by the local administrators and the police.

The local people blame the Kenya Wildlife Service for harassing fishermen who go fishing around the marine parks. The farmers, on the other hand, accuse the organization for not protecting the wild animals that have been destroying their crops. Consequently, most people have opted out of farming for fishing and mangrove cutting and this has lead to the degradation of the ecosystem. Nonetheless, the KWS is commended for the continued assistance to the local people.

The other category of conflicts is that between the mangrove ecosystem managing organizations themselves. There are accusations and counter accusations between the organizations over the degradation of the mangrove ecosystem. The KEMFRI, for instance, blames SPEK for using the name of its projects in Gazi bay to attract funding

from donors. The Forestry Department, on the other hand, blames KEMFRI and other NGOs for inciting the local people against the department. It also took issue with the K.W.S for being insincere as far as their co-operation is concerned. On their defensive, the KWS blamed the Forestry Department for the depletion of mangroves around Ramisi River and other parts of the district. The KWS personnel cited widespread corruption as one of the major vice haunting the Forestry Department. The organization also complained about the senior government officials who are extorting money from it so that it can be allowed to initiate projects.

Generally speaking, there is hatred and obstruction between the organizations charged with the management and conservation of the mangrove ecosystem. This could be because there is no coordination between the organizations that are operating in an inter-linked ecosystem where a change in one affects the other.

Other sources of conflicts revealed by the study but do not fall in any of the above categories include land grabbing like the case of Funzi Island. Land conflicts around Shimoni area is another source of conflicts. The local people in these areas allege that their land has been allocated to foreigners. Lastly, there is hatred between the coastal and the upcountry people in the region. This was even intensified during and after the infamous ethnic clashes in 1992 and the subsequent massacre in 1998.

6.1.3 Major Causes of Conflicts

The major causes of conflicts, according to the local people, are high charges for permits, poverty and an influx of foreigners. The local community also believes that the diminishing resources against the increasing population cause conflicts. Thus, there is a lot of competition for the limited resources that leads to conflicts between the competing parties. The cutters and fishermen thought that conflicts are as a result of unscrupulous mangrove dealers who exploit cutters and fishermen who use poor methods of fishing.

In general, conflicts are as result of poverty. The findings reveal that there are poor education and employment trends in Kwale District. Most people, therefore, rely on fishing and mangrove cutting. The fishermen lack credit facilities and, therefore, capital to venture in modern methods of fishing. They even lack the basic fishing equipment such as nets and boats and since the shallow waters have been overfished and they do not have the equipment to venture into deep-sea fishing, thus, most of them have abandoned the occupation. In fact, many people just hover around the landing bay for some fish for domestic use locally known as *Kitoeo*. Others assist Pemba fishermen to transport fish from the landing bay to the main road at a fee. Mangrove cutting, as an occupation, has also suffered a great blow with the declining tourism industry. The demand for mangrove construction poles has fallen drastically since there is no expansion in hotels. Many cutters have, therefore, been rendered jobless. The few that receive orders are underpaid because there are many cutters chasing a few jobs, hence, poor bargaing power.

In short, conflicts are hinged on the premise that the resources at the Kenyan coast are diminishing against the increasing population. There is, therefore, a lot of competition for the limited resources. The conflict theory that guides this study has, therefore, succeeded as it also emphasizes the idea of scarce resources and competition for the limited resources.

6.1.4 Possible Resolutions for Conflicts

According to the local people, conflicts can be resolved by reducing charges on the permits and licenses. They also think that conflicts could be resolved by banning foreigners from exploiting the mangrove ecosystem. Others called for the abolition of licensing system and terminating the services of all corrupt officials from the management organizations. Most key informants called for the promotion of agriculture and animal husbandry and initiating re-afforestation programmes as a way of averting conflicts.

Indeed, there is every need for those concerned with the management and conservation of the mangrove ecosystem to come up with alternative sources of income for the local people. These should be backed up with capacity building for the local people. The current coastal economies: fishing and mangrove extraction are strained. In fact, Anderson *et al.* (1998) also observe that coastal dwellers rely more heavily on common property resources. Fishing is one of the most capital-intensive activities in the coastal zone since it requires expensive equipment and a boat. In addition, it requires knowledge and familiarity with sailing, gear handling, bait collecting, maintaining of equipment and marketing of the catch. The authorities concerned should always put in consideration such factors when making plans.

6.2 Conclusion

From the foregoing it is evident that the local people understand their environment and should, therefore, be involved in the management and conservation of the mangrove ecosystem. Local people should be set free to identify their own socio-economic needs rather than outsiders deciding for them. It is evident from the findings that local people do not participate as true partners in designing, managing and conservation programmes. It is like everything is decided for them. The organizations in charge do not recognize that local support is fundamental to the long-term conservation and sustainable use of the mangrove ecosystem. There is a need to make the management and conservation of the ecosystem open, flexible and adaptive. The current situation indicates that decisions in most cases are made at the headquarters and implemented at the local level.

Equally clear is that there are low literacy levels and poor employment trends in the areas of study hence poverty is widespread. This is coupled with poor options and lack of economic choices to mangrove exploitation and the fishing. It is evident that people who were displaced for the construction of hotels and other structures or creation of parks are not compensated. Where there are compensations, they are not equivalent to the land taken. In addition, the revenue generated from tourism industry does not benefit the local

people.

The study also clearly indicates that there is poor information flow to and from the local populations. No local meetings such as *baraza*, seminars or workshops as purported by most key informants, were witnessed during the entire period of the research. In some areas, people were not even aware of the current charges for permits and licenses neither were they sure whether or not bakeries and/or factories were still exploiting the mangroves for fuelwood.

The findings unearth conflicts in the management and conservation of the mangrove ecosystem. Also clear is the fact that politics and related ethnic differences have affected mangrove management. The conflicting roles between the resource users themselves and between resource users and protectors could be discerned. Also conflicting were the roles of the management organizations. The role of the government-created organizations and NGOs in the management activities is important, however, some officials are condemned of corruption. Unfortunately, the absence of a critical role of the local community in the management and conservation of the mangrove ecosystem was noted with a lot of concern. The role of the local administration, on the other hand, has also been insignificant.

With regard to conflict resolutions, one could safely argue that the major managing organizations have played an insignificant role. Apart from issuing permits and licenses to the ecosystem users, the bodies seem dormant as far as conflict resolution is concerned. Generally, no overall national authority exists that can effectively resolve conflicting issues related to management and conservation of the ecosystem.

Lastly, Semesi (1998:97) concludes by putting it as follows: "In the medium term, harvesting of mangroves will continue, therefore, conflicts will be there. Thus, greater control and management is needed. However, the growing awareness of the importance and fragility of the mangrove ecosystem in East Africa and other parts of the world is a

good sign". This notwithstanding, the authorities concerned should think of sourcing alternatives to fishing and mangrove cutting if at all the strain on the mangrove ecosystem is to reduce. This will go a long way in reducing the user conflicts currently witnessed in the areas.

6.3 Recommendations

The local people have better knowledge of their environment, therefore, the authorities concerned with the management and conservation of mangrove ecosystem should ensure that they participate as true partners in designing, managing and in conservation programs. They should always be consulted so that they can effectively participate. The authorities concerned should also ensure that people who bear the costs of conservation projects also receive a high proportion of the benefits, for instance, compensation for protected area regulations.

The government-created bodies and NGOs interested in the mangrove ecosystem should ensure continuous information flow to and from the local community. For example, there should be frequent meetings among representatives of local populations and others with a stake in conservation development projects. This way, the two parties are likely to strike a good working relationship and even put in place strategies for conflict resolution.

The management and conservation of the mangrove ecosystem should be open, evolving and adaptive. Such an approach will help ensure that the mangrove ecosystem and its local communities are better placed to respond to external political, economic and social pressures.

The authorities concerned should emphasis greater community cohesion because it makes participation and management easier. They should also respect the differences of the local communities and ensure that assistance is appropriate to each community. The organizations interested in the mangrove ecosystem should promote alternatives to

fishing and mangroves. For example, agriculture and livestock keeping should be promoted in the region. Other viable alternatives include marine farming, oyster cultivation as well as salt extraction. Capacity building for the local people is also necessary.

The government should allow for and encourage local initiatives in which local communities can articulate their own solutions to conflicts. For it is at the local level that most important effort at creating conflict resolution mechanisms are made. The authorities concerned should focus on modifying human behaviour rather than exclusively identifying technical problems then applying solutions to them. This, therefore, calls for a shift from a resource-centred approach to a people-centred approach in the management.

Finally, the study calls for further social science research on the mangroves as most works have been of natural scientists that are interested in the structure and ecological factors of the mangroves rather than the socio-economic perspectives of the ecosystem. The past projects have been to save specific species and habitats from destruction. Frequently such projects have to concentrate on trying to keep the local human population away from the management site, but with, at best, short-term success.

I, therefore, call upon the anthropologists and other social scientists to carry out research on coastal marine areas that focus on people living close to these ecosystems. This area is still virgin, thus, researches that focus on community participation in management are most encouraged than those that focus on keeping communities a way from the management sites. More specifically, researches aimed at modifying human behaviour and balancing and applying societal values to use resources are encouraged than those that aim at only identifying technical problems then applying solutions to them.

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APPENDICES

Appendix: i : Questionnaire guide for the study

Questionnaire No .....

Date .....

Village **Sub-Location**

Location

The information given here will be held in strict confidence.

Mangrove Ecosystem

1. What do you understand by the term mangrove ecosystem ?

   .....

   (ii) What species are dominant in the ecosystem ?.....

   (iii) What species are endangered or threatened ?.....

2. How do you exploit the mangrove ecosystem?

   .....

   .....

   .....

3. At what time do you cut the trees: (i) Night (ii) Daytime (iii) Any time

   (ii) What are the reasons for the answer above?

   .....

   .....

4. Do you engage in the commercial extraction of mangrove timber, poles and fuelwood?

   Yes No

   (ii) If yes, are you a license holder?

   .....

   (iii) If no, give reasons why?

   .....

   .....

   .....

5. Do you think the exploitation is sustainable? Yes No.

(ii) What is the reason for the answer above?

.....

.....

6. What else do you do for a living apart from mangrove exploitation?

.....

.....

7. If you are employed, does your salary meet your basic needs together with those of your family members? Yes No.

(ii) If no, what other sources of income do you have?

.....

.....

8. Do most people in this area produce enough food crops? Yes No.

(ii) What are the reasons for your answer above?

.....

.....

.....

9. Apart from the local community, are there other organizations, factories, and industries that exploit mangrove ecosystem? Yes No.

(ii) Give reasons for your answer above?

.....

.....

10. Are you happy with their way of mangrove exploitation? Yes No.

(ii) What is the reason for the answer above?

.....

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.....

11. What are the causes of mangrove resources depletion?

.....

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.....

12. Apart from extraction of timber, fuelwood and poles are there other ways of mangrove exploitation? If yes, name them.

.....

.....

.....

13. Are there any changes in these ways of exploitation? Yes No.

(ii) If yes, what are the changes?

.....

.....

.....

14. Are the changes good or bad?

(ii) Give reasons for the answer in question 14?

.....

.....

.....

15. What do you think are the possible consequences of the current rate and ways of mangrove exploitation?

.....

.....

.....

(ii) What should be done about it?

16. Who manages the resources in the mangrove ecosystem?

.....

17. Are you happy with the management arrangement? Yes No.

(ii) What is the reason for the answer above?

.....

.....

.....

18. What are the changes in the management?

.....

.....

19. Are they good or bad?

20 Apart from the NGOs or/and government -created organs, is the local community

involved in the management of the ecosystem? Yes No.

(ii) If yes, how?

(iii) If no, why?

.....

.....

.....

21. What are the advantages and disadvantages of mangrove cutting?

Advantages	Disadvantages

22. In light of the above question, do you support or oppose the ban on mangrove cutting?

(ii) Give reasons for your answer in question 19

.....

.....

.....

23. Do you have any indigenous means through which you have maintained this ecosystem? Yes No.

(ii) If yes, how was it done?

.....

.....

24. In your own view, do you think people should be encouraged to plant mangrove trees?

Yes No.

(ii) What are the reasons for the answer above?

.....

.....

.....

Conflicts n the Management and Conservation of the Mangrove Ecosystem

25. What do you consider as better ways of mangrove ecosystem management?

.....

.....

.....

26. Are the methods mentioned in question 25 practiced? Yes No

Give reasons for your answer above.

.....

.....

.....

27. In your opinion, what should be done to enhance mangrove management conservation practices?

.....

.....

28. Are there any conflicts in the management and conservation of mangrove ecosystem?

Yes No.

(ii) If yes, fill the table below accordingly:

Nature of Conflict	Parties Involved

29. What do you think are the major causes of the conflicts above?

.....

.....

30. In your own opinion, do you think these conflicts can be resolved? Yes No.

(ii) If yes, give suggestions how they can be resolved?

.....

.....

.....

(ii) If no, why?

.....

.....

.....

Appendix ii: Interview Guides for Group Discussions

Focus Group Discussion Guide

1. How do both the local community and other organisations manage the mangrove ecosystem?
2. (I) Specifically, what groups or communities have interest in the mangrove ecosystem?
   (ii) How do the interested groups utilise the mangrove ecosystem?
   (iii) What are the apparent impacts on each use type?
   (iv) Are the people happy about what is done? Why?
3. Are the people sensitised on the importance of the mangroves?
   (ii) If yes, through which agencies?
   (iii) If No, why?
4. Could you suggest some of the best methods of mangrove ecosystem management?
5. What are some of the problems facing those who manage the mangrove ecosystems?
   (ii) What are the major causes of the problems?
   (iii) How best can these problems be solved?
6. Are there any conflicts between those that use or wish to use the ecosystem and those who manage it?
   (ii) If yes, what is the nature of the conflicts?
   (iii) What are their causes?
   (iv) Can you suggest some ways of resolving them?

Interview Guideline to Mangrove Ecosystem Managers

1. What laws govern the management of mangroves?
2. Do you encounter any problems in their application? Yes No.
   (ii) If yes, what problems?
   (iii) How do you go about these problems?
3. Do you think the local people are happy with what you are doing? Yes No.
   (ii) Give reasons for the answer above.
4. To what agency or agencies has management of this ecosystem been assigned?
5. What other agencies are- or see themselves- as responsible for management of mangrove ecosystem?
6. At what groups is management directed?

(a) Hotel developers

(b) Forest exploiters

(c) Fishermen

(d) Others - specify.

7. What changes in individual or group behaviour does the management activity seek?
8. What do you think are some of the problems people face when they try to harvest mangroves?

   (ii) How do you solve these problems?
9. What information is used to make management decisions?

   (ii) How is it collected?
10. Are there any conflicts in the management and conservation of mangrove ecosystem? Yes No

    (ii) If yes, what are they and which parties are involved?

    (iii) Can you suggest some ways of resolving these conflicts?

Informal Interview Guide for the Forest Rangers/Forest Officers.

1. What are some of the activities you engage in to ensure the protection of mangroves?
2. How do you sensitize the local community about the same?
3. Are the local people happy with your activities? Yes No

   (ii) What are the reasons for your answer above.
4. What do you think are some of the problems you encounter in your activities?

   (ii) How do you solve them?
5. In your opinion what should be done to increase mangrove productivity?
6. Do you advice people to exploit alternative resources to mangrove? Yes No

   (ii) How do you go about it?
7. What are the primary implementation problems as seen by officials directly involved in management?
8. What sort of public participation in management occurs?

   (ii) What is the objective of such participation?

   (iii) How effective is it?