

**RELIGION AND ECOLOGY:
AN INVESTIGATION OF THE ROLE PLAYED BY A ROCHA CHRISTIAN
COMMUNITY IN CONSERVATION OF ARABUKO SOKOKE FOREST AND
MIDA CREEK MANGROVE FOREST IN MALINDI AND KILIFI DISTRICTS.**

BY

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE
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Declaration

This research project is my original work and has not been presented in any other University for academic purposes or any other research.

Signature..........Date.....3rd July 2008.....

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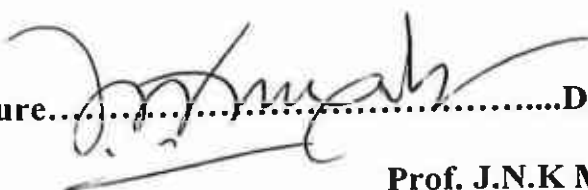
(Mbogo Pauline. Waigumo)

This research project has been submitted for examination with our approval as the University's supervisors

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DEDICATIONS

This research project is dedicated to my husband Peter and my daughter Karen.

ACKNOWLEDGEMENTS

The completion of this research project has been through the contributions of various persons and institutions.

Firstly, I would like to appreciate the University of Nairobi for granting me with a scholarship that facilitated the completion of this research. Secondly, I would also want to acknowledge my Supervisors, Prof J.N.K Mugambi and Dr N.W Ndung'u for their advice, positive criticism, encouragement and understanding that made this research a reality.

Thirdly, I wish to thank the Director of A Rocha Kenya Mr. Collins Jackson and the entire staff of Mwamba field study for their support. To Stanley, Jonathan, Tsofa and Roni who coordinated the process of meeting the ASSETS parents and the beneficiaries.

Fourthly, to Mr. and Mrs. John Mwarabu for giving me accommodation during the research period.

Lastly, to Eric Russell and to all that assisted me in one-way or the other in realizing the goals of this research and of whom this medium may not be sufficient to mention by names.

To all I say God bless you.

ABSTRACT

Environmental degradation is one of the global challenges that are heavily attributed to the rapid advance in science and technology.

Kenya as a developing country faces a number of environmental challenges. This includes soil and water pollution especially through the use of polythene bags, air pollution and deforestation.

This study is based on the contribution of a Christian organization under the umbrella of A Rocha Kenya that has tried to solve the problem of environmental degradation in two major ecosystems namely;

(i) Arabuko-Sokoke forest found in parts of Kilifi and Malindi Districts.

Arabuko -Sokoke forest covers an area of 420km² and comprises of the remnant of Dry Coastal Forest that once stretched from South Somalia to Mozambique.¹

However of late, the neighbouring community has over exploited the resources within the forest. This is mainly through felling trees for charcoal extraction, woodcarving, and timber for both domestic and commercial use.

Currently, two indigenous trees (Muhuhu and Murihi) are at the verge of extinction.

(ii) Mida creek Mangrove forest is an important breeding zone for fish and a stop over for migrating birds. This ecosystem is also threatened through cutting down of trees for both domestic and commercial purposes.

This study therefore, seeks to examine the role played by Christian's organization in general and in particular by the local Christian community in conservation of Arabuko-Sokoke and Mida Creek mangrove forests.

Through: - a forestation, reforestation and Agro forestry. In addition, the study looks at the steps taken by the Christian community in order to provide sustainable livelihoods that bring ease to cheap livelihoods that result into environmental degradation.

The study' hypothesis are; The destruction of Arabuko Sokoke and Mida creek mangrove forests is as a result of need for timber for both commercial and domestic purposes.

Poverty is both a cause and effect of environmental degradation in Mida Creek and Arabuko Sokoke forests.

The study's theoretical framework is delivered from Peter Harris book *under the bright wings*. In this book J. Scott argues that ecological involvement falls under the heading of Christian Mission since Christian Mission embraces everything since, Christ sent people to the world to do service as well as evangelism. Therefore Christians cannot claim to engage in social service if at all they are destroying the environment in which they and their neighbors live.²

Information related to this study was gathered through personal interviews, participant observation questionnaires and literature received from A Rocha Kenya. The data collected, has revealed that human activities as a result of population growth is putting pressure on the environment resulting into degradation of the coastal dry forests, mangrove forests and land, water and marine ecosystems.

However, the umbrella cause of environmental degradation is poverty that has led to use of cheap livelihoods such as charcoal burning that cause great strain to the environment since they are not sustain ably harvested.

In connection to poverty, this study has realized that is difficult to win the battle of environmental degradation in a community faced by poverty especially when the community for so long has depended upon the natural resources surrounding them for survival.

The implication of this is that: firstly, its is of great importance to strike a balance between conservation of natural resources and harvesting of the same resources by initiating sustainable social economic development projects that will provide alternative means of survival and ease pressure on the two forest ecosystems.

Secondly, there is important for A Rocha – Kenya, Churches in Kilifi and Malindi Districts KWS, Forest Department and other stakeholders involved in conservation and preservation of Mida Creek and Arabuko Sokoke to put more emphasis on

comprehensive community participation both in environmental conservation and sustainable development projects with a lot of emphasis to the youth. This will avoid the feeling of alienation and lack of accountability by the local communities especially with the squatters who may not consider themselves as accountable to both conservation and development of the pieces of land they are currently occupying.

Thirdly, Environmental degradation and poverty are intertwined whereby poverty becomes a cause and effect of environmental degradation. This is because all organisms draw from the environment things they need for survival. Human beings place the largest demand on the environment and where poverty levels are high a lot of reliance is placed on the environment.

Therefore, for total rehabilitation of the two forests ecosystem in a scenario of alarming population growth and sky rocketing demands for the natural resources there is need for more emphasis to be laid on reforestation, a forestation, and Agro forestry campaigns.

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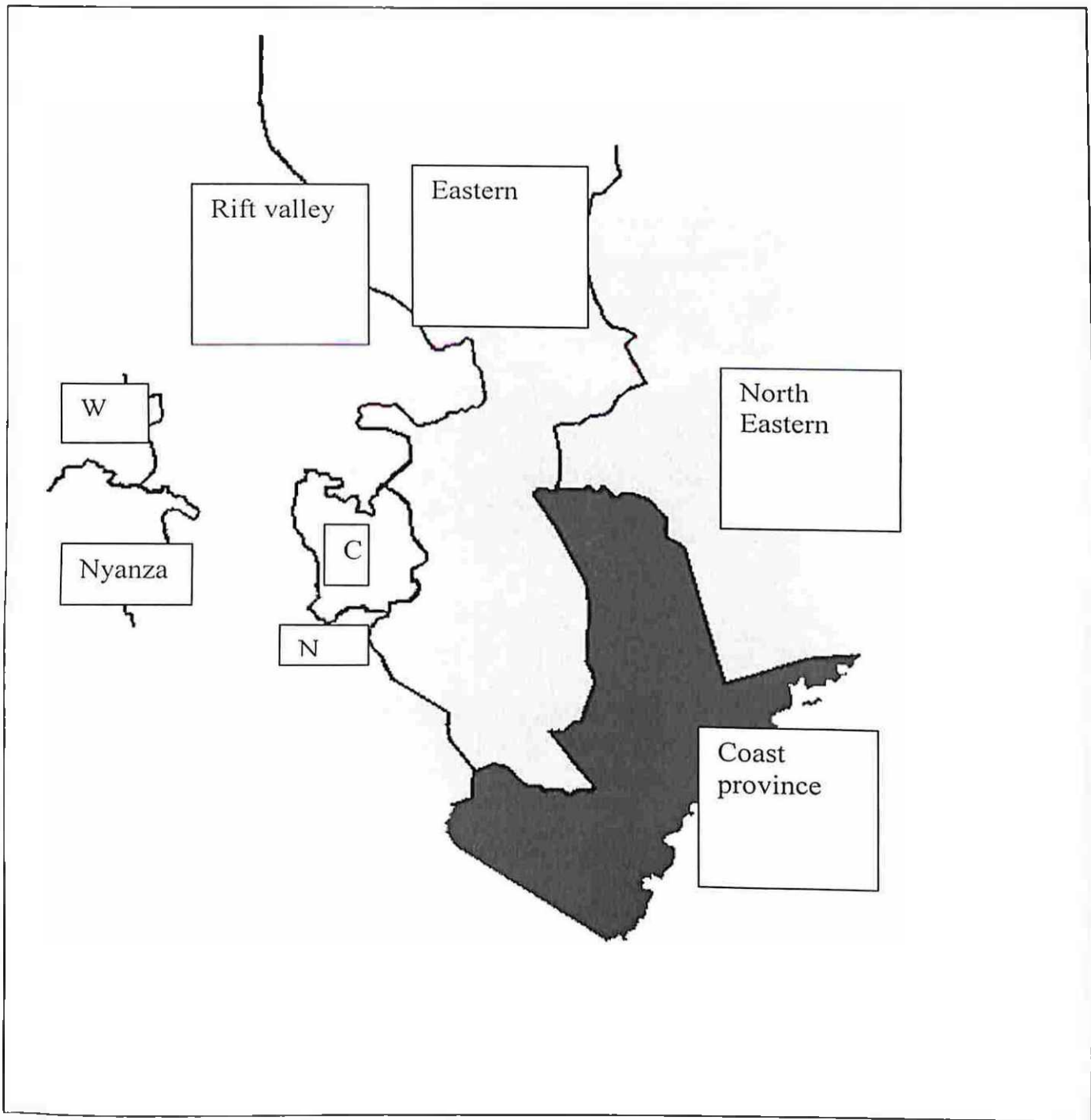
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Map of Kenya showing the position of Coastal province.

Key

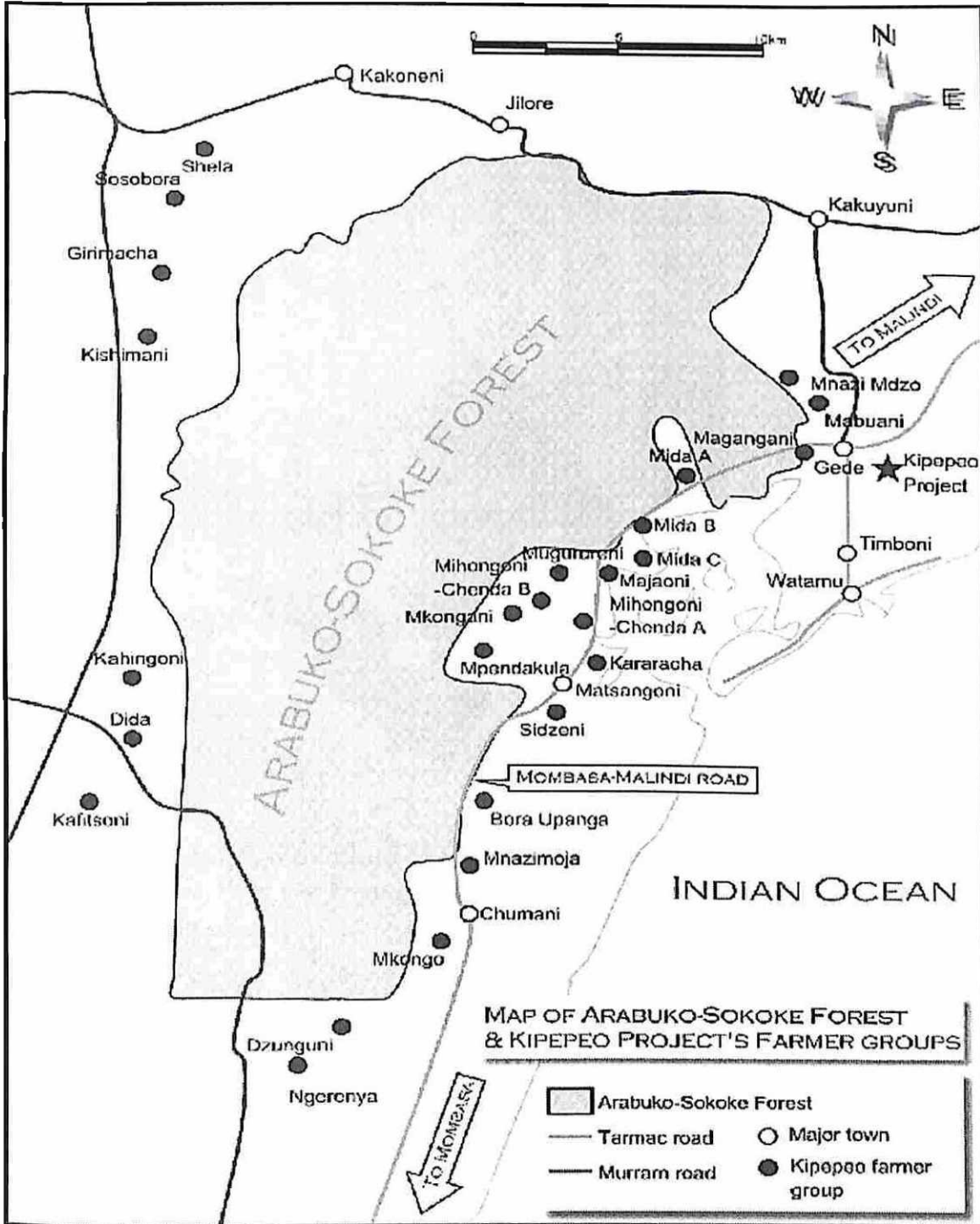
— Provincial boundaries W-----Western Province N-----Nairobi

C-----Central Source :Kenya bureau of statistics (2005)

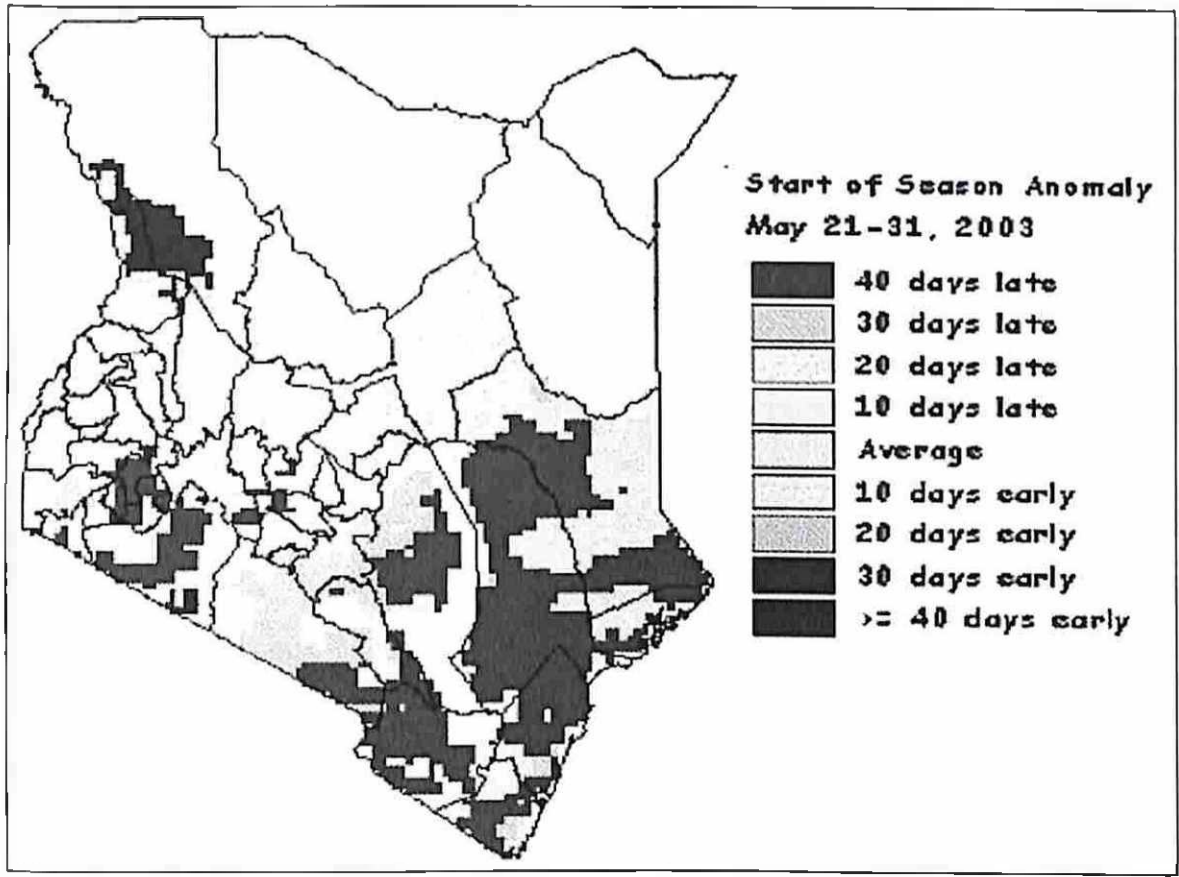
Map showing Location of Arabuko Sokoke forest and Mida Creek Mangrove forest

(Shown as Mida A,B,C) Where Mida Creek Mangrove Forest is located

Source: www.kipepeo.org



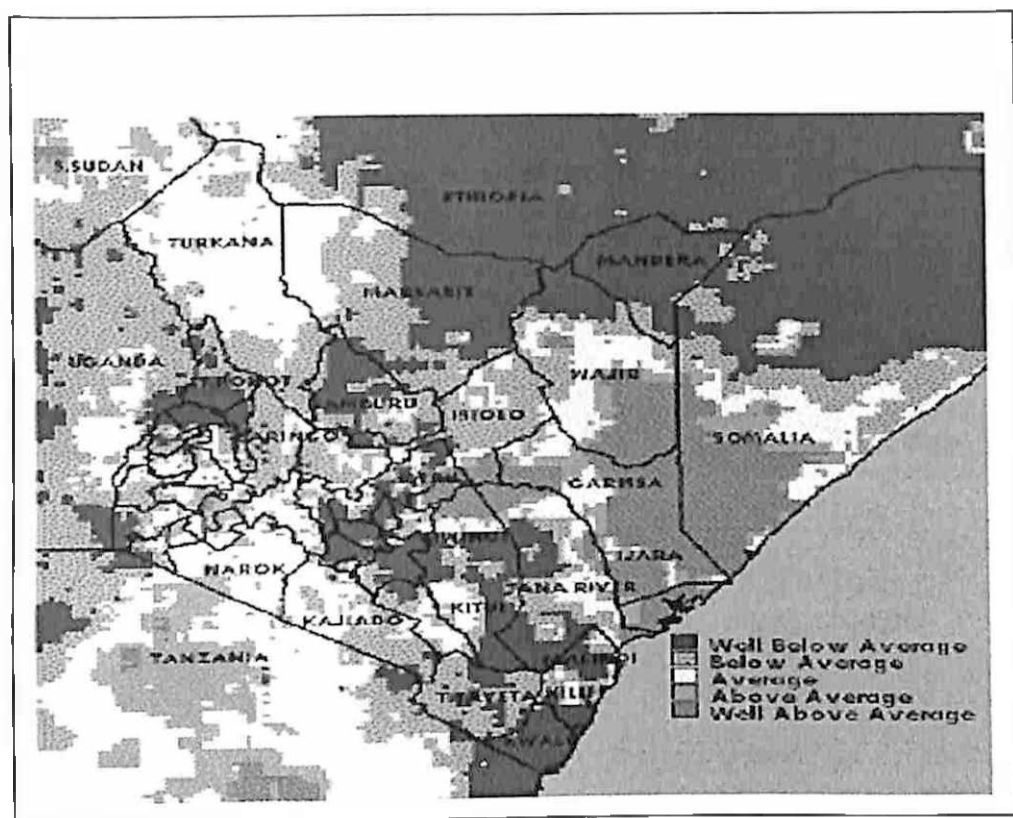
Map of Kenya showing delay of long rain season in May 2003



This diagram shows the failure of long rains in 2003. Notably is long delay of rains in Coast Province. This has been considered as climatic change owing to destruction of the Coastal dry forests.

Source GOK, NOAA/FEWS NET

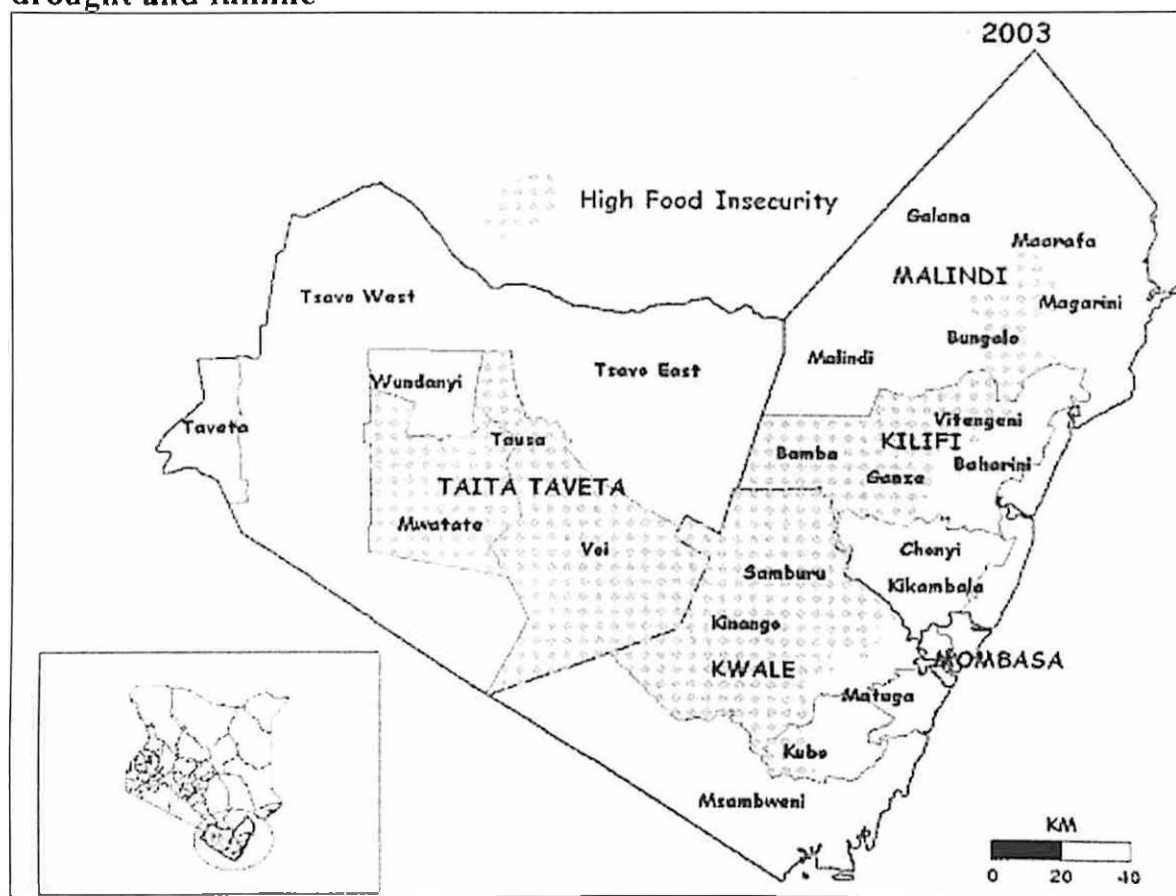
Map of Kenya showing cumulative rain for year 2003 as compared to normal rains received annually



Note the Coast province especially Malindi and Kilifi Districts where Arabuko Sokoke forest is located received well below average rainfall.

Source NOAA/ FEWS NET.

Map of Coast Province showing food insecurity in October 2003 as a result of drought and famine



Source GOK, WFP, UNICEF, WVI, and UNDP.

Note: High food insecurity in Malindi and Kilifi Districts especially Ganze which neighbors Arabuko Sokoke Forest.

DEFINITION OF TERMS

- Environment:** This refer to a series of interlocking systems, the atmosphere, the pedo-lithosphere, the hydrosphere and biosphere, which are all, inter related and interdependent parts of a complex whole.
- Ecosystem:** This is a natural habitat where organisms living and non-living coexist together in interdependent and dependent relationship.
- Christian community and groups:** This refers to social organizations and groups that profess Christianity belief as their point of reference in their endeavors to salvage the environment
- Poverty:** State of destitution where by a person survive with less than one US dollar per day.
- A Rocha:** Portuguese term for a rock. It refers to a Christian Organization in Conservation

ABBREVIATIONS

A.S.S.E.T.S:	Arabuko- Sokoke Schools and Eco tourism Scheme
C.B.O:	Community Based Organization
G.O.K :	Government Of Kenya.
G.R.C :	Gospel Revival Church.
I.S.F.P:	Intensified Social Forestry Project
J.I.C.A:	Japan International Center for Agro forestry.
K.E.M.A	Kayole Environment Management Association.
K.W.S:	Kenya Wildlife service
M.C. E. P	Murihi Charcoal Eradication Project.
N.G.O:	Non Governmental Organization.
P.E.F.A	Pentecostal Evangelism Fellowship of Africa.
T.O.T	Training Of Teachers.
U.N.E.P:	United Nations Environmental Programme.
U.N.E.S.C.O	United Nations Educational Scientific and Cultural Organization.
U.N:	United Nations.
W.W.F:	Wild Wildlife Fund.
W.F.P	World Food Programme.
K.C.P.E	Kenya Certificate Of Primary Education.
NARC	National Alliance of Rainbow Coalition.

1.0 CHAPTER 1

1.0 INTRODUCTION

1.1 BACKGROUND TO THE PROBLEM

Majority of the people in the world today are aware of the advance in science and technology during the 20th and 21st century. Some of the new insights developed during this period include, genetic engineering, cell cloning and rapid improvement in industrial development among others.

Consequently, advancement in science and technology has to an extent improved the human standards of living. Modern science and technology has been used in exploiting various natural resources within our environment. Environment is and has in the past provided humanity with all that pertains to existence and survival. However in the search for survival, techniques in exploiting the natural resources –which includes advanced scientific research and application of science and technology- have been employed. These methods in turn have resulted into some negative consequences that are bound to affect humanity in particular and life in the entire universe in general.

This means that, though the great progress in science and technology is wonderful and credible, the quality of social economic development advanced by science and technology ought to be understood against the shortcomings and negative consequences of this technology to human beings and other components of nature; living and non-living.

This was reflected in the Earth Summit held in Rio de Janeiro on June 1992, it dawned to the world that for all immediate gains human being get from the environment there are always to be a future implication in terms of social and economic costs, which should be weighed against such gains.³

Environmental degradation pose great challenges to humanity and life in the universe through, global warming, depletion of ozone layer and its related consequences, extinction of some species of flora and fauna, desertification and increase of natural catastrophes such as earthquakes, drought and famines among others.

It is amazing to see how all of a sudden the world has woken up to a new dawn of 'abrupt' climate change. The shock can be seen through numerous articles on global warming that have emerged in our local dailies and our favorite magazines not to mention the many television documentaries being watched worldwide. These columns carry out some of the shocking news about global warming and extinction of flora and fauna. In the former deputy president and environmental activist AL Gore's essay *An inconvenient truth*, he describes the crisis of global warming as "planetary emergency".⁴ Gore and other experts are giving a warning that unless the world deals with this crisis, we will experience worse catastrophes than hurricane Katrina and the December 2005 Tsunami which might occur even more frequently.

As a result of increase in global gas more glaciers and ice is melting. But more sickening is the issue of melting of the Arctic Ocean glacier. Research shows that the ice edges have disappeared to more than 60km in some places. This is also accompanied by

drowning of polar bears, which are caught up in the process⁵. Several other parts of the world have been hit by extreme weather. In Australia in the month of June 2007 the worst floods hit the area just after the Government had warned 50, 000 farmers against using irrigation method due to drought.⁶

Here in Africa the disappearance of Lake Chad has been attributed to global warming⁷ and in Nigeria there is the fear of losing the city of Lagos to submerging⁸. More close to us is the melting of the ice cap in East African Mountains. Mount Kenya has so far lost more than 92% of its glacier⁹ while Mt Kilimanjaro in Tanzania has lost nearly 82% and it is predicted that by year 2020 it will have completely lost its ice caps¹⁰. The oceans too are affected, the bleaching of coral reef in Kenya, Seychelles, Mauratius, Somali and Madagascar are attributed to the issue of global warming¹¹.

It is not just the melting of ice and glacier and bleaching of the coral gardens, global temperatures have been increasing causing either high temperatures or very low temperature at other times. In January, 2000 South Africa recorded the highest temperatures ever recorded in the country. A temperature of over 40°C was recorded that brought about extensive fires along the Western Cape Province¹².

In 2001 Kenya was in the limelight for the worse drought hitting, where by over 4million people were affected by severely reduced harvest and poor sanitary conditions¹³. This not forgetting the two terms El Nino and La Nina that are almost becoming Kenyan house

hold names that express the floods and the dry spell conditions that have been experienced in the country in the recent past.

Last year (2007) climate change affected a number of areas in the world. In the month of June alone almost 40 people perished in Greece and the neighboring countries of Romania, Bulgaria and Turkey when the heat wave hit this region with temperatures reaching over 46°C. Due to this people would gather on the beaches in the late afternoons to seek relieve from the heat wave. In India 70 people were recorded dead after temperatures rose up to 50°C.

Torrential rains in the same month left 106 people dead in South East Asia (Bangladesh) and 600, 000 were left homeless in China and by mid June more than 10 Million people had too little water to drink because of severe drought. Up to 20, 000 people in Arabia had to be evacuated where by 20 of them died after a severe storm hit the Arabian Gulf .It was recorded as the worst to happen in 60 years time¹⁴.

Here in Africa 130,000 people were affected by floods and cyclones early 2007 in Mozambique. In addition, to this South Africa experienced storms and very low temperatures were recorded in over 40 places¹⁵.

According to Gore global warming, together with cutting and burning of the forests and dumping of carbon gas is causing risk to living species. A conservative estimate of flora and fauna is that by year 2050, 15 to 35 percent of the 1,103 species studied will be at risk of extinction¹⁶.

Currently, in Kenya the urban residential areas are highly polluted with litter dumping sites, polluted water that occasionally results in outbreaks of water borne diseases such as typhoid and cholera.

Unfavorable weather conditions that are as a result of slow climatic changes over a long period of time have affected the Agricultural Sector in Kenya. Today, farmers in Kenya experience some long dry spells or floods that destroy crops and animals. In turn this has resulted to food shortages and famine in the country.

The Coast Province of Kenya has for the last four years that is 2001 to 2006 been hit by severe drought, the worst being 2001-2003.¹⁷ Some of the most affected areas were Kilifi, Malindi, Tana River and Kwale Districts. After this great famine that in 2003 was declared a national disaster by the Government, the unpredictable climatic pattern hit again in November 2006 in form of floods that saw the washing away of bridges in Coast Province. Once again Kwale and Kilifi Districts emerged as the most affected after the washing away of the Hamisi Bridge on Mombasa – Tanzania Highway, and Kombeni Bridge, that link Mombasa and Kilifi (now Kaloleni Districts).

This climatic change is easily linked to environmental degradation in this area. Some of the local people lament that a few years ago the rain patterns were predictable which not the case is today. At the same time the local people in these areas have greatly cleared the existing forest ecosystem and trees in general. It is estimated that the Coastal forests in 1942 accounted for 3% of the land. However, today almost a half of it has been chopped

away as today it stands at 1.7%¹⁸ this is owing to population increase and need to make room for settlements and farming, in search of timber for commercial and domestic uses and extraction of charcoal.

The destruction of the Arabuko Sokoke and Mida creek forests has been of great concern to the Christian community in Kilifi and Malindi Districts. Apart from the ecological and climatical effects that have affected the area, the Christians feel that such gross destruction of the forests is against their beliefs and goes against God's aim of creating the universe. They have affirmed that God takes glory and pleasure in his creation and expects humanity to respect and take care of it. Moreover, creation gives an in-depth understanding of God since it portrays His power and love over the universe. This study aims at examining the role played by the Christian community in the umbrella of A Rocha Kenya in trying to re- find the Biblical duty of humanity towards God's creation. It closely looks at the Christian community effort in conservation of the Arabuko Sokoke forest and Mida Creek Mangrove forest in Kilifi and Malindi Districts.

1.2 STATEMENT OF THE PROBLEM

The continued destruction of the Arabuko Sokoke and Mida Creek Mangrove forests for the past three decades has led to adverse Climatical conditions of scanty and unpredictable rains. This has had a negative impact on agricultural production in Kilifi and Malindi Districts leading to complete crop failure and drought between 2002 and 2006¹⁹.

Deforestation in the area of study has condemned the local residents to a life of Misery and poverty. A recent poverty survey conducted by Murithi Kariuki ranked Ganze constituency, where part of this forest is situated, as number two ten (210) out of two ten (210) constituencies. Hence emerging the poorest constituency in Kenya. In addition, two more constituencies neighboring the area of study were ranked among the 10 poorest constituencies in Kenya²⁰.

Why is it that a forest that once stretched from Mogadishu in the North and Mozambique to the South only exists as fragments with the largest being only 480km² and in great threat? Why is it that the residents of Malindi and Kilifi Districts who were harvesting enough food crops are constantly relying on relief food? What went wrong? Why should Christians in this area get involved in the conservation of their environment? What are the measures Christians in this area are putting into place in order to curb deforestation? The answer to these questions is what this study was set to investigate.

1.3 objectives of the study

This study set out to investigate the following objectives.

- 1) The role played by A Rocha in preservation and conservation of the Arabuko- Sokoke and Mida Creek Mangrove forests
- 2) The causes and impact of deforestation in Arabuko Sokoke and Mida Creek Forests.
- 3) The role of A Rocha in educating the local community and creating awareness on environmental issues affecting them and their environment.

- 4) The role of A Rocha in initiating sustainable social economic projects that allow the local community to use their resources sustainably.

1.4 Justification of the study

Much study has not been done to depict the efforts of Christians in Malindi and Kilifi Districts and the A Rocha Organization in their effort to salvage Arabuko Sokoke and Mida Creek Forests. Therefore, this study targeted the relationship between Environmental Conservation and Sustainable economic development initiatives of Christians and Christian Organizations in Kilifi and Malindi District. This depicts the need for initiating sustainable economic projects as a means of fighting environmental degradation.

Moreover, the findings from this study were to be made available to A Rocha and other Christian Based Organizations fighting environmental degradation in the area of study so that they can effectively beef up their campaign on environmental conservation in this area.

Lastly, this study is important since it depicts the need of involving the community-based organizations in the fight against deforestation in the area. Through carrying a study that stands out as an appraisal of a community that has effectively conserved their environment through afforestation, reforestation and eco-tourism it is possible for other religious groups in the area and other parts of Kenya to emulate it in order to make their environment better.

1.5 Literature Review.

A lot has been written down and said about the environment. In connection to this, the study will be focused on two major categories of literature. The first deals with literature touching on the Bible and Christian ethics of environment. While, the second type deals with the topic of environment at large.

In his thesis 'Toward a Kenyan African Christian theological basis for environmental conservation', Dr. Gitau has observed that the Church is asleep on the issue of environment and related issues. In addition, he has observed that pollution and desertification have brought a big crisis to Mother Nature and all creation in general.

For example, water, air and soil erosion is a big threat to residents of Makongeni estate in Thika who due to this, suffer from various ailments. This has triggered him to construct an Environmental Theology that integrates African and Christian ethics in the conservation of the environment²¹.

The environmental theology he has constructed is mainly based on the ecological concept of man and woman being stewards over the Universe. On top of this he has brought out the issue of Biblical concept of the Messianic Time where the gap between human and nature brought about by the fall of man at the Garden of Eden is zipped by the coming of the Messiah. This Messiah is Jesus Christ who advocates for voluntary poverty hence not putting much strain to the environment. The African Christian theology becomes a point of reference for churches in Kenya to use in their endeavors to conserve the environment.

Zumneri (1971) brings the issue of humanity having a special place in creation and is dependent on its creature. Therefore, humanity should rule in care and knowledge. This implies that the human being is incorporated into creation to rule God's creation in His glory and its reference to creation.²²

E.M Odum (1981) has noted that ecology is related to human affairs. Therefore humanity and nature are inseparable. He has also shown that relationship between all living things and all non- living things cannot be separated.²³

However, though humanity is interconnected to all other creation, R. Wagner (1971) has observed that there are great changes that have occurred on the face o the earth. He has seen human being as a threat to their life and threat to other organisms on earth. He notes that most of the changes that have taken place are irreversible. He therefore calls for the human being to search for an ecological balance that will enable all organisms to co exists²⁴.

This peaceful co existence starts in Genesis with the creation of the universe .In a workshop held in Jose Costa Rica on deforestation and its effects on rural development they affirmed that: -

- ❖ God is the creator of all things- land, water, air, plants, animals and humankind to live in harmony on the earth (Genesis chap 1)

- ❖ God is the creator of human beings. He (human being) has been called to care for, cultivate and preserve God's work. Therefore, in this way they (participants) believed that humanity accepts responsibility to be good stewards of the creation.

They also noted that the over use of natural resources make some of these resources become extinct. For example, they observed that in the Amazon forest two million trees are felled every day and over 20 hectares of tropical forests are cleared out every minute. Such destructions on environment trigger climate change²⁵.

In Kenya some ecosystems such as Mt Kenya forest and the Mt Kenya ice peak are at the verge of great destruction. For example, 92% of the Mt Kenya glacier has already melted and it will only take approximately 10 years to melt the remaining ice²⁶. This could spell doom to the country since most of the country's rivers originate from this area.

Having noted global warming as triggered by factors such as deforestation the group at Jose placed a challenge to all Christians that...

'As Christian, our life and the life of our dependants depends on the food produced from the earth, the air we breath, on the forests that provide us with medicine, food, water, wood, recreation and many other things. Thus the Church has a responsibility to safeguarding the production of foodstuffs so that all might be fed and the purity of the water, air and the fertility of the soil might be maintained²⁷.'

However, though the group made the above challenge to Christians Dr. Gitau observes that at the end of the workshop the delegates did not provide a model on how Christians could actually face the challenge of salvaging nature such as being involved in afforestation and soil control programmes, so that they can propagate the gospel message through conservation of the environment. Therefore bringing out the need to come out with an environmental gospel, which, will aid Kenyans to fight environmental degradation²⁸

U. Dchrow in his paper notes that there is urgency for humanity to conserve environment. He talks about liberation of the creation and as a practical principal of that creation and the reduction of violence done to creation by human beings.

This shows that creation has integrity. In order to save the situation human beings need to understand the experience of the disintegrated creation, the suffering experienced by God's creation and the concrete threats of life faced²⁹.

This therefore, brings out the urgency for environmental conservation. In relationship to natural resources, Tivy 1981 says conservation involves the protection of animals and plant species.³⁰ In order for such conservations to take place some measure have to be implemented. In connection to this R Sharland (1981) has developed a model on Christianity and ideas on sustainable agricultural teaching. He has exploited different principles as the Biblical basis for environmental conservation. He says that the Bible has laid down basis on how to take care of the earth. He has viewed the earth as the Lord's

and everything in it, the world and all who live in it: for he founded it up on the seas and established it upon the waters. (Psalms 24 vs. 1-2)

Moreover, he explains that Such Biblical verses provide very strong motivations for Christians to be concerned about the condition of the whole world that God has given us and work to take care of it both in our forms and in the general environment round about. However, this is not the case in the modern life where modern society's philosophy is based on materialism, quick gain, selfishness where the earth is seen as a resource to be used exploited and then exhausted. Therefore, in order for man to be fair to the environment, Sharland calls for humanity to be concerned for one another in so doing they will be in a position to change the culture of waste.

He gives some motivational ideas for sustainable agriculture, which includes: soil and water conservation techniques, use of organic matter in farming and tree planting among others³¹.

In addition to this, C. Mwikamba (1993) agrees with Sharland that natural resources are overexploited overstretched, polluted and shrinking. All this he attributes to what he refers to as human civilization and the end product has been great ecological imbalance.

He views the death of nature as the death of humanity whereby, though humankind was the last to appear on the earth their survival depends entirely on the Mother Nature without which they shall completely be wiped out. He considers the Church to have a great role on the matters of the environment but comments that scientific and industrial revolution over the years brought about churches to be defensive and withdrawn from a world that has become so self centered in the effort to preserve themselves and survive.

This brings a situation of churches and their mission being withdrawn from this world and 'issues pertaining to the world'.

However, the mission of the church is to preach the gospel to all creatures. Therefore, salvation is not a monopoly of the few but it ought to be available to all those outside the visible church as it is to those within.³²

M. Getui (2000) stresses on the role of the church towards environmental conservation. She has observed that most of our suffering and problems have something to do with the environment. Specifically because of the way it has been used or mismanaged. Therefore the mission of the Church and healthy environment seems to qualify as some of the integral and care factors that can make life meaningful and worth of living. In addition, she states that destruction of the environment is a sin against the essential cosmic dimension of creation and redemption. She affirms that Christians have reason, duty and responsibility to conserve the environment and therefore, calls the Church to promote strategies that are relevant to Africa in the fight against environmental degradation.³³

C. Russell (1978), campaigns for Biblical command against hurting the earth (Rev 7:3). When this restraining command is revoked the impending disaster are seen to include Revelation 8:7, 8-9, 10-11, 12-13, 9:3-6, 15-19 that is:

- ❖ Mass conflagration.
- ❖ Wholesome destruction of marine life.
- ❖ Wholesome pollution of rivers.
- ❖ Partial blackout of sun, moon, and stars

- ❖ Painful and deadly diseases.
- ❖ Devastating warfare.

According to him the greatest foes of the environment include; human ignorance, greed and human aggression. The remedies he gives for the above is human becoming a steward over Gods creation.³⁴ Humanity should realize that God Himself is active in creation and restoration of the universe. Since they are supposed to be co creators with Him, they then have a responsibility to conserve and restore what human activity has destroyed.

P. Harris (1993) looks at both the real cause of environmental destruction and how Christians can be involved in the conservation of the same. He sees environmental degradation as a course and effect of poverty³⁵. Beisner (1988) presents poverty as a natural condition. Whereby, in order to come out of it human beings are driven to work harder. However, while trying to flee themselves from such snares they forget the principle of stewardship³⁶. He agrees with Russell (1978) that human beings cause the current suffering in the world. This is because majority of people lack knowledge on how to best exploit God given resources thus they engage in environmentally destructive behaviors that lead to poverty.³⁷

Women and children who are responsible for looking for water and fuel mainly experience this poverty according to W. Mathai³⁸.

Kabugumila agrees with Maathai, he has made an observation that women are directly linked to the environment as life givers. For example, they are responsible since they are involved in production of food, collecting firewood and fetching water. Due to this they often become more active in rehabilitating environment than their male counterparts.³⁹

However, this duty is not exclusively for women, J. Stott (1993) looks at ecological involvement not just for women but it is part and parcel of Christian Mission. This is because Mission embraces everything surrounding humanity. For example Christ sent his people in the world to serve as well as evangelism. This implies that we cannot live and assume to serve our neighbors when at the same time we are destroying the environment they are living in, or acquiescing in its destruction or even ignoring the environmentally depleted circumstances in which many people are condemned to live in. As in incarnation Jesus Christ entered into our world .So true incarnation mission involves entering into other peoples' world including the world of their social and environmental reality. Therefore, environmental conservation is an exciting contemporary form of Christian Mission that has come alive.⁴⁰

Christians ought to immediately and without any more hesitation pick up this form of Christian Mission. This is because the accelerated deforestation is causing jitters across the globe. The world figures on deforestation are alarming. The United Nations estimates that world wide about 13 Million hectares of forest are cleared every year. This will in turn have an impact such as increase in global carbons when such trees

are cut or burned. Tropical deforestation, Kenya being one of the tropical countries, contributes 20% of the global Carbon emissions.⁴¹ Therefore slowing the rate of forest destruction is one of the cheapest ways to fight climate change. Deforestation does not only result into increase of global carbon emissions that result into global warming and other climatic changes but also threatens extinction of animals and plants that are housed by the forests. Around two thirds of the world's estimated five to 30 million animals and plants species are to be found in the forest. Moreover 60 Million people inhabit forests and depend on them for their livelihoods⁴².

The above reviewed literature depicts the serious attention the scholars have directed towards environmental issues of late. Some of this reviewed work has depicted the deficiency of environmental issues as an important component of Christian Mission. Christianity for so long is seen as alienated from environmental concerns. Therefore, this study aims at making the connection between Christianity and environmental issues. This study has depicted the role played by Christians, Christian organization and Churches in seeking to address sustainable developments geared at establishing an ecological balance that so far is threatened by human activity. The study specifically looks at the contribution of A Rocha Kenya and Christians in Kilifi and Malindi districts in conservation of Arabuko Sokoke and Mida Creek forests.

1.6 Theoretical Framework

This study adopts Peter Harris (1993) theoretical framework that ecological involvement is under the heading of Christian Mission. In his book *under the bright wings* he breaks

the dualism between the sacred and the secular, the spiritual and the material and the soul and the body therefore portraying Christian Mission and discipleship as a complete whole rather than compartments⁴³.

This wholistic mission is derived from Christ's command to go to the world to serve as well as evangelize.

The Church is as a missionary community, in that the Churches are called to be a sign of hope, God's grace and salvation to the world⁴⁴.

Mission is defined as proclamation, fellowship and service –*kerygma*, *koinonia* and *diakonia*. It also involves witness- *matyria*⁴⁵. This is seen in the Acts of the Apostles where, the apostles proclaimed the gospel; they founded Churches as areas of fellowship and communion and were engaged in social service (Diakonia).⁴⁶ The environmental mission of the Church is seen as to have begun with God's relation to his creatures in the book of Genesis. Therefore, natural theology is based on God's revelation through creation. After creation God found everything that he created being good (Genesis 1 vs 31). Upon realization that all what he created was good, God commanded humanity who is rational above all other created things to take care and look after the earth. The Lord God took man and put him in the Garden of Eden to work and take care of it (Genesis 2 verse 15)⁴⁷ Therefore, the call for the churches and Christian congregation and fellowship to conserve and take care of the environment is rooted in the responsibility of humanity as stewards of God's world.

The mission of humanity is to shepherd, nurse and protect the environment. This means that humanity needs to respect the rights of nature.⁴⁸

This means, Christians' Mission ought to be a process of total concern for the well being of all faculties of a person in the community- working and maintenance of a society that is complete and satisfying. Therefore, Christians have an obligation and duty to conserve their immediate environment. In any case environmental degradation is against and hinders the objectives of Christian Mission.⁴⁹

This study had adopted Peter Harris theoretical framework that the Church is a missionary community. It has examined the *Diakonic* mission of the church in depth. In this study *Diakonia* is seen as part and parcel of the Church's global Mission. *Diakonia* here involves service in the wholistic angle that is; service to the humanity and to the whole of creation and a means of engagement for reconciliation, social justice, liberation, harmony, unity and peace.

In particular, this theoretical framework has been realized through the study of a Christian group in Conservation. This study has not only highlighted the need for Christian to conserve their environment but also the need for social service in terms of providing sustainable development to communities that directly depend upon natural resources for their survival and who are at the danger of starvation in case of extinction of the resources surrounding them. It looks at A Rocha Kenya- a Christian organization in conservation in partnership with Christians in Malindi and Kilifi Districts on; Firstly; their environmental conservation campaigns for Arabuko Sokoke and Mida Creek forests and secondly, on how they are using social service as a means of environmental conservation and raising environmental degradation awareness.

1.7 Working hypothesis

- 1) The destruction of the Mida Creek Mangrove and Arabuko-Sokoke forests is as a result of need for timber for both commercial and domestic purposes.
- 2) Poverty is both a cause and effect of environmental degradation of Mida Creek and Arabuko Sokoke forests

1.8 Research Methodology

1.8.1 Design and locale of the study

1.8.1.1 Design.

This is a field study on the role played by A Rocha Christian group in conservation and the Christian community in Watamu area in conservation of Mida Creek Mangrove and Arabuko – Sokoke forests. This study is considered as a field study since its major source of data is delivered from a field research. Secondly, the study has made a situational analysis to the role of the A Rocha Kenya and Christian groups in Malindi and Kilifi Districts, in initiating sustainable livelihood development projects conservation and rehabilitation of Arabuko Sokoke and Mida Creek Mangrove forests.

1.8.1.2 Locale of the study

The study was carried out in parts of Kilifi and Malindi Districts. This area was selected because it reflects on the environmental issues and their implication to the society that this study intended to carry out. In the History of the Kenyan coastline this area was once a vast Coastal dry wood forest that spread from Mogandishu in Somalia to the South of Mozambique. The Monopoly of the woodland was broken by ancient East African cities

such as Malindi, Gedi, Sofia and Kilwa among others. The ancient Arab and Chinese explorers described the area as having been dense with vegetation and a few rivers flowing in the Indian Ocean. By then, the populations mainly of the East African Bantus were concentrated on the upcoming cities. Further on the Coastal strip is the Nyika Plateau where the majority of the Coastal Bantu especially of the Mijikenda community had settled. By 15 century there was a lot of Migration of the Coastal Bantus from the interior to the upcoming cities and also near the Coastline. With the upcoming settlement a lot of vegetation was cleared. Trading with wood was also a booming business where by the indigenous hard wood was exchanged with merchandise from the Far East. Some of the other wood was used for boat making. However, during this era not so much of the vegetation was destroyed. The great destruction took place in the 19th Century. It began with European settlers that took over the Beach plots especially the area between Mtwapa and Mamburui in Malindi. Today, there are two major agricultural estates along the Coastal line that is Vipingo that owns a vast sisal estate and Kilifi plantation, a dairy farm estate. The two companies also have vast beach plots that currently they are selling to the private developers .In addition, the government created a few settlement areas in order to settle the landless. These settlements that comprise of Matsangoni, Chumani, Tezo Roka and Gede area have come up with clearing of the forest. All this development has come up at a cost of the coastal woodland being cleared.

Moreover, in 1979 a sawmill firm was extracting timber from the Arabuko Sokoke Forest. This brought a lot of concern and the Kenya Wildlife Service (KWS) in conjunction with the forest department ordered the saw mill closed. However the closure of the saw mill only solved the issue of mass logging of the trees in the forest but

poaching of the trees has continued even today. This has resulted into fears of extinction of some flora and fauna

1.82 Target population and sample selection

1.8.2.1 Population Description.

This study targeted the people of Kilifi and Malindi District who live in a radius of 10km from the two Forest ecosystems (Arabuko –Sokoke and Mida Creek mangrove forest.) The population is mainly made up of the Mijikenda community majority being of the Giriama origin and the Bajun people. The population living near the forest is estimated to be 104,000 living in 50 or so villages. 90% of these local communities are peasant farmers while 10% practice both farming and fishing.⁴⁶ However the Bajun community who are the minority are to be found in Watamu and Gede towns and are mainly fishermen and also practice small scale businesses such as fish mongering The farmers (Mijikenda community) grow maize (of katumani and traditional seed) and cassava mainly for domestic consumption and mangoes and coconuts bushes that is meant for sale. The population is composed of Christians and Muslims and very few traditionalists. They are also professionals comprising of teachers, administrators, agricultural officers, hoteliers, social workers, and health workers among others. However majority of them are concentrated in town centers such as Watamu and Gede among others.

1.8.2.2 Sample Strategy.

This section describes the various sampling techniques that were employed during the actual research

Simple random sampling.

The researcher hand picked 30 responds that comprised of the local residents, 20 ASSETS student beneficiaries in secondary schools, and 10 in primary schools, 5 local church pastors and 5 A Rocha staff members.

Cluster Sampling

Cluster sampling was used in selecting the ASSETS beneficiary schools.

Purposeful Sampling

Purposeful sampling was used to pick sample for bird ringing, ASSETS and environmental education programmes. 70 respondents was an ideal sample population since the area is not very big. The various clustering methods were administered to ensure that the sample was a true representation of area of the study.

1.8.3 Data collection instruments and procedures

A number of data collection instruments were employed, which was tested to affirm validity before actual use and eventually used.

The instruments used for study included: -

Questionnaire

The questionnaire was selected to be used to gather information from the respondents who could read and write. Sets of easy to read and understand questions were formulated about the study.

30 questionnaires were dispatched. Thirty was a good number since majority of the local residents are illiterate. Since the area was vast two errand assistants were employed to dispatch to the respondents. They were also recalled to collect the questionnaires.

Questionnaire Interview method. (Oral interviews)

This method was employed mainly to the old respondents that could neither read and write nor understand English. It was also employed for gathering information from the young respondents in primary schools. This method was used in guiding some key informants through oral interviews in order to collect in-depth information from clerical leaders, ASSETS student beneficiaries and A Rocha staff members. Sets of questionnaires were prepared and were later used to interview the respondents.

Observation method.

Observation method was employed through the researcher participating in various social activities and after the activities or sometimes during the activities would retreat to record her observations. This included Environmental games, recruitment process for ASSETS new student beneficiaries, environmental education in schools and villages, brainstorming meetings and fishers of men plastic bag weaving activity.

Observation method was also used in identifying the extent of environmental destruction especially on Mida Creek mangrove and Arabuko Sokoke forests and their consequences to social economic life of the people within the locality of the study.

1.8.4 Data Analysis.

Data analysis involved descriptive and social analysis. The data collected was organized into tables with respect to the study objectives before tallying. The tallied figures were added before being converted to percentages using Microsoft Excel Office suite.

1.9 Limitations of the study

The study had two limitations.

Firstly, the study had targeted to issue 50 questionnaires to be filled by the ASSETS parents. However, the researcher discovered that majority of the parents were not literate. As a result of this the researcher opted to carry out oral interviews and only issue 30 questionnaires.

Secondly, due to lack of time the researcher was not able to find out the role played by A Rocha in conservation of Sabaki River Mouth, which is highly threatened.

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2.0 CHAPTER TWO

BACKGROUND INFORMATION OF ARABUKO SOKOKE FOREST AND MIDA CREEK FOREST AND A ROCHA CHRISTIAN COMMUNITY IN CONSERVATION

2.1 Introduction

This chapter attempts to give the background information of the Arabuko Sokoke forest and Mida Creek Mangrove forest. This is in terms of location and size, biological importance, composition, economical, religious, and social importance to the community living around the forests and finally environmental degradation as a result of human activities and its effects to the surrounding communities. Moreover it gives the history of A Rocha Kenya and their rationale of getting involved in environmental conservation.

2.2.1 Location and size of Arabuko Sokoke Forest.

Arabuko Sokoke Forest is located in the Coast Province of Kenya along the Mombasa -Malindi Road (B8). It is approximately 100Kms North of Mombasa and transverse Kilifi and Malindi District at latitude of 3°.20e South and a longitude of 39°.05e on the East.¹

Arabuko Sokoke forest is a segment of the East Africa Coastal Dry Forest that once stretched from Mogandishu, Somalia on the North and Mozambique on the south.² Currently, it forms part of the Northern Zanzibar- Inhambane Coastal Forest Mosaic, which is approximately 43,200 square miles (111,800 km²) and considered as the Northernmost ecoregion of East and Southern Africa Coastal Forest Belt found in Tanzania, Kenya and Somalia. Arabuko Sokoke today exists as a fragment of this

great belt of coastal dry forest. It is approximately 420 km² and so far it is the largest block of indigenous coastal forest remaining in East Africa³.

2.2.2 Ecological/Biological importance.

Biome wise this forest comprises of tropical and sub tropical moist Broad Leaf Forests. This region supports a large number of endemic species, at a density among the highest in the world⁴. Arabuko Sokoke forest is rated as the 2nd important forest in Mainland Africa. It is important for bird conservation and currently houses six globally threatened bird species. It is also a home for the Sokoke Scops owl the African smallest owl and a rich site for frogs.⁵ This forest houses 90% of the Golden rumped elephant shrew and the African most endangered antelope-adder duiker (*paanungu*). It also supports 1/3 of Kenyan butterflies of which some are very rare⁶. Together with Mida Creek Mangrove forest and Watamu Marine Park form part of UNESCO biosphere reserve.⁷ The forest was crowned under KWS as a National park in 1968.⁸

2.2.3 Composition and Characteristic and Climatic Condition of Arabuko Sokoke forest.

This forest can be classified into three main distinct forest types namely;

Mixed forest, it is rated as the 2nd most important in Africa in terms of bird diversity. It has a well-established undergrowth layer and rarely any bare ground.

Brachystegia woodland, It is characterized by clustering of the trees leaving open patches of grassland as well as open patches of white sand.

Cynometra, Characterized by thick vegetation in some places forming a thicket that occurs on the red sandy soils. Despite the thick vegetation some bare red soils can be observed.⁹

Arabuko Sokoke forest experiences climatic patterns similar to those of the Northern Coastal Dry Forests Eco-region. Climate of this area can be described as tropical, with average temperatures of 25°. It has little variation in day length and generally high humidity. Rainfall normally falls in distinctive rainy seasons. They are two major rainy seasons, with the longest coming in April to June and the shorter coming in November to December. During the dry season the forest floor becomes quite dry and despite the high annual variability in the rainfall, the long-term climate of this eco-region has remained stable over millions of years.¹⁰ Its climatic condition is also controlled by two great Monsoon winds that is the South Eastern Monsoon wind (*Kusi*) that blow cold air between April to October and the North Eastern Monsoon (*Kaskazi*) that blow warm air from October to April.¹¹

2.3 Mida Creek Mangrove forest

2.3.1 location and size

This Mangrove forest lies between Kilifi and Malindi Districts. It is part and parcel of the Kenyan Coastline that extends for about 600km.¹² It is found immediately to the East of Arabuko Sokoke between Watamu and the main Mombasa –Malindi road near the Matsangoni shopping center. The Mangrove forest lies on an Indian Ocean tidal inlet named Mida Creek hence the name. It is approximately 43km².out of the 500km² of Mangrove forest in Kenya¹³

2.3.2 Ecological Importance.

Mida Creek mangrove forms part of UNESCO Biosphere together with Arabuko – Sokoke forest and Watamu Marine Park. The Mangal is a habitat for a wide variety of life forms. It is an important stop over for the migrating bird from Europe, Asia and Middle East to Eastern and Southern Africa. Since it is a sheltered creek it is also a major breeding zone for the fish and supports oysters and crabs. This ecosystem is internationally recognized, as the most productive mangrove forest in Africa. It is also the largest Mangrove creek in East Africa¹⁴

2.3.3 Characteristic, Composition and Climatic Condition.

The forest supports several species of mangrove, however they are two dominant species in this ecosystem namely *Ceriops tagal* and *Rhizophora micronatta*¹⁵. Due to a lot of poaching of its sturdy wood a forest that was once thick with tall trees has been reduced to scattered and crooked trees, which probably were spared, as they could not make any good poles for construction.

The forest experiences a climatic pattern similar to that of the Arabuko Sokoke forest with an average rainfall of around 500mm annually¹⁶.

2.4 People living around the forest

The degradation of the Arabuko Sokoke and Mida Creek mangrove forest cannot be understood without looking at the people who have lived near these two ecosystems and also have depended on the natural resources found in these two forests for many generations that have passed. The Coastal dry forest belt as indicated earlier stretched all the way from Mogandishu, Somalia in North and Mozambique in the South.

Surprisingly, today this forest belt exists as fragments with the largest –Arabuko Sokoke being only 420km². From this information the question that is to be asked is what happened to the Dry Coastal Forest Belt? From historical records the earliest settlers in on the Coastal Belt were the Arab traders who are believed to have made contact with the East African Coast as early as the 7th Century¹⁷. Some of them settled on the East African Coast establishing the earliest Coastal towns such as Mada, Faza, Malindi, Gede, watamu, Mombasa, Kilwa and Pemba among others. For their “modern” construction these early settlers found it easy to fetch materials from the Coastal Woodland Forests. Dry Coastal Wood was particularly important in making furniture and doors that portrayed the aesthetic value of the Coastal people. Some of these ancient patterns carved doors are well preserved in Fort Jesus Museum and others can be found in Swahili villages such as Watamu, Malindi, Lamu and Mombasa’s Old Town.

The earliest Mijikenda tribe is believed to have migrated to the coastline at around 14th century. They were mainly subsistence farmers who occasionally engaged into hunting and gathering. They engaged in traditional system of land tenure. They considered the numerous forests as sacred and therefore they had their shrines erected in the forests known as Kayas, some of which do exist up to today. They only harvested resources in accordance to their needs but misuse of these resources was not entertained. However within the forests the shrines were kept virgin and any animal or tree within the shrine was not supposed to be trapped or harvested¹⁸. This hence ensured that the resources were not misused or overexploited.

Currently, the Coast Province of Kenya especially along the Coastal strip where these two forests are located supports diversity of cultures. This diversity has come to existence as the Coast Province has had interaction with diverse people such as the Arabs, Indians, Europeans and the Africans. This makes Coast Province and especially the major cities a cosmopolitan region. However, there is a unique Coastal culture that is associated with the interaction between the Coastal Bantus and the Arabs of the Shiraz origin that has come to be known as Swahili culture. The wider usage of this term includes the Coastal Bantu people that have been islamacized and at times it include the Mijikenda, Pokomo and the Taitas.

Mida Creek Mangrove and Arabuko Sokoke forests administratively lie in Kilifi and Malindi Districts. Therefore, the areas are under the jurisdiction of the District Officers. However, since they are also in Coast province they fall under the rule of the Provincial Commissioner.

Kilifi District is 4,779km² and has a population of 543,803 people while Malindi has a population of 281,552 people within an area of 7,751km²(This is per 1999 Census).¹⁹

There two main communities living around the Arabuko Sokoke and Mida Creek forests. The first group is the Mijikenda community especially the Giriama sub tribe.

Occupying 50 or so villages²⁰. They are mainly subsistence farmers planting maize and cassava although some do some fishing for domestic purposes.

The other community is made up of the Afro-shiraz culture and the Bajun community who claim to have originated from Oman although they are regarded as pure Coastal Bantus especially due to their dark skin color.²¹ This community has settled in Watamu, a town that has been described as a small fishing town and the home to the 1st East African Marine National Park²². However, it should be noted that Watamu is more of a tourist center although it has a lot of fish landing spots for fishermen. The Waswahili people that include the Bajun are fishermen who own small motor fishing boats. They are also traders with some operating shops in Watamu and Gede towns.



Plate 1 showing the Arabuko Sokoke Forest. Photo by Judy O

2.5 Historical Background of A Rocha International

A Rocha is a Portuguese word that when translated to English means a rock. The A Rocha community was born in 1983 in Portugal after a few Christians (including the vision bearer Peter Harris and Miranda Harris) felt that they were living in world

where some Christians thought that the growing environmental crisis had nothing to do with them and where very few people would expect any conservation work from Christians.²³ This triggered them to consider putting in practice Biblical call to care for all creation.

The very first challenge was to set up a field study center and probably a bird's observatory center in the South West Portugal (Peter Harris had an interest in birds).

Between 1986 and 1999 the center was established in Crizinha Portugal. The period that followed (1985-1994) can be defined as reaching the outside world where the Portugal project was left at the hands of the national management and Peter and Miranda Harris went out to help other Christians in other countries who had the same vision to set up projects for environmental conservation. This included; Kenya, Lebanon, France, Canada and United Kingdom.

By year '2001 the small Christian community had become an international Network of National Movements with their own local relevance support and impact. Today, A Rocha works in a number of countries world wide these are; Kenya, Lebanon, USA, France, Czech Republic, Netherlands, Finland Peru and Brazil, Bulgaria, Ghana, India, UK and South Africa.²⁴

2.5.1 A Rocha Core Values.

The organization has four core values namely: -

CHRISTIAN

A Rocha conservation work is based on Biblical faith in the living God, who made the world, loves it and entrusts it to the care of human society. Their point of

departure is based on the theoretical concept from Biblical teachings that environmental concern is part and parcel of Christian Mission.

CONSERVATION

A Rocha is a Christian group in conservation whereby they carry out environmental research and restoration of the natural world and run environmental education in the countries they operate. Their approach is that of conservation rather than preservation. That is encouraging humanity to sustainably exploit the natural resources as opposed to don't touch- Preservation approach.

COMMUNITY

A Rocha works hand in hand with communities who interact with the environment the organization seeks to conserve worldwide. This is by enhancing good relationship within the inner circle (That is within the A Rocha staff community) and communities within the environment of conservation.

CROSS CULTURAL

In the process of conservation A Rocha draws on the insights and skills of people from diverse cultures both locally and around the world and integrates them in their environmental conservation campaigns.

COOPERATION

The organization work in partnership with a wide variety of other organizations and individuals who share its concerns for a suitable world.²⁵

A Rocha kenya.

A Rocha Kenya was started in 1993 by Collins Jackson, after realizing that the church in Kenya was so large but the Christian understanding of creation at that time was so limited to an extent that environmental conservation was not a topic of preaching in the churches²⁶. A family of missionaries brought up Collins so that at a tender age he had learnt more about Christianity, its beliefs and doctrines. However, may be the environment he grew up in, blended by the strict Christian discipline in his family might have impacted his vision and mission on caring for Gods creation. He grew up in Riverside Drive in Nairobi where he watched birds fly up and down. At one point of life he came across some old literature that belonged to his dad, which talked about natural life with a lot of emphasis on the bird life. One of his teachers in school also had a lot of interest in wildlife something that positively impacted Collins. Together with the teacher they would watch the birds and by the time he was a teenager he could identify a lot of bird species. His kid friends too would join them in identifying the birds. When he grew up he chose to undertake a degree in environmental science in the United Kingdom. Upon finishing his degree he went to work for A Rocha Portugal as a volunteer in the capacity of an Assistant Warden.

When he came back to Kenya, he worked for the Turtle Beach Hotel as a manager. In his free time he would carry out his hobby for bird watching at Mida Creek. It is in this context that he realized that the ecosystems where birds were hiding and feeding were threatened. He resigned and together with some other Christians who had the same vision established A Rocha Kenyan Chapter.

Currently, A Rocha Kenya has its offices in Nairobi and a field study in Watamu. (Mwamba bird observatory and field study).

2.5.2 A Rocha Kenya Christian in Conservation

A Rocha Kenya defines ecology as the study of connections. They seek to make connection between ecology and Christianity in a world where majority of Christians feel that ecology has little or nothing to do with salvation. Peter Harris remarks that there is nothing new but the message of the Old Testament that prophesied the days of serious disconnections. For example:-

Hear the word of the lord...there is no faithfulness, no love, no acknowledgement of God in the land There is only cursing, lying and murder, stealing and adultery...because of this the land mourns...the beast of the field and the birds of the air and the fish of the sea are dying²⁷.

Isaiah also remarked the same; that the land lies polluted under its inhabitants. And Paul still agreed with this ancient prophets that

For the earnest expectations of the creation of God eagerly waits for the revelation of the sons of God...for the creation was subjected to futility, not willingly but because of him who subjected it in hope...because the creation itself also will be delivered from the bondage of corruption into the glorious liberty of the children of God²⁸.

Therefore, A Rocha community makes a strong relationship between God's creation and humanity. For A Rocha ecology is part and parcel of Christian

Mission. Dr Stott a member of the A Rocha international remarks that Christian and ecology is an exciting form of Christian Mission. Due to this they urge Christians to go out and make caring for Gods creation a core part of the gospel message. This is because evangelization involves solving immediate problems that threaten the life of humanity and their environment. Therefore, a mission to the environment is also a mission to humanity. A Rocha have four Biblical bases for their conservation work namely: -.

LOVE.

God's works of creation is based on his great love to the creation. Everything in the universe belongs to him (Psalms 50). Christians should therefore portray love to God through taking care of his creation.

OBEDIENCE

God requires Christians and all humanity to obey him. His wish after the creation was the humanity to be a steward over His creation. True obedience to God is through looking for ways to be good and responsible stewards over Gods creation.

JUSTICE

When the environment is destroyed the first to suffer are the poor and the vulnerable that directly depend upon the natural resources. Therefore, to give justice to the poor and to make the world a just place, Christians should push for ways to take care of the environment.

HOPE.

Those who care about the environment can easily become depressed. The news is so often profoundly disturbing: the destruction of forests, the disintegration of coral reefs, the extinction of species, over-fishing, global warming and a multitude of other disasters and gloomy forecasts can cause people to wonder if there is any point in even trying to take action. But the Bible provides much-needed grounds for hope. The Old Testament prophets Isaiah and Hosea foretell a time of human and environmental harmony. In the New Testament, Jesus is described not just as the Savior of fallen mankind, but as the one for whom all creation was made - and as the one through whom all creation will one day "be liberated from its bondage to decay" (Colossians 1, verses 15-17; Romans 8, verses 19-23). Christians do not know how all this will be accomplished, but we are given motivation and hope. Christians can be sure that the Almighty God who created and sustains His world wants all his people to be actively involved in His great plan to redeem the whole of creation. Redemption is perceived through God being reincarnated to man and Christians have been called to proclaim this hope.

2.6.1 Environmental Conservation and the Christian Mission.

In his book caring for the creation, John Stott in his forward has observed that Creation is a much-neglected Biblical topic and caring for the creation has over the last many decades received the same kind of treatment. Religion has for so long been forced to stay aloof on matters termed as secular. Martin Palmer, secretary general of Alliance of Religions and Conservation (ARC) observed that the World's major religions have been until recently voiceless in the

environmental debate.²⁹ However, today more and more churches and Christian groups are getting involved in making caring of God's environment a core part of the gospel message. Caring for God's mission has been described by Christian conservist such as, John Stott, as a new form of Christian mission³⁰.

Environmental conservation as an integral part of Christian Mission starts in Creation in the book of Genesis where God created human beings and made them stewards of His creation. Man being more rational than any other created beings was given authority to subdue the world and have dominion over all living and non-living things created by God. Therefore, God can be seen as having given humanity nature to take care of and scripture to guide him.

God's expectation was that humanity rule nature through respect and justice. Unfortunately, they took the role of the Masters and not that of faithful stewards. This was followed by their fall due to their greed to exploit natural resources that had not been placed within their jurisdiction. Out of their master hood nature, the reached out to the tree of knowledge of good and bad of which they were to take care of but not eat of it. After this, they fell on the hands of suffering that was subsequently followed by the suffering of nature. For example, after the fall the nature was put under curse where the land produced thorns and thistles (Genesis 3: 18). In addition, the serpent was cursed where it lost its appendages and was to crawl on its belly and eat of the dust (Verse 14). The snake was also made an enemy of humanity where humanity would seek to kill it upon being sited (Verse

15). This symbolically represents the suffering of nature under the human rule, which is captured by Paul in Romans 8 19- 20

For the earnest of expectation of the creation of God waits for the revelation of the sons of God. For the creation was subjected to futility, not willingly but because of him who subjected it in hope. Because also the creation will be delivered from the bondage of corruption into the glorious liberty of the children of God³¹.

Christians being the followers of Jesus Christ have been called to bring justice and peace to all creation. Their Mission includes witnessing, proclamation fellowship and social service. Social service here implies getting into all parts of their life including their environment. In so doing Christian will be portraying love for Gods creation at the same time giving hope to a world that is currently faced by many challenges; environmental crisis being one of these challenges.

In this realization, religious organizations are increasingly partnering with the environmental and development movements in order to make this world a better place for all life, which can be seen as Gods, aim in creation of the Universe.

Environmental degradation cannot be described well than Violence against Gods creation and *sin against the word of God. God said let there be trees, birds, water bodies' animals and all components of life. Degrading this life is acting contrary to Gods holy intention. As Mrs. Baya said³²*

2.6.2 Environmental Conservation And Christian Worship

The connection between environment and Christianity may be enhanced through the Christian way of worship. Worship involves six basic aspects namely; praise, thanksgiving, confession, proclamation, offering and prayer. Worship is only attainable if Christians *move from a spirituality of alienation from the natural world to a spirituality of intimacy with the natural world, from a spirituality of divine revealed in words to a spirituality of the divine as revealed in the visible world about us, from a spirituality concerned with justice merely to the humans to a spirituality of justice to the devastated earth*³³...This implies that Christians should take care of the creation as an integral part of their worship, that will express love for God the creator, for humanity and nature.

Praise. Christians praise God for he is the creator of all that is. They praise God when they marvel at the great works of creation...animals, rivers, the sky, trees and wind...

Thanksgiving. Christians thank God for all creatures in the world and for the earth that sustains them. They thank God that through the creation they have a better in-depth understanding of the creator. The creation portrays the glory of God. Christians are also grateful to God when they see the enormity of Gods creation and realize that they are just but a small section of Gods creation. They thank God for having shared his image with them.

Confession. Confession too can be a subject of environmental awareness when Christians do confess the sins of a world that has embraced the culture of consumerism, wasteful and greed in utilization of natural resources. In so doing they also acknowledge the suffering of the poor who have suffered more through environmental degradation as they directly depend upon natural resources.

Proclamation. For God so loved the world that he gave his only begotten son. So that who ever believes in him shall not perish but have everlasting life. Christians proclaim the love of God to his creation through careful creation. Through so doing humanity will be in a position to treat the creation with respect, justice and integrity.

Offering. Christians should follow the footsteps of Jesus Christ by becoming selfless and offer themselves as agents of God and stewards of his resources therefore redeeming and restoring all that has been destroyed through degradation. For example they should seek to plant trees where deforestation had taken place or clean polluted environment.

Prayers. Christians can offer their prayers to the victims of environmental degradation such as the poor, the sick the threatened ecosystems and endangered species

2.6.3 Summary of key teachings on Christianity and Environment

1. God is the creator of the universe.

This is a core belief in Christianity. Its implications are that only God has absolute ownership over Creation (Gen. 1-2, Psalm 24:1, I Chron. 29:10-16). The environmental implications are that humans must realize that they do not have unrestricted freedom to misuse Creation, as it does not belong to them. Everything we own, everything we use ultimately belongs to God. Even our own selves belong to God. As we are “sojourners with you, mere transients like our ancestors; our days on earth are like a shadow...” (I Chronicles 29:15), Christians must always have in mind when using of Creation with a view to the larger good in both time (responsibility to future generations) and space (others on this world). Christians must also think beyond their own species to that of all Creation.

2. God's Creation is good.

In Genesis 1: 31 when God found all of Creation, “very good,” this means several things. First of all, it means that Creation is sufficient, structured and ordered. It is also harmonious. It exists to serve God (Psalms 148). This order reflects God's wisdom (Psalms 104:24), which is beyond human understanding (Psalms 92:6-7, Job 38-39). All of God's creations including humanity are consequently part of the Order of Creation and all are subject to its nature (Psalms 148).

2. Human beings are created in the image of God.

Human beings have a special place and role in the Order of Creation. Of all God's creations, only human beings have the power to rule over Creation. This power,

which gives them a kind of control over Creation, comes from special characteristics that no other creature possesses (Psalms 8). This idea is expressed in the concept that humans were created in the image of God. In its original sense, it implies that humans were put on the earth to act as God's agents (faithful stewards) and to actualize God's presence in Creation.

This also has ethical implications, which are seen from the fact that human beings have certain intrinsic dignities: infinite value, equality, knowledge, wisdom and uniqueness. It also means that human beings possess God-like capacities: power, consciousness, relationship, will, freedom and life (Human soul is immortal). Human beings are supposed to exercise their power, consciousness and free will to be wise stewards of Creation. God's intention was for the humans to maintain the balance and order over the creation at the same time use it for their own good (Genesis 2:14). However, this balance was distorted during the fall of man and ultimate expulsion from the Garden of Eden. Since then, Creation has tended to be out of balance because of the human impulse towards inequality resulting from the misuse of its powers for selfish ends.

3. Humanity should view their place in Creation with love and awe.

It may be said that there are two books of God's revelation to humanity: The Scripture and nature. (That is the totality of creation). Christian basis of love is rooted in the Biblical laws that call for the love and fear of God (Deuteronomy 6:5, 13). Thus, when Christians study Creation with all the tools of modern science they are filled with a sense of wonder awe and love for God's creation. This realization makes Christians feel humbled knowing that they are but just a small

fraction of Gods creation. Love and humility should then invoke in them a sense of reverence for Creation and modesty in their desire to use it.

4. *The 7th Day (Sabbath) as a means to achieve Gods love*

The Sabbath is a way to begin to contemplate this sense of love and humility before Creation. It is also is a way to living a sustainable life. For one day out of seven, Christians are meant to limit their use of resources. This reminds me of the Otange fleet of buses that play Nairobi- Nyanza route. Since the owner is a Seventh Day Adventist the buses do not operate from Friday sunset to Saturday sunset. I don't know if any one has ever thought how much pollution they prevent for that period? This is because the better part of the day is meant for worship, for relaxation, contemplation and reflection on the real purpose of human life. As Rabbi Schorsch has written:

"To rest is to acknowledge our limitations. Willful inactivity is a statement of subservience to a power greater than our own." (To Till and to Tend, page 20).

The mood of prayer during the worship day make Christians realize that all that which is of them and in them comes from God. Prayer lays people bare before God and before the creation making Christian realize that the creation is sacred since it expresses the Devine nature of its creator.

5. The Bible prohibits misuse of resources.

Deuteronomy 20:19-20:

"When in your war against a city you have to besiege it a long time in order to capture it, you must not destroy its trees, wielding the axe against them. You may

eat of them, but you must not cut them down. Are trees of the field human to withdraw before you into the besieged city? Only trees that you know do not yield food may be destroyed; you may cut them down for constructing siege works against the city that is waging war on you, until it has been reduced³⁴ "

This is also emphasized in Exodus 16:4-6, 16 where the children of Israel were to collect Manna for the immediate consumption. These law teach Christians to be moderate in the exploiting of the resources and to shun selfishness and greed. Jesus Christ (Mathew 4:20) followed this rule during the feeding of 5000 people where the remains were not thrown away but gathered for later use.

6. The Law of Moses prohibits the extinction of species and causing undue pain to non-human creatures

If along the road, you chance upon a bird's nest, in any tree or on the ground, with fledglings or eggs and the mother sitting over the fledglings or on the eggs, do not take the mother with her young. Let the mother go, and take only the young, in order that you may fare well and have a long life."

(Deuteronomy 22:6-7)³⁵ Ramban (Moses ben Nachman, Nachmanides, 1194-1270) in his commentary to the Torah wrote:

"This also is an explanatory commandment of the prohibition you shall not kill it [the mother] and its young both in one day (Leviticus 22:28). The reason for both [commandments] is that we should not have a cruel heart

and not be compassionate, or it may be that Scripture does not permit us to destroy a species altogether, although it permits slaughter [for food] within that group. Now the person who kills the mother and the young in one day or takes them when they are free to fly, [it is regarded] as though they have destroyed that species.³⁶ ”

This excerpts guide against extinction of Gods creation. Though the creation is lesser than humanity, from the Old Testament and the creation stories its evident that God find happiness and pleasure in his creation. This means that the creator has specific purpose for each creation no matter how useless or unimportant it may be in the eyes of human beings.

Related to this, is the prohibition of hurting animals without good purpose (Deut. 22:6, 22:10, 25:4, Numbers 22:32, Exodus 20:8-10, Lev. 22:27-8). These concepts spell out the inter relationship and interdependence of the creation and acts as checks and balances to human greed and selfish desire to own everything on the universe.

7. The Bible calls for fair distribution of resources (Environmental justice)

The Bible tries to address the issue of social economic inequalities in the society and Creation. Examples are the Sabbatical year (Exodus 23:11, Leviticus 25:2-5, Deuteronomy 15:1-4) and the Jubilee (Leviticus 25:8-24). Hence striving to have a balanced distribution of resources across all walks of life. Currently, world resources are shrinking and put into pressure by modernization and globalization. In so doing a lot of wealth has been created but also a lot of people mainly in the

third world have been forced to live in absolute poverty. (Exodus 22:24-26, Leviticus 25:36-37, Deuteronomy 23:20-1, 24:6,10-13,17).

2.7 Conclusion

In conclusion, Jesus Christ the foundation under which Christianity is built called upon voluntary -poverty (poverty by choice). This implies that Christians should only seek what is enough for their living as opposed to heaping of material wealth. Our interpretation of this is heaping wealth by a few locks out the majority into poverty and denies them chance of survival. This results into over exploitation of resources leading to extinction and degradation of the resources. Christians as the subjects of hope and love givers should therefore educate the world against over exploitation of natural resources. In addition, they should seek to address the plight of the poor through initiating social economic development activities that not only addresses the economic power of the poor but ease pressure to natural resources such as forests. The pastors should also use the pulpits to spread the environmental theology which as seen above is part and parcel of Christian mission.

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3.0 CHAPTER THREE:

CAUSES AND IMPACT OF ENVIRONMENTAL DEGRADATION IN ARABUKO-SOKOKE AND MIDA CREEK FOREST

3.0 Introduction.

This chapter seeks to examine various causes and agents of environmental degradation in the area of study. It will also look at the environmental, social, religious and economic impact of the degradation. Lastly, it will seek to look at the relationship between sustainable livelihoods and the environment.

Arabuko Sokoke forest and Mida Creek Mangrove forest just like other forests along the East African coast are in great threat. The Kenyan Coastal forests are highly threatened while the Tanzanian ones are slightly less threatened¹. The study found four major threats namely: Conversion of forests to agricultural land and settlement areas as a result of population increase, extraction of woody material for building (poles, ropes and timber) firewood, charcoal burning and wood carving industry and poverty and land squatters related issues.

Earlier before these two ecosystems became national reserves threats came in form of plantations and sisal estates especially on the south of Kilifi with Vipingo sisal plantation and Kilifi plantation mainly dealing with daily farming and cattle ranch.

Currently, major threats are as result of poverty and unsustainable economic activities that go hand in hand with population growth especially in the major towns along the Kenyan Coast.

3.1.0 Poverty.

The major cause of environmental degradation is poverty. According to Oxford Advanced Learners Dictionary poverty is defined as the state of or conditions of being poor². Poor where poverty is derived from is described as not having enough money for meeting basic needs. In Coast province it is estimated that 57.6% of the total population live below the poverty line³. Poverty line is expressed as inability to earn 1US\$ per day. Poverty becomes a means of environmental degradation when the neighboring communities are not able to meet their basic needs hence forced by circumstances to exploit and over harvest the natural resources around them. In this area majority of the population are peasant farmers and fishermen. Lack of rainfall and unpredictability of the seasons has resulted into the farmers being unable to harvest anything from their farms. In search of satisfaction of the basic needs they have resulted in cheap livelihoods such as charcoal burning and poaching of woody materials meant for poles, ropes or timber for sale. However, the poachers who are local people are highly exploited by the middlemen who use them to harvest the materials then sell such products in the neighboring towns. For example, a sack of Charcoal (70kg) in Mombasa sells between Kshs500 and 600 while the middlemen buy from the poachers between Kshs 200 and 300 shillings. This exploitation of the

local poachers by the middlemen only leaves the local person poor and exhausted and his environment more degraded. Nevertheless, since life has to continue the local person becomes optimistic that the next pole or the next sack or timber extracted will fetch more money. What is the end result? More trees being brought down without any replacement.

Poverty has also been associated with the gazettement of the natural and cultural resources. The people living around these two ecosystems for so long depended upon the natural resources as source of food, clothing and income. However once the resources were gazetted and put under game reserves, national parks or simply under the National Museums of Kenya the local people were left without food or any source of income bringing in the situation of poverty .As Stella Simuyu puts it.

“If you look at Africa, for example, the rural poor depend directly to the natural resource base. This is where their pharmacy is, this is the local supermarket, this is where the do it yourself store is ‘this is in fact their fuel station, their power company. What would happen if these things are removed from your local neighborhood?”⁴

This is exactly what has happened to the community living around the Arabuko Sokoke forest. In 1943 Arabuko Sokoke was gazetted as crown forest part of it was gazetted as a strict nature reserve in late 1960s, this meant that the local communities could not go in the forest and harvest resources freely as they had done for many generations.⁵ However, in order to overcome this local people have come up with

tactics that see them harvest resources illegally. An undercover investigation carried out by one conservist and elders who are involved in the conservation of the forest including Mohhamed Thoya, Samson Katana, and Sharif Baya on 17th July 2006 revealed that illegal logging still takes place in the forest. They found a place in the interior with countless tree stumps dotting over a vast area. Besides them lay drying tree branches and firewood. The stumps look like those left after being cut by a power saw. The felling of the trees had been done randomly probably to cover up the money-minting racket. This undercover investigation revealed the destruction of mature indigenous trees.⁶ According to one of the elders who sought anonymity he had constantly spotted trucks at night. Surprisingly, when the elders raise this issues sometimes the wardens deny such information. Stanley Baya, over the years he has observed that majority of school going children drop out after class eight due to lack of school fees. In fact the situation was worse before the NARC Government where parents were also paying fees for the primary school children.⁷ According to the data at ASSETS web site in year 2000, 23,000 Out of 25,000 of the students who sat for KCPE and qualified to join high school they did not.⁸ Poverty is also seen through their homesteads where some of the homestead the researcher visited were made of mud and makuti with some having holes patched by polythene papers or rags. This reveals the kind of poverty in the area. This kind of situation creates a condition of vulnerability to the environment as in humanity have to survive even under the spell of poverty. Mrs. Thoya Baya observes that

"I agree that we need to conserve the environment especially for tomorrow's life. But what about today do I watch the children die out of hunger? And if they die

wont I have wiped tomorrow's generation that I am preserving the environment for."⁹

3.1.2 Conversion of forests to Agricultural and Settlement areas.

Another underlying situation that has contributed to the destruction of the two forests is conversion of forests to Agricultural and Settlement areas as a result of population increase especially in the major towns in Coast Province. The Coast Province supports about 9% of the total National Population¹⁰. Currently, it is estimated to be over two Billion people. Kenya's population growth is estimated to be 4.2% pa, which makes it one of the fastest population growths in the world¹¹. This population increase has constantly placed some significant pressure to the Coastal environment, its resources and infrastructures, given that 60 % of the Coastal strip forms the semi urban area¹². Most of the population is located along the 30km Coastal strip that stretches from Lunga Lunga in the South to Mabruui in the North. The two forest ecosystems are found between urban area farmland and some quarries.¹³ This has resulted into a lot of land being cleared to make room for settlement and urban area expansion. A good example is the Gede, Roka Matsangoni and Chumani settlement schemes. These settlement areas were chopped away from the forest in the 70s and the 80s to settle the landless people. All what is today the Gede town, Watamu and Malindi including some small shopping centers along Kilifi –Malindi road were once part of the Dry Coastal Forest. However, most of the dangers related to population increase today are as a result of demand for Charcoal, firewood and timber for construction. The demand for charcoal in the neighboring towns (Malindi, Watamu

and Mombasa) makes it difficult to eradicate charcoal burning. Charcoal made from hard wood is extremely high in demand as it burns for long and give adequate energy. This means that, it is very hard to eradicate charcoal burning as a whole as long as the demands for charcoal in these towns continues to increase. Charcoal is cheap and affordable as compared to LPG (cooking gas or even paraffin). It is also desired as it gives less or no smoke as compared to firewood. The cooking Jikos are also cheap and affordable as compared to Gas cookers and paraffin stoves. This suggests that the issue of charcoal burning should be done sustainably rather than fight to remove it altogether.

3.1.3 Land related issues and Squatters problem

More pressure on these two ecosystems is as a result of land issues. In 1997 Kilifi squatters, who claimed to have been landless since independent, urged the Government to degazette part of the Arabuko Sokoke and Karachi Mpendakula forests. However, the then Chairman for the Presidential Commission on Soil Conservation and a Forestation, Hon. Mulu Mutisya, urged the forest officers to ensure that Kayas and Mangrove forest were not violated by anyone.¹⁴ It is sad that up to today the Government has not been able to resolve the problem of the landless people in Coast Province hence the danger of eradicating forests to settle people is still there.

The landless people lack the basic means of survival in Coast, which is farming for domestic use. Due to this, the people poach trees and animals from the forest in order to make a living. More important is that they feel no obligation to develop or

conserve the natural resources surrounding them since they do not have a sense of belonging towards the environment they are living in. Why do we have land issues in coast province? This question can only be answered by looking at the process of land ownership in Coast province over the years.

Land tenure system refers to the system into which individuals or groups in a society hold or have access to land including the conditions under which the land is held. In Coast Province, the oldest land tenure system that still is practiced today is the traditional land tenure system.

The Mijikenda are believed to have settled near the Coastline. However, with the establishment of the Arab settlement around the 15th century they were pushed inland. The Mijikenda community, which was made up of 9 clans initially, settled under 9 fortresses in the Coastal Dry Forests. The term Miji Kenda refers to 9 homes, which categorically connotes the land ownership system –as owned by 9 homes. They believed that the earth was their mother and was fertilized with rain by the Supreme Being.¹⁵ All the members of the sub tribe were considered as her children and had equal rights to her. The land was divided into two; the Kayas that were sacred places of worship and the common land where members were entitled to tilling and herding or even hunting and gathering. Members were allowed to till a portion as individuals. However, the portion was not legally his or hers but could be passed to somebody else once the person died or had no interest in cultivating there. This can be seen as communal ownership with recognition of individual title to cultivated land.

On the other hand Arabs that had settled along the seashore were predominantly Muslims. They recognized individual tenure to farmland and land in trading centers; pastures forest and water points as the properties of Ummah (congregation) and sustained from the bounties of God¹⁶. The Mijikenda and the Arabs (washiraz) lived as per these land systems without any major conflicts. However, with the coming of the Colonial Government a lot of emphasis was laid on individual ownership and title deed system was introduced. This saw the registration of parcels of land that were held by the elite and the ruling class of Mombasa such as the Mazruis, Omanis and the Swaleh Nguru families under the Mzrui Land Act in 1931 ¹⁷.

Meanwhile, the Mijikenda communities continued with their traditional land tenure system not aware of the changes that were taking place. After the independence the situations continued to change. Every Kenyan had gained right to settle, engage into business and other enterprises and exploit resources in any part of the country as per the constitution .It happened that there were lots of such opportunities in Coast because:

- The population was sparsely distributed and there were vast areas of seemingly vast empty land.
- The area was rich in natural resources and minerals.
- Land ownership was ill defined with a few demarcated and registered properties.
- The local population was friendly and well disposed towards strangers.

- Attitudes and perspectives were largely traditional and not yet awaked to the rapacious dictates of the modern commerce, and where assets were available cheaply from the Europeans and Indians who were going back to their countries.¹⁸

Therefore, some manipulation within the wall of law could take place. What was the end result the local ignorant community were left wanting while people fetched from many miles as far as central Kenya were settled on rich fertile settlement schemes. It is until the 1980s that the local community came out of sleep and found that they were squatters on the land they had lived for so long.

Out of despair the local communities have continued to push for resettlement of the squatters and issuance of land title deeds so that they can match with their competitors from *bara*. This problem of the squatters unless resolved, the Arabuko Sokoke forest's future stands to be dimmed. Currently, the Minister for Environment and Natural Resources is contemplating re- introducing the Shamba System and if that is used in the Arabuko Sokoke forest the future of the forest will be at great peril.

3.1.4 Extraction of woody materials.

Wood carving is a booming business given that the Coast province receives a lot of tourists from all over the world. Wood carving business is particularly booming in Mombasa, Malindi and Watamu towns with major handcraft shops such as Muungano and Akamba handcrafts situated in the neighboring Malindi town. Already the Forest Department in the Arabuko Sokoke forest has made a distress call on one of the indigenous tree that is at the verge of extinction from the wood carvers. This tree is

locally known as *Muhuhu*. The wood cavers like this tree because apart from being a hard wood the carved items do not crack easily as is common with other trees' products. Roughly this tree takes at least 35 years to mature. The Forest Department has banned the use of this tree and currently anyone found carving from this tree or with products made from it is immediately prosecuted.

Charcoal burning contributes a lot to the destruction of the forest. However, it is quite hard to catch the offenders since they normally fell the trees, carry the woody materials and make the kilns in their homes. Once they are caught they excuse themselves by saying that they had felled trees from their shambas. Amazing all round the forest one meets people ferrying charcoal on bicycles for sale or numerous sacks of charcoal awaiting selling by the road side. Two parents under the ASSETS scheme confessed that they were still burning charcoal secretly since though their students were under scholarship it was not sufficient and they also needed to take care of the other basic needs. In the course of study the researcher also realized that some of the local people had joined conservation groups for monetary gains but did not have conservation of the environment at heart. For example Jonathan Baya and the researcher found a man in the forest cutting down the rare *Murihi* trees. After being questioned the man confessed that he had been given some work by a person in a conservation group to extract charcoal from the trees. Below is a picture of the cut down tree and one that was still in the process of being cut down.



Plate 3 A *Murihi* tree poached from the forest for the purpose of charcoal extraction.

Photo by the researcher



Plate 4 *Murihi* tree rescued by Jonathan Baya and the researcher from the hands of the poachers. Photo by the researcher.

Another cause of forest destruction in this area is through harvesting of wood for the purposes of domestic firewood. Majority of the local people living around the forest, use firewood as fuel. However, destruction of this nature only gives some minimal destruction since firewood poachers mainly depends upon the dry dead wood for firewood. This mainly robs the forest its organic fertility but does not necessarily interfere with tree population not unless trees are felled specifically for the extraction

of firewood. Areas where firewood is harvested includes Mangugho, Matsangoni and Mijomboni areas. On the other hand the poachers who extract poles for construction mainly destroy Mida creek forest. This has robbed the Mangrove forest the good tall trees and only the crooked that cannot be used for building are left behind. One of the adjacent dwellers after being away for a decade laments; -

I visited Magangani, one of the eight landing sites within the creek, where I spent my first fifteen years of childhood either just fishing for fun or swimming in the still waters of the creek. It was a shocking venture. I could not believe how much destruction could take place in just a decade.

As if in a dream, I recalled those days when the mangrove canopy formed a very nice hedge between the water and shambas (farms) on the other side. You could only see the top of the coconut palms in the plantations bordering the creek due to the dense canopy formed by the mangrove thicket. After wading through the mangrove forest for nearly quarter of an hour, appearing at the openness of the creek was breath taking. Today this once dense canopy of mangrove has been reduced to nothing more than a very thin, open strip of crooked mangroves. These mangroves only survived as they could not be used as poles and were therefore not worth a cent in the market. While mature mangroves are a target by poachers, young regenerating mangroves are struggling to survive as fishermen destroy scores of them every day in search for bait.¹⁹



Plate 5 Local people carrying firewood from the forest. Photo by ASSETS.

3.2 Effects of destruction of Arabuko Sokoke Forest and Mida Creek Mangrove Forest.

The people living near these two ecosystems are already experiencing the effects of the destruction of these two forest. The effects will be discussed under: cultural and religious, economical and biological/climatic effects.

3.2.1 Ecological effects.

a) Destruction of habitat and extinction of flora and fauna

Arabuko Sokoke is the largest block of the Coastal Dry Forest that once stretched from Somalia to Mozambique. This forest block is only 420km² however its ecological significance cannot be underrated. Just but to mention it is the 2nd most important forest in mainland Africa for bird conservation. Currently it houses six globally threatened birds. It is also a rich site for frogs and supports 90% of the

threatened Golden rumped elephant shrew and the Africa's most endangered antelope- under duiker (paa nungu).²⁰

Destruction of this forest is destruction of the life in this forest where by it's a habitat for a good number of animals and plants. Once the forest cover is destroyed the animals- a number of which are threatened- will easily fall vulnerable under the hands of trappers and poachers .In a country where a lot of indigenous trees are destroyed and every day being replaced by fast maturing exotic trees, conservation of this forest means that there will some trees of our own left for beauty and cultural reasons. Destruction of it risks our own animals and trees. Currently two tree species in this area *Muhuhu* and *Murihi* are under the threat of extinction and are only to be found in this forest and some parts of Girimacha. However, even in Girimacha where the

Murihi tree is a bit numerous charcoal dealers are not sparing it. See the photo below



Plate 6 Part of Murihi trees cleared in Girimacha for the purpose of charcoal burning.

Photo by the researcher.

b) Disruption of Ecological Balance.

The continued destruction of the Arabuko Sokoke forest has resulted into conflict between man and wild animals especially the elephants .Due to the shortage of water in the forest a lot of animals are moving out in search of water and food or simply in search of a safer environment. This has resulted into conflict between animals and human activities. More often, elephants and monkeys have destroyed farms especially in Kakoneni and Kakuyuni area as they move to the Sabaki River. Unfortunately this is one of the fertile areas and most farm products in Malindi market come from this area. Such destruction is attributed to the shifting balance between animals, plants and human activities.

3.2.2 Climatic Effects.

Global warming and unpredictable weather conditions

Due to the destruction of the trees in the area rainfall has become rare and unpredictable. Between year 2003 and 2004 the Coast Province was hit by a severe drought, which was declared a national disaster by the Government. Part of the worse hit areas included Kinango in Kwale District, Tana River District and Ganze in Kilifi where part of this forest lies. According to the local resident Bi Mraba such drought has not been common in the area. His comments were

“I am an old man (My father was born here so my grand fathe)r. We have in the past experienced drought in this place but not as severe as this one. We are accustomed to have long rains between early March until the end of July and it starts again around October and November and sometimes

even to early December. But this time we have crossed fingers four times without any rains. At first we thought it is a curse though some attribute to a curse from our ancestors but from A Rocha and what we can see we know for sure that we have destroyed our environment by cutting tree without replacing them ²¹

Destruction of this forest will only worsen this situation. Trees normally store carbon gas hence curb global warming. A forest of 420km² holds a lot of carbon gas, which is released upon cutting down of the trees. Therefore, destruction of this remaining forest will have disastrous effect to our climate in terms of global warming and unpredictable weather pattern. In the past the forest has helped the surrounding area secure abundant rainfall with the weather station at Msabaha recording high rainfall in the area. The elders in the area associate the drought experienced a few years ago with the continued destruction of the two forests.

On the other side Mida creek mangrove forest is a feeding zone and a stop over for the migrating birds. It is also a breeding zone for fish since it is sheltered. Destruction of this important ecosystem will affect the breeding of fish in the ocean. This will in turn result to low fish population in the ocean bringing suffering to those who depend upon fishing as their economic activity and also for food.

3.2.3 Religious and Cultural Effects.

Coast Province of Kenya is a place of different cultures that has been preserved for more than ten generations. The two-dominant cultures include the Mijikenda traditional culture and the unique blend of Coastal Bantu and Arabs known as Swahili

civilization. The Mijikenda community has always treated forests with importance as they house the sacred Kayas. Today the Kayas exist as the residual patches of one extensive diverse lowland forest. The existence of the Kayas is founded on the beliefs, culture and history of the Mijikenda ethnic tribes. The forests are celebrated for having housed the Mijikenda where they had the nine fortified villages for each ethnic group. A part of the forest was left aside for worshiping and burial purposes hence acquiring the sacred and religious status. During the 19th century as the population grew and security became more sure, they started migrating out of the forest villages.²² However, the Kayas remained sacred where only the religious specialists were allowed to enter. Trees and animals in Kayas were also not to be destroyed.

Presently, due to decline in cultural beliefs and spread of Islam and Christianity the Kayas are not highly venerated although some respect is still attached to them.

The growing demand of natural resources and population increase has resulted into the kayas being encroached and robbed their religious, cultural, historical and biodiversity importance.

Today, Kaya Chonyi has been reduced to one fifth of the original area due to rising demand for agricultural land. On the other hand, Kaya Jibana, Rabai and Kambe are greatly degraded. On the South Coast the Digo Kayas that were located along the beaches have been destroyed by hotel development and other private developers²³. This implies that the Kayas outside the National Parks such as Arabuko Sokoke are already destroyed. Further destruction of Arabuko Sokoke and the Kayas located in it,

will be robbing the generations to come an understanding of their rich culture, traditions and religion.

Kayas are also known for their rich botanical diverse and high conservation value that is bound to be lost if the Arabuko Sokoke forest is not conserved. Moreover, the Coast Province still has people practicing their traditional religion and traditional herbal medicine. It is only justice to conserve this ecosystem so that elders such as Simba Wanje can enjoy their freedom of worship.

For so long the waswahili and Bajuni of Watamu have been well known for their fishing art. More often than not, Watamu town is described as a small fishing community town. The Waswahili own motor fishing boats that they use for their economic activity. The fish are normally sold at the local markets where they make some of the Swahili dishes like *samaki wa kupakwa* and *samaki wa nazi*. Local and foreign tourists normally visit Kenyan Coast to see the people and more importantly, the traditional cuisine. However, it is sad that with the destruction of a fish-breeding zone at Mida Creek fishing activities might be curtailed and the local people may end up losing an important traditional cuisine.

3.2.4 Social economic effects

Coast Province contributes the highest percentage of tourist attraction due to numerous tourist attraction sites. It is home to some of the best hotels in the World. In 2006 tourism earned more than 56.2 Billion, which was a 15% increment from 48.9 Billion in 2005 making tourism the leading foreign exchange earner in Kenya for the

year. Apart from foreign exchange it is estimated that tourism offers 130,000 formal jobs and over 360,000 informal jobs in Kenya²⁴.

Arabuko Sokoke and Mida Creek forests are located along a highly popular Coastal Belt for tourists. These two ecosystems attract both domestic and foreign tourists hence contributing to foreign currency earnings for Kenya. The tourists normally come for holiday away from the cold winter abroad, for site seeing, boat riding around the creek, bird watching, sport fishing while others come for research and field study. These tourists therefore, boost the economy of the towns around the area of study especially Watamu and Malindi towns whose economy is entirely controlled by tourism. This means that during tourism high seasons, ranging from July to February the economy grows while during low season march to July the economic condition lowers to a point of some business premises being closed. Most of the hoteliers choose to do repair and rehabilitation works during the low season.

Arabuko Sokoke and Mida creek forests offer economic support to local people and other investors who own business premises that are supported by tourism such as; business people in hospitality industry, tour traveling operators and tour guides among others. These firms in turn offer employment opportunities to a number of local people. They are also people who work for the Forest Department and Kenya Wildlife Service. Finally, there is the community, which directly looks at these two ecosystems for food, fuel and construction materials. Destruction of these two forest ecosystems then will have negative impact to the economy of the area in particular and that of the country in general.

3.2.5 Food Insecurity.

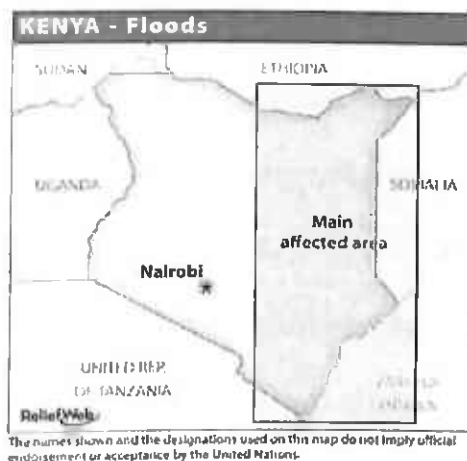
Food insecurity is tied to unpredictable weather patterns and extinction of some flora and fauna. The Coast Province between year 2000 and 2006 was hit by a severe drought due to crop failure as a result of unpredictable weather conditions that brought delay of both long and short rains. In 2000, 4.4 Million people in Coast, Central, North Eastern and part of Eastern Province required food aid as a result of famine²⁵. This was followed by 2003/2004 droughts as a result of short rains and long rains in 2003 becoming erratic. In the same year, the Kenya Food Security Steering Group assessment revealed high food insecurity in Coast Province. The Government was forced to distribute 9,000 MT of maize, 1,550 MT of beans and 489 MT of vegetable oil to an estimated 651,700 persons in Pastoral and Coastal Districts only²⁶.

Drought persisted in 2005 and during the 2006 New Year celebrations the Government through the Head of State declared the famine in Coast Province and some other areas in Kenya a national disaster. In his speech his Excellency President Kibaki said,

I renew my appeal to both local and international friends and partners to join the Government in extending a helping hand to our brothers and sisters who are experiencing this difficult situation. These areas have been faced by crop failure and depletion of the livestock herds due to prolonged drought²⁷ ...

Flooding has also caused food insecurity. Soon after the drought-ended floods hit the area on 11th and 12th November 2006 as a result of torrential rainfall received in Coast and

North Eastern Provinces. Crops in the field were destroyed and at least 30 people perished. An estimated 20,000 people were displaced with the office of the president estimating 50,000 displaced.²⁸ Below are a map and a table showing the effects of the floods.



Source United Nations.

The detailed figures of affected populations by the flood according to the Kenya Red Cross is as follows:

Area/ District	Populations affected = Total 207,000
Dadaab	100,000
Kwale	50,000
Garissa	17,000
Kilifi	10,000
Tana River	10,000
Ijara	10,000
Wajir	3,000
Moyale	3,000
El Wak	2,000
Budalangi (Western Province)	2,000

Source United Nations.

3.3 Sustainable livelihoods / Development and Environment

Sustainable development can be defined as Development or livelihoods that meet the needs of the present without compromising the ability of the future generations to secure their own needs.²⁹

It is very important for communities to engage in ecologically sustainable development. This is by using conservation and enhancing community's resources so that ecological processes, on which life depends, are maintained and the quality of life, now and in the future can be increased.

Communities living around the Arabuko Sokoke and Mida Creek Mangrove forest have for so many generations used resources within their reach. It is in the forest that they had their worshiping areas; they harvested herbal medicine, also extracted fuel, meat, fruits and materials for building and construction of their houses. The resources were quite a lot and seemed as though they could not be exhausted.

Today, the resources are over harvested and the community living around is poor and majority being landless. It is also a time where that freedom to get into the forest and harvest the resources has been limited. However, despite the measures to curb deforesting poaching still continues. This then brings the question whether environmental conservation is going to succeed in area hit by poverty? The battle for environmental degradation is doomed to fail in places where poverty thrives. This is because in the race for survival people engage in cheap livelihoods that only jeopardize conservation business.

In this case, for effective conservation, it is important for the team players to address the issue of poverty and landlessness in the Coast Province. This sustainable

development cannot be attained unless the communities are fully involved, educated and set independent.

3.5 Conclusion.

In conclusion to this chapter, since poverty has emerged as a cause and effect of environmental degradation, it is evident that sustainable development projects need to be initiated. Sustainable development here brings on board all the components of environment, such as humanity, wildlife, climate and to an extent non-living things. Poverty should be addressed within the means of reducing the gap between the rich and the poor, settlement of the landless through different projects aimed at creation of wealth. This can be achieved through creation of projects that will ease direct pressure on the natural resources such as agro forestry, aloe Vera planting, Kipepeo Butterfly Project, weaving, poultry farming and eco-tourism among others.

Any sustainable project therefore will require an integration of various approaches of creating wealth. However, the community should be involved and be facilitated so that in the near future they will be able to run the projects independent of the facilitators. This brings the concept of showing one how to plant an apple tree rather than giving a person an apple that lasts just but for a day.

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4.0 CHAPTER FOUR:

CONSERVATION ACTIVITIES OF A ROCHA CHRISTIAN COMMUNITY

INTRODUCTION.

This Chapter aims at examining various conservation approaches employed by A Rocha Kenya in salvaging the Arabuko Sokoke forest and Mida Creek mangrove forest. The forest sector contributes to the country's social economic and cultural development. This is through stabilizing soils and ground water hence making agricultural activities attainable. Moreover it preserves water catchments areas and it is a habitat for biological diversity and wildlife that attracts tourists and gives a community a sense of belonging. The guarantee for these benefits is rested on ability for a community to use the resources sustainably and engage in the ultimate good of conservation and preservation of forests. Statistics show that 75% of the wild animals live among human beings within the forest ecosystems¹. Therefore, if human beings are to survive, then they must build a sustainable society. A society that lives in harmony with nature, as opposed to a society that destroys its' resource base².

A Rocha Kenya understands this principle and in relation to it, works towards conservation of Arabuko Sokoke and Mida Creek Forests. Their approach is to enable the community to co-exist with their neighboring environment by utilizing resources sustainably. This is a conservation approach as opposed to preservation approach since it is natural for humanity to survive within its environment and therefore a preservation of don't touch attitude does not benefit the community. The organization has four major

conservation programs namely ASSETS, Environmental Education, Bird ringing and Monitoring and community involvement and partnership.

4.1 Arabuko Sokoke Schools And Eco-Tourism Scheme (ASSETS)

ASSETS was formulated in 2001 after a base line survey carried out by A Rocha Kenya and Forest Department on cause of deforestation in Arabuko Sokoke and Mida Creek forests³. Establishing of ASSETS was formulated in conjunction with: -

- The United Nation Development Programme Global Environmental Facility.
- Kenya Wildlife Service.
- Kenya Forest Department.
- The Ministry of Education, Malindi and Kilifi Districts.

The base line survey identified poverty as a major player in the destruction of the forests, which manifested itself through cheap livelihoods and high school dropouts among the neighboring communities. A Rocha Kenya through ASSETS tries to address this issue of education and school dropouts. This is because the youth that drop out of schools are the ones involved in illegal logging of trees and fishing using none recommended nets. According to Stanley Baya, assets coordinator, this brings a vicious cycle where by, poverty pushes kids out of school. Once out there, they are involved in environmental destruction that worsens poverty levels in the area and in return more students drop out of the schools. Addressing school dropout issue meant fighting both ignorance on environmental issues and illiteracy in the area.⁴

The ASSETS scheme is a pioneering conservation project which bridges the conflict between people and wildlife through promoting child education, alleviating poverty, whilst encouraging community involvement in nature conservation, ASSETS meets the social and economic needs of the people through offering scholarships to the secondary school students. It integrates bursaries, eco tourism and environmental education to the beneficiaries and their parents.

4.1.1 Funding

There are currently a number of projects that are aimed at easing pressure on the natural resources. However, though such projects aim at salvaging the forest resources, there is still demand for the woody materials by the local people and within the nearby towns that has not been addressed. Poverty is also rampant and therefore the projects have not been able to remedy the situation. They are a number approaches that the stakeholders are engaging in order to initiate sustainable development. Some of these approaches are discussed below.

Gifts.

This is where the stakeholder gives some tokens to the community in question in the effort to help the community live for the day and hopefully not put pressure to the threatened resources. Gifts have their shortcoming; first, a gift is so valuable that the person receiving cannot be able to reciprocate to the one giving. Since it is very valuable then the receiver always feels indebted to the person giving. It is also short term since it cannot be an every day activity. This then implies that it cannot be a solution to sustainable development since it only solves the immediate problem without taking consideration to the future.

Donations.

Donations can be defined as something that is given to a person or an organization such as charity in order to help them. A donation may help in kicking off a sustainable development project, however, in itself is not sustainable because it cannot last forever. Donations also may kill a philosophy and culture of hardworking since they place the donor at a higher level and the receiver at a lower level. It discourages independence and promotes dependency and slavery where the donor is seen as the master and the receiver as a beggar. More often donations are misused or are used contrary to the intended use. Take this example. A certain NGO donated mosquito nets to villagers in Mida Creek village as a project of fighting malaria. However since they didn't have a burden to own nets they ended up being used for fishing in Mida creek. This was not only sad but it's also hazardous to the environment since the nets having small mesh were catching young fish that are not supposed to be caught.

Grants

This is aid given to a Government, an organization or local areas for the purposes of achieving a certain objective. Grants just like the donations over values the person giving while devalues the one receiving. They are also subject to abuse and might end up in a few peoples pocket rather than achieve the under said objective. In additional, grants can create a situation of over dependency and make a community only concentrate on myopic projects hence end up not securing their future. However, when well utilized they can be used to setting up long-term projects geared to sustainable development.

Loans.

This is money borrowed and expected to be paid at an agreed time especially with a given interest. Loans just like the other approaches discussed above may help start sustainable projects. However this money is not free as it is repaid sometimes at high interests. This suggests also that the interests are very high and money also is mismanaged the community may end up not benefiting from the loan. The issue of interest also beats the logic since the lender benefits out of a poor community.

Facilitation.

This is an act of making a process or an action easy and possible. A facilitator is a person who helps to do something easily by discussing the problem and giving advice without telling the people what to do. Facilitation method incorporates the community and the facilitators where problems and solutions are discussed across a round table. It incorporates the efforts of both the community and the facilitator. In so doing the community appreciates the sustainable development as their own project as opposed to something imported and remote. However facilitation at times needs financial back up. This means though a better method of initiating sustainable development it might not stand on its own.⁵

ASSETS Programme raises funds from Eco –Tourism facilities developed by A Rocha Kenya and its partners and also from well wishers in departments such as Local Tourist Industry and National and International donors.

a) Eco-tourism facilities.

They are several facilities in both Arabuko Sokoke and Mida Creek forests that tourist use in order to have a clear view of the forests and the wildlife inside. These facilities raise money for ASSETS Eco Bursaries. They include a suspended walkway, canopy platform, Arabuko nature trail and snorkeling equipments for hire.



Plate 7 (Source forest department)



Plate 8(Source ASSETS)

Plate 7 shows Nature trail in Arabuko Sokoke forest some of the eco tourist facilities put across by ASSETS and stakeholders in order to fund Eco bursaries.

Plate 8 Shows a 260 Meters hanging walkway that meanders to a bird hide overlooking the Mida creek. The facility was launched in 2003 and so far over

2,000 International and local tourists have used the facility. Just like the other facilities put up, every guest pays 150 shillings that goes to ASSETS Eco- Bursary kit.



**Plate 9 Canopy platform
Rocha Kenya)**



Plate 10 A tree house (Source A

(b) Hotels

A number of hotels in the area provide information about ASSETS project. They also place donation boxes in their hotels where guests can make their donations. Some of the hotels have come up with the bed night scheme where they donate US\$ 10 cents per guest per night.

Some of the hotels in this project include: -

Turtle Bay Beach Hotel.

Eden Roc Hotel-Malindi.

Mnarani Club- Kilifi.

Scopio Villas- Malindi.

Drift Wood Club- Malindi

c) Other fundings.

UNDP, saw the construction of the hanging mangrove walk way and they also pay the salaries of the staff working under ASSETS. Kipepeo Butterfly Project usually contribute a small fee for every butterfly pupa they sell. Friends of Arabuko Sokoke donate all the profits they make from soda selling in the tuck shops inside the two forests. In year 2001 the Afro Caribbean Pacific held a symposium in Brussels where the Kenyan Ambassador was the chief guest. In the symposium, they donated money that was used for the first Eco bursary funding. The International Coral Reef Action Network through KWS also assisted in making the bird hide in Mida Creek.

Direct donations. A Rocha Kenya has a membership project where members contribute a minimum of Kshs 500 shillings per anum. Visitors also taking soda in tuck shops within Mwamba, Arabuko Sokoke and Mida Creek forests indirectly contribute towards funding of the ASSETS Eco Bursaries.

The first eco bursaries were awarded in year 2002 from money raised by the Afro Caribbean Pacific event held in 2001 in Brussels. To kick off ASSETS targeted STD eight graduates from three schools (Mijoboni, Mida and Bogamachuko) near the two ecosystems. Today, ASSETS beneficiaries are distributed in eight schools namely: - Mida Creek, Mijomboni, Boga Machuko, Girimacha, Nyari, Kipande, Kahingoni and Malanga.

ASSETS programme selects the beneficiaries among the bright and needy kids living in a radius of 3km from the forest and attending any of the eight schools. For a new applicants

they must have obtained 300 marks and above in the KCPE. After proceeding to high school sponsorship is guaranteed upon maintaining a mean grade of C plain in end term exams and posting report cards to the ASSETS Coordinator. However, ASSESTS do not give full sponsorship. In many instances they only pay 1/3 of the total fee.

4.1.2 ASSETS and environmental conservation.

ASSETS main concern is addressing human needs in the area while conserving the environment. Conservation is done through three major levels.

1. Offering bursaries to ease destruction through cheap livelihoods. ASSETS acknowledges that this is an area where both human and wildlife has come to conflict in the struggle for survival. It also notes that the surrounding communities has been benefiting from the natural resources ever time in memorial until a decade ago when they were prohibited from doing so. In connection to this, ASSET believes that the community might not be interested in the conservation of the forests if at all they have no direct benefits they can draw from them. Therefore they seek to offer tangible benefits by offering bursaries to bright and needy children.

2. The community is also involved in community conservation programme where by. ASSETS beneficiaries together with their parents make a declaration to conserve the environment. This declaration is made up of five condition that: -

- They will keep a well-maintained wood lot. Each beneficiary is provided with seedlings to plant in their homesteads. They are also taught how to take care of the trees such as watering, pruning and weeding.
- To protect Arabuko Sokoke Forest and Mida Creek by not cutting down any trees from it or hunting wild animals and birds.
- To protect Mida creek by not fishing using the undersized nets and by releasing in good condition any turtles caught in the nets.
- To be actively involved in conservation initiatives like Mangrove planting, butterfly farming, bee keeping and joining wildlife clubs and other conservation groups.
- To work in their holidays in order to contribute Kshs 300 towards running of the ASSETS scholarship programme.

3. The ASSETS programme also train tour guides from the local community. This tour guides are later stationed along the beaches and other tourist zones where they are hired for their services. By this the programme offers self-employed jobs to the youths who probably would be involved in poaching and destruction of the two forest ecosystems. At the same time ASSETS hold beneficiaries day where by they come together acquire environmental education and get involved in planting of the trees or environmental clean ups.

4.1.3 ASSETS Achievements

- I. ASSETS Programme has so far been able to support over 173 children in secondary schools. Within five years they have managed to assimilate 8 primary schools in this project.

- II. In the last five years ASSETS Programme and partners has distributed over Kshs. 2.8 Million to its secondary school beneficiaries. Out of this, Kshs 200, 000 has been raised through the eco tourism structures erected in the two forests.

- III. The programme has also come up with beneficiary Days, where by the beneficiaries together with their parents are brought together through an event. During such events they are educated on specific issues concerning their bursary fund and the environment. They also come together to plant trees especially the Mangrove trees in Mida creek and they are also encouraged to plant indigenous trees in their homes. So far over 3,400 indigenous trees have been planted in the beneficiaries homes.

- IV. ASSETS has also helped in registration of the ASSETS Parents Association. This association encourages the ASSETS parents and their children to get involved in the habitat regeneration through tree planting and tree nursery setting especially of indigenous species that at long run encourages conservation.

V. One of the biggest achievements ASSETS has made is fighting ignorance on environmental issues. 90% percent of students interviewed and 91% of ASSETS Parents Association members were able to define what is an environmentally degraded area, gave indicators of environmental degradation in their environment and possible remedies of the situation.

The ASSETS beneficiaries were asked the following questions during an interview

- a. Define the term ASSETS?
- b. Name at least three benefits of conserving your environment?
- c. Name at least three effects of environmental degradation.
- d. Give at least five indicators of environmental degradation in Malindi and Watamu areas.
- e. The ASSETS policy dictates that you should have a well-maintained woodlot. Have you observed this policy?
- f. ASSETS encourage students to join the wildlife club or any other club that encourage environmental conservation. Have you joined such a club?
- g. Have you at any point planted trees as an individual? (Not in an organized event)?

Below is a table showing some of the responses from students interviewed.

Table 1 showing the results of students interviewed in Ngala memorial girls school in Dabaso Watamu.

FORM	HOME PLACE	WOODLOT	ASSETS DEFINITION	INDICATORS OF DEGRADATION	EFFECTS OF DEGRADATION	BENEFITS OF CONSERVATION	MEMBER OF WILDLIFE CLUB	PLANT TREES INDIVIDUALLY
4	Mijomboni	Has not	Defined	Named 4	Listed 2	Named 3	Not	Yes
4	„	Has	Could not	Named 4	Listed 2	Named 4	Not	Yes
2	„	Has	„	Named 4	Listed 4	Named 3	„	No
2	Mida	Has not	„	Named 3	Listed 3	Named 2	„	No
y 3	Mijomboni	Has not	„	„	„	„	„	No
2	Mida	Has not	Defined	„	„	„	„	No
2	Mijomboni	Has not	Could not	„	„	„	„	No
4	Mijomboni	Has	Defined	Named 5	Listed 4	Named 5	Member	Yes

Table 2 showing responses from students from Gede Secondary school.

Form	Home place	Woodlot	ASSETS Definition	Indicators of degradation	Effects of degradation	Benefits of conservation	Member of wildlife	Planted to individual
4	Mijomboni	Has not	Defined	Listed 3	Named 3	Listed 3	Member	Has
4	Mida	Has	Defined	Listed 4	Named 2	Listed 1	Member	Has
3	Mijomboni	„	Could not define	Listed 5	Named 4	Listed 4	„	Not
4	Mida	Has not	Could not define	Listed 2	Named 3	Named 3	Member	has
4	„	Has not	„	Listed 3	Named 2	Listed 3	Member	Has no

Some of the answers they gave during the interview.

Indicators of environmental degradation in the area of study.

- a. Numerous tree stumps in the area.
- b. Charcoal being sold along the Malindi Mombasa highway and visible charcoal burning kilns in the area.
- c. Polythene bags littered along the beaches.
- d. Crooked and immature mangrove trees in the Mida Creek mangrove forest.
- e. Lack of rains and long drought period.

Effects of environmental degradation.

- a. Lack of rainfall
- b. Decline in tourism industry.
- c. Soil erosion and other natural catastrophe
- d. Global warming.
- e. Extinction of flora and fauna
- f. Loss of cultural and religious heritage.
- g. Poverty.

Reasons why ASSETS students should conserve their environment.

- a. Tourist attraction
- b. Reduce soil erosion
- c. Attract rainfall
- d. Its habitat for animals
- e. Trees absorb Carbon dioxide hence reducing global warming

- f. Preserve indigenous trees that so far display our culture and environment
i.e. the Kayas in the forest.
- g. For beauty.
- h. In order to avoid diseases

What do ASSETS students do when they meet during ASSETS Beneficiaries' day?

- a.Environmental education
- b.Beach cleaning
- c Planting of trees
- d.Eating

How can ASSETS student best conserve the environment?

- a. Plant trees and take care of them i.e. mulch and weed the trees.
- b. If we have to cut trees then we should replace them.
- c. Take care of the animals and by avoiding poaching them.
- d. Educate our peers and village mates on environment and be watchdogs of the environment by reporting to the relevant authorities those who plunder the environment.

Why do you think ASSETS pays your school fees?

- a. Because we are next to the forest.
- b. Reduce the burden of their parents relying on natural resources hence easing over harvesting of the resources within their environment
- c. To enjoy the fruits of their efforts in the conservation and motivate them to stop poaching of trees and animals in Arabuko Sokoke and Mida Creek Forest

How the ASSETS beneficiaries involve others in the conservation business

Caro Mumbi said she does not involve people since she once told her village mate not to cut down trees but they ignored her. Emma asked her parents not to kill birds while, Cecilia talked with her relatives and advised them not to cut the mango trees in their homestead but they continued cutting. Harleate asked her relatives to plant trees if they have to cut them.

4.1.4 Challenges facing ASSETS program.

a) Funding related problems.

ASSETS Program operates in an environment of absolute poverty where majority are needy people. This means that ASSETS has too much on their hands that they can hardly handle. To ensure that more students get the funding, ASSETS does not issue 100% bursaries. Given that the community is deprived of decent and sustainable livelihoods, a few among those who are funded are not able to adhere to the ASSETS laid down rules of a healthy and poaching free environment. This implies that in the effort of A Rocha Kenya trying to reach out to the community and advocate for the conservation of the their environment, a few locals in the conservation business out of lack jeopardize the same environment they are supposed to safeguard in order to make ends meet.

In addition to this, ASSETS so far is only able to fund for students living at a distance radius of 3 km from the forest. This leaves out adjacent people who live near the two forests at a distance greater than 3 km out. More often than not the people secretly creep to the forests and plunder the natural resources.

b) Staffing problems.

ASSETS currently have two full time staff. The ASSETS Coordinator, who basically runs the programme and the community officer who, is involved in carrying out interviews for the new recruitments. Due to this, beneficiaries in Ngala and Gede secondary schools lamented that they were a lot of delays before remitting the bursaries to the schools amounting to the students being sent out of school. In Gede secondary the beneficiaries informed the researcher that previously any one being sent for school fees if he mentioned that the ASSETS programme was to pay a given amount, they were exempted from being sent off. However, the school has to an extent lost faith with the programme due to delays in submitting the money and that was no longer an excuse for the beneficiaries. Related to this is lack of coordination. For a beneficiary to continue getting support from ASSETS they are expected to attain a C plain grade in their end term exams and also mail their report cards to ASSETS offices in Mwamba Watamu. However, some students having satisfactory fulfilled the laid down regulations did not receive their bursaries. Either the ASSETS offices claimed they did not receive the report cards or that they were received but not channeled to the right offices. Moreover, ASSETS offices suffer from lack of mechanized labor. The office share computers that have the vital data, office, motorbikes and a vehicle with other departments within the wider umbrella of A Rocha Kenya located in the Mwamba. So that the only vehicle (span tail) may be allocated to Bird and monitoring unit, environmental education and ASSETS at the same time making some department reschedule their plans. However, such are but challenges of a young organization and may be overcome in the future

c) Demand to have more tangible benefits.

Assets also suffer from pressure from the local community who desire more tangible and practical benefits from their environment. The local community is object of poverty and being landless. This has resulted into vulnerable livelihoods that are not only unsustainable but also risk destruction of the environment. They therefore see issuance of bursaries as a drop of water in the ocean since apart from securing their sons and daughters education they need shelter, clothing and food. This makes them not to understand that education is empowerment and a secure of tomorrow's generation. Due to this they call out for more practical and tangible benefits. A Rocha Kenya solves this problem by linking the locals with other stakeholders that have initiated social economic development projects such as Kipepeo Butterfly Project.

4.2 Environmental Education

A-Rocha Christian community involves the neighboring community in environmental conservation through education. The organization has full time trained environmental Educator- Mr. Tsofa Mweni. He comes from Gede and he neighbors Arabuko Sokoke forest. Mr. Mweni developed interest in the forest ecosystems while teaching at Gede secondary school. Since he came from the neighborhood he watched day-by-day degradation of the forest through over harvesting of forest resources.

He felt that he needed to do something to conserve his neighborhood. Due to this, he resigned from Teachers Service Commission (TSC) and joined Nature Kenya- an organization that was involved in conservation of birdlife and their ecosystem in Arabuko-sokoke Forest as an environmental educator.

After completing his contract in Nature Kenya he left for A Rocha Kenya where he became the head of Environmental education.

4.2.1 Environmental Education within wildlife clubs

Environmental education is mainly conducted within the wildlife clubs in both primary and secondary schools although a lot of emphasis is done in primary schools

His main work is to go to schools and engage them in environmental activities. This includes:

(a). Establishing of tree nurseries

A Rocha in partnership with wildlife club patrons set up tree nurseries. The members are taught how to take care of the nurseries and later are left alone to take care of the trees.

Currently, the schools that have maintained the tree nurseries include Mangundho, Mkongani, Bogamachuko, Mida, Mizizima, and Roka although the nursery at Roka is not doing well.

Once the seedlings reach the age of transplanting, the wildlife members plant them within the school compound. In addition, each member is given 26 seedlings to establish a wood lot in their homes

However, due to staffing problem and Mr.Tsofa's tight schedule, neither him nor any other A Rocha staff member has been able to evaluate or monitor the woodlots establish in the member's homes.

Establishment of nurseries has not gone on without a number of challenges such as: -

- **Cutting down of trees by the school administration**

The school administration sometimes cut down trees or sells without the knowledge of the clubs. For example; In Gede primary the school administration decided to cut down trees without the consent of Wildlife Club members. The trees were used for the construction of more classes.

In Roka primary the school administration sold the trees. Unfortunately no money was remitted to the wildlife club. This demotivated the members to an extent that they no longer took care of the trees and nurseries that were in place until they dried up.

Such a move by the school may be considered as improper because:-

The Administration did not establish a plan to plant trees for the replacement of the cut down trees.

The administration was supposed to buy the trees from the club since the school did not directly own them.

Before the exercise began there was a need to seek consent from the club something that was not considered.

The real motive for planting the trees was for beautification and environmental conservation especially from the dust coming from the adjacent road. Cutting such trees without replacement contravenes the desired objective of the members.

- **Lack of human resource over the holiday**

It becomes a challenge to water and maintain the nurseries over the school holidays. For example, in Mangundho Primary School the initial tree nursery established with the help of M.r Tsofa dried up since the watchman they had hired to assist them water the nursery

failed to do so. However, the nursery was replaced and it was doing well by the time this study was done.

(b) Environmental education lessons.

Mr. Tsofa prepares the environmental education lessons. The content includes conservation of flora and fauna in their surrounding environment.

He uses simple terms and elaborations to ensure that the message is sent home.

His major point of departure is in conservation of indigenous trees such as Mbambakofi *Murihi* and *Muhuhu*.

He also gives similar consideration to animal life and birds such as, African fish eagle found in Mida Creek Mangrove forest and adder duiker (paa nungu) among others.

In such lessons the students are supposed to identify the trees/birds in their mother tongue, give their importance, threats facing them, and how best they can be conserved.

In administration of environmental education, students are able to learn about connection between their future and conservation of the Arabuko sokoke forest.

For example; Cleopphas Sulubu 15 years old and a student in Mijombini after learning the importance of the Forest commented that.

“When I was young I used to poach small birds by trapping and shooting them. We used take animals for grazing. At grazing site we just gave the animals to the younger kids and we converged inside the forest to poach some animals”⁶

Cleopphas confess that he even ate the rare Golden Rumped Elephant. After learning such importance the students also impact environmental education to their family members and villagers.

George Yaa from the same school adds.

"In those days, my parents used to burn charcoal for fuel. They used to cut down the big hard wood trees". After learning from Mr. Tsofa, and then he passed that message to them explaining the importance of forest conservation. Asked what his family use now. *He says dead wood and fallen branch⁷,* which is what A Rocha staff group found when they made a surprise to visit to his home after the interview.

Ruwa Jeremiah a student at the same school says that after learning the importance of forest conservation, he told his parents to plant more trees. His parents went to the forest station to buy seedlings and helped to plant the seedlings.

(c) Environmental games, videos and slides.

The A Rocha staff prepares videos and slides shows and documentaries on endangered species and environmental degraded areas. For example, areas in the forest where trees have been poached. In such a situation the students watch the documentaries and engage on a discussion on how best such ecosystem can be conserved. After the discussion the students go ahead to watch a slide on conservation measures that have been taken on the area. They compare the slide show with the outcome of their discussion.

Students are also engaged in animal images jigsaw puzzle. They are expected to fix the puzzle, identify the animal in English, Kiswahili and their mother tongue. After that they identify the ecosystem where it can be found, how it is threatened and how it can be conserved.

Students also play the game of the endangered species, which is not only educative, but also very interactive. In this game some students assumes the position of threatened animals and plants. Other students take the position of poachers and trappers while the third group takes the role of the wildlife Club members. The endangered species especially animals tries to access resources in their ecosystem. However, the poachers and trappers intercept them on the way and try to cut them down, trap or kill them. The wildlife members come in to assist them escape from the poachers and trappers.



Plate 11

Students playing the game of the endangered species. Note the blinded person represents the endangered species as they look for resources. Behind is the wildlife club members at the distance watching are the trappers and poachers

4.3 A Rocha Kenya in partnership with Church Based Organizations

A Rocha organization reaches out to the community through partnership with Church Based Organizations. One of this C.B.O is the Murihi Charcoal Eradication Project (MCEP) currently under the Fishers of Men Baptist Church –Mida. MCEP is one of the

early A Rocha Kenya projects although of today it operates independent of A Rocha but still in partnership with A Rocha.

The project was initiated by two staff of A Rocha Jonathan Baya and Nancy. This is after a big Murihi tree that Jonathan estimated to have been more than 80 years of age was brought down by one of the Church members, owner of the plot where the church stands, for the purpose of charcoal extraction.

The birth of this church based organization became an answered prayer to the members of the church living near the Mida Creek who had watched their environment get destroyed through over fishing, beach littering and deforestation of the Mida creek Mangrove forest. The main Challenge for Jonathan and Nancy was fighting the ignorance and getting the resources to start the project.

Since that was a church, Jonathan and Nancy discussed the matter with the Church pastor. They decided to start fighting ignorance concerning environmental issues on the pulpit and therefore Jonathan was given the chance to preach during the Sunday service on faith and environment. His sermon was divided into three parts namely: Biblical principles on environment, environmental degradation in Mida Creek area and lastly environmental conservation as part of Christian mission. This was later followed by more sermons on environment. To ensure the conservation work was continuing the members set aside Friday as a day of environmental sermons and conservation work.

In their analysis of the environment they attributed degradation to poverty (njaa ya pesa), clearing forest for settlement and farming and illegal logging in search of timber for construction and charcoal burning.

According to Mrs. Lydia Benson⁸ degradation of their environment had cost them a lot of problems. Firstly, the weather had become so unpredictable something that they later learned was as a result of global warming. The implication of global warming is that they could no longer receive rain in a regular and predictable pattern they had been accustomed to. This then resulted into famine and food insecurity. Secondly, those who practiced fishing had been hit by decline in number of fish in the ocean. Abdalla Mohammed from Malindi confirmed this, being a fisherman for over 20 years he had studied the trend and so far at times a whole night they would get just but a handful fish not enough for the market. Bearing in mind that fish is a popular meal in Coast and that horticulture and market gardening is seasonal, low supply of it only made food security worse in the area. It also resulted into hike of prices of which most families could not afford.

In addition, the beaches were so littered that relaxing on the beach was not as enjoyable as it has always been. Fuel was also of a significant challenge although even today it is still a thorn in the flesh given that the alternative technology developed by this group has not been able to bear fruits and become popular to the local community. After a series of motivation lessons on careful creation and other related environmental issues the group decided to undertake projects that would fight degradation at the same time provide means of earning a sustainable income.

4.3.2 Conservation work of MCEP

Murihi Charcoal Eradication Project mainly deals with the environmental issues affecting the community living in Mida Creek. They have also initiated different social economic projects that supplement over- reliance on the natural resources. Their main concern is addressing the issue of deforestation especially as a result of charcoal burning, beach littering and over fishing in Mida Creek. To do so they have come up with a number of projects such as alternative technology in making charcoal, environmental education, plastic bag weaving and afforestation project.

a) Alternative technology (Charcoal Briquette)

The main objective of this project was to come up with a supplement for the wood charcoal. The group discovered that the demand for charcoal was very high especially from the neighboring towns of Mombasa and Malindi. Charcoal was not only being used for domestic purposes but also fuel for the hotel industry.

The very first challenge for the group was to purchase the necessary equipment that included extruders, press and mcloy machines. Initially, they made briquettes from old newspapers. However, they were faced by setbacks as Jonathan narrates

*“The briquette we made from newspapers lacked market because they were too smoky and also newspapers was not something reliable. This prompted us to look for other better materials”*⁹

The other alternative they came up with was to use a mix of coconut husks, cow dung and charcoal dust. The briquettes made are then sold at one shilling to two shillings per piece.

Challenges to Charcoal briquette

The very first thing the researcher observed is that this group was making the briquettes for sale only while they were still using firewood, paraffin and even charcoal that they were supposed to eradicate in the very first place. This brings back the issue of poverty and the need to introduce sustainable social economic projects for the people. This raises a lot of issues on the driving force and the environmental honesty of the members. That is are the members engaging in environmental conservation with the main aim of making money or for the desire of making their environment a better place?

The demand for charcoal is hard to eliminate since charcoal is cheap, easy to use and readily available as compared to cooking gas (LPG) paraffin and other petroleum products. This implies that instead of striving to eradicate the use of charcoal it is better to design ways of burning charcoal in a more environmental friendly manner such as the methods used by Telecom and Kenya Power in getting poles for the wiring network.

The process of making the briquette is time consuming and need a lot of manpower. The group only meets on Friday afternoon and at many times only women involved in weaving came up. On other Fridays, the women agree to do weaving from their houses hence not meeting at all. To make the briquette it involves a process of oxidizing the materials where the members have designed a method of burying the coconut husks for a week. This means that to make enough bricks for sale so as to guarantee impact in environmental conservation and provide some income for the group a lot of time need to be dedicated. At the time of this study the group was not making any charcoal briquettes.

The implication of this trend is that, the group only makes little briquette that has little impact on salvaging the environment or earning a living for the group. However, if the project is well coordinated it could make a mile in salvaging their environment.

The other challenge is the mode of marketing their products. According to Jonathan they had only managed to sell their briquette to Turtle bay beach club. It could be easier for them to reach out Turtle bay given that the beach hotel has always supported A Rocha conservation work. This implies that the organization has not been able to market the products as opposed to lack of market. In order for them to make market entry they need to do some promotion of the product within the neighboring towns and also carry out exhibitions of the products. Some times back on KBC TV they carried out a documentary of a women group in Kisumu who were making Charcoal briquettes from soft mud and charcoal dust. According to the neighboring community this kind of briquette was good as it burned for long and was cheaper. This means for the Murihi Charcoal eradication product they need to tailor briquettes that are cheaper and have longer burning period than ordinary charcoal for them to beat the market.

b) Fireless cookers (basket hot pots)

This is classified as an alternative technology as the baskets allow one to use little fuel while cooking. This technology involves using insulated baskets that have lids. The idea is to half cook food especially foodstuffs that need to be boiled like grains. After boiling for some few minutes normally half the time needed for cooking the food is placed in the basket. The warmth of the boiling water then slowly cooks the food. The baskets are

made by stuffing poor conductor of heat materials such as cotton wool and *sufi*. They are then well binded by clean cotton cloth.

This mode of technology unlike the charcoal briquette is more popular and easy to use. Currently, the fireless cookers are widely accepted in Kenya and leading supermarket such as Nakumatt and Tuskys stock them. This means that the future of fireless cookers is bright and the market is more defined for this product. However, one great challenge of this technology to the group is that none of the members was using the technology. The reasons attributed to this is some have their friends asked to buy them and hence they sold and never made others for themselves. This is quite disturbing as the members are supposed to be the mentors to the others in using this alternative technology.

c) Waste management and plastic bag weaving.

This group strives to manage waste plastic bags through weaving them into baskets, handbags and hats. The aim of this project is to manage the plastic bags littered on the beaches. They refer to the damped plastic bags as the official flower of Kenya. Catherine the chairlady of the group says that the plastic bags were causing a lot of environmental hazard as a time they would block sewage lines. Calling for veterinary services when animals such as goats and cows swallowed them was an added cost. Moreover, at times the Veterinary officer could not help, as the animals would die. In addition, they were making the beaches so dirty that they would not be able to freely relax on the beaches. The other problem was the fear of choking the fish breeding zones though this never got out of hand.

Women working in this project collect the waste plastic bags littered on the beaches, where they clean and trim them ready for weaving. Most of the materials they use are recycled materials. Instead of using steel needles, the women use chopsticks made from tender branches of trees. In addition, they buy thread, scissors and leather that are used for making the base of the bags and also as a top bidding. To ensure that their technology is dynamic, they try out different designs and at times they visit other C.B.Os to learn new and latest designs on the market.

Their main outlets for the finished products is through the gift shops at Turtle Beach Club and Mwamba field study office in Watamu. The group also sells the products on the basis of one on one to their neighbors. The finished goods are sold between Kshs 300 hundred shillings to five hundred Kenyan shillings. For every sale made 30 % is deposited with the group's account, which is used for the expansion of their environmental campaigns.

d) Adopt a tree.

This group advocates for planting of the trees especially the mangrove trees and indigenous trees with emphasis on three Coastal indigenous trees namely *Murihi*, *Muhuhu* and *Mbambakofi*. They have a group tree nursery at the church grounds that has specialized in the three mentioned indigenous hard wood trees. In addition, each member has laid a tree nursery in his or her homestead.

To ensure that the seedlings are doing well, the group has come up with a strategy of adopting a tree. This is whereby the tree seedlings transplanted are given human names to show how important they are to the owners. This is then followed by the various members of the family especially the children are made to adopt a number of the seedlings. The reason behind the adoption is to ensure individual attention and care is given to the seedlings. The person adopting a seedling ensures that he or she waters it on daily basis and that the plant is mulched and weeded regularly. In the evening as the family members sit for dinner every member is requested to inform the family if the trees were watered and the general condition of the seedlings.

On top of this the group organizes tree-planting activities and so far they have planted over 2000 mangrove trees in Mida Creek. They have also managed to visit 10 other small groups and have educated them on environmental issues.

In a nutshell this CBO is involved in environmental conservation through

- Waste management and recycling.
- A forestation and reforestation.
- Environmental education.
- Alternative technology and sustainable development.

The group members have acquired a lot of benefits from this group. Lydia Benson commenting on the benefits received says that: -

"We are happy that now our environment is being conserved and the marine ecosystem has improved since we partnered with KWS and we report any one fishing using

*undersized mesh nets. At the same time we have had an avenue to get trained on various arts and trades and as for me I can now stand before people and boldly share about environment something I could not do before*¹⁰.

4.4 Bird Ringing and Monitoring.

This was the driving force of A Rocha Kenya. The founder was concerned about the plight of numerous birds found in the area. Collins Jackson the director of A Rocha Kenya and the head of birding department says that there are numerous birds in the area due to the diversity habitats such as the scrub and dry coastal forests, creeks, beaches reefs and even open sea. He has noted that particularly the East African Dry Coastal forest is a unique habitat of hence supporting birds that may not be found else where outside that East African Coast.

His interest in conservation of the two-forest ecosystem is out of realization that Watamu and Malindi are not only important for plain birding to people of that interest but the survival of the numerous birds depends upon the conservation of the area.

4.4.1 Bird ringing and monitoring and environmental conservation.

Collins Jackson and his wife Roni Jackson use bird ringing and monitoring as important tools in gauging environmental degradation and conservation activities within the Arabuko Sokoke and Mida Creek forests. For example decline in bird population ringed within a given period of time is suggestive of poaching or habited destruction. Bird ringing and monitoring helps in identifying the endangered birds and through a global networking they can determine globally or international threatened bird species.

Bird ringing and monitoring also aids in accessing the status of the habitat within which the birds are living. When a habitat is destroyed the bird behavior is to run away and look for viable place to hide. So when the number of ringed birds' decrease in a given habitat then the conservist are able to put mechanisms in place to detect degradation of the habitat and also put in place conservation measures.

4.4.2 Bird Ringing and Conservation of Arabuko Sokoke and Mida Creek forests.

In Kilifi and Malindi Districts there are five important bird areas, designated because of their international importance. These are Arabuko Sokoke forest, Mida Creek, Whale Island, Gede ruins, Sabaki River Mouth and the Dakatcha woodland.

Arabuko Sokoke is considered to be on of the most important forests for bird conservation on the mainland Africa. This forest is rich in rare endemic wildlife especially its fauna. This forest houses six globally threatened birds and three rare near-endemic mammals. Mida creek mangrove forest is rated as the most productive mangrove ecosystems in the world with seven out of nine of East African mangrove species found there. At least 65 species of aquatic birds are regularly recorded with individual population reaching up to 6000 birds¹¹. It is out of this biotic importance that the UNESCO graded these two ecosystems together with Watamu Marine Park to UNESCO biosphere reserve. Degradation of these two ecosystems threatens the diverse bird life and other fauna and flora housed in them. In the effort of A Rocha Kenya conserving the bird life it has meant conservation of the two habitats. Therefore, bird

ringing and monitoring has contributed to a great part conservation of Arabuko Sokoke and Mida Creek forests.

Bird ringing and monitoring department encourages training and re-sourcing Kenyan field workers. Collins Jackson involves the local communities in birding since by interpreting the data; sharing with them and involving them itself is a mile ahead in developing living behaviors geared at conserving the environment that they interact with on daily basis.

Bird ringing and monitoring also collect vital ornithological data about national biodiversity which is vital in the conservation of over 1,092 species of birds national wide¹². It is also important to researchers interested in ornithological studies and in search of understanding the bird population and their conservation status in Kenya.

Bird monitoring and ringing come in handy in prediction of climatic patterns. For example some birds are associated with rainfall while others are associated with dry spell. Lastly, it is essential in the discovery of bird species such as the Amani bird that was discovered not long ago.

Currently, a number of birds in this two ecosystems are endangered prompting to conservation works of the two ecosystems. The table below shows a list of endangered birds of Arabuko Sokoke and Mida Creek Mangrove Forests.

NUMBER	BIRD	CONSERVATION STATUS
1	Spotted Ground thrush	Globally Endangered
2	Sokoke Scops Owl	Globally Endangered
3	Clarke's Weaver	Globally Endangered.
4	East Coast Akalat	Globally Endangered.
5	Amani Sunbird	Globally Endangered
6	Sokoke Pitip	Globally Endangered.

Source. www.arocha.org

4.5 Challenges faced by A Rocha

Collins Jackson the director of A Rocha Kenya mentions the following challenges facing them.

- Lack of qualified and adequate human resource.

Collins says that the organization's human resource is in adequate. This makes them rely on volunteers. At the time of study the organizations had five volunteers. Crucial office such as caretaker and administrator were being run by Dave and Liz a couple from Canada who would be in the country for a period of not less than two years. The Organization was in dire need of a Fundraiser and an Administrator for ASSETS programme.

- Financial constraints

The organization was receiving very little funding that was not adequate for the demanding projects that the organization run. In connection to this

some of the donors interested in funding them were putting some conditions that the organization could not meet. Conditions that Collins summarizes as “interest in themselves rather than conservation”. A times the donors were giving out projects that they wanted to fund some of which could not be viable in that environment and also with the local community. For example some donors wanted to fund bee keeping since they were funding such projects in other areas such as Kitui and Machakos without considering climatic and cultural differences between Malindi and Kitui

- Transport problems

According to Collins and Roni Jackson transport for the organization was a thorn in the flesh. The organization by the time of study had two vehicles of which one could not be used on rough road. This hindered running of all the programs co- currently.

Together with above discussed challenges, the researcher noticed a challenge in community involvement and benefits – costs sharing.

- Community involvement and costs- benefits sharing.

One of the A Rocha five-core commitments in their work is community. This implies that in their commitment to God the organization involves the local community in their

conservation. This implies that the community ought to share in the costs of conservation and the benefits of the same work. The main challenge here is the methodology used in involving the community and also in bringing on board the community that need to be involved. In so doing, two methodologies can be employed. This is the top- down methodology and the down -top methodology

Top- Down methodology.

This methodology assumes that a given society has social stratification made of the upper class, middle and lower class .The upper and middle class form the cream of the society and at the same time they are few in number. The lower class has the majority of the population. The top classes who are also the intellectuals identify the problems in the society sit down and formulate the solutions upon which they impose on the community to adapt and effect the necessary changes. This means that the research of the problems and the implementation of the solutions move from top to bottom. This method is sympathetic to the community and assumes that the community is helpless therefore it needs Mosses to liberate them. The community assumes the role of the consumers (takers) and not “manufactures”. This is a good method for a community that wants to share benefits only and leave the costs involved out. There are not fully immersed in the work in question but play the game of convenience. They will only take what suits them and leave out the rest. However, a development conscious community will reject this method. The organization will describe this as resistance. However, the community will be rejecting the alien ideas upon which if they don't reject they will experience a feeling of alienation. In conclusion, of this method the ideas are imposed to the society rather than impacted or inbred.

Down- top methodology.

Likewise this method assumes social stratification of a given society. The top class is made of the few educated people while the lower class is made of the common masses. However, unlike the top- down method where the top class reaches out to the lower class with ideas, the upward method assumes that the majority in the society knows the problems affecting them. They also have solutions of their problem but reach out for the intellectuals to give them recommendations, suggestions and help them implement the solutions. In this case the larger society does not play the role of the inferior but become equal partners with the intellectuals. The solutions are not imported and imposed but are inbred and discussed. They are implemented at the reach of consensus. In this case the wider society feel part and parcel of the ideas or the project in question and therefore identify with it.¹³

In the situation, of A Rocha Kenya and the local community there has been a challenge in involving the community and in benefits- cost sharing. The community is delighted about the eco bursaries and the whole challenge of environmental conservation. However, their involvement in the running of the environmental issues is minimal and to some extent assumes the role of the third party. The representatives of the community only come into picture during the allocation of eco- bursaries. Out of four meetings organized the attendance was exclusively for the A Rocha staff despite the main agenda being conservation. Moreover, the ASSETS beneficiaries engage into conservation since it is the only way into securing the eco bursaries. They therefore, do what are the laid

standards without striving to take an extra mile towards conservation. Their view of conservation is therefore limited to the short-term benefits given to them. At times they fall short of the laid standards for example; it is a requirement that the applicants of the scholarships must have a well-maintained woodlot. The results are 61% of the interviewed beneficiaries did not have woodlot. At the same time only 46% had planted trees as individuals. The reason behind the 61% having not established a well-maintained woodlot is because the ASSETS Coordinator had not delivered seedlings to them. This brings us to the conclusion that they were planting trees because they have been told to do so. Two families out of the beneficiaries were still felling trees down for charcoal extraction attributing it to lack of means of survival. While it would be easier to condemn them, this act reveals the strain between costs and benefits sharing. It also brings out the issue of addressing the main cause of deforestation- poverty.

4.6 Environmental Ethics As Portrayed By A Rocha Group

Environmental ethics refers to the moral authority and responsibility human beings have towards their environment. The genesis of environmental ethics in Christianity is in the Biblical creation story. In a nut shell, the story tries to answer the following questions.

- Who created the earth?
- Who did God command to rule over the earth?
- Is God concerned over his creation?
- Why are there environmental problems?

The creation story asserts that God is the creator universe and everything in it. This implies that God values, loves and cares for His creation and the creation has integrity. In

addition, it demonstrates that God's creative work continues every day. Lastly, it affirms that human beings are created in the image of God and were given the role of the faithful stewards.

A Rocha Kenya believes that Environmental ethics is a vital component of Christianity since; the Bible commands the conservation of God's creation. They hold that Christianity as a religion has the moral responsibility in Conservation given that human beings are made in the image of God and hence rightly related to both the creator and the creation. This is because God in the book of Genesis and through out the history is understood as an ecological God who has been venerated as living in all processes that make life. In addition, He has bestowed humanity with the responsibility to be faithful steward of His creation.

A Rocha in their conservation work demonstrates the need for dialogue between religion and science. They seek to re-find the Biblical awareness of the interconnectedness of all life that the Church has lost. A Rocha Kenya in the line with the creation story found in the Bible demonstrates that: -

(a) Creation has integrity

Creation has integrity as it gives humanity the understanding of who God is. Since the creation is orderly, then the creator is perceived as an orderly God. Furthermore, creation upholds the truthfulness of God. So that Christians are convinced that the God revealed in scripture and Human flesh is the same God revealed in nature. A Rocha work of conservation is based on an understanding of the integrity of the creation. Pollution or any form of environmental degradation disrupts the order of creation and at the same time it goes against the theological viewpoint that negates the importance of faithful

stewardship. In addition, environmental degradation gives a limited understanding of the nature of God.

(b) Immanence of Gods creative activity.

God's creative activity was not just a one time historical event but also a reality that continues even today. Gods creative work is today seen through the systems that God has put into place in the universe that give life to new organisms everyday. The ability of God to sustain his creation today depicts Gods ongoing work of creation. The mystery of God's works of sustainance and care for his creation is highlighted in the book of job.

"Can you hunt the prey for the lion, or satisfy the appetite fo the young lions, when they crouch in their dens or lie in wait in their thicket? Who provides for the raven its prey, when its young ones cry to God for help, and wander about for lack of food? Do you know when the mountain goats give birth? Do you observe the calving of the does?"¹⁴

God is so great that He provides food for the animals & watches over their young. This life should be respected and treated as sacred. In this respect A Rocha demonstrates the love and respect of God's creation through preservation of Arabuko Sokoke and Mida Creek forests. However God has given humanity Freedom to participate in the accomplishment of his will while he remains providently in control and the sole source of power for his creative work. In respect to this Christians as faithful stewards should responsibly take up the role of God's co- creators as opposed to destroyers. God's work of sustaining his creation should teach Christians to take care of His creation.

(c) Enormity of God's creation.

God's power is manifested by the enormity of His creation. The universe is soon enormous that Human beings are just but a small section of it. The enormity of God's creation depicts the power of God. God's creative work demonstrates the love God has creation. He looks at his creation and declares that it is good. It is therefore the duty of Humanity to preserve God's creation. Preservation of creation by the A Rocha seeks to preserve the glory of Gods creation. Conserved environment depicts the strong bond that God has established with his creations. Under this relationship God does not manifest himself as an absent hysterical power that is emotionless or merciless rather, He manifests himself as caring and loving towards his creation¹⁵. A Rocha believes that God watches over his creation and follows them through out the history. He also suffers because of the irresponsible behavior humanity have towards his creation. The greatness of God seen in His creation should only humble humanity and makes them realize that their position in the universe is to take care of the creation.

4.7 Conclusion

A Rocha together with Christians in Kilifi and Malindi Districts have embraced environmental conservation as a contemporary form of Christian Mission. According to Collins Jackson, the Mission to the environment is not a new idea¹⁶. However the churches and Christian organizations have for so long ignored environmental issues.

A Rocha has demonstrated to Christians in Coast Province that human beings have a moral responsibility towards nature. God being an orderly being and having created an orderly Universe does not love to see his creation destroyed.

Nature should be conserved as God rejoices in his creation and His creation gives him glory and proclaims His hard work. In addition, it demonstrates the incomparable wisdom and the power of God. This implies that God takes pleasure in His creation and expects respect and care of His creation from the human beings.

To accomplish this moral responsibility A Rocha Kenya has come up with a number of projects geared at conservation of Arabuko Sokoke and Mida Creek forests. This includes ASSETTS, environmental education to students in schools, environmental education to churches and Church leaders and partnering with other church based organizations that are in Environmental conservation mission and finally through scientific research in bird ringing and monitoring.

In so doing, A Rocha and Christians in Malindi and Kilifi Districts have paved a way for churches in Coast Province to carry out environmental conservation activities. The work that started with a few Christian in Watamu has spread to more than 15 local churches. Currently, environmental conservation has formed part and parcel of the Sunday sermons in these churches. This demonstrates that A Rocha Christian group has effectively managed to spearhead conservation in Arabuko Sokoke and Mida Creek. This group stands as an example that Christians too have a moral obligation towards their environment. Their work of conservation stands as a motivation to other Christians in Coast province and also in Kenya.

Notes

¹ Suchoff,(2006),Environmental endeavors of Coast Province, www.focusathro.org

²UNEP,(1998),east African Atlas of Coast Resources ,UNEP, Nairobi pg 2

³www.assets.org

⁴ Interview with Stanley Baya at Mwamba in Watamu on 26th Feb 2006

⁵ Insights from Prof J.N.K Mugambi on 28th November 2006 at Ufungamano House.

⁶ A Rocha News. Making the connection in poverty and conservation issue, Indigo publications UK pg3.

⁷ Ibid pg 3

⁸ Interview with Lydia Benson on January 10th 2006 in Fishers of Men Baptist Church Turtle Bay.

⁹ Interview with Jonathan Baya Fishers of men Baptist Church Turtle Bay.

¹⁰ Interview with Lydia benson 12th January at Turtle Bay.

¹¹ A Rocha (2006) Birding Watamu and Malindi North Kenyan Coast. Pg 10.
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¹² Ibid pg 11

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¹⁴ E.B. Calvin, Prospects for growth: A Biblical view of population, resources and future, Westchester Cross way Books.

¹⁵ R. Bouline, Christian Environmentalism, Probe Ministries, www.leadedu.com.

¹⁶ Interview with Collins Jackson at Mwamba Field Study Centre in Watamu on 28th Feb 2006 at 10am.

5.0 CHAPTER FIVE.

5.1 SUMMARY AND CONCLUSION.

This study aimed at realizing the role played by A Rocha group and Christians in Malindi and Kilifi Districts in conservation of Arabuko sokoke forest and Mida Creek Mangrove forest. In addition, the study sought to understand the contributions of the organization towards educating and creating awareness on environmental challenges facing the area of study among the local community. Finally, it also sought at illuminating on steps the organization has taken to provide sustainable development that will bring to a stop cheap livelihoods that contribute to degradation of Arabuko Sokoke forest and Mida Creek Mangrove forest.

A Rocha Christians in conservation in a nut shell has come to a place where poverty levels are very high, the soils in the area are depleted and above all where there have been serious land ownership and squatters crisis that have persisted for long threatening to completely wipe out the to important forest resources such as Arabuko Sokoke forest and Mida Creek forest.

In addition, the organization has established itself during the times where the Kenyan church is large and influential on social, political and economic issues but limited when it comes to environmental issues and the stewardship over God's creation. In order to address the issue of degradation A Rocha Kenya has used four major programmes namely ASSETS, Environmental Education, Partnership with CBOs and other Environmental Conservation groups and Bird Ringing and Monitoring. (Scientific

research) An organization that started as a trust for conservation of birds along Malindi Watamu Coastal strip has today recorded numerous growths and a lot of acceptance from the Kenyan Church and the communities living in Kilifi and Malindi Districts. The organization has been able to extend its services to incorporate community conservation of the Arabuko Sokoke and Mida Creek Mangrove forest.

The Murihi Charcoal Eradication group view A Rocha as a God sent angel and a prayer answered given that the church in this area previously wasn't in a position to make the connection between Christian Mission and Environmental Conservation or Careful Creation. Therefore, the organization has been an eye opener to the Christian organizations involved in social work in the area of study.

A Rocha involvement in environmental conservation is rooted deep in the Biblical teaching that the Universe and all that is in it belongs to God and Man is just but a small fraction of the creation, which has been adorned with power authority and intelligence to watch over God's creation. Not to be a master of the creation but to be faithful stewards. Therefore, human beings should demonstrate their love to God through taking care of His creation. They should also be a source of hope and justice to the ailing world. This is why A Rocha recognizes that the poor community will always suffer at degradation of the resources since they directly depend upon those resources. Suffering leads to despair and Christians should offer hope A Rocha offer this hope by conserving the environment where the poor have been condemned to live in.

A part from active conservation of threatened habitats and life in Malindi and Kilifi Districts, A Rocha working within this environment, has demonstrated this love for God and his creation through providing sustainable social economic development projects and emphasis on education as a means of fighting degradation in the area of the study. These projects include: -

a) Eco bursaries programme. This organization asserts that education is a major player in fighting poverty and ignorance. Eco bursaries offers double benefits first a short-term benefit in that it helps the local communities ease over-reliance on the natural resources in providing school fees. It is also a long-term solution since education offers work opportunities to the people hence substituting total dependency upon the natural resources within their reach.

b) Creation of employment. First, to the local people who have joined A Rocha Kenya as staff members. Secondly, to a number of youths trained by the organization as freelance tour guides. Upon completion of the training, which is free of charge, these youths station themselves within the tourist attraction sites such as Mida Creek, Arabuko Sokoke forest and along the Coastal beaches. Lastly, is to the small Church based organizations such as M.C.E.P through adorning them with various trade and skills such as plastic bag weaving and second promoting their products locally and abroad.

c) Offering training. The organization has offered training to a number of individuals and groups. Some of the groups that have benefited from organized training on careful

creation include pastors from Watamu where by 15 pastors have attended two workshops on careful creation integrated with bird ringing. The pastors got an opportunity to release birds they had participated in ringing. In so doing they were able to identify local birds and also migrating birds and their importance in maintenance of ecological balance. The pastors were expected to share the message they had acquired with their congregations. The researcher confirmed this by visiting four churches within the area namely, Mijombini GRC church, Fishers of men Baptist Church, Timboni PEFA church and Watamu Worship Center.

In addition, A Rocha is currently having a programme for Training of Teachers (TOT), which aims at training primary school and secondary teachers to incorporate environmental education in their normal teaching syllabus since environmental management has not been included in primary school syllabus.

Moreover, the organization ensures that the local and foreign tourists visiting Arabuko Sokoke and Mida Creek forests have an in-depth view of the sites by providing facilities such as hanging mangrove walk, constructing nature trails and bird hide. The high school and primary school students have benefited through environmental education. Therefore, being equipped not only with the understanding of their environment better but also with good skills to protect and conserve their environment.

As a result of this benefits to the community and the major role the organization has played in the preservation and conservation of Arabuko Sokoke, Mida Creek and the fauna especially the birds, this organization stands as a model to other Church based

organization on how Christians can get involved in co creation with God and also in conserving and taking care of God's creation.

The organization afforestation and reforestation campaign is done through integrating it to three out of four major approaches to the conservation of Mida creek and Arabuko Sokoke forest.

Firstly, ASSETS where the beneficiaries of this programme has concentrated their tree planting campaign on but not limited to Mida Creek Mangrove forest. Up to date the beneficiaries has planted mangrove tree totaling to over 5,000. At the same time A Rocha has made it a requirement to every ASSET beneficiary to establish a well maintained woodlot .The organization gives 25 seedlings to the beneficiaries to set up the woodlot. The study revealed that 39 % of the ASSETS beneficiaries have a well-maintained woodlot while 46% have, as individuals got involved in the planting of trees in their homes and neighborhood.

Secondly, Tree planting campaigns has also been enhanced within the primary and secondary schools through the environmental Education programme. The environmental educator assists Wildlife Club members to set up tree nurseries. The seedlings are then planted within the school but every member is given 20 seedlings to plant at home. Five schools have had successful tree nurseries and have managed to plant trees in the schools. This are Mida creek primary school where beautiful casuarinas trees portrays the efforts of the students, Mangudho where at the time of the study the tree nursery had been set up and was doing very well, Roka, Gede primary and Mizizima School.

Lastly, tree-planting campaign is enhanced through partnering with church based organizations and churches within the area. The MCEP a church based organization through the assistance of Jonathan Baya one of the A Rocha staff has so far assisted the organization in planting of over 2000 Mangrove trees in Mida Creek and over 1000 indigenous trees in their homes.

In addition, A Rocha has interacted and trained 15 pastors within the area on careful creation and need for aforestation and reforestation. This has been followed by churches setting up tree nurseries a good example being Fishers of Men Baptist Church that has set up a tree nursery made up of three threatened indigenous trees.

This study proved positive the working hypothesis, that the destruction of Mida Creek Mangrove forest and the Arabuko Sokoke forest was a result of need for timber for both commercial and domestic purposes and poverty is both a cause and effect of environmental degradation in the area of study.

Poverty levels in the area of study are very high where 57.6%¹ of the total population lives below the poverty line. Due to this poverty, they over harvest the natural resources surrounding them. Over harvesting of tree resources in this area has led to lack of rainfall between year 2000 and 2006. This in turn crippled the subsistence farming in this area leading to food insecurity and poverty. This, therefore, implies that environmental

sustainability can only be guaranteed if the poverty levels are pushed down and the poor who directly depend upon these resources get involved in more sustainable livelihoods.

This organization in its endeavor to salvage Arabuko Sokoke and Mida Creek forests has not gone without challenges and it is on the background of this challenges the researcher wish offers suggestions and recommendations.

a) For better environmental conservation results and building of sustainable livelihood the study recommends the organization to increase its interactions with the Community Based Organizations rather than individual ASSETS beneficiaries. These community-based groups should then be exposed to a lot of training and interaction with other community organizations involved in conservation.

In this regard, the study recommends A Rocha Kenya to touch base with successful CBO such as Kayole Environment Management Foundation Association (KEMA). This foundation offers training for CBOs on waste management and sustainable development. For example the organization has trained 3,000 Kenyans, 1000 Tanzanians and 500³ Ugandans on making roofing tiles from plastic waste. The tiles made are more durable and since they are made out of poor conductor materials may fetch market in coast province or even be integrated with the traditional Makuti roofing. This will be geared at providing sustainable development and ease a lot of reliance to the natural resources.

b) The organization should also step up their campaign on planting of trees. So far they do not have clear polices on tree planting apart from the requirement of ASSETS

beneficiaries to have a well maintained woodlot which has become unwritten policy of 25 seedlings. A part from planting of mangrove trees where by the organization has done so well. (Having planted more than 5000 individual trees) the organization should try to meet the demand for tree based building materials by encouraging the community to plant various species of tree for various needs. e.g.

- Indigenous trees for beauty and cultural value. Since these trees take a lot of years to mature they should not be relied upon for timber.
- First maturing trees such as casuarinas for timber and construction purposes. Casuarina trees mature within 5 years and do well in Coast Province. The aim of these trees is to divert reliance on endangered mangrove trees.
- Neem tree grow almost naturally and it is equally good for carving. Therefore' the organization should encourage the carving industry to switch to neem trees while encouraging farming of the same by the local community especially where the soils are a bit poor.
- Giant mango tree branches for charcoal. Rather than trying to fight charcoal burning the organization may pursued the community to extract charcoal from farmed tress such as the giant mango trees and encourage planting of trees for the same purpose.

c) They should also dwell on environment conservation activities that integrate food security and fight for poverty. This is by ensuring that the local farmers are articulated in order not only produce food alone but have self sufficient stock for timber and wood. In the lime light of that, the organization should in future team up with farm forestry field

schools such as the programme run by Intensified Social Forestry Project (ISFP) and Japan International Center for Agro forestry (JICA).

The local community should also be encouraged to venture into fruit market given that the surrounding area of Arabuko Sokoke is known for quality Mango and Paw paw production.

5.2 Recommendations.

In conclusion, the researcher has observed that as Coastal population in Africa continue to grow and pressures on the environment from land based and human activities increase, Coastal and marine resources and their habitats are being lost or damaged in ways that are diminishing the biodiversity.

This in turn will contribute to unpredictable weather patterns, food insecurity, loss of cultural and religious heritage and extinction of flora and fauna. The ultimate end result is absolute poverty to a community that is already lavishing in this kind of poverty. Careful creation should therefore be applied in securing life for humanity and also for the other components of nature. This is why this study and other related to this should be expanded or extended. In respect to this, the study wishes to make recommendations on further study on the below listed area that could not be covered due to limitation of time: -

- Future scholars to examine the contributions of A Rocha Christian in conservation in conservation of Sabaki River Mouth, which is an important eco region for bird life, which the researcher was not able to cover as a result of time factor.
- A Rocha contribution in ornithology studies through bird ringing and monitoring in Watamu.

- A detailed study of Murihi Charcoal Eradication Project that was started by A Rocha Kenya but today it operates independently of A Rocha

Notes.

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APPENDICES.

Appendix 1

List of Informants.

Informants from A Rocha Kenya

Name	Position	Sex	Education
Collins Jackson	Director	Male	University
Roni Jackson	Program Manager	Female	University
Stanley Baya	ASSETS Coordinator	Male	Diploma
Tsofa Mweni	Environmental Educator	Male	University
Jonathan Baya	Community Officer	Male	O- Level
Elizabeth David	Hospitality	Female	Graduate
David Lessman	Visitor	Male	Graduate

ASSETS beneficiaries

Name	Place	Sex	Class	School
Caro Mumbi	Mijomboni	Female	Form 4	Ngala
Magret Safari	Mijomboni	Female	Form 4	Ngala
Emma Mwenyi	Mijomboni	Female	Form 2	Ngala
Cecilia Marandu	Mida	Female	Form 2	Ngala
Rose M. Karisa	Mijomboni	Female	Form 3	Ngala
Rita Changwawa	Mijomboni	Female	Form 2	Ngala
Harleat Karani	Mijomboni	Female	Form 4	Ngala
Thoya Baya	Mijomboni	Male	Form 4	Gede
Zai Charo	Mida	Male	Form 4	Gede
Karani Justus	Mijomboni	Male	Form 4	Gede
Thoya Peter	Mijomboni	Male	Form 3	Gede

Name	Place	Sex	Class	School
Mohd Shauri	Mida	Male	Form 4	Gede
Aisha Mohd	Mida	Female	Form 2	Gede

ASSETS parents.

Name	Sex	Religion	Place	Education	Marital status	Age Bracket
Bi Mraba	Male	Christian	Mida Creek	Other	Married	40-59
Shauri Tungo	Male	Tradationalist	Mijomboni	Other	Married	40-59
Thoya Nyundo	Male	Traditionalist	Mida	Other	Married	40-59
Mary Munyule	Female	Christian	Girimacha	O-level	Widowed	21-39
Bobo Wanje	Male	Christian	Boga	Other	Married	40-59
Chengo Masha	Male	Christian	Boga	Other	Married	40-59

Murihi Charcoal Eradication Programme Members.

Name	Sex	Position
Jonathan Baya	Male	Chairperson
Lydia Benson	Female	Secretary
Erastus Mlewa	Male	Member
Ayub Manene	Male	Member
Florence Nyabuto	Female	Treasury
Priscilla Nzaro	Female	Member
James Ziro	Male	Member

Name	Sex	Position
Mary Changawa	Female	Member
Betty Kalama	Male	Member
Loise Mulewa	Female	Member
Harrison Baya	Male	Member

Pastors.

Name	Church	Position
Erastus Nga'nga	Watamu Worship Center	Senior Pastor
Lawrence Nyabuto	Fishers Of Men Baptist Church	Senior Pastor
Joseph Mwanzia	Watamu Worship Center	Youth Pastor
John Mwarabu	PEFA- Dabaso	Assistant Pastor (ag)

Appendix ii

Sample respondents' questionnaire to be filled by ASSETS beneficiaries' parents and guardians.

PERSONAL INFORMATION.

Name-----

Marital Status-----

Age bracket (tick where applicable)

Below 30 () 30-49 () 50- 69 () 70-89 () Others specify

Education level

Primary () Secondary () College () University () Other (specify)

Occupation-----

Gender Female() Male()

Religion -----Denomination (If any)-----

Environmental related Question.

1. In your own understanding describe what is environmental degradation.

2a) Looking at Malindi and Kilifi Districts would you consider them to be environmentally degraded? Yes () No ()

2b) If your answer above is yes list down indications that suggest the environment is degraded. -----

3. In your own understanding what is the cause of environmental destruction in these areas?

4. In your own opinion give reasons as to why people in Malindi and Kilifi Districts cut down trees?

5a) Is there any observable damage or negative effects that has been caused by illegal cutting down of trees in Arabuko Sokoke and Mida Creek forests?

Yes () No ()

5b) If your answer above is **Yes** list down some of observable damage.

6. Suggest ways in which the damage effect you have mentioned above can be prevented or reversed. -----

7a) Do you consider charcoal burning as a means of environmental destruction to the Arabuko Sokoke and Mida Creek mangrove forest?

Yes I do. () No I don't. ().

7b) If your answer above is yes suggest possible alternative ways of earning income rather than charcoal burning.

8. As a member of ASSETS programme mention some of the benefits you have received from this project.

9. Mention some environmental conservation activities you have undertaken in the last 12 months as an ASSET member.

10) Apart from ASSETS mention other projects within A Rocha Kenya that contributes to Environmental Conservation.

11.a) Are you a member of any other conservation group?

Yes () No ().

11.b) If yes above, mention the name of the group and how you got introduced to the group.

Appendix iii

Sample interview scheduled for A Rocha staff.

1. Give a brief history of A Rocha.
2. What is the driving force of A Rocha and how is it different with other secular organizations involved in Environmental Conservation?
3. What are your core values and what is the place of environmental conservation within Christianity beliefs.?
4. Give reasons as to why A Rocha Kenya decided to conserve Arabuko Sokoke and Mida Creek ecosystems and not any other ecosystem.
5. What are the major contributors of degradation of Arabuko Sokoke and Mida Creek?
6. Peter Harris in his book under the bright winds describes you as working in a place where the Church is large and influential but the Christian understanding of creation is very limited. How are you addressing this issue in the local churches?
7. How does birding in Watamu and Malindi add up to environmental conservation of the two ecosystems?
8. Give some of the challenges A Rocha has encountered in its mission to salvage Arabuko Sokoke and Mida Creek
9. What is the future of conservation in A rabuko Sokoke and Mida Creek.

APPENDIX IV. Photographs



Photo 1 .An aerial view of the Arabuko Sokoke Forest . Note the Mida Creek Mangrove forest at the background. Source Judy O.

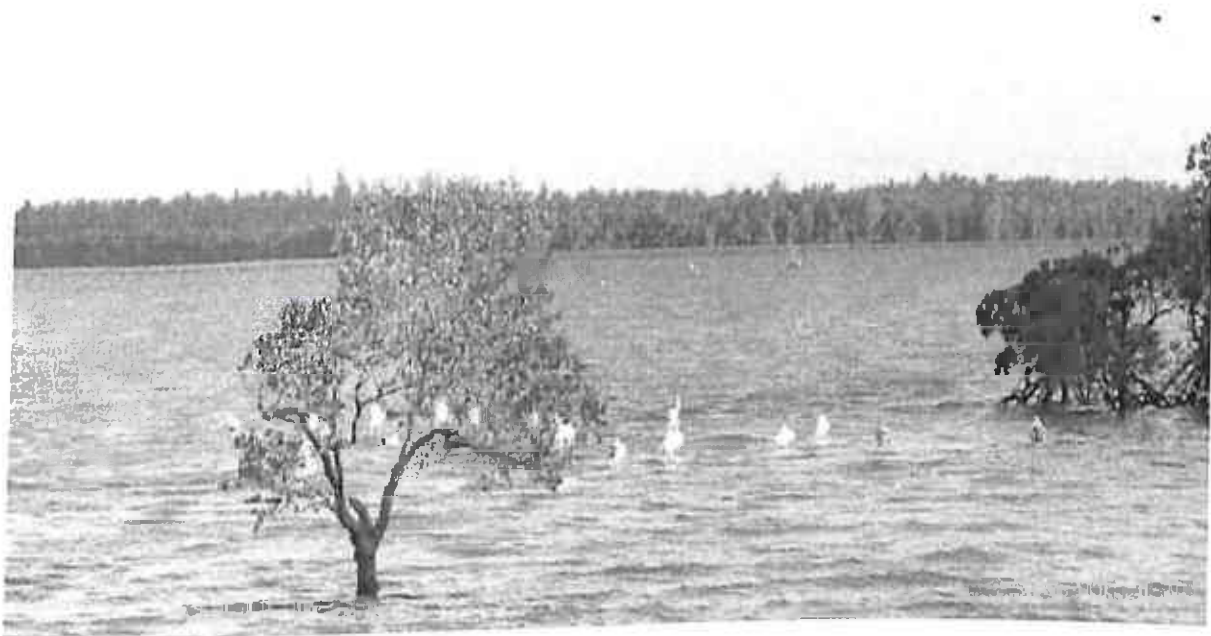


Photo 2. Mida Creek tidal inlet showing Mida Creek Mangrove forest. It a stop over and breeding zone for migrating birds.



Photo 3. Mwamba Field Study center a community office for A Rocha Kenya situated at Watamu near Watamu Marine Park. Source Assets Website.

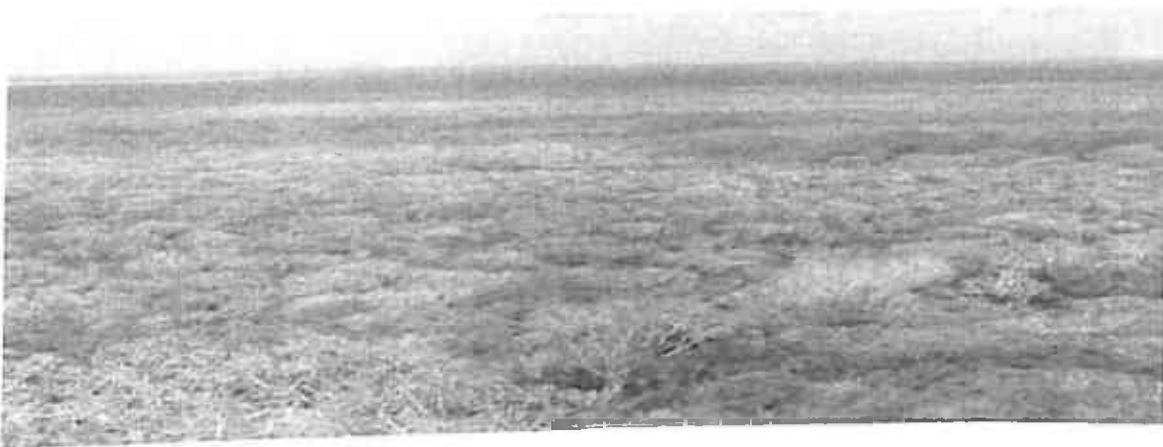


Photo 4 Arabuko Sokoke Forest during the dry season. Source A Rocha Website



Photo 5. School pupils participating in environmental education. Note they are imitating how birds fly. Source www.assets.org



Photo 6 The researcher participating in environmental education class in Girimacha primary school. Source Researcher.



Photo 7. Researcher and Jennifer Roberts playing the game of the endangered species. Source: Researcher.

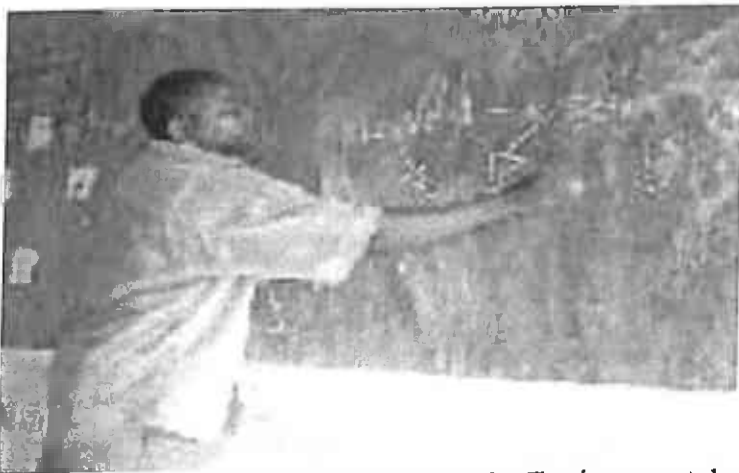


Photo 8 Mr Tsofa Mweni the A Rocha Environmental educationist in a environmental education class in Boga Primary school. Source Researcher.