THE EFFECTS OF CULTURAL PRACTICES AND PERSPECTIVES ON SUSTAINABLE COMMUNITY BASED ECOSYSTEM MANAGEMENT IN LAKE BARINGO, KENYA

By

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A Thesis Report Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Environmental Studies (Community Development) in the School of Environmental Studies of Kenyatta University.

MAY, 2017
DECLARATION

Student’s Declaration
I declare that this thesis report is my original work and has not been presented for any other award in any university or academic institution

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Supervisors’ Declaration
We confirm that the work reported in this thesis report was conducted by the candidate and submitted with our approval as the University Supervisors

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DEDICATION

I dedicate this work to my supportive family including my husband and my dear children Abigael and Bernice as well as friends who have continually offered me invaluable support particularly in preparation of this research thesis. Their persistent encouragement and support helped me to compile this project report. Thanks to all of you for your moral encouragement and support during the entire period of my studies.
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LIST OF ACRONYMS AND ABBREVIATIONS

BMU Beach Management Unit
FAO Food and Agricultural Organizations
HH Household Head
KII Key Informant Interviews
KNBS Kenya National Bureau of Statistics
MEA Millennium Ecosystem Assessment
MENR Ministry of Environment and Natural Resources
SPSS Statistical Package for Social Sciences
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ABSTRACT

Environmental degradation has been a common phenomenon in various ecosystems in various parts of the world. This is a result of an interaction of multifaceted nexus of social-economic, technological and institutional factors which are either natural or human induced. In East Africa and Kenya in particular degradation of ecosystems is common as characterized by occurrences such as sedimentation in lakes. Lake Baringo in Kenya is one such ecosystem that is currently threatened by degradation needs innovative measures to be conserved. A study by Odada and others (2004) identified socio-cultural factors such as cultural beliefs as key contributors to degradation of this ecosystem. Given this scenario, this study’s general objective was to analyze how culture affects resource utilization and conservation by the ethnic groups living in Lake Baringo ecosystem. Specifically it aimed at evaluating the natural resource utilization and establishing the environmental conservation cultural practices and perspectives of the people to determine how they affect resource use and management of Lake Baringo ecosystem. The study sample involved 378 members from 3 ethnic groups namely Pokot, Njemps and Tugen who live in Lake Baringo ecosystem who were selected using simple random sampling procedure. The study utilized descriptive survey method where data was collected using semi structured questionnaires administered to household heads and face to face interviews with key informants including staff from the Ministry of Environment and Natural Resources. The data collected was analyzed using Statistical Package of Social Sciences (SPSS). Quantitative data was analyzed through descriptive analysis inform of percentages, frequencies and chi square test. Pearson-chi squared test was used to establish association between culture and environmental management. The study revealed that the livelihood systems for the 3 ethnic groups native in Lake Baringo ecosystem depend on the ecosystem. The study also revealed that the three ethnic groups believe in and practice environmental cultural practices, values and norms including but not limited to belief in God/supernatural beings, upholding plants of cultural value, attachment to livestock and practice of initiation. Chi squared test indicated that there exists a strong significant relationship between cultural aspects such as cultural values and norms and environmental management ($\chi^2=297$, df =2, P<0.001). The study concluded that culture is a fundamental determinant of environmental attitudes which influence environmental attitudes and values and behavior. The study recommends that policy makers utilize a culture-specific approach in designing environmental policies to develop culturally appropriate environmental laws, regulations and policies. This is to ensure that the rights, livelihoods, and culture of communities are considered in designing of environmental laws, policies and regulations and the communities are actively involved in design of policies for sustainable environmental conservation and management.
CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Environmental degradation has been a common phenomenon evident in every part of the globe. According to Etuonovbe (2009), environmental degradation is the deterioration of ecosystems as evidenced by diminution and pollution of resources such as soil, air, water, damage of habitats and extinction of wildlife. According to Vliegher (2003), environmental degradation is a multi-dimensional phenomenon dependent on several influencing factors. Vliegher (2003) further describes it as a resultant of a complex nexus of socio-economic, technological and institutional factors with the various factors that cause it being both natural or human related.

Environmental degradation is characterized by phenomena such as soil erosion, reduced vegetation cover, water shortages, air pollution and biodiversity loss (Duraiappah, 2006). It is also evidenced by extreme weather conditions and natural disasters including but not limited to droughts, floods and desertification (Duraiappah, 2006). Environmental degradation affects the quality and quantity of ecosystem goods and services that support human and animal life (Sarch & Birkett, 2003).

The impacts of environmental degradation are negative and affect human life in a variety of ways including outbreak of diseases associated with drought and floods; poverty due to loss of livelihoods; desertification; loss of plant genetic diversity and land alkalinitiation among others. In fact, environmental degradation in severe cases affects the right to human life as it is a threat to life (Duraiappah, 2006). This is because the environment provides the basic needs that support human life including food, shelter and even clothing. In addition the environment provides recreation goods and services such as clean air and shade (Sarch & Birkett, 2000). Thus, it is fundamental that humans ensure sustainable conservation and management of the environment to ensure their availability for other generations.
Various ecosystems including but not limited to water bodies such as lakes and rivers have been affected by degradation (Vliegher, 2003). Water is the most fundamental basic need for both humans and animals and is usually referred to as “life”. Degradation of water bodies is therefore a threat to life. Despite this, there is evidence of water degradation as characterized by pollution and scarcity of water characterized by draining of large quantities of untreated sewage, agricultural and industrial wastes into water bodies (Meena, et al., 2010).

Water degradation in lakes, river systems and coastal lines have several consequences on human life including health risks, high costs of providing safe water, economic constraints because industries are affected and threatened livelihoods due to declining fisheries (Duraiappah, 2006). In addition, water degradation has a devastating impact on food production and hence food security (Meena et al., 2010). “Water is life” as fresh, safe and sufficient water is fundamental to the existence of every living thing and thus there is need for sustainable conservation and management of natural water ecosystems (Meena et al., 2010).

Sarch & Birkett (2000) explain that degradation of lakes is common in Africa where various lakes such as Lake Chad basin and Toshka in Egypt are affected. This has been explicitly caused by human activities such as chemical contamination from agricultural lands and draining industrial wastes into the lakes and is characterized by increasing water temperatures and flooding (Sarch & Birkett, 2000). In East Africa, Lake degradation is also common. Lakes, such as Lake Victoria basin that covers Kenya, Tanzania, Uganda, Rwanda and Burundi are experiencing environmental problems such as sedimentation, declining fisheries, water quality deterioration among others (Olang & Kundu, 2011). This degradation has various consequences including increase in poverty levels, human diseases associated with water contamination among others.
Various categories of people including both genders are usually affected with women and children being the most vulnerable. Thus the protection of our lakes is important as water and fisheries play a major role in the livelihoods of the rural poor. According to Sarch and Birkett (2000), African governments have an uphill task of protecting the aquatic resources because there is evident decrease of fresh water fisheries. There is a universal acknowledgment all over the globe that the diversity of life entails both biodiversity and the human perspectives of the meaning of life which is generally referred to as cultural diversity (Berkes, 2001). According to Cocker and Mabey (2005), cultural knowledge is essential in management of nature as evidenced by unsustainable utilization and management of resources in most societies where there is cultural assimilation (Cocker & Mabey, 2005).

Lockwood (2009) recognizes the importance of mainstreaming culture of people and their traditions in the management of Lakes in Africa. This is because Africa is a residence to many ethnic groups; comprising more than 3000 people of different ethnicities as well as traditions and value systems. Although each society has different values systems, the values act as agents of cohesion which guide their behaviors and preferences (Falade et al., 2009). Values are present in every African society and in most cases religiously guide these value systems. According to Awoniyi (2015), most communities in Africa are inclined to a religion which makes it have a sense of belonging to God. This makes them to take care of the environment and their fellow persons. In essence the value systems in African communities regulate interpersonal relationships in the community and are united and are in harmony with one another and the environment (Awoniyi, 2015).

It is essential to point out that most African communities have a strong attachment to lakes and other water bodies (Lockwood, 2009). They attach cultural, religious and
spiritual importance to the waters in these bodies as some oceans, lakes and rivers serve as major repositories of natural and people’s history where ancient centres such as Fort Jesus are located at their shores (Falade, et al., 2009). Some people who uphold indigenous cultures believe that contamination of waters makes water gods irritated resulting in either drying of the rivers or flooding (Falade, et al., 2009). Besides, people who live around such lakes have adopted a particular lifestyle. For instance, their livelihoods are majorly dependent on the lakes through fishing and tourism activities (Falade, et al., 2009).

Environmental degradation is common in developing countries where majority of the population’s livelihoods depend on ecosystem services (Donohoe, 2003). In Kenya, most of the populations are small holder farmers and fishermen (Donohoe, 2003). These populations have increased resulting to unsustainable extraction and use of natural resources and hence environmental degradation affectingof natural resources including forests, land, water and atmosphere (Hassan et al., 2005). The importance of biodiversity cannot be emphasized as it is well revealed by its intrinsic value, use to humans and in maintenance of resilience of the natural environment (Geser et. al., 2009; Hassan et al., 2005). Ecosystem health is a critical precondition for good human health and sustainable livelihoods necessary for achieving sustainable development (Hassan et al., 2005; Geser et al., 2009).

Despite lakes providing a livelihood source for majority of rural people in Africa, they are severely faced by environmental degradation (Hassan et al., 2005; Lockwood, 2000). Lake Baringo ecosystem in Kenya is one such lake whose survival is seriously threatened by degradation despite being a source of livelihood to the community members in its ecosystem (Akivaga et al., 2010). It is faced by water quality degradation, sedimentation, land use changes and uncontrolled abstraction of water which impact negatively on its biodiversity (Ballot et al., 2003; Akivaga et al., 2010).
Several measures including laws and policies have been set up in an effort to sustainably use and conserve Lake Baringo (Ballot et al., 2003). The Fisheries Act Cap 378 of 1989 which illegalizes fishing of immature fish (GoK, 1989). The Beach Management Units also have regulations on types of fishing gear to be used (Berkes, 2004). However, these strategies and efforts have not resulted in substantial success in conserving this resource as evidenced by the continued degradation of Lake Baringo (Ballot et al., 2003).

Onyando and others (2005), state that there is need to come up with innovative and collaborative ways of conserving this lake. Culture is one element which may provide an essential avenue for intervention strategies as the communities living in Lake Baringo ecosystem have a rich pool of cultural practices and perspectives (Rappaport, 2000). This study examined the cultural practices and perspectives of three indigenous communities (Ichamus/Njemps, Pokots and Tugen) living in Lake Baringo ecosystem to identify the environmental conservation cultural practices and perspectives which can be enhanced to sustainably use and manage this ecosystem.

1.2 Problem Statement

Lake Baringo is currently faced by environmental degradation as revealed by various studies which is contributed by growth of both human and livestock populations coupled with deforestation in the upper catchment areas (Ballot et al., 2003; Britton et al., 2009; Akivaga et al., 2010). Studies by Britton and others (2009) indicate that there is severe degradation of lake Baringo as characterized by reduced by fish size and fish populations as well as decreased surface area and depth. The degradation of this lake has resulted to loss of livelihood for the fishermen and farmers who depend on this lake for food, water and as a source of income due to the frequent flooding occurrences of the lake and its ecosystem (Britton et al., 2009).
Various institutions in Baringo such as the Ministry of Fisheries, Non-Governmental Organizations, United Nations and Community Based Organizations such as Beach Management Units (BMUs) have in the past initiated various conservation and management interventions of Lake Baringo (Omwega & Norgbeys, 2004). Some of these interventions are land and water management techniques, substitute income generating ideas and capacity building of the communities living in the lake Baringo (Omwega & Norgbeys, 2004). However these initiatives have not yet yielded enough as degradation of the Lake is still taking place as revealed by recent occurrences such as flooding which displace communities living around the Lake (Akivaga et al., 2010).

The dominant ethnic groups (Tugen, Pokot and Ichamus) living in Lake Baringo ecosystem have a rich culture and though many scholars such as Odada, Onyando and Aloo (2004) acknowledge that customary practices play a role in biodiversity conservation of ecosystems. According to Odada and others (2004), socio-cultural factors including cultural practices, beliefs and perspectives and stratification of the communities in Lake Baringo, contribute to its degradation (Berkes, 2004; Berkes, 2008). Given this scenario, this study sought to assess how these cultural practices and perspectives affect resource use and management and evaluate how they can be exploited for sustainable ecosystem management in Lake Baringo.

1.3 Research Questions

1. What are the natural resource utilization practices of the communities living in Lake Baringo ecosystem?
2. What are the environmental conservation cultural practices and perspectives of the communities living in Lake Baringo ecosystem?
3. How do environmental conservation cultural practices and perspectives of the communities influence Lake Baringo ecosystem resource use and management?
1.4 Study Objectives

The general objective of the study was to examine how culture affects resource utilization and conservation by the communities surrounding Lake Baringo while the specific objectives were:

1. To evaluate the natural resource utilization practices of the communities living in lake Baringo ecosystem.
2. To establish the environmental conservation cultural practices and perspectives of the communities living in lake Baringo ecosystem.
3. To determine how the environmental conservation cultural practices and perspectives affect resource use and management of lake Baringo ecosystem.

1.5 Significance of the Study

Traditional cultural practices play a role in environmental conservation and management of various ecosystems (Odada et al., 2004). Although cultural factors have been identified by Odada and others (2004) to play a key role in conservation in Lake Baringo, no study on how they affect resource use and management and how cultural factors can be exploited for sustainable ecosystem management in Lake Baringo ecosystem has been done. This study seeks to fill this knowledge gap. Besides, lake Baringo is severely threatened by degradation and the results of this study will provide baseline data to policy makers on the cultural issues to consider when formulating environmental management regulations to conserve this Lake as well as other natural resources. The study will also offer useful insights on how culture can be utilized as an entry point for community environmental management programmes and the cultural aspects which should be promoted to sustainably use and conserve Lake Baringo ecosystem.
1.6 Conceptual Framework

A societies’ cultural background defines people’s perceptions and actions towards nature (Berkes & Folke, 2002). According to Rapport (2006), there exists a symbiotic association between social systems and eco-systems. This study asserts that ecosystem use and management is shaped by the cultural practices and perspectives of a community which determines environmental attitudes and behavior. This is further illustrated in Figure 2.1.

![Conceptual Framework Diagram]

**Figure 1.1: Conceptual framework: The association between culture and ecosystem management and conservation**
1.7 Definition of Significant Terms

*Cultural belief*
This is an opinion that reveals an individual’s specific knowledge and evaluation of an issue or subject according to a particular culture or society (Belfiore, 2012).

*Cultural norms*
These are informal understandings that control the behaviour of members of a society as the acceptable conduct of individuals (Lapinski & Rimal, 2005).

*Cultural perspectives*
These are the perceptions, values, meanings, altitudes, beliefs and ideas that underpin the culture of a society (Berkes, 2001).

*Cultural practices*
These refer to the demonstration of a culture of people particularly in regard to traditional and habitual patterns of social interactions, behaviors and activities undertaken by an ethnic group (Kiriro, 2011). They are manifested in forms such as religious and spiritual practices, dietary preferences and traditional ways of natural resource management (Milfont *et al.*, 2006)

*Cultural values*
These are guides of behaviour that entail the commonly upheld standards of what is acceptable or unacceptable, right or wrong in a society (Belfiore, 2012)

*Culture*
This refers to the ideas, beliefs, values, norms/customs that control the behaviour of the members of a specific community or society (Kakudidi, 2004)

*Ecosystem*
An ecosystem is a system of interconnected elements including living (biotic) and non-living (abiotic) components that interact with one another through nutrient cycle and energy flows (Steiner, 2002).

*Environmental attitude*
This refers to a person’s concern for the physical environment and surrounding (Heberlein, et al., 2012).

*Environmental behavior*

This is behavior that intentionally makes an effort to ensure that an individual’s actions reduce negative impact on both the natural and built environment (Heberlein, et al., 2012).

*The Beach Management Units*

These are community-based organizations that mobilize fishermen at a beach to work with government and other concerned stakeholders in managing fisheries.
CHAPTER TWO: LITERATURE REVIEW

2.1 Natural Resource Utilization in Communities

Resources are the backbone of every nation and community as they play two basic roles including the provision of basic materials for production of goods and services as well as environmental services such as water, air and soil (Rodgers, 2004). Natural resources exist in various forms such as extractive resources which require extraction including oil, gas and minerals and land resources (such as water, soil, and forests) which do not require extraction (United Nations, 2013). Sustainable utilization of resources refers to use of resources for social and economic benefits while maintaining biodiversity protection for use by future generations (Kellert et al., 2000).

Natural resources are used in different ways depending on the livelihood of the community living in an ecosystem. For example, the natural resources found in pastoral areas are used for both productive and non-productive uses. Water, which is the most essential natural resource in the ecosystems where pastoralists (arid environments), live is used for both domestic chores and livestock (FAO, 2004). On the other hand, in ecosystems where fishing is the economic activity, water serves the purpose of breeding fish. It is equally a fundamental natural resource for farming populations besides soil which is also used for pottery and brick making.

Plants are the most diversely utilized resources followed by wildlife. Plants are utilized for foodstuff, fodder, timber, fuel, and fiber for tools as well as for construction of housing structures and fences, crafts, weapons, musical instruments, utensils, medicine, and for ritual purposes/product (FAO, 2004). Besides plants provide shade, are used as landmarks, for orientation in space among other uses. Utilization of natural resources depends on the livelihood strategy of people. For instance, hunter-gatherer groups of people depend more on wild plant resources as their permanent source of food unlike
pastoralists who substitute it with milk and meat and use it as a food supplement (Kellert et al., 2000).

However, they still utilize plants for other uses other than food which are crucial features of their daily life. The specific populations use the plants either for self-consumption or commercialize them by collecting and selling them sometimes as medicinal plants, fruits. For instance, the Wodaabe Fulani people in Niger collect therapeutic plants and sell them when out of season as they migrate into other countries including Mali and Guinea (FAO, 2004).

Animals and insects are used for food, and as indicators of ecological dynamics. Various animals are utilized by various communities for food basically as meat but also by consuming their by-products including but not limited to milk and eggs. It is important to note that the consumption of animals and insects as food in most communities is frequently accompanied by taboos that regulate the use or killing of certain species that are of cultural value. For example, among the Turkana community, some animals are not eaten because they are associated with supernatural powers or traditional taboos (FAO, 2004).

The water bodies such as lakes and rivers have cultural and spiritual importance to some communities in Africa. Their waters are utilized for medicinal uses where water is used in cleansing ceremonies such as cleansing of evil spirits in communities who still uphold traditional medicine (Geser et al., 2009). Many African cultures also have natural totems, some of which are associated to species that live in water including fish and crocodiles. Some communities that identify themselves with particular animal species that live in water take it as a taboo to consume them as food or in any other manner (Chenje, 2000). These Lakes are considered as holy as it is a sin to the gods of water or lakes to consume the species. This result to conservation of the water bodies by the communities owing to the cultural values attached to them. Therefore it is very evident that there is an
imminent need to mainstream culture in sustainable management of lakes and other natural resources in Africa.

Although Governments have the mandate and responsibility to manage and control use of natural resources, sustainable utilization of these resources can only be achieved through a multi-stakeholder approach which involves government, communities, local institutions, development partners among others (United Nations, 2013). Most of the conservation regulations developed and enforced by governments focus more on rules for use by communities and punishments of not observing the same rather than on cultural issues and dynamics that affect use (Kellert et al., 2000). Therefore, sustainable utilization of natural resources takes into consideration the socio-cultural characteristics of users (Roe, Nelson & Sandbrook, 2010). Such an approach calls for a participatory method which involves the community that uses these resources in totality (Kellert et al., 2000). This approach is what is commonly known as Community Based Natural Resources management.

Communities particularly those in rural areas depend entirely and directly on natural resources for their livelihoods as they use ecosystem services as food, water, aesthetic and other basic needs (Henshey, 2011). Their economic activities revolve around use and management of natural resources as defined by their culture (Henshey, 2011). Sometimes equity issues and conflicts arise in their use due to diminishing resources. Community based natural resources management ensures equitable distribution and allocation of the resources, empowers the community to participate in decision making and control of the resources and resolving conflicts (Roe, Nelson & Sandbrook, 2010). Thus this model is appropriate in sustainable environmental management and it can largely utilize/incorporate the cultural aspects of communities that enhance environmental conservation to make it effective and successful.
One of the most fundamental pillars of community-based natural resource management is a decentralization process whose objective is to empower grass root institutions inorder for them to be able to make decisions and have the right to have power over their natural resources. This strategy has the potential to ensure that rural communities are involved in management of resources by the law enforcers and those environmental laws and regulations are adhered to by the community resulting to sustainable management (Isilda et al., 2003).

Community based natural resource management is a participatory strategy that allow as communities to participate in the management of resources surrounding them (Isilda et al., 2003). For example if a forest is located within a community’s land, the community members are allowed access to resources such as timber for income generation with the principle of payment for ecosystem services. This strategy also recognizes the role of local institutions including community based organizations to protect the rights of the community members. Isilda and others (2003), explain that community based natural resource management is founded on the basis of common property resources and recognition of customary rights and local knowledge of the resources hence fights for the protection of the community against land and resource use rights.

According to Gimenez (2000), community based natural resource management has the capacity to increase sustainable resource management and conservation since it promotes collective action of community members. It ensures equitable resource access and participation of every gender and people of all ages, ethnic tribes, religions and class in management of natural resources. Gemenez (2000) have indicated the potential of the existence of a relationship between community-based management of resources and sustainability of social-ecological systems and hence improved livelihoods. Another closely related principle is that of community based conservation which proposes the involvement of people who affect and are affected by conservation laws, regulations and
decisions in the planning and decision making processes of environmental management. It further calls for provision of economic and social benefits to the people involved as they sustain biodiversity (Child and Lyman, 2005). Thus, the inherent role of culture is also recognized by the principle community based natural resource management and community based conservation.

Community based natural resource management is a model that has been used by environmental conservationists to share benefits between the government and concerned communities but in most circumstances has not yielded adequate results (DeGeorges & Reilly, 2009). There are various reasons why it has failed including low resources particularly in the rural areas which are high populated as well as unequal distribution of the benefits that arise from the model and low incomes of rural households. The rural populations therefore do not change their attitude towards conservation as they perceive the model as having few benefits to them and their society. In most cases the governments usually maintain ownership of the resources and acquire revenue from it alienating the rural communities (DeGeorges & Reilly, 2009). Thus for the model to yield long-term benefits, there is need for full devolution of land ownership and natural resources so as to make best use of the benefits thereof.

It is also recommendable to reduce pressure on rural natural resource base by promoting urbanization and industrialization to convert the unique resources including wildlife, herbal medicines and agricultural products into more useful products (Gimenez, 2000). Gimenez (2000), further points out that it must not be forgotten that the natural resources in the rural set up often have socio-cultural ties to these populations which must be put into consideration while undertaking this course. Thus the ideal model should be a multiple resource model which enhances benefits to the rural households and meets socio-cultural needs.
2.2 Environmental Conservation Cultural Practices and Perspectives

Culture is a complex whole that entails the sum total of the way of life which exists in two forms namely material culture (represented by tangible symbols) and non-material/ideological culture (that encompasses practices, knowledge, economic activities, beliefs, taboos, behavior, cultural values, religion and customs) of a community (Milfont et al., 2006). Cultural practices refer to the demonstration of a culture of people particularly in regard to traditional and habitual patterns of social interactions, behaviors and activities undertaken by an ethnic group (Kiriro, 2011). They are manifested in forms such as religious and spiritual practices, dietary preferences and traditional ways of natural resource management (Milfont et al., 2006).

Cultural perspectives are the perceptions, values, meanings, altitudes, beliefs and ideas that underpin the culture of a society (Berkes, 2001). The cultural perspectives of a community characterize the community members’ view of nature (Berkes, 2001). Cultural perspectives including cultural practices, knowledge, resources enhances the capability of human/social systems to adapt and cope with change (Harmon, 2002). It is worth noting that cultural perspectives of a people are shaped by various factors including environment, social as well as cultural factors and they permeate every facet of human life, affecting even how people relate to each other and with their surroundings (Gunderson & Holling, 2002). Cultural perspectives influence the relationships that exist between human beings and their spiritual, mental and emotional world (Silori & Badola, 2000).

Most African communities practice totemism whereby a clan uses a certain plant or animal species which they have a spiritual connection with as their symbol (Kiriro, 2011). For example, animals such as lions and leopards are believed by certain clans to be symbols of bravery. The members of that clan are thus forbidden from harming these totems and even name their children after them (Silori & Badola, 2000). For example, in
the Kikuyu, children names such as Ngari (leopard), Nyaga (Ostrich) and Njogu (Elephant) are common among some clans. Children named after these animals are believed to share some positive characters of the animals such as bravery. In so doing, these animals are endeared to the community and protected even if they are destructive.

Traditional religion is another cultural practice that is earnestly adhered to in most African communities where they fulfill ritual and spiritual obligations (Paden, 2009). Religion is fundamental and possibly the most powerful component of culture that influences the lives of Africans (Awolalu, 2006). Traditional religion means indigenous religious beliefs and practices which Africans have sustained faith of the forefathers to present and is practiced in various forms and magnitudes (Awolalu, 2006). It penetrates into every facet of the lives of Africans and thus environment cannot be considered in isolation.

According to Paden (2009), the modern societies still worship and pray to traditional gods and spirits most of which were symbolic. Most of the symbols used were environmental elements such as trees, rocks, rivers, mountains and groves (Silori & Badola, 2000). These symbols are preserved as sacred places where sacrifices are offered to gods and spirits and cultural ceremonies such as circumcision conducted (Eneji et al., 2012). Furthermore, some African Communities have beliefs in ancestral spirits who are usually souls of dead people living in the spirit world (Henshey, 2011). These spirits are believed to appear in other forms such as animals and to live in forests, rivers, lakes and caves which are usually not destroyed and out of bound for the communities unless they need to meet with the spirits resulting in their conservation (Smith & Wishnie, 2000).

However, it should be noted that some writers people like White (2000), have suggested that religion including Judaism and Christianity, which basically teach that God is in control of nature and that he has given power to human beings to be in charge of living
things on the earth, has resulted in devaluing of biodiversity and successive unsustainable exploitation of resources for their own gains. This trend is partly the cause of environmental problems and for it to be reversed, this religious view will have to change, as it is increasingly apparent that diminishing of natural resources has become a serious challenge that requires urgent redress (White, 2000).

Furthermore, religions play a fundamental role in influencing change and coping with transformations. Religions such as Christianity preach about the promise of salvation after death; a realization which results to creative tensions leading to a further balanced comprehension of the contribution of religion to environmental management (Mary & John, 2009). This in turn determines how humans relate with their environment striving to be in harmony with it. In another perspective, religions have additionally been significant to the achievement of social change as revealed by the rise of innovative alliances where social justice institutions merge with organizations environmental justice. Therefore, religions have the potential to encourage values and ethics of reverence, respect, sharing and equity; responsibility, and renewal for devising wider environmental ethic plans which considers humans, ecosystems, and other species (Mary & John, 2009).

Taboos and customary laws that are practiced by communities also act as environmental conservation cultural perspectives (Venkataraman, 2000). These taboos vary across communities. For example it is a taboo to cut certain trees like Mugumo tree among the Kikuyu community. This ensures that it is conserved. It is also a taboo to drink milk, eat meat, and drink blood at the same time in some Kalenjin communities. This practice ensures efficient use of resources (Kiriro, 2011).

According to Harmon (2002) most African communities also have traditional ecological knowledge of natural resources within their environment which is passed from elders to younger generations through myths and stories. The role of indigenous knowledge in
environmental conservation is internationally recognized in United Nations declaration of the rights of indigenous peoples and Agenda 21 (Berkes, 2008). Besides, they celebrate cultural ceremonies such as child births and circumcisions which culturally require use of certain diets resulting in conservation of certain animal or plant species to ensure their availability (Venkataraman, 2000).

2.3 Cultural Elements of the Dominant Ethnic Groups Living In Lake Baringo Ecosystem

Baringo County is inhabited by four dominant ethnic groups which include the Pokot, Tugen, Ichamus (Njemps) and Endorois. The county is also a resident to various communities that have migrated into the area form other counties including but not limited to Luo, Kamba, Kikuyu and Turkana. The dominant ethnic groups native to Baringo County demonstrates cultural practices and still holds onto some traditional beliefs. This study was focused on three of these ethnic groups namely the Tugen, Pokot and Ichamus. The members of the three ethnic groups believe in God and supernatural beings. Although nowadays the majority of the members of Tugen, Ichamus and Pokot have accepted Christianity as their religion, some people still adhere to traditional beliefs (Mukadi, et al., 2015). It is worth to note that even the converted Christians still hold onto their traditional beliefs and practices. Traditionally the Pokot people believed in a God called Tororot while the Njemps and Tugen believed in a God called Asis (Kaendi, 1994).

The culture of the three ethnic groups is also marked by strong attachment to livestock where livestock such as cattle, sheep and goats form a significant feature of their culture. The cattle are particularly significant as they are viewed as a source of wealth and act as a traditional currency in marriage ceremonies including dowry payments (Mukadi, et al., 2015). Besides, the culture of the three ethnic groups is marked by gender differentiation of roles. Men are traditionally assigned the role of being the protectors of their families
and property in the Tugen, Pokot and Njemps ethnic groups ensuring their safety from attacks by external aggressors (Kaendi, 1994). This role is assumed by young men immediately after undergoing initiation. On the other hand, women are the caretakers of their families where they undertake domestic chores and also provide labor in the farms.

Agriculture is the main economic activity that supports the economy of Baringo County. The members of the ethnic groups engage in different economic activities with the Tugen living in the highlands such as Tugen hills practicing cultivation of crops such as coffee and food crops. The Pokot practice pastoralism where they keep large herds of livestock while the Njemps are basically fisherfolk with some of them being farmers (Kaendi, 1994). The members of all the three ethnic groups also engage in other economic activities such as beekeeping and tourism.
2.4 The Link between Environmental Conservation Cultural Practices and Perspectives and Natural Resource Management

Sustainable management of natural resources calls for community involvement in their management and conservation (Kellert et al., 2000). This is often referred to as Community Based Natural Resource Management and it demands for community participation and integration of indigenous values and knowledge in modern ways of natural resource conservation (Kellert et al., 2000). Thus, sustainable Community Based Natural Resource Management recognizes the inherent role of culture in environmental conservation.

The importance of incorporating culture in environmental management is also founded on the concept of sustainability, which aims at improving quality of human life without degrading the environment or rather protecting the environment while upholding social values; one of which is culture of people (Mensah & Castro, 2004). Mensah and Castro, (2004), continue to elaborate that sustainable development aims at achieving economic development while considering culture as an important aspect of people as well as ensuring that the environment is conserved. According to Spies (2003), there is a close interdependence of biologic and social systems which is basically a relationship between the environment and the culture of people. In addition, Becker (2002) argues that in order for sustainability to be achieved there is need to acknowledge environmental and cultural diversities of communities. In this regard, sustainable development entails utilization of natural resources at local, regional, national and even international levels with regard to cultural and environmental preservation.

Culture defines the perception of nature by a society and determines how a society interacts with environment (Brink et al., 2012; Kanaka’ole, 2009). Culture is historically transmitted from one generation to the other and it provides environmental conservation cultural practices and perspectives which are vital determinants of how various
generations associate, use and manage natural resources (Milfont et al., 2006). This is evidenced in various ways. For instance, cultures of most African communities forbid members from destroying and killing of animal and plant species that are of cultural importance to them, which leads to species’ conservation and enhanced genetic diversity (Harmon, 2002; Venkataraman, 2000).

Some African communities also believe in ancestral spirits usually symbolized in environmental components which are forbidden from being destroyed (Smith & Wishnie, 2000). They have superstitions that killing some animal species (such as owl) or cutting some plant species which are of cultural importance result in a curse on either the individual or community (Silori & Badola, 2000). These superstitions defined and regulated environmental values, behavior and attitudes ensuring conservation (Tilman, 2000).

Religion provides communities with codes of conduct and ethics that guide their relationship and even use of environmental elements that are of religious importance (Shastri, et al., 2002). These elements are believed to be the dwelling places for gods and ancestors and are protected and preserved by the communities. The elders ensure that the environmental ethics are passed from one generation to the other and those who destroy them are punished (Karume 2010; Shastri, et al., 2002).

According to Venkataraman (2000), taboos and customary laws which act as cultural conservation perspectives are also common in African communities which define the Do’s and the Don’ts of societies. They define moral principles and regulations to be upheld even with regard to management and conservation of natural resources (Venkataraman, 2000). They control wasteful use of resources since they act as environmental regulations in the communities. In addition, indigenous knowledge is also useful in environmental conservation (Harmon (2002); Gunderson & Holling, 2002). The
importance of biodiversity cannot be emphasized as it is well revealed by its intrinsic value, use to humans, its role in economic market and sustainable development (Hassan et al., 2005; Geser et al., 2009).

2.5 Summary of literature and identification of the research gap

Various studies on the relationship between culture and nature have been done and the role of culture in environmental management and conservation recognized (Brink et al., 2012; Griskevicius et al., 2006; Purzycki et al., 2012). A study conducted by Stern (2000) indicates that both environmental attitudes and environmental behavior are closely determined by environmental cultural conservation practices and perspectives. Odada and others (2004) reveal that socio-cultural factors including strict cultural beliefs and stratification of the communities in Lake Baringo ecosystem play a role in degradation of the Lake’s ecosystem. This study sought to understand how cultural factors affect resource use and management and how they can be exploited for sustainable ecosystem management in Lake Baringo ecosystem since no such study has been done despite cultural factors being identified as playing a key role in degradation. The other research gap that the study sought to fill was to assess how culture can be utilized as an entry point for community environmental management programs and the cultural aspects which should be promoted to sustainably use and conserve Lake Baringo ecosystem.
CHAPTER THREE: METHODOLOGY

3.1 Study Area

The study was conducted in Baringo County which have a population of 555,561 people (Kenya Housing Population Census, 2009) and covers an area of 11,075.3 km². Administratively, Baringo County is sub-divided into following sub-counties: Baringo Central, Koibatek, Marigat, Baringo North, East Pokot and Mogotio. This County was purposively sampled as the study site because it hosts Lake Baringo which has experienced serious environmental degradation in the past few years (Aloo, 2002). The study was conducted in Lake Baringo ecosystem (including the islands: Bal Morok and Ol Kokwe and Rivers- Molo and Pekerra) in the Rift Valley. The respondents came from the following sub-locations: Marigat, Loruk, Salabani, Ng’ambo, Komolian, Kambi ya Samaki and Darajani as shown in Figure 3.1.

Figure 3.1: Map of the Study Area; Baringo County
3.2 Study Design

The research design utilized by the study was descriptive survey method. Questionnaires that were semi structured were administered to household heads to collect data on specific issues. In addition, qualitative research was conducted through face to face interviews that were conducted with key informants including community and religious leaders, beach management committee members, Staff from the Ministry of Agriculture, Livestock and Fisheries and the Ministry of Environment and Natural Resources. This method allowed for probing of in-depth information and was used to explore the environmental cultural practices and perspectives of the indigenous communities in Lake Baringo ecosystem. Observation and recording of the natural utilization forms of the communities living in Lake Baringo ecosystem were also used by taking photographs. Besides, qualitative data was also collected from secondary sources internet, journals and online books through literature search/review.

3.3 Target Population

The target population of this study came from Baringo County which has a Population of approximately 89,000 Households (KNBS, 2009). The target population comprised a total of 3949 households from seven Sub-locations including: Marigat, Loruk, Salabani, Ng’ambo, Komolion, Kambi ya Samaki, and Darajani. The number of households in each of the target Sub-locations was as elaborated in Table 3.1.

Table 3.1: Total Number of Households per Sub-location

<table>
<thead>
<tr>
<th>Name of Location</th>
<th>Total Number of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marigat</td>
<td>1341</td>
</tr>
<tr>
<td>Loruk</td>
<td>578</td>
</tr>
<tr>
<td>Salabani</td>
<td>345</td>
</tr>
<tr>
<td>Ng’ambo</td>
<td>588</td>
</tr>
<tr>
<td>Komolion</td>
<td>361</td>
</tr>
<tr>
<td>Kambi ya Samaki</td>
<td>500</td>
</tr>
<tr>
<td>Darajani</td>
<td>246</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3949</strong></td>
</tr>
</tbody>
</table>

*Source: KNBS, 2009*
3.4 Sampling Procedure

Stratified random sampling was used to select seven Sub-locations which are in proximity to Lake Baringo and the residents in these Sub-locations regularly use the lake due to its proximity. Then, simple random sampling was used to get participants from each of the selected Sub-locations. In addition, purposive sampling was used to select key informants including community and religious leaders, beach management committee members, Staff from the Ministry of Agriculture, Livestock and Fisheries (MOALF) and the Ministry of Environment and Natural Resources (MENR).

3.5 Sample size

The sample population was comprised of 378 households from three ethnic groups namely; the Pokot, Njemps/ Ichamus and Tugen living in Lake Baringo ecosystem. The sample size (n) was determined using the following formulae given by Dongol (2007) as cited in Cole (2009):

\[
\text{Sample size (n) = } \frac{NZ^2 \times 0.25}{d^2 \times (N-1) + (Z^2 \times 0.25)}
\]

Where

n = Sample size required;
N = Total target population;
d = Precision level (0.05)
Z = Number standard deviation units of sampling corresponding to the desired confidence level; Z = 1.96 at 95% confidence level

From this formula, the required sample size for this study was 378 households and it was regarded as representative of the total households. The total number of households and the number of sampled households in each Sub-location were as shown in Table 3.2.
Table 3.2: Total number of households and sampled households

<table>
<thead>
<tr>
<th>Name of Location</th>
<th>Total Number of Households</th>
<th>Sampled households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marigat</td>
<td>1341</td>
<td>65</td>
</tr>
<tr>
<td>Loruk</td>
<td>578</td>
<td>40</td>
</tr>
<tr>
<td>Salabani</td>
<td>345</td>
<td>50</td>
</tr>
<tr>
<td>Ng’ambo</td>
<td>588</td>
<td>60</td>
</tr>
<tr>
<td>Komolion</td>
<td>361</td>
<td>58</td>
</tr>
<tr>
<td>Kambi ya Samaki</td>
<td>500</td>
<td>54</td>
</tr>
<tr>
<td>Darajani</td>
<td>246</td>
<td>51</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3949</strong></td>
<td><strong>378</strong></td>
</tr>
</tbody>
</table>

In addition to the household heads, key informants were also interviewed to obtain more information and to check the reliability of the information collected from the respondents. The key informants included 5 community elders and 5 religious leaders, 2 beach management committee members, 1 Staff member from the Ministry of Agriculture, Livestock and Fisheries and the Ministry of Environment and Natural Resources.

3.6 Research Instruments

A questionnaire was developed as guided by the study objectives. The questionnaire sought to capture information on cultural practices and perspectives from the Tugen, Pokot and Ichamus (Njemps) ethnic groups living in Lake Baringo ecosystem. The Questionnaire was semi-structured with both closed questions and open ended -questions. The open ended questionnaires aimed at eliciting in-depth responses from the respondents that would not be predicted prior to the study. Key informant interview schedules were also developed to capture more information on environmental cultural practices and perspectives that the ethnic groups uphold and how they affect the way they utilize and manage natural resources including Lake Baringo. Additionally, an observation sheet was developed to record the natural utilization ways and phenomenon degraded natural resources by both noting down in the sheet as well as taking photographs.
3.7 Data Collection Procedure

Before data collection, the reliability of the research tools was checked through piloting where the research instruments including key informant interview schedules and the questionnaires were administered to few respondents in the research site before the study was conducted. This was done to ensure that the questions were clearly understood by the respondents. Questions that were ambiguous were revised and rephrased to enhance comprehension.

Data was collected using a semi-structured questionnaire to generate quantitative data that is attached as Appendix II. The questionnaire had some open-ended questions which were useful in generating qualitative data in order to gain a better understanding that enabled more insightful interpretation of the results from the study. The researcher administered the questionnaires to the respondents who were household heads from three dominant ethnic groups (Pokot, Tugen and Njemps) that live in Lake Baringo ecosystem. Questionnaires were administered to a total of 378 household heads from the three ethnic groups of interest in the study. In addition, qualitative data was collected through key informant interview schedules where 5 community elders, 5 religious leaders, 2 beach management committee members, 1 Staff member from both the Ministry of Agriculture, Livestock and Fisheries and the Ministry of Environment and Natural Resources were interviewed. In addition, an observation sheet was used to collect data on the natural resource utilization by the communities. The data was collected between the month of August and September, 2015.

3.8 Data Analysis

The data collected was both qualitative and quantitative as derived from the questionnaire and key informant interviews respectively. The quantitative data was analyzed using Statistical Package of Social Sciences (SPSS) through descriptive analysis inform of percentages, frequencies. Pearson-chi squared test was used to establish association between culture and environmental management variables. In order to analyze quantitative data, the questionnaires were coded as per household using the abbreviation HH that represented Household and a number which indicated the sequence of the respondents. Hence the questionnaires were coded
HH 01 to HH 378. Key informant interviews schedules were coded KII 01-KII 20. The qualitative data derived from the open ended questions in the questionnaires and the key informants was analyzed by arranging different themes together and analyzed thematically. The analyzed data was then presented in form of frequency tables, pie-charts and bar graphs and texts in a descriptive way.
CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 General Information

4.11 Response Rate

According to Dillman, Smyth and Christian (2009), response rate is the number of participants who completed a questionnaire that is administered divided by the sum of participants who were asked to participate in a study. There were a total of 378 questionnaires administered to household heads that formed the study sample which were completed and returned. Proper and adequate planning was undertaken before the start of the study where the consent of the chiefs of the sub-locations where the study was undertaken was sought before the start of data collection. The chief would then inform potential respondents of the study which increased their willingness to participate in the study. The questions included in the questionnaire were also written in simple language and translated in Kiswahili and local languages to enhance understanding.

According to Bogen (2007), the length of a questionnaire affects the response rate where shorter questionnaires are usually attributed to higher response rates compared to longer questionnaires. He further indicated that questionnaires that are approximately 10 pages long achieve response rates of at least 68% an observation that was verified in this study as the questionnaire used was only 9 pages long.

4.2 Demographic Data

4.2.1 Respondents gender

The study aimed at evaluating the respondent’s gender whereby among the respondents, the majority were males at 54% (204) while 46% (174) were female. The inclusion of both genders in environmental management is fundamental as they have different roles to play in conservation of natural resources. Women are usually in close nexus with their environment as they feed their families. It is fundamental to note that gender roles and responsibilities as well as norms and division of labor determine how human beings relate to the environment. The differences in gender influence the extent and nature of environmental use and even impact (Milfont, et al.,
It is important to include women in the study as women and environment are inseparable as they manage the ecosystem’s biodiversity and natural resources.

Different gender also have diverse power to control natural resources as women lack power to make decisions while men have power to control management of resources (Aditya, 2016). The study established that both women and men use and manage natural resources differently since women are major water users as their role is particularly focused on household chores such as cooking, washing, cleaning and bathing the family all of which require water. Women are also involved in fetching the water from the lake and as such they often interact with the resource. As such if women are targeted in the sustainable management initiatives of the lake, the efforts would be successful. This finding agrees with that of Aditya (2016) who indicated that women take the roles of cultivating the land; collectors of water and firewood have a close relationship with the local ecosystems.

### 4.2.2 Age of Respondents

The study evaluated the respondents age, and the results indicated that 27% (100) of them were between the ages of 18-35 years while 21% (80) of them were above the age of 60. The majority 52% (198) of the respondents were between the ages of 36-60 years. This is further explained in Figure 4.1.

![Figure 4.1: Age of Respondents](image)
The results of the study indicated that the age of the respondents was significantly different ($\chi^2 = 105.2$, df=2, P< 0.005). It was important to involve people of all age groups in the study including the young generation as they form an important target of environmental education which is a key tool in ensuring there is adequate awareness on environmental policies, laws and conservation measures. The middle aged population (36-60 years) was the majority and was equally important in the study as they are the heads of the interviewed households who actually utilize the environment for their livelihoods. The findings suggest that they are actively involved in natural resources utilization and can actively participate in natural resources management. Equally important were the elderly respondents who provided an in-depth knowledge of the cultural practices and perspectives that the study sought to establish. Thus it was similarly fundamental to involve them.

4.2.3 Education level

The study also aimed at establishing the education level of the respondents. The majority (66%) have attained some education with 32% having primary school education, 21% had secondary education while 13% had tertiary and university education. However, 34% had no formal education as illustrated in the Table 4.1 below.

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary education</td>
<td>120</td>
<td>32</td>
</tr>
<tr>
<td>Secondary education</td>
<td>80</td>
<td>21</td>
</tr>
<tr>
<td>Tertiary and University education</td>
<td>50</td>
<td>13</td>
</tr>
<tr>
<td>No formal education</td>
<td>128</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>378</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The findings of the study showed that the level of education among the respondents was significantly different ($\chi^2 = 210$, df=3, P< 0.01) with majority 250(66%) of the respondents
having a relatively high level of understanding and hence were in a position to understand and respond to the questions asked during the study. This result also suggests that the respondents are capable of making appropriate decisions concerning natural resources utilization and management.

4.3 Natural resource utilization ways of the dominant ethnic groups living in Lake Baringo ecosystem.

The first objective of the study sought to evaluate the natural resource utilization ways of Lake Baringo ecosystem by the ethnic groups living adjacent to it. Natural utilization ways of the lake’s ecosystem goods was a fundamental factor in understanding how the communities interact with the resource and how the resource utilization methods can be enhanced to be sustainable. It was established that lake Baringo ecosystem have diverse natural resources including water, fertile soil, fish, medicinal plants and animals which the communities living in Lake Baringo ecosystem utilize for their survival. The study revealed that most of the respondents living in the lake Baringo ecosystem indeed depend on the lake’s ecosystem for their livelihood. The respondents interviewed during the study were from 3 ethnic groups namely the Pokots, Ichamus/Njemps and the Tugen people.

The communities’ economic activity was used as means to indicate their natural resources utilization ways. According to the study, 193(51%) of the respondents practice pastoralism 98(26%) are fishing while 38(10%) of them are farmers. The communities also utilize the Lake and its ecosystem for tourism activities such as rafting where approximately 38(10%) of the interviewed respondents indicated that they practice it in Baringo. Bee keeping is also an emerging economic activity that is being practiced by a small group (3%) of residents in Lake Baringo ecosystem. This is further elaborated in the Table 4.2
Table 4.2: Natural utilization ways of the respondents

<table>
<thead>
<tr>
<th>Natural utilization way</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pastoralism</td>
<td>193</td>
<td>51</td>
</tr>
<tr>
<td>Fishing and related business</td>
<td>98</td>
<td>26</td>
</tr>
<tr>
<td>Farming</td>
<td>38</td>
<td>10</td>
</tr>
<tr>
<td>Tourism</td>
<td>38</td>
<td>10</td>
</tr>
<tr>
<td>Bee-keeping</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Totals</td>
<td>378</td>
<td>100</td>
</tr>
</tbody>
</table>

The results revealed that the natural utilization ways of the respondents were significantly different ($\chi^2 = 277$, df =4, P<0.0005) with the majority depending on pastoralism and fishing as the dominant livelihood systems. This result indicates that the respondents’ livelihood systems are dependent on the Lake either directly or indirectly.

The study further indicated that the Pokot ethnic group members who were interviewed are majorly pastoralists keeping large herds of livestock including cows, goats and sheep with a small group of them being agricultural and miners. This was in agreement with the findings of Stewart (1950) who described the East Pokot as being roughly 60% pastoral and 40% agricultural. The Pokot agriculturalists are usually referred to as “the men of the seed” as they practice small scale crop farming (sorghum, maize and beans mixed with livestock keeping) thus are agro-pastoralists (Berkes, 2008).

The Njemps, also known as Ichamus ethnic group was also interviewed and the responses revealed that this community practiced mixed economic activities including mixed farming (livestock keeping and crop cultivation) as well as fishing. The lake provides an important habitat for various fresh water fish species namely: Tilapia, lung fish, cat fish, Libelous and black barbas with Tilapia being prevalent in the lake. This community is unique as it is the only pastoral communities that eat fish as eating fish is a taboo among other pastoral community such as Pokot, Samburu and Maasai.
The study established that the Njemps communities normally live in islands such as Ol Kokwa, Devil, Rongena and Parmolok Island at the southern shore of the lake. One key observation made during the study was that these islands such as Parmolok Island are unique with vegetation of medicinal plants that are continuously preserved from generation to generation. Fishing is particularly an important source of livelihood to the youth who live in the islands as evidenced in the Figure 4.2:

Figure 4.2: Young Fishermen from Njemps ethnic group at Ol-Kokwa Island

The study further revealed that the Tugen community is basically small scale farmers practicing mixed farming where they grow various crops but also keep small herds of livestock as evidenced by the Figure 4.3 below.
**Figure 4.3:** A Farm with crops and livestock

The Figure 4.4 below further illustrates the natural utilization ways for each ethnic group as indicated by the study:

![Bar chart](image)

**Figure 4.4:** Natural Utilization by the Ethnic Groups
The study established that the natural resource utilization ways of the three ethnic groups depend on the lake for one natural resource or another: the fishermen depend on it for fish while the pastoralists use the water for their livestock as well as pasture that grow at the lake shores. Farmers, on the other hand, utilize the lake water for irrigation hence there is extensive exploitation of the lake and its resources by the communities. This results to over-dependence on the lake and its resources by the communities which is the cause of the current degradation (including sediments due to intense soil erosion, water quality degradation, extinction of some fish species) of the lake and even on the catchments. The Figure 4.5 is a sample of evidence of the Lake’s degradation illustrating deforestation of trees in the uplands which are then carried by soil erosion and taken as log sediments into the lake.

Figure 4.5: A sample of evidence of the Lake’s degradation
4.4 Environmental conservation cultural practices and perspectives of ethnic groups living in Lake Baringo ecosystem

The study also sought to establish the environmental conservation cultural practices and perspectives of the communities living around Lake Baringo ecosystem. The study established that each of the 3 communities believe in and practice cultural practices and norms. When the respondents were asked whether their community have cultural practices and norms as well as cultural beliefs, 190 (50%) percent of them confirmed that have cultural norms, 260 (69%) have cultural practices while 250 (66%) believe in supernatural beings and cultural beliefs. This is further illustrated in the Figure 4.6:

![Percentage of respondents practicing cultural aspects](image)

**Figure 4.6: Percentage of respondents practicing cultural aspects**

4.41 Cultural practices and perspectives of the communities living in Lake Baringo ecosystem

During the study, the respondents were asked whether their community have cultural practices and their responses showed that majority (95%) of the respondents said that their ethnic group members uphold cultural practices while 5% of them said that they do not as shown in the Table 4.3.
Table 4.3: The number of respondents upholding cultural practices

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>95</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

The study further sought which were the cultural practices of the communities living around Lake Baringo ecosystem and the findings were as follows: 67% of the respondents indicated that they engaged in initiation rites as revealed by respondents such as HH 080, HH 120 and HH 205; 40% were involved in birth ceremonies as indicated by house heads such as HH 008, HH 025 and HH 352; 98% participated in marriage ceremonies while 61% practiced religious rituals as indicated by households such as HH 25 and HH 74 and 33% participate in cleansing rituals. This is further shown in the Figure 4.7:

![Cultural practices and perspectives](image)

**Figure 4.7: Cultural practices and perspectives**

Other cultural practices and perspectives of the communities that are closely related to the ecosystem management include attachment to livestock, differentiation of roles and
responsibilities, plants with cultural value as well belief in religion and God. The extent to which each of them is practiced by the community members as indicated by both household heads and key informants is as shown in Table 4.4.

**Table 4.4: Cultural practices and perspectives of ethnic groups in Lake Baringo ecosystem**

<table>
<thead>
<tr>
<th>Cultural practice</th>
<th>Number of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment to livestock</td>
<td>194</td>
<td>51</td>
</tr>
<tr>
<td>Differentiation of roles and responsibilities</td>
<td>333</td>
<td>88</td>
</tr>
<tr>
<td>Upholds plants of Cultural Value</td>
<td>340</td>
<td>90</td>
</tr>
<tr>
<td>Belief in religion</td>
<td>306</td>
<td>81</td>
</tr>
</tbody>
</table>

**4.4.1.1 Environmental cultural practices and perspectives of the ethnic groups living in Lake Baringo ecosystem**

**4.4.1.1.1. Attachment to Livestock**

According to the study, majority of the respondents living in Lake Baringo ecosystem are pastoralists keeping either large herds of livestock or practicing it alongside other activities. Out of the 378 respondents interviewed, 194 (51%) of them practice livestock keeping including households such as HH 2, HH8, HH 200 and HH 300. Livestock, in particular cattle, is an important feature of the Tugen, Pokot and Njemps communities as it is viewed as a major source of wealth and serves as a form of traditional currency used to bargain for wives and payment of dowry. Cattle also have ritual importance where they are offered to ancestral spirits during sacrifices a fact that Berkes (2008) supports. Their food includes blood; milk and meat this makes them to have a special attachment to livestock. Therefore it is common for Pokot people to attack their neighboring communities including Tugen and Turkana in order to enlarge their herds (Juma, 2000; Patterson, 1969). According to a key informant, the Pokot ethnic group is aggressive in enlarging their herds a factor that results to frequent conflicts in areas where they live.
They believe that conflict over cattle is justified as cattle are given to them by God. A study conducted by Schilling and others (2012) had similar findings where it established that conflicts related to livestock raiding were increasingly becoming common in pastoral communities. In their findings, they cited wealth and payment of dowry as the major reasons behind raiding conflicts particularly among the Pokot community. Conflicts often have a negative effect on the environment as it results to destruction of natural resources. In addition, keeping large herds of livestock puts pressure on the pastures and water resources available resulting to unsustainable management of resources. They also indicated that the direct impact of these conflicts includes ineffective resource utilization and limited access to pastures and water (Schilling et al., 2012).

4.4.1.1.2 Differentiation of Roles and Responsibilities

All the three communities have clearly differentiated roles and responsibilities of both men and women as indicated by 88 percent of the respondents such as HH 12, HH 20, HH 289 and others. Men are traditionally given the responsibility for looking after livestock and offering protection to their families from attacks by external aggressors while women’s duty is to take care of children, offer labor in the farm, and perform domestic chores including cleaning and washing. In addition, the women in the study area are involved in processing and marketing of fish. It was established that men in Lake Baringo ecosystem have the role of protecting their families as well as looking after the livestock and fishing and thus they interact more with resources such as land, forests, and plants. The men move from one area to another together with their livestock to look for pastures and water. This finding alludes to the findings of a study conducted by Mustafa & Young (2003) who described the Pokot men as “war-like and cattle loving people” who move from one location to another in search of pastures for their cattle, sheep and goats. The roles and responsibilities of the men and women in Lake Baringo ecosystem are as shown in Table 4.5.
Table 4.5: Gender roles of respondents

<table>
<thead>
<tr>
<th>Role/responsibility</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looking after livestock</td>
<td>Men</td>
</tr>
<tr>
<td>Family and property protection</td>
<td>Men</td>
</tr>
<tr>
<td>Offering labor in the farm</td>
<td>Women</td>
</tr>
<tr>
<td>Domestic chores (cleaning, washing)</td>
<td>Women</td>
</tr>
</tbody>
</table>

The study findings imply that women in the study area interact with the lake and rivers draining to it to a greater extent compared to men. In this regard, conservation and management efforts aimed at reducing sedimentation in the lake and river as well as enhancing water quality should target both women and men because both have a role to play.

Furthermore, women are exceptionally vulnerable to environmental degradation since, it is well established that environmental hazards such as drought and flooding which are now common in Lake Baringo ecosystem affect women and young children more than they affect men (Masiga et al., 2012; Nyakayo & Njeru, 2013). In addition, men and women have different knowledge of the environment and natural resources which affect how they manage the environment. The differentiated roles have an implication on how each of these gender conserve and manage the environment in that the men relate more with natural ecosystems such as forests, pastures and water bodies to a greater extent than women while women have a closer relationship with the land systems as they interact on a daily basis. Therefore, engaging women in environmental protection would assist societiesto develop a sense of responsibility that is required to sustain healthy balance between humans and the earth’s resources (Aditya, 2016).

4.4.1.3 Belief in Religion, God and Sacred places of worship

The study revealed that most (81%) of members of the ethnic groups living around the lake’s ecosystem are monotheistic-worshippers of one God as shown in Figure 4.8. This was revealed by various respondents including but not limited to HH 18, HH 92, HH 140 and HH 208. The
Pokot community believe in one God called Tororot, the Tugen and Njemps communities’ believe in a God called Asis. The study also established that most of the respondents from the three ethnic groups under study have adopted Christianity where they also believe in a supernatural God. This is well illustrated in Figure 4.8.

![Figure 4.8: Percentage of Respondents who believe in Religion](image)

**Figure 4.8: Percentage of Respondents who believe in Religion**

The communities also have sacred places of worship where they believe that particular forests and hills are holy and that they are the dwelling places of their God. One such hill is called Morop and Tugen hills where the community elders go to worship gods in times of disasters such as drought. The communities refer to a hilltop specially set aside for worship as Kaapkoros. These holy hills and forests are habitats of native herbs used for local purposes including medicinal, social, and religious purposes. As such these natural resources are preserved by the community (Kakudidi, 2004).

The findings of the study revealed that all the communities living around the lake’s ecosystem are monotheistic-worshippers of one God. The common belief in a religion provides values that guide and regulate utilization, conservation and management of resources (Adzobu, Okeame & Peter, 2011). This implies that religion can be used as an entry point for awareness creation on environmental conservation and promotion of sustainable environmental conservation practices. In addition, according to the study, the belief in a supreme God who is all powerful and controls
the universe make the community to implement bio-centric attitudes and instill in their generations a behavior of conserving the environment as a result of the intrinsic value attached to natural environment (Adzobu, Okeame & Peter, 2011).

The values propagated under indigenous religion are usually very conservative, resisting the influence of modernization including modern religions such as Islam and Christianity (Mary & John, 2009). Thus communities that uphold and practice traditional religion hold rigidly to these values and covenant that join them together and pass them from generation to generation. This contributes to environmental conservation as it ensures that environmental values inherent in traditional religion are insistently upheld and practiced. It is also important to note that traditional religion is based mainly on oral transmission and not documented on paper. It is written and apprehended in the minds of the communities, oral history, rituals, shrines and religious practices (Awolalu, 2006). As the findings of the study indicate, it is clear that religions have a central role to play in the formulation and the articulation of ethics that guide human behavior and management of the environment a fact that Awolalu (2006) agrees with. There are particular religious attitudes, practices and ethical values that can be identified to enhance environmental conservation perspectives.

The study findings agrees with the findings of Shastri and others(2002) who indicated that traditional African communities had a religion that propagated environmental ethics which was fundamental in regulation of human-environment interactions. Their study further elaborated that traditional religion was characterized by environmental beliefs, practices, features and symbolism which ensured that natural resources were conserved. For instance, there were protected areas set aside for gods and goddesses, a practice which run from one generation to the other enhancing conservation. Although the introduction of modern religions such as Christianity and Islam coupled with western education have corroded the rich cultural values and religious beliefs of the African communities, Traditional religion is still upheld in most of these communities and play a significant role in environmental conservation (Smith & Wishnie, 2000). Therefore there is need to integrate traditional religion environmental principles in the
modern conservation and management programs so as to achieve sustainable management of natural resources (Eneji et al., 2012).

4.4.1.4 Plant species with cultural and spiritual value to the ethnic groups

The study also revealed that the three ethnic groups living in Lake Baringo ecosystem have various plant species that are of cultural value to their members. Plants feature in various areas of the communities’ culture under this study including medicine, use in ceremonies, religion and social structure. Several plant species play a cultural and symbolic role in the lives of the community members. Some of the plants are used in cultural ceremonies such as weddings including specific species of mushroom and millet. Millet and sorghum are also usually provided in ceremonies of birth and naming of children as well as worship ceremonies either as porridge or traditionally prepared beer.

According to key informants such as KII 001,003 and KII 008, some plants such as Bersama abyssinica (Kaptalilet in Tugen) are used to protect community members against witchcraft. In addition, some plants are used for religious purposes including trees that are considered sacred such as Euphorbia tirucalli, Mormodica foetida schumach, Ficus sycomorus and Ficus carica, or Ficus thonningii (referred to as Simotwo in Pokot) among the Pokot ethnic group as revealed by household heads (HH) 12, 30, 80 and 270. It is worth noting that it is also a taboo to use some of the trees for firewood and therefore such trees are never cut. One such tree is Erythrina abyssinica (Kokkowo in the Pokot) ethnic group and when it falls it is curved into various traditional items for instance bowls.

According to Kakudidi (2004), this is also true for some African communities such as Abagahein Uganda where it is a taboo to use Ficus exasperate (Musomoro) as a walking stick as it is believed to chase away wealth. Besides, it is a taboo to use a tree called Sapium ellipticum as poles for the major house because the owner is believed to become insane and be hated (Kakudidi, 2004). The effect of communities’ belief in cultural and symbolic value of plants is that they are strictly conserved and sustainably managed by the members.
The Tugen ethnic group has two sub-ethnic groups with two dialects namely Aror and Samor. They live in 3 ecological zones including Mosop (highlands), Soin (lowlands) and Kurget (the area between highlands and lowlands). The ecological partitions influence how they interact with the environment in many ways including indigenous medicine. In all these ecological zones there are herbal plant species particularly in the forests that cover the Mosop and Kurget. They have continued to uphold, preserve and propagate indigenous knowledge which they apply in many areas of their life such as medicine (herbal treatment). The Tugen ethnic group believes in the efficaciousness of particular herbal plants which are of medicinal value to them. They believe that the plants cure certain diseases and as such they are loyally protected by the community and the knowledge of their value passed to the young generation.

The respondents were asked whether there are plant species that are of cultural value to their community and 340 respondents such as HH 45, HH 80 and HH 213 constituting 90 percent indicated that there were tree species and other plants which were medicinal, religious and others used in various ceremonies. The study showed that the Tugen community has various medicinal plants that they use for treatment of various diseases such as Malaria (Esse) and Leishmaniasis. Key informants such as KII 7 and KII 8 indicated that plants such as Chepking’un and Seketet are used as medicine as shown in the Table 4.6 below:

### Table 4.6: Medicinal plants among the Tugen Community

<table>
<thead>
<tr>
<th>Plant species (Tugen language)</th>
<th>Botanical name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chepking’un</td>
<td><em>Momordica friesiorum</em></td>
</tr>
<tr>
<td>Seketet</td>
<td><em>Myrsine africana</em></td>
</tr>
<tr>
<td>Kibulwa</td>
<td><em>Gardenia ternifolia</em></td>
</tr>
<tr>
<td>Sok</td>
<td><em>Warburgia ugandensis</em></td>
</tr>
<tr>
<td>Anon</td>
<td><em>Manilkara butugi</em></td>
</tr>
<tr>
<td>Muarubaine</td>
<td><em>Azadirachta indica</em></td>
</tr>
<tr>
<td>Arwa</td>
<td><em>Tamarindus indica</em></td>
</tr>
<tr>
<td>Kipchepkwere</td>
<td><em>Harrisonia abyssinica</em></td>
</tr>
<tr>
<td>Kosirich</td>
<td><em>Gomphocarpus fruticosus</em></td>
</tr>
<tr>
<td>Ngwadere</td>
<td><em>Ajuga remota</em></td>
</tr>
<tr>
<td>Tilomwo</td>
<td><em>Ziziphus mucronata</em></td>
</tr>
</tbody>
</table>
The study established that the Njemps community has plants that are of cultural values. According to respondent HH 282, one such shrub is called ambach plant which providesambach wood used in making boats used for moving around the lake during fishing. This plant is protected among the community members enhancing plant diversity. The community lives in islands such as Parmolok Island which are habitats to vegetations of medicinal plants. In addition, the study revealed that the Pokot community also has some knowledge of herbal remedies and have various medicinal plants used for treatment of diseases and in stimulating increased milk and meat in livestock. Various households including HH 85, HH134 and HH 263 indicated that various plants have medicinal value as shown in the Table 4.7 below:

Table 4.7: Medicinal plants among the Pokot community

<table>
<thead>
<tr>
<th>Plant Species (Pokot language)</th>
<th>Botanical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerelwo</td>
<td><em>Crotalaria dichogamus</em></td>
</tr>
<tr>
<td>Muikutwe</td>
<td><em>Garcinia jonstonii</em></td>
</tr>
<tr>
<td>Kimira</td>
<td><em>Croton incana</em></td>
</tr>
<tr>
<td>Kalobotwo</td>
<td><em>Solanum incanum</em></td>
</tr>
<tr>
<td>Ngopkwo</td>
<td><em>Acacia mellifera</em></td>
</tr>
</tbody>
</table>

The belief of the community in the relevance of medicinal plants agrees with the research done by Kaendi (1994) who found out that plant such as *Tamarindus indica* and Muarubaine were traditionally used for treatment of diseases such as Malaria. This study revealed that as Munguti (1997) points out the elders of Tugen community identify plants with medicinal value and teach the youth on how to preserve them. The members of the community are prohibited from destroying such plants ensuring their survival. There are indigenous practitioners who prepare, prescribe and dispense herbal medicines from roots, leaves, bark and other plant or animal parts. The symbolic and cultural value of the plants in the communities make forests to be of significant cultural value to them as they offer ritual, religious and social needs. This point of view is supported by Kakudidi (2004) who indicates that forests supply communities with cultural needs used in social events making them be protected as totems.
4.4.1.5 Initiation Rites

The study revealed that all the three communities practice initiation rites of both girls and boys. Out of the respondents interviewed, 94% explained that it is a requirement for young girls and boys in their community to undergo initiation and join an age set system. Respondents such as HH 20, HH126, HH 357 and others confirmed that young people in Tugen, Njemps and Pokot communities undergo circumcision ceremony. This is as shown in the Figure 4.9:

![Figure 4.9: Practice of initiation rites](image)

The initiation rites play a significant role in the society as their authority is based on both sustainable environmental traditions and religious superstitions. This view is supported by Rappaport (1999) who conducted a field study in New Guinea among the Maring-speaking people and established that rites and rituals regulate relationships between human beings and society, and also between society and the environment, thus are fundamental in maintaining healthy ecosystems. He further, indicates that rites and rituals act as a specific kind of communication where they convey essential messages that are rooted in the moral and cultural set of laws of a society. The rites and rituals are culturally viewed as possessing indisputable values and therefore the communities upholding them practice them as they are without negotiation (Rappaport, 2000). Thus, by transmitting unquestionable messages, rites and rituals can be exploited by communities to propagate conservation and management messages for sustainable natural resources utilization.
In addition, the study indicated that during cultural ceremonies such as initiation and marriage, young people are trained by the elders to be responsible adults and members of the community and to preserve the communities’ cultural heritage and wealth. Most respondents (63%) such as HH 235, HH 243 and HH 250 teach their children on various issues including environmental conservation while 37% of them indicated that they do not.

The young generation forms groups such as age-sets and age-groups which are then assigned to specific elders who teach these groups about various cultural values and mentor the members to ensure that they uphold the values that they are taught. According to a key informant coded as KII 004, the elders utilize various methods in teaching the young people including storytelling, riddles, songs and personal chats.

The findings of the study concur with those of a technical report by Government of Kenya (2012) which explained that age sets constitute a shared and discrete structural feature of pastoral communities. This report further indicated that age-sets and age-groups are powerful forces of cohesion and elders who act as knowledge resources use them to pass values to the youths involved in the initiation rites. The study results are also supported by Aubel (2010) who asserts that elders play a fundamental role in intergenerational learning through the use of cultural methods of passing knowledge such as storytelling. Among the values that are passed to them, is environmental ethics which guide them on the use of environmental services such as water and forests. In addition, some rites such as initiation are performed near the rivers or in the forests. These ecosystems are therefore preserved by both young and old generations. According to key informant (KII 004), this is usually guided by taboos such as “it is a catastrophe to answer a short call or defecate in the rivers”

This view is further supported by Rappaport (2000), who indicates that the rites practiced by communities have a role to play in environmental conservation. He elaborates that rites can be viewed as an adequate medium for protecting environmental values as there is a moral efficacy in the rites with environmental responsibility. Rappaport (2000) further urges that rites and
rituals put forward values and ethics that advocate for responsible humanity. This is true because the responsibility of human beings is called for in environmental conservation today where degradation poses a threat to human’s well-being.

It is worth noting that when the respondents in this study, were asked whether the children and young people know their cultural practice about 59% indicated that children and youths are aware of their cultural practices while 41% of them indicated that they are not aware of their culture. This view was supported by a key informant (KII 008) that young people are relatively aware of their culture depending on their upbringing. Besides, more than half (54%) of the respondents interviewed during the study indicated that children and young people observe their culture while 46% of them said that they do not. This can be attributed to the fact that most of the adults transmit indigenous knowledge and cultural values, perspectives and practices to the young generation through various methods including storytelling, myths, songs and dances. This is a good indication that young people are a viable target group that should be targeted for environmental conservation initiatives through channels such as education and cultural festivities.

4.5 The relationship between environmental conservation cultural practices and perspectives and resource use and management in Lake Baringo ecosystem

The study sought to determine the relationship between the environmental conservation cultural practices and perspectives and resource use and management in Lake Baringo ecosystem. Pearson’s chi squared test was used to determine whether there is a relationship/association between the cultural aspects of the communities living in Lake Baringo ecosystem and resource management and the findings indicated that there exists a significant relationship between cultural aspects such as cultural values and norms and environmental attitudes which then influence its management. During the study, the respondents were asked whether their community uphold cultural aspects such as cultural practices, norms and perceptions. The survey results showed that majority (95%) of the respondents involved in the study uphold cultural
aspects while 5% do not, a difference that is statistically significant ($\chi^2 = 309.4$, df=1, $P<0.001$) as shown in Table 4.8.

**Table 4.8: Upholding of cultural aspects**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>360</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>378</td>
</tr>
</tbody>
</table>

This is an indication that culture is a very fundamental feature in the lives of the members of the three ethnic groups under study and a determinant of various aspects such as natural utilization, housing and food/diet. This implies that a change in the cultural aspects of the ethnic group members would significantly influence how the members use and manage their natural resources.

The study also revealed that each of the ethnic group members uphold various cultural norms, believe in cultural beliefs and perform some cultural practices. Out of the total number of respondents who participated in the study, 50% of them indicated that they uphold cultural norms, 69% revealed that they perform cultural practices while 66% pointed out that they have cultural beliefs in which they believe in. This is further illustrated in the Table 4.9.

**Table 4.9: Cultural aspects of the dominant ethnic groups living in Lake Baringo ecosystem**

<table>
<thead>
<tr>
<th>Cultural aspect</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural norms and Values</td>
<td>190</td>
<td>50</td>
</tr>
<tr>
<td>Cultural practices</td>
<td>260</td>
<td>69</td>
</tr>
<tr>
<td>Cultural beliefs</td>
<td>250</td>
<td>66</td>
</tr>
</tbody>
</table>

Pearson’s Chi squared test was used to determine whether there is a relationship between the cultural aspects of the communities living in Lake Baringo ecosystem and ecosystem management and the computation gave the following results ($\chi^2 = 297$, df =2, $P <0.001$). This finding indicated that there exists a strong statistically significant difference between the proportion of ethnic group members who uphold cultural aspects of their culture and those who
do not. This result also indicates that most of the respondents interviewed upholds and/or practices more than one cultural aspect of their culture and that the cultural aspects are significantly related among the different ethnic groups. These findings in general indicate that that culture is significantly related to natural resource management and that enhancing the environmental cultural practices and perspectives would result to better environmental conservation and management.

The study findings agree to the findings of the authors Stern and Dietz (1994) who explain that there are three distinctive motivators for environmental attitudes namely the individual, the community, and all living things. The community and culture are intrinsically interrelated and thus culture drives the different environmental attitudes of a community namely egoistic, eco-centric and bio centric attitudes. According to their study, cultural beliefs and norms drive the individuals in the community to adopt eco-centric environmental attitude due to the belief that environmental destruction has negative effects on them (Dietz, Kalof, & Stern, 2002). The individuals conserve the environment because it has benefits to them and their personal interest is to ensure that they do not suffer from the effects of environmental degradation. Culture further influences the communities to adopt social-altruistic environmental attitudes which are founded on promotion of good for the sake of other human beings (Aoyagi-Usui, Vinken & Kuribayash, 2003).

Some cultural norms, perceptions and practices call the community members to conserve the environment in order to ensure that it is protected for the next generations and even for spiritual beings which they believe in (Adzobu, Okeame & Peter, 2011). According to altruism theory proposed by Auguste Comte, sustainable management and protection of the environment is fundamental because its destruction have long-term consequences for a community. This inspires the community to conserve the environment due to the benefits that they get from it (Aoyagi-Usui, Vinken & Kuribayash, 2003).
Furthermore, the study findings are in agreement with previous studies (Abo, 1994; Lincoln and Kallenberg, 1990; Taylor et. al., 1996) which have already revealed that cultural beliefs in a community influence values and decisions of people and even managers. It established that indeed culture influence and shape community’s environmental attitudes. These attitudes propagate behavior which could be sustainable or unsustainable, pro-environmental or anti environmental behavior which affect people’s actions on the environment.

Authors such as Eneji and others (2012), assert that societies that have preserved their traditionalism, commonly referred to as indigenous communities have been able to maintain a balance between humans and their ecosystem much better as compared to communities that have been modernized, referred to as Western societies. In the indigenous societies, culture acts as a central means that maintain a balance between the interests of the individuals, the society and the environment (Eneji et. al., 2012). There is not only traditional ecological knowledge embedded in the cultural practices such as rites and rituals but the community members also invest emotions in their practice, and since every member associates with culture the entire society becomes involved. This promotes participation of every individual in the society in environment protection which is necessary.

Livestock is a key environmental cultural practice as pointed out earlier and a relationship between this practice and ecosystem management was determined using Chi square. A Chi squared test on the number of respondents who kept livestock and those who did not gave these results; ($\chi^2 = 0.26$, df=1, P=0.10). The findings indicated that there is no statistically significant difference between the number of ethnic group members rearing livestock and those who do not rear livestock. This implies that livestock rearing do not significantly affect natural utilization in Lake Baringo ecosystem and hence it does not considerably influence natural resource management in this ecosystem. This is an indication that environmental conservation and management intervention measures would be fruitful if they focus on all natural utilization ways of the people including farming, fishing and pastoralism despite livestock keeping being a dominant livelihood strategy.
As indicated earlier, another key environmental cultural value that the three ethnic groups have is upholding plants of cultural value as indicated by their responses as shown in Table 4.10.

**Table 4.10: Percent of Respondents who use Plants with Cultural Value**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>340</td>
<td>90</td>
</tr>
<tr>
<td>No</td>
<td>48</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>378</td>
<td>100</td>
</tr>
</tbody>
</table>

The study results indicated 90% of the respondents utilize plants with cultural value while 10% revealed that they do not utilize them. The observed difference however was not statistically significant; there is no statistical significant difference between the ethnic group members who utilize them and those who do not ($\chi^2 = 2.40$, df =1, $P= 0.10$). This suggests that despite utilization of plant species with cultural value being dominant among the ethnic groups, the use of these plants do not significantly affect Lake Baringo ecosystem management. Thus, it implies that the cultural values attached to these plants make them be utilized sustainably and sustainable management of the ecosystem would need a broader strategy that integrates other ecosystem components besides proper management of the plants.

It is important to note that although the study revealed the existence of a positive relationship between culture and environmental management, according to a key informant in the study, some cultural practices such as use of herbal medicine in treatment of diseases pose a danger to the plant species used, particularly if the species are not replanted often. The natural resources used in the cultural practices are slowly becoming endangered according to a key informant and thus there is need to merge cultural ways of conservation with conventional natural resource management methods for sustainable resource conservation.
According to a key informant interviewed during the study, some medicinal plants such as *Garcinia jonstonii* (*Muikutwe* - Tugen), are currently vulnerable to extinction as they are largely exploited for their medicinal value. There is need for medicinal plants and plants with cultural and economic importance to be protected to ensure their continual usage among the community. Healthy harvesting of these plants should be encouraged to avoid unnecessary destruction and possible wastage.

In all the communities involved in the study, it was noted that there were both dominant values and tender values which are well illustrated by the roles and responsibilities of either gender. Dominant values are expressed by males/men and they include assertiveness, protection, wealth and material things while tender values are associated with females/women such as care and service for others (Gemenez, 2000). Gemenez (2000) further, indicates the communities are influenced more by the dominant environmental values as men have authority over women but the influence of the resulting decisions is short lived. On the other hand, the tender values have a long term effect as women are caretakers of the environment and families.

The study also sought to find out whether stakeholders who are mandated by the government to do environmental management engage the communities living in lake Baringo ecosystem in their activities. It found out that more than half (55%) of the interviewed respondents said that they are usually engaged in activities such as environmental conservation days, and in developing conflict resolution mechanism that are related to the resource. Thus, it was established that the environmental institutions that manage the ecosystem utilize the principle of co-management whereby the decision making power is shared between the local community and the authorities involved including local and national government institutions (Gemenez, 2000). Further, according to a key informant from the Ministry of Agriculture, Livestock and Fisheries, they have established institutions such as Beach Management Units which are led by the local communities. These units, with the guidance of the relevant institutions, come up with laws that regulate fishing gear and the size of fish to catch from the lake.
However, 45% indicated that they are not involved in the management of the lake and its resources as illustrated in Table 4.11.

**Table 4.11: Community Involvement by Stakeholders**

<table>
<thead>
<tr>
<th>Community involvement by stakeholders</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>207</td>
<td>55</td>
</tr>
<tr>
<td>No</td>
<td>171</td>
<td>45</td>
</tr>
</tbody>
</table>

A chi squared test was performed on this result and it showed that there is significant statistical difference between community participation and ecosystem management ($\chi^2 = 3.42$, df = 1, $p < 0.05$). This implies that community involvement and ecosystem management are significantly dependent/related and thus it is fundamental to engage community in ecosystem management and conservation for sustainable environmental management.

However, from this finding, it is clear that there is need for increased involvement of the communities in management of the lake and its resources a principle founded on community based natural resource management as well as co-management which call for communities’ active involvement in the management of resources within their environment (Pretty & Ward, 2001). This is because this results to ownership of the conservation and management initiatives being implemented and achievement of their goals as the community’s participation is fundamental in sustainable environmental management (Walker & Salt, 2006).

This is fundamental as both of these principles are attributed with various benefits including: increased implementation and compliance to rules and regulations, reduced natural resources related conflict, the appliance of both indigenous and modern knowledge in environmental management as well as reinforced relationships between the communities and relevant institutions and above all enhanced environmental management (Walker & Salt, 2006).
Therefore it is evident from the findings that there is a significant relationship between environmental conservation cultural practices and perspectives and natural resource use and management in Lake Baringo ecosystem. This is well illustrated by the associations established during the study between cultural practices such as livestock keeping and ecosystem management.
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

As per objective 1, the study revealed that lake Baringo ecosystem has diverse natural resources including water, fertile soil, fish, plants and animals which the communities living in Lake Baringo ecosystem utilize for their livelihoods. Most of them utilize land and pastures since the study revealed that 51% of the respondents practice pastoralism, while 25% of the respondents utilize water and fish resources as they practice fishing. A further 10% are farmers utilizing land to a greater extent.

The ethnic group members also utilize the lake and its ecosystem for tourism activities such as rafting where approximately 10% of the interviewed respondents indicated that they practice it in Baringo. The community members interviewed during the study depend on Lake Baringo and its ecosystem for their survival implying that the lake is a significant resource to them and this weighty dependence on it has led to its considerable degradation.

In case of objective 2, the study revealed that the communities living in Lake Baringo ecosystem have a rich cultural heritage where each of the three communities involved in the study uphold some cultural values and practice cultural practices. According to the interviewed respondents, 50% confirmed adherence to cultural norms, 69% observe cultural practices while 66% believe in supernatural beings. The communities have a strong cultural attachment to livestock as it plays a cultural role in their lives including payment of dowry and provision of food. The effect of this cultural practice on the environment is negative because it has made the communities in particular the Pokot to become aggressive in enlarging their herds. They carry out frequent attacks on their neighbors to steal livestock resulting to destruction of natural resources. The large herds of livestock also deplete pastures and put pressure on water resources hence resulting in unsustainable management of resources.
The communities believe that various plants have medicinal value and cultural functions which are tenaciously protected by the community members and conserved from one generation to the next though these plants are gradually becoming depleted. Besides, all the communities have a religion which is either traditional religion or Christianity or both. They believe in a supernatural being who is the provider and a judge to those who do not observe and adhere to cultural norms and practices. These religions ensure that environmental values and ethics which are inherent in them are upheld because the followers believe that failure to practice what is stipulated by religious laws and regulation attracts a punishment from God.

It was also established that the communities have clearly differentiated roles between men and women whereby men’s daily roles include looking after the livestock and fishing while women do cultivation of land besides the domestic chores. This has an implication on how each gender conserves and manages the environment. Men relate more with natural ecosystems including the lake, forests, and pastures while women have a closer relationship with the land systems as they interact with it more often and closely.

In all the communities involved in the study, there are initiation rites whereby young people of both genders undergo circumcision which is characterized by various teaching of their roles and responsibilities as they enter into adult life. These teachings include how to take care of their families and the environment. Those who undergo the rite are also assigned mentors who are usually elders who continue to teach them and encourage them to adhere to the teachings.

It is worth noting that the study found out that most of the adults transmit indigenous knowledge and cultural values, perspectives and practices to the young generation through various methods including storytelling, myths, songs and dances. In addition, more than half of the respondents interviewed in the study indicated that more than 50 percent of young people practice and follow their culture. This means that they can be targeted for involvement in environmental conservation through activities and events that they engage in for example boat racing. During these events environmental education can be offered to them to increase awareness.
In the case of objective 3, the study showed that there exists a relationship between culture and environmental management. The relationship is majorly positive in that environments/ecosystems in which communities uphold and preserve their culture have a rich biodiversity/genetic diversity. Their physical environments are characterized by clean rivers and lakes, thick forests, medicinal plants, hills among other natural resources.

The study findings further revealed that culture determines environmental attitudes and values. It was established that the culture of the 3 communities promotes biospheric/ecocentric attitudes which promote protection and concern for the environment as opposed to egoistic altitude and behavior. This is because the respondents interviewed during the study revealed that their communities upheld cultural practices, norms and values which prohibit their members from destroying the environment and encourage them to preserve and protect it. For example it is catastrophic to cut down sacred trees or answer a call of nature in the river or sacred forests. As previous studies (Abo, 1994; Lincoln and Kallenberg, 1990; Taylor et al., 1996) have already shown, the study further revealed that cultural beliefs of a community influence values and decisions of people and even management of natural resources.

5.2 Conclusions

Based on the finding of the first objective which was to evaluate the natural resource utilization of the communities living around lake Baringo ecosystem, the study concluded that the natural resource utilization ways of all the communities living in Lake Baringo ecosystem depend on the lake for one natural resource or another; the fishermen depend on the water for fisheries while the pastoralists use the water for their livestock as well as pasture that grow at the lake shores. On the other hand, the farmers utilize the lake water for irrigation of their crops while all the communities depend on the lake water for domestic uses. A large proportion of the youth from all the communities also practice rafting and boat racing and act as tourist guides for a fee. The tourist activities thus form a livelihood source for many youths in the area. Hence, there is extensive exploitation of the lake and its resources by the communities which results in over-dependence on the lake and its resources.
From the findings of the second objective, “to establish the environmental conservation cultural practices and perspectives of the communities” the study concluded that the communities living in Lake Baringo ecosystem have rich cultural diversity as they uphold values, practices and perspectives which promote environmental conservation and management. They believe in religion which instructs them to protect their environment they live as a commandment from a supernatural God. This commandment attracts either blessings to the members who heed to it or a punishment to those who disregard it resulting to environmental conservation.

The communities progressively pass cultural values, perspectives and indigenous knowledge on environment and how to protect it from elders to young generations through teachings and other methods such as myths and songs. In conclusion, the moral and value systems instilled in societies by religion are indispensable in mobilizing people toward preserving the environment for future generations. Further, the communities practice traditional herbal medicine where they use various parts of plants such as roots, bark and leaves for treatment of various diseases. Such plants with medicinal value are keenly conserved from one generation to the other and the elders teach the young people about them and their importance to the community. The communities practice pastoralism with cattle having a cultural significance in their lives; a factor that make them keep large herds of cattle and even perform aggressive attacks on their neighbors in endeavor to enlarge their herds. This has a negative contribution to the environment as it puts pressure on the natural resources available such as pastures and water.

The practice of initiation performed by the three communities for both girls and boys at a young age is significant in propagating environmental values from the old generation to the young generation. The morals and values taught during these rites and rituals are unquestionable and are adhered to without any compromise and thus they are fundamental in passing environmental ethics and values from one generation to another. There is also need for the stakeholders involved in environmental conservation and management in Lake Baringo ecosystem to enhance community based natural resources management as a
principle as it is attributed with various benefits including enhanced participation and environmental conservation.

Based on the finding of objective 3 which was to determine how the environmental conservation cultural practices and perspectives affect resource use and management of Lake Baringo ecosystem. The study concluded that there is an identifiable cultural identity of each of the communities which is environmentally relevant and efficacious in conservation of the environment and as such cannot be ignored. All the communities involved in this study, have a common belief in religion which prescribes and puts forward unquestionable ethics and moral values that guide environmental management by enhancing responsibility of humans towards the environment and guide the relationship between humans and environment.

Based on the findings of the study it can be concluded that culture is a fundamental aspect of determinants of environmental attitudes which influence environmental behavior as it determines environmental attitudes and values. This is because culture propagates a wide range of unquestionable ethics and morals including those that directly or indirectly affect environment that people follow.

It was established that the culture of the three communities promotes biospheric /ecocentric attitude which promote protection and concern for the environment as opposed to egoistic altitude and behavior. In addition, culture plays a role in propagating environmentally sustainable conservation initiatives by transmitting environmental cultural practices, values, norms and beliefs that conserve and protect the environment from one generation to the other.

5.3 Recommendations

5.3.1 Recommendations to policy makers

Based on the conclusion one of the study that the natural resource utilization ways of all the communities living in Lake Baringo ecosystem depend on the lake for their livelihood it is recommended that policy makers should introduce policies that enhance livelihood
diversification in order to reduce pressure on the lake and its natural resources. This can be done by both introducing new livelihood strategies that do not put pressure on directly on the lake and promoting their adoption. Such activities would include boat racing and tourism activities as these do not put pressure on the ecosystem services.

Based on conclusion two that the communities living in Lake Baringo ecosystem have immense cultural heritage, there is need to create private and public partnerships on environmental conservation initiatives which takes into account the role of culture in environmental conservation. Such initiatives would include tourism ventures where both private and public conservation institutions enter into legal agreements with community leaders to be able to access natural resources such as the lake, islands, wildlife and other natural resources. The income earned ought to be used to sustainably conserve the ecosystem (lake and its resources).

Despite religion of communities living in the lake ecosystem providing essential environmental values and ethics, religions are generally not well equipped to provide precise guidance in dealing with complex environmental issues facing the communities. Therefore, there is need for collaboration between religious leaders, communities and other stakeholders/actors to be involved in environmental conservation in order to integrate their knowledge so as to sustainably manage the lake and its surrounding ecosystem. This is because researchers as well as religious leaders can be key players in the policy formulation and articulation process. All concerned parties should form alliances by creating common ground for dialogue and creative partnership for envisioning and implementation of sustainable solutions to reduce environmental degradation.

In addition, based on the significant relationship that exists between culture and environmental management, policy makers would benefit from a culture-specific approach to designing environmental policies. There is need for policy makers to develop culturally appropriate environmental laws, regulations and policies, to ensure that the rights, livelihoods, and culture of communities with strong cultural identity are considered in design of policies. Environmental
policy makers ought to officially recognize it and consider utilizing it in sustainable ecosystem management of this lake.

In the case of objective 3, cultural festivities of the communities with rich culture can be used as avenues to promote peace among communities living in Lake Baringo ecosystem in order to reduce or end the fights that the area has been experiencing which are threats to environment. There is need for policy makers to consider employing community based natural resources management as a strategy of enhancing the participation of local communities living in Lake Baringo ecosystem since it ensures that all relevant actors are consulted deeply and their inputs considered. This would enhance adherence and enforcement of environmental laws and communities.

5.3.2 Recommendations for Further Research

This study focused on assessment of the environmental cultural practices and perspectives of the communities living in Lake Baringo ecosystem and how they affect its resource use and management. There is need to carry out a widespread research in other lakes in Baringo County and rift valley as a whole. The findings have provided several insights on how culture can be integrated in community based natural resource management of Lake Baringo and its ecosystem. There is need to conduct comprehensive research to explore the environmental management strategies used by stakeholders involved in environmental management in Lake Baringo ecosystem.
REFERENCES


Belfiore E. (2012). “Defensive instrumentalism” and the legacy of New Labour’s Cultural policies. Vol. 21 Iss.2


Waveland Press.


Appendix I: Formulae

The following formulae will be used to calculate the sample size:

Sample size (n) =

\[ n = \frac{N \cdot Z^2 \times 0.25}{d^2 \times (N-1) + (Z^2 \times 0.25)} \]

Where

n=Sample size required; N= Total target population;
d= Precision level (0.05)
Z= Number standard deviation units of sampling corresponding to the desired confidence level (Cole, 2009).
Z=1.96 at 95% confidence level (See Appendix B).

When the figures are substituted in this formula the sample size is 378 as shown below:

\[ n = 89000 \times (1.96^2) \times 0.25 \]
\[ 0.05^2 \times (89000 -1) + (1.96^2 \times 0.25) \]

\[ n = 89000 \times 3.8416 \times 0.25 \]
\[ (0.0025 \times 88999) + (3.8416 \times 0.25) \]

\[ n = 85475.6 \]
\[ 223.4579 \]
\[ n = 377.513 \]
\[ n = 378 \]
### Appendix II: Z Factor Table

<table>
<thead>
<tr>
<th>Confidence level</th>
<th>Z factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>99.9</td>
<td>3.2905</td>
</tr>
<tr>
<td>99.7</td>
<td>3.000</td>
</tr>
<tr>
<td>99.5</td>
<td>2.8070</td>
</tr>
<tr>
<td>99.0</td>
<td>2.5758</td>
</tr>
<tr>
<td>98.0</td>
<td>2.3263</td>
</tr>
<tr>
<td>99.5</td>
<td>2.000</td>
</tr>
<tr>
<td><strong>95.0</strong></td>
<td><strong>1.9600</strong></td>
</tr>
<tr>
<td>90.0</td>
<td>1.6449</td>
</tr>
<tr>
<td>85.0</td>
<td>1.4395</td>
</tr>
<tr>
<td>80.0</td>
<td>1.2816</td>
</tr>
</tbody>
</table>

Source: Cole (2009)
Appendix III: Questionnaire


Instructions- The respondent must be at least 18 years.
Fill out the responses in the provided spaces

General Household Information

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Name of respondent</td>
<td></td>
</tr>
<tr>
<td>2. Gender</td>
<td>1= Male 2= Female</td>
</tr>
<tr>
<td>3. Tribe/commuity</td>
<td></td>
</tr>
<tr>
<td>4. Place of birth</td>
<td></td>
</tr>
<tr>
<td>5. Age</td>
<td>1=18-35yrs 2= 36-60 yrs 3= &gt;60</td>
</tr>
<tr>
<td>6. Number of dependants in your household</td>
<td>1=none[] 2= &lt;2[] 3=2-5[] 4=5 and above[]</td>
</tr>
<tr>
<td>7. Marital Status</td>
<td>1=Married[] 2= Single[] 3=Separated[] 4=Divorced[] 5=Widowed[]</td>
</tr>
<tr>
<td>8. Level of Education</td>
<td>1=Primary[] 2=Secondary[] 3=Tertiary[] 4=No Formal Education[]</td>
</tr>
<tr>
<td>9. Economic Activity</td>
<td>1=Fisherman 2=Farmer 3=Pastoralist</td>
</tr>
</tbody>
</table>
Cultural practices and perspectives of the communities

10. Does your community have some cultural practices (cultural things they do e.g ceremonies, religious rituals.)

   1=Yes  2= No

11. If yes, what are the cultural practices of your community (Name them)?

   i.
   ii.
   iii.
   iv.
   v.

12. Are the cultural practices similar to what your fore fathers practiced?  1=Yes  2= No

13. Are these practices known by current generation (youth and children)? 1=Yes 2= No

14. Do the children and youths practice them?  1=Yes  2= No
   b. If Yes, explain.

15. If No, do the elders and adults encourage them to take up the practices?
   1=Yes  2= No

16. If Yes, How do the elders teach the young and children about the community’s cultural practices?
   1=Story telling 2=Songs and Dances 3=Chants/Poems
   4=Others (Specify).................................

17. Do these cultural practices affect the way people use resources such as: the land, lake, livestock or rivers around the lake ecosystem?

   1=Yes  2= No

18. If yes, what do they affect?
<table>
<thead>
<tr>
<th>What resource do they affect</th>
<th>How do cultural practices affect the way people use it. Explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1=Land</td>
<td></td>
</tr>
<tr>
<td>2= Lake</td>
<td></td>
</tr>
<tr>
<td>3= River</td>
<td></td>
</tr>
<tr>
<td>4=Animals</td>
<td></td>
</tr>
<tr>
<td>5=Plants /Vegetation</td>
<td></td>
</tr>
<tr>
<td>6=Others(Specify)</td>
<td></td>
</tr>
</tbody>
</table>

19. Do the communities living around Lake Baringo have some cultural beliefs (things they believe as a community)? 1=Yes 2= No

20. What are the cultural beliefs of the communities living in Lake Baringo ecosystem?

i.
ii.
iii.
iv.
v.
vi.

21. Do these beliefs influence how people use the land, Lake or the rivers 1=Yes 2=No

22. If yes, what do they affect and how?
23. Does your community have cultural beliefs that determine how people relate/use the environment?  
1=Yes  2=No

24. If yes, what are these cultural beliefs of your community?
   a) 
   b) 
   c) 
   d) 
   e) 

25. Does your community have cultural norms and superstitions? (things that people are not allowed to do, are punishable by the community/elders)
   1=Yes  2=No

26. What are the cultural norms of your community?
   i) 
   ii) 
   iii) 
   iv) 
   v) 
   vi

27. Do the cultural norms influence how the communities utilize the land, lake, the rivers, animals, plants and other resources?
   1= Yes  2=No

28. If yes, what do they affect and how?

<table>
<thead>
<tr>
<th>Resource</th>
<th>Explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td></td>
</tr>
<tr>
<td>Rivers</td>
<td></td>
</tr>
<tr>
<td>Plants</td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td></td>
</tr>
<tr>
<td>Others(specify)</td>
<td></td>
</tr>
</tbody>
</table>
29. Do the cultural norms affect how the communities manage the lake?
1=Yes  2=No

30. If yes, how do these norms affect how the way the community manage the lake and its resources?

31. Are there norms that the communities have set to govern fishing, grazing and farming?
1=Yes 2=No

32. If Yes which ones?

<table>
<thead>
<tr>
<th>Cultural norms</th>
<th>What and how does it affect?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>i) Fishing</td>
</tr>
<tr>
<td></td>
<td>How?</td>
</tr>
<tr>
<td>2.</td>
<td>ii) Grazing</td>
</tr>
<tr>
<td></td>
<td>How?</td>
</tr>
<tr>
<td>3.</td>
<td>iii) Farming</td>
</tr>
<tr>
<td></td>
<td>How?</td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
</tbody>
</table>

33. Are there some animal, plant or fish species that either men or women or children do not eat?

a) Which animal species
i. Men do not eat.............................................................
ii. Women do not eat..........................................................
iii. Children do not eat....................................................

b) Which plant species?

i. Men do not eat.............................................................
ii. Women do not eat..........................................................
iii. Children do not eat....................................................
c) Which fish species?

i. Men do not eat............................................................

ii. Women do not eat......................................................

iii. Children do not eat..................................................

34. Are there plant species e.g trees that are of religious or other cultural value?  1=Yes 2=No

35. If Yes which ones? Name them

36. What is their cultural value to the community?

37. Are there some natural resources (plants, water, and fish) that the community uses in times of ceremonies?
   1=Yes 2=No

38. If yes, which ones:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Ceremony in which it is used</th>
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<tbody>
<tr>
<td></td>
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</tbody>
</table>

39. How can societies be encouraged to maintain cultural practices which improve environmental conservation?

i) 

ii) 

iii) 

iv)
40. Do the stakeholders (like fisheries dept, KEMFRI, KEFRI) engage you as community in their management activities? 1= Yes 2= No
41. If yes, how? 
42. If No, how can governments work together with societies in maintaining cultural practices, norms / values that enhance environmental conservation?

43. Are there some conservation measures that the community has initiated? 1=Yes 2=No
   If Yes, which ones?
   i)
   ii)
   iii)
   iv)

44. Are there some policies that conflict with your belief, culture? 1=Yes 2=No

45. If yes, which ones that conflict (community believes in one thing but the authorities say something different)?
   i)
   ii)
   iii)

46. How can indigenous people best be empowered for environmental conservation while maintaining their own cultural values?
47. What do you think should be done to promote increased participation by communities in environmental conservation and decision-making processes?

i)

ii)

iii)

iv)
Appendix IV: Key Informant Interviews Schedule


Section 1: Respondents Information

<table>
<thead>
<tr>
<th>Name:</th>
<th>Institution:</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Tel/Mobile No:</th>
<th>Date:</th>
</tr>
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</tr>
</tbody>
</table>

Section 2: Fill in the appropriate response

1. What are the cultural practices of the ethnic groups that live in Lake Baringo ecosystem? Explain.

2. What are the cultural beliefs of the ethnic groups that live in Lake Baringo ecosystem? Explain.

3. What are the cultural values and norms of the ethnic groups that live in Lake Baringo ecosystem? Explain.

4. How do these cultural practices, Values and norms affect the way the ethnic group members utilize and manage the lake and other natural resources (Land, Lake, Plants, and Animals)?

5. To what extent and in what ways does the relevant institutions (Such as MENR, BMUs) engage the community in natural resource management in Lake Baringo ecosystem?