COMMUNITY INVOLVEMENT IN NATURAL RESOURCE CONSERVATION AS A MEANS OF ALLEVIATING POVERTY: A STUDY OF BONJOGE NATIONAL RESERVE AND ITS ENVIRONS, KENYA.

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DECLARATION

DECLARATION BY CANDIDATE

I declare that this thesis research is my original work and it has not been presented to any university or examination body for any degree award.

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DEDICATION

I dedicate this report to my father, my wife, siblings and friends for their moral and spiritual support.

ABSTRACT

Local communities have co-existed with and utilized natural resources within their environment and hence the need to involve them in the conservation of these resources cannot be overemphasized. Bonjoge National Reserve (BNR) has diverse wildlife some of which escape to neighbouring farmlands destroying property. This has accelerated outright hostility and resentment among local residents, human-wildlife conflicts, and poverty due to wildlife destructions. This study assessed how the local community has been involved in the conservation of BNR and its resources as means of alleviating poverty, determined local residents' attitudes and perceptions towards BNR and its wildlife resources, determined the benefits accruing to the community from the reserve, and established the challenges faced in involving the local community in conserving the reserve and its resources and how these challenges are being mitigated. The study utilized an exploratory and descriptive research designs. The study targeted all residents living 1 km from the reserve boundary. Data was collected from 250 randomly selected residents living within 1 km from the reserve boundary using questionnaires and focus group discussions and interviews. To facilitate selection of respondents, the study area was divided into three strata in relation to their location to the reserve namely the Kaptumek on the Eastern, Pemja on the Western, and Kipsartuk on the Northern side guided by existing administrative boundaries. Data was analyzed using descriptive statistics to determine frequencies and percentages and the t test. Results showed that most of the local community (64%) had not been involved in conservation yet community involvement has been shown to have capacity to alleviate poverty since the uninvolved had a greater percentage of multi-dimensionally poor individuals. The weighted score (poverty index) between those involved and not involved in conservation of natural resources in the study area was statistically significant ($t=2.129$, $df= 248$, $P=0.03$). Results further showed that 24% of the respondents had established income-generating activities (24%), minimized human-wildlife conflict (14%) and promoted the sense of ownership (17%).Community involvement has been challenged by high human-wildlife conflict and an alarmingly low illiteracy level. The latter is being mitigated by promoting education and security among others. The study concludes that local community is a vital stakeholder for a sustainable conservation and recommends further investigation to the effect of community involvement in natural resource conservation at country level context.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

BNR	Bonjoge National Reserve
CCA	Community Conservation Area
DFID	Department for International Development
HPI	Human Poverty Index
IIED	International Institute of Environment and Development
KFS	Kenya Forest Service
KWS	Kenya Wildlife Service
KM	Kilometre
MA	Millennium Assessment
MPI	Multi-dimensional poverty index
PAs	Protected areas

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Promoting sustainable effective natural resource management, biodiversity conservation, and poverty alleviation within and around protected areas are serious challenges currently facing national governments and other stakeholders in the conservation sphere. Increasingly, these issues are viewed as linked both to international declarations on Millennium Development Goals and currently Sustainable Development Goals. Despite this, there is little understanding of how natural resource conservation can be used to simultaneously promote natural resource and biodiversity conservation and also provide benefits for communities and alleviate poverty in developing nations (Glew *et al.*, 2010). This situation has been compounded by lack of data to inform rational decision-making.

Local communities have co-existed with natural resources like wildlife and the link between natural resource management, biodiversity conservation, and poverty reduction is dependent on a conservation system that recognizes the need to involve these communities in conservation. Consequently, the wisest and most equitable decisions about natural resource use and management need to be made openly and transparently to enhance transparency and accountability so that those who are most affected by these decisions should have access to information, to be able to participate in decision-making processes.

To meet poverty reduction goals, resource custodians must be assisted to build effective institutions and reduce corruption. Likewise, local communities must be empowered to manage their own resources. This way local people are more likely to conserve resources if they are involved in conservation.

Community conservation emerged from the recognition that strictly protected areas often failed to consider the interests of local communities, thus reducing their willingness to support or abide by conservation regulations (Pimbert and Pretty, 1997; Kiss, 2004). Community conservation aims at providing an incentive for sustainable management of natural resources by linking their maintenance with poverty alleviation or livelihood benefits for people living in their vicinity (Salafsky and Wollenberg, 2000). If communities are involved in conservation, the benefits they receive will create incentives for them to become good stewards of resources. This vision of the community is attractive and permits easy contestation of dominant narratives that favor state control or privatization of resources and their management since people often have an understanding necessary to bring about long-term change in conservation. Reporting on an integrated conservation and development project in Cameroon, Abbot *et al,* (2001) concluded that the inclusion of rural development initiatives promoting alternative livelihoods can improve the sustainability of conservation in an area by altering community attitudes and behaviors.

It is against this backdrop that it can be argued that local communities are an integral part of wildlife conservation and natural resource management, and their participation in conservation projects, programs and initiatives are not only a key to their success and

sustainability, but can also empower communities, promote sustainable livelihoods and alleviate poverty.

1.2 Problem statement

Although protected areas are cornerstones for conservation, the problem most past efforts to conserve nature have faced has been that nature conservation has taken place without paying any attention to the interests and needs of local people. Consequently, local communities seldom have any advantages from natural resources wrapped up in protected areas adjacent to them. Subsequently, while over the years natural resources found within and around protected areas have been harnessed, no substantive measures have been taken to ensure that local communities who have coexisted with these natural resources and bear the cost of their mismanagement are involved in their conservation in order to improve their livelihoods.

The area currently designated as Bonjoge National Reserve was inhabited by local communities until 1983 when they were evicted following a presidential directive to pave a way for the reserve. Most of the poverty-stricken evictees were relocated to the new Bonjoge area in Kaptumek while others remained in the proximity of the reserve living in acute poverty. As a result, because of denial of access to the reserve's resources they have remained a threat to BNR.

While involving the local community living adjacent to BNR in the conservation of wildlife and other natural resources is faced with many challenges, which have jeopardized conservation efforts, the management of the reserve also faces a myriad of other challenges most of which are anthropogenic in nature. This calls for the need to

involve local communities in conservation in order to enhance sustainable resource management, mitigate poverty and promote sustainable livelihoods.

Likewise, efforts to conserve wildlife and other natural resources in BNR and its surroundings have remained futile due to lack of community engagement in conservation amidst a high poaching rate and wildfires from cane farmers. The area designated as a game reserve is small averaging approximately 21km^2, and this has locked out most of the wildlife to community land. As the human population continues to increase in the entire Nandi County, wildlife will be at the receiving end as the local community converts land to agriculture. This study aimed at assessing local community involvement in natural resource conservation for poverty alleviation and sustainable livelihoods with a view of making recommendations that can promote sustainable management.

1.3 Study objectives

1.3.1 General objective

To assess local community involvement in the conservation of wildlife and other natural resources as a means of alleviating poverty among residents living in and around Bonjoge National Reserve.

1.3.2 Specific objectives

1. To determine the ways in which the local community is currently involved in the conservation of wildlife and other natural resources in and around Bonjoge National Reserve.

2. To determine the role of community involvement in the conservation of wildlife and other natural resources in alleviating poverty in and around Bonjoge National Reserve.
3. To assess the attitudes and perceptions of the local community towards the conservation of wildlife and other natural resources in and around Bonjoge Natural Reserve.
4. To determine the benefits accruing from local community involvement in the conservation of wildlife and other natural resources in and around Bonjoge National Reserve.
5. To establish the challenges of involving the local community in the conservation of wildlife and other natural resources in and around Bonjoge National Reserve and the measures adopted to mitigate them.

1.4 Research questions

1. In what ways is the local community involved in the conservation of wildlife and other natural resources found in and around Bonjoge National Reserve?
2. What is the community role in the conservation of wildlife and other natural resources in and around Bonjoge National Reserve?
3. What are the attitudes and perceptions of the local community towards the conservation of wildlife and other natural resources found in and around Bonjoge National Reserve?
4. What benefits accrue to the local community from their involvement in the conservation of wildlife and other natural resources found in and around Bonjoge National Reserve?

5. What challenges are experienced due to involving the local community in wildlife and natural resource conservation in and around Bonjoge National Reserve?
6. What measures have been adopted to mitigate the challenges faced in integrating the local community in conserving wildlife and other resources in BNR?

1.5 Hypothesis

7. **H_O:** There is no significant difference in poverty level between local residents involved in conservation and those who are not involved in conservation.

1.3 Justification and Significance of the study

Conservation and management of natural resources is a multi-stakeholder undertaking where all parties to a resource must be involved. More often, the custodians of natural resources such as national governments and protected area management authorities have failed to recognize the input of local communities living close to resources and often perceive them to be poachers and a threat to conservation.

This study hypothesized that local communities can be involved in resource management and benefits can be accrued with full realization of the process. Despite this, very few studies have been done in the study area to ascertain this and this study aimed at being a yardstick to the conservation and management of natural resources in Bonjoge National Reserve since the host county government has pledged to invest heavily in the conservation of natural resources to boost tourism in the area.

Bonjoge National Reserve is one of the smallest national reserves in Kenya and is located in an arable county. Most of the wildlife occurs outside the designated area and therefore a research assessing ways in which the local community can be involved in conservation, ensure benefits accrue, and challenges experienced are mitigated is justifiable.

Findings of the study will inform protected area managers, policy makers and the county government on ways in which the local community can be involved in the conservation of natural resources within and around BNR.

Study results will be important for conservationists in the local community and other stakeholders since they will bring into focus the current ways in which the local community is involved in conservation, the benefits that accrue, the challenges that are encountered when involving local communities in conservation and the measures used to mitigate them, as well as attitudes and perceptions of local residents towards the reserve, its wildlife and other resources.

The thesis will be a reference for researchers, scholars and students undertaking similar or related studies to add to the pool of knowledge on the study topic.

CHAPTER TWO

LITERATURE REVIEW

2.1 Local community involvement in natural resources conservation: A global overview

Recent global trends show that community-based natural resource management approaches have overtaken the conventional approach to natural resources and biodiversity conservation (Bajracharya, 2004), and the importance of incorporating a more participatory approach to natural resource management has been widely recognized in literature (Brown 2003; Grainger, 2003; Pretty and Smith, 2004; Anthony, 2007; Reed, 2008; Low *et al*.,2009). Consequently, local community involvement in conservation aims at providing an incentive for sustainable management of natural resources by linking their maintenance with poverty alleviation or livelihood benefits for the people living in their vicinity (Salafsky and Wollenberg, 2000). Hence, the importance of collaborative management in enhancing conservation of natural resources has become critical to the long-term success of protected areas (Mbile *et al.*, 2005; Yonariza and Webb 2007; Kaltenborn *et al*., 2008). To this end, conservation should generate benefits like local employment and livelihood options for local people. Since people's judgment of conservation is based on what benefits it brings to them, their participation is possible only if conservation enhances the local economy. In addition, it is important that local people invest in development projects that generate economic benefits.

The involvement of local communities in conservation is a participatory management system that conserves species and ecosystems of a region and promotes sustainable resource use for the benefit of local communities. This approach adopts community participation and multiple land use approaches which largely reflect other programs and activities of the area. Hence, one of the main objectives of participatory conservation is to address local issues, which may include maintenance of socio-cultural traditions and generation of livelihood resources. Deploying traditional eco-friendly knowledge, skills and practices in conservation is also a prime concern, which not only rationalizes the conservation cost by ploughing back the revenue generated (Sibanda and Omwega, 1996) but also justifies local people's rights and responsibility to be involved in the management of local resources (Barjacharya, 2007). Hence, incorporating local communities in the decision-making processes can potentially create a sense of stewardship, where local residents collaborate with protected area managers and act together to conserve biodiversity and local livelihoods (Horowitz, 1998). As documented by Milner-Gulland *et al* (2003) local people are more likely to support full protection of some areas if they perceive direct benefits from them.

In Nepal, local communities have been involved in conservation through formal and informal ways, which include enhancing conservation awareness, educational tours, workshops and training, and conservation education in schools. Social development activities promoted among communities include adult literacy and awareness camps. Conservation education was introduced in schools from sixth to eighth grades, particularly focusing on protected areas and natural resources of the area, local development activities and environmental impacts, and rights and responsibilities of local

people in conservation and development. Besides forestation, clean-ups and conservation, development activities in schools and villages were the main awareness-creating activities (Basnet *et al*., 2007).

Based on the foregoing, it has been acknowledged that conservation can only be effective with the support of communities (Alcala and Russ, 2006). This shift towards a people oriented-approach to conservation is increasingly handing over the responsibility for natural resource management to communities.

2.2 Community-based conservation in Africa

Since the establishment of the first national park in the United States of America, many protected areas have been established in various parts of Africa based on this conventional and exclusionary top-down approach embodied in the Yellowstone Park model since 1872 (Lane, 2001; Pretty and Smith, 2004). As such, many protected areas especially parks have failed to consider other important factors including social, cultural, and political issues of local communities.

More often, local communities are forbidden from extracting natural resources that are important for their livelihoods, and in many instances, traditional communities are removed from their lands with little consultation or adequate compensation (Jim and Xu 2002, Brown 2003, Anthony 2007). Inevitably, this has often triggered adverse social impacts on local communities, disrupting their traditional ways of living (Garcia-Frapolli *et al*., 2009). This approach can result in hostile attitudes toward conservation strategies (Mehta and Heinen, 2001; Hamilton *et al*. 2000; Jim and Xu 2002; Fu *et al*. 2004; Anthony 2007), jeopardizing conservation of natural resources through conflicts between

park managers and local communities, and reducing the effectiveness of protected areas for biodiversity conservation (Lane, 2001).

Literature reviewed abounds with examples of where local communities have been marginalized following establishment of protected areas. Gazettement of Bwindi Impenetrable Forest led to conflicts among natural resource stakeholders marked by loss of natural resources due to fire. Fire burnt 5% of the forest (Hamilton *et al*., 2000). In Tsitsikamma National Park in South Africa, conflicts often arise among local communities who practice illegal activities as a form of retaliation to the command-and-control conservation policies (Watts and Faasen, 2009). This situation is compounded due to forceful eviction and lack of recognition arising in relentless claims for their property.

In the Kruger National Park, almost half of the land is under claim, while in the Limpopo region about a third of private game reserves are under claim. In Kwa Zulu Natal about 90 per cent of state-owned conservation land and 80 per cent of private nature reserves are under claim. Consequently, statutory conservation authorities are conscious of the need to merge their mandate to protect the nation's biodiversity assets with the rights and interests of local communities. Land claims under the restitution program in various parts of Africa suggest significant scope for stimulating local economic development to the benefit of communities behind these claims (Hall, 2004).

To avert conflicts with local communities over resources, various policy and legislative instruments have been designed by various countries. For example, the Biodiversity Act (2004) of South Africa considers community participation in conservation as an

alternative way of securing poverty alleviation, while the Protected Areas Act (2003) provides for co-management and contractual parks where local communities are granted entitlements to benefit sharing (Algottsen, 2006).

Community involvement in wildlife and natural resource conservation faces a number of challenges that cannot be underestimated. Grossman and Holden, (2006) and Kepe *et al.* (2005) suggest a host of challenges, which comprise divergent agendas of the multiple actors involved; unequal power relations between communities and conservation agencies; resistance by conservation staff to surrendering sole control; and a lack of internal cohesion among poor local communities who tend to be politically weak and poorly organized. There are no fast and easy answers to any of these factors, and much sensitivity is required to steer and support marginalized communities through the lengthy negotiation processes involved, and ensure that economic opportunities arising from these cases are not hijacked by local elites.

Protected areas in developing countries like Kenya often have a common funding deficit feature (Bruner *et al.*, 2004). Considering this, it is argued that community involvement in the conservation of natural resources could promote a win–win outcome. Allowing more active local participation in natural resource conservation decision-making processes means that protected area financial resources can be better invested in improving governance, local capacity building, participation, and outreach programs rather than draconian measures. For instance, patrolling and management costs could be reduced with local collaboration (Boissière *et al.*, 2009).

Community participation in natural resource conservation has a dual goal of conserving natural resources and improving socio-economic conditions of local people (Kothari *et al.*, 1998). It also promotes a positive attitude toward the conservation program (Abbot *et al.*, 2001). This promotes positive changes in attitudes toward conservation strategies (Pretty and Smith 2004; Ban *et al.*, 2009). Based on this, there is some evidence suggesting that local communities are more likely to comply and commit themselves to long-term conservation strategies when their knowledge and opinions are incorporated into conservation decision-making processes (Mascia, 2003; Fu *et al.*, 2004; Pretty and Smith, 2004; Gelcich *et al.*, 2005). On the other hand, others have suggested that enforcement of this conservation alternative approach is the cornerstone for the success of conservation in PAs (Bruner *et al*., 2001; Lock and Dearden, 2005).

Local community involvement in natural resource management lowers management costs by recognizing the role of local communities in conservation, involving them in the process, and protects biodiversity and other natural resources (Bajracharya *et al.*, 2005). This is a holistic approach to development that includes maintenance of socio-cultural practices, community development, promotion of indigenous knowledge, and development of ownership feelings and responsibility at individual, community and government level. It is considered the best way of achieving sustainable development in developing countries (Wells and Brandon, 1992; Christensen, 2004; Wells *et al.*, 2004). Community involvement in nature conservation helps to eradicate poverty since natural resource conservation has the potential for creating additional employment opportunities by encouraging people to take up wildlife farming and related activities (Grieg-Gran *et al*., 2005; Adams *et al*., 2004). Consequently, the most important goal, in this case, is to

foster economic development of local communities, improving their livelihoods and at the same time reducing the exploitation of natural resources inside wildlife reserves (De Fries *et al.*, 2007).

Natural resources play a significant role in the livelihoods of rural households (Shackleton and Cousins, 2000). The utility of natural capital in securing rural livelihoods comes into sharper focus when viewed against the background of fragile agricultural systems characterized by a rugged and rocky terrain in areas like Bonjoge National Reserve and frequent crop failures due to fluctuating climatic conditions and disease attack. Under these conditions, and in the context of livelihood diversification, commercializing wild resources can have beneficial poverty reduction outcomes. As Shackleton *et al.,* (2000) reported policies and programs which enhance productivity and incomes from natural resources have the potential to alleviate poverty and inequality while simultaneously promoting growth.

2.3 Local Community involvement in natural resource management in Kenya.

Literature on local community involvement in the conservation and management of wildlife and other natural resources in Kenya is scanty, despite acknowledgement that it can reduce environmental degradation vices such as charcoal burning and illegal logging (Ruuska, 2013). Despite this, findings of a study by Kipkeu *et al*. (2014) indicated that community participation in wildlife conservation in the Amboseli ecosystem is relatively low, and this stems from the fact that community members seem not to have been involved in conservation, as most community needs and aspirations have been ignored in

developing conservation programs. This has led to difficulties in enforcing conservation policies in the area as the policies are not respected by the local community.

Natural resource management in various parts of Kenya is under resource custodians that are mainly government parastatals like KWS and KFS. Kenya Wildlife Service manages wildlife while forests are under Kenya Forest Service. National reserves such as BNR and game reserves are managed by the relevant county governments and are expected to involve communities in conservation. The Wildlife Conservation and Management Act (2013) provides for the establishment of community wildlife associations and wildlife managers are mandated to facilitate conflict resolution and cooperative management of wildlife within a specified geographic region or sub-region. This is a major improvement from the old act (CAP 376), and this move is expected to promote greater local participation in wildlife conservation and natural resource management.

Community conservancies some of which are under local communities are crucial to the conservation and survival of Kenya's wildlife, both within and outside the parks system. It has been argued that approximately 70% of all Kenya's wildlife resides in community or private land outside Parks. The remaining 30% of wildlife that resides in parks and other protected areas often spends much of the time outside the parks and is therefore often heavily dependent on both the pastures outside these areas and the tolerance of the communities and private landowners for its survival. As such, wildlife conservation outside protected areas is increasingly taking centre stage in global conservation discourse with the aim of involving local communities in their conservation.

Conservation authorities are increasingly becoming aware of the need to involve local communities in managing natural resources to safeguard and secure more space for wildlife conservation through providing communities with sustainable benefits focusing on water resources, health facilities, education, infrastructure and nature-based enterprises (Sifuna, 2005; Twyman, 2000). One of the main drivers of community involvement in conservation is the evidence and feasibility of benefit sharing from projects and activities among various stakeholders. Kenya's experience suggests that local communities are now seeking ways of getting benefits from wildlife resources on their lands particularly through wildlife-based ecotourism ventures especially among marginalized groups like youth and women (Manyara and Jones, 2007; Southgate, 2006 ; Scheyvens, 2000).

Currently, many countries including Kenya have been challenged to adopt sound and realistic approaches to enhance effective conservation of their natural resources in and around protected areas, particularly where sources of livelihood of rural communities have been affected (Andrew and Essien, 2014), and have potential for direct benefits (Kipkeu *et al*., 2014). Whereas protected areas in Kenya are state owned and have been set aside for purposes of wildlife conservation, areas outside these protected areas that serve as dispersal areas and migratory routes are communally or individually owned. Consequently, boundaries between protected areas and communities are becoming distinct through erection of fences and other barriers. Besides, there are inadequate incentives to motivate communities and landowners to adopt land use practices that are compatible with wildlife conservation and management (Krug *et al*., 2004), a situation that is aggravated by corruption in the delivery of incentives (Akech, 2014).

Persuading communities to protect wildlife when it deprives them of their means of livelihood and endangers their lives and property remains a challenge. In such areas, where wildlife is threatened by competing land uses, Kenya Wildlife Service often looks for ways and means of formulating workable compromises that promote wildlife conservation and sustainable livelihoods. For instance, to minimize conflicts measures such as fencing, wildlife translocation, elimination of problem animals, land use zoning and maintenance of wildlife corridors and dispersal areas have been adopted and implemented whenever possible (Anyonge-Bashir *et al*., 2012). These measures have however, had varying degrees of success.

Bonjoge National Reserve has majority of its wildlife outside its designated boundaries and hence the need to involve the local community in its management for optimal and sustainable conservation. The foregoing challenges notwithstanding, local community involvement in wildlife conservation and natural resource management is still lacking and unappreciated globally and particularly in Kenya. This, therefore, necessitated this study to generate information to inform decisions on innovative ways of mitigating challenges faced in integrating local communities in protected area management as well as wildlife conservation and natural resource conservation with a view to promoting sustainable management to enhance sustainability of resources found within and around protected areas and alleviate poverty.

2.4 Local community attitudes and perceptions towards conservation of wildlife and other natural resources.

Despite a wide pool of literature acknowledging the relatedness of perceived benefits with attitudes and perception towards conservation of natural resources (Alexander, 2000; Gillingham and Lee, 1999; Mehta and Heinen, 2001), there is scanty information available in literature reviews on the impact of community involvement on attitudes and perceptions. It is therefore, essential to understand local people's attitudes and make efforts to improve their awareness. Moreover, understanding and acknowledging residents' knowledge and perceptions about wildlife conservation is an important part of a process of engaging with local communities and building constructive relationships between residents and protected area management (Fiallo and Jacobson, 1995).

Benefits are an incentive for people to perceive conservation positively. Correlation between benefits accrued and positive attitudes has been confirmed in many cases (de Boer and Baquete, 1998; Gillingham & Lee, 1999; Hamilton *et al*., 2000; Abbot *et al*., 2001; Mehta & Heinen, 2001). Attitudes towards conservation of wildlife are mostly influenced by the benefits that people gain, as well as the negative consequences that they experience (Gereta and Roskaft 2010; Gillingham and Lee, 1999; Hemson *et al*. 2009; Røskaft 2012; Roskaft *et al*., 2007). Nature reserve authorities should strengthen local communities' participation in wildlife conservation and strive to strengthen the role of positive attitudes and undermine negative factors that influence people's attitudes (Agrawal and Gibson, 1999; Kideghesho, 2007).

The interactions between humans and wildlife have resulted in both positive and negative attitudes towards conservation objectives. Positive attitudes are predominantly associated with wildlife-derived benefits, whereas negative attitudes are generated by wildlife-related costs, including the opportunity costs of conservation (Gereta and Roskaft, 2010; Roskaft, 2012; Roskaft *et al*., 2007). Negative attitudes to conservation are generated when wildlife-related costs supersede wildlife-related benefits especially when compensation schemes are lacking (Holmern *et al*., 2007; Kideghesho *et al*., 2007; Nyahongo, 2010).

Local people's knowledge about natural resources conservation is influenced by education and awareness programs, and services and benefits local people receive from conservation-related projects (Spiteri and Nepalz, 2006; Sah and Heinen, 2001). Information about local people's knowledge and perceptions about conservation are important in wildlife conservation and evaluating the success of conservation projects (Berkes, 2004). Local residents acknowledge the importance and value of wildlife and the need to protect them (Allendorf, *et al*., 2006) especially when they benefits and inclusion in conservation projects. For example, in Selous Game Reserve, Tanzania, Gillingham and Lee (1999) found that the absence of democratic participation spaces on the management of the protected area, and the inequitable benefits distribution made local residents to negative views of the conservation project (Gillingham and Lee, 1999).Attitudes and perceptions of local residents to conservation are of vital interest to improve participation and integration strategies involve local residents to work in, otherwise essential, conservation projects.

Rapid population growth and change in local community values about wildlife as a resource, shift in land uses, attitudes and patterns of land ownership further make wildlife conservation unfeasible within and outside protected areas (Shibia, 2010). Lack of a holistic approach to wildlife conservation makes communities adjacent to protected areas view wildlife as a liability and have negative attitudes towards wildlife and the reserve.

The intensity and magnitude of conflicts are influenced by local people's negative attitudes and perceptions about wildlife. It has been argued that negative attitudes towards wildlife and consequent land use changes will in the long run threaten the conservation and survival of wildlife outside protected areas, the integrity and viability of wildlife reserves and the biodiversity they are established to conserve (Shibia, 2010). The success of wildlife conservation depends on the support of local communities living adjacent to a reserve, and for community wildlife conservation to succeed an understanding of the attitudes and perceptions of local communities is paramount. It is therefore important to understand attitudes towards wildlife, and important factors that affect these attitudes and perceptions to improve tolerance since wildlife is of major conservation significance (Shibia, 2010).

From the foregoing observations, it can be inferred that people's acceptance or rejection of protected areas and protection restrictions depends on their perception of nature, relations between humans and nature, and perceptions of costs and benefits. Local residents' attitudes and perceptions are shaped by their involvement in conservation and the benefits they accrue in the engagement (Kollmuss and Agyeman, 2002). However, in most cases, people's perceptions of these efforts are rarely elicited, analyzed and included in decision-making processes (Chase *et al.*, 2004). Hence, understanding

human attitudes and their potential for wildlife conflicts in the context of protected area management is critically important in designing long-term conservation strategies (Heinen, 1993).

2.5 Benefits accruing to local communities from wildlife and natural resource conservation

Wildlife and natural resource conservation confer numerous benefits to local communities especially in developing nations (Wittemyer *et al*., 2008), and this can be either aesthetically or culturally; through provision of ecological services such as climate regulation, soil formation and nutrient cycling; and from direct harvest of wild species for food, fuel, fibres and pharmaceuticals (Balmford, 2002).

Protected areas have impacted greatly on the livelihoods of people living in and around them. These impacts are usually categorized as economic, social, and cultural. Economic benefits may include the influx of alien land uses like tourism resorts or intensive sustainable agriculture substituting the loss of access to protected area resources (Wittemyer, 2008). These new economic opportunities that also include agriculture intensification, can temporally increase the benefits of people living around the protected area, but after a while, if there are no technological changes, the high population growth of these areas will provoke a reduction in the fertility, a loss of secondary forest products and services, and a reduction of the effectiveness of protection that will again generate costs to the local population (Wittemyer, 2008; West, *et al*., 2006).

Community wildlife and natural resource conservation has altered and affected social relations, including gender relations, and power structures (West *et al*., 2006). For

example, the establishment of protected areas has changed the social and economic position of women through building alliances with other social, political, and economic actors that had never been in contact before. Protected areas, for example, can provide them with new opportunities to work outside their immediate family (West *et al*., 2006).

A wide pool of literature (Roe *et al*., 2000; Roe and Jack, 2001; IIED, 1994) describe the benefits accrued to communities from conservation to include: re-awakening appreciation of the value of wildlife in and around people-dominated areas, cultural strengthening: reinforcing feelings of cultural identity and self-confidence, social re-empowerment, minimizing wildlife-human conflict due to improved acceptance of a certain degree of disturbance, elimination or a drastic reduction in poaching, improving environmental conservation practices, using wildlife revenues for food security in times of drought, providing employment and entrepreneurial opportunities (indirect financial benefit), increasing household revenues from tourism (direct financial benefits), institutional development and strengthening funding schools, clinics, grinding mills and other community infrastructure, livelihood diversification and risk spreading.

Community-based natural resource conservation can yield benefits attributable to local communities in the form of direct benefits derived from the values of eco-tourism and from the yields of timber and non-timber products (Ferraro and Simpson, 2002), while indirect benefits include use and existence values, the values of watershed and erosion protection, and the potential values of biodiversity itself (Pearce and Moran, 2013).

Non-financial benefits include: new adaptable institutions with a defined and committed membership; accountable leaders and a participatory decision-making process that

includes women; new skills; integrated resource management systems; experience and confidence in dealing with outsiders; recognition from neighbours and outside authorities and increased pride through increased control over their own resources and livelihoods (Jones, 1999). These non-financial benefits of living next to a conservation area have been stressed in Western Serengeti in Tanzania and included the availability of domestic energy, construction materials, grazing, foods and medicines in wildlife habitats, and illegal hunting opportunities (Roe and Jack, 2001).

In recent years emphasis has been on the importance of integrating human dimensions into biodiversity conservation policies and programs (Grumbine, 1994) and management of biodiversity by, for, and with local communities (Gibbs and Bromely, 1990; Rao and Geisler 1990; Western *et al*., 1994; Gibson and Marks, 1995) through a common assumption that biodiversity conservation will succeed only if local communities receive sufficient benefits, participate in management, and, therefore, have a stake in conserving the resource (Gibson and Marks, 1995), promoting income generating activities, and empower local communities so that they have greater leverage in decision-making and the management of local resources. In Central America, community guards earn good incomes from guarding turtle eggs (Campbell *et al*., 2007) while Namibian game guards receive substantial benefits from anti-poaching patrols (Jones, 2012).

A community-based natural resource management project in the arid Kunene Region of Namibia successfully implemented a joint conservation program with emphasis on local empowerment (Manyara and Jones, 2007; Jones, 1999). This project grew out of concern by conservationists and local leaders about a major decline in wildlife numbers due to heavy poaching and severe drought during the 1970s (Jones, 1999). Benefits to the

community were gained from tourism levy, safari companies and tourist lodges and employment of former poachers as game guards (Jones, 1999). As a result, the people's attitude towards wildlife improved.

From the foregoing observations, it can be argued that if a wildlife management programme is to be effective in the long term, it must be based on active involvement and participation of local people, and provide them with significant and sustainable benefits in terms of both food and income (Blum, 2011), rather than applying force in ensuring that harsh conservation policies are implemented as this may negatively affect wildlife and other natural resources conservation (Ipara *et al*., 2005).

2.6 Role of community involvement in natural resource conservation in alleviating poverty among local communities living adjacent to protected areas.

Issues pertaining to conservation and integration of wildlife and other natural resources in improving local livelihoods, considering local felt needs, encouraging interactive communication and strengthening local institutional capacity has been widely accredited in literature (Sunderlin *et al*., 2006; Otto *et al*., 1993; Brown, 1998; Brown *et al*., 2003; Sutherland, 2000; Roe and Jack, 2001; Roe, 2001; Mbile *et al*.,2005) especially to the poor who are highly dependent on natural resources (Reddy and Chakravarty, 1999; Cavedish, 2000; Millenium Assessment (MA), 2005). Conversely, the potential of biodiversity conservation to contribute to poverty reduction is still largely unrecognized by developing countries (Koziell and McNeill, 2002). In part, this is due to the fact that despite the particularly high dependence of poor people on biodiversity and other natural resources, environmental goods and services are generally unaccounted for in national

statistics and thus not reflected as priorities in national policies (DFID, 2002). Consequently, this has underestimated the value and role of biodiversity in alleviating poverty.

Poverty is multifaceted (Alkire, 2002) and it can be eradicated through community involvement in aspects such health, access to services, energy and food security, and sufficient income to meet the requirements for a decent life. Natural and modified environments offer a variety of goods and services termed as ecosystem goods and services that are the foundation for all facets of human endeavour and well-being from materials for shelter, food and health, to support systems that drive nutrient and hydrological cycles, and provide recreational and spiritual contentment (Millennium Ecosystem Assessment, 2005). Thus, a reduction in environmental integrity or quality can lead to a change in the quantity and quality of ecosystem goods and services provided for human benefit. For example, forest fragmentation in Costa Rica has been linked to declining quantity and quality of coffee production due to loss of pollinators (Ricketts *et al*. 2004). Likewise, a decline in water quality increases the incidence of diseases (Ashbolt, 2004).

Community participation is often regarded as one of the essential tools if tourism is to make a substantial contribution to the national development of a country (Lea, 1993). Tourism on the other hand plays a substantial contribution in alleviating poverty amongst local residents as their involvement in tourism ensures that there is sustainability (Woodley, 1993), better opportunities for local people to gain benefits from tourism taking place in their locality, positive local attitudes and the conservation of local resources (Tosun, 2006), and attracting economic returns from the industry (Murphy,

1985). Poverty can also be reduced by minimizing the adverse impacts of environmental factors such as flooding, crop pests and wildfires (Zhang *et al*., 2007). Direct consumption of wild natural resources in sub-Saharan Africa contributed significantly to rural household total net income in countries such as in South Africa by 28.2%, Ethiopia 38.2%, Ghana 38%, and Uganda 18.7%, (Shackleton *et al*., 2007).

The contribution from wild biological resources typically accounted for between one-quarter and one-fifth of net total household income, but could have closer to one-half in some situations (Vedeld *et al*. 2007). This is a meaningful contribution, which if not available due to overuse, infrastructural development or harvesting restrictions would result in significantly deeper poverty levels (Scherr, 2000). For example, conservation restrictions on forest access and use in eastern Madagascar resulted in some households having to reduce food consumption levels or migrate away in search of other livelihoods Toillier *et al*., 2011, Pollini *et al*., 2014).

Natural resource conservation contributed in rural areas, its contribution to alleviating poverty has frequently equaled or exceeded that from other land-based livelihood activities such as arable agriculture or livestock husbandry, and at times, both combined (Shackleton *et al*., 2001). The benefits accruing from wildlife and other natural resources such as firewood (or charcoal), medicinal plants and bush meat play a critical role in poverty alleviation (Lawes *et al*., 2004), and in their absence, households would fall below the poverty line (Davenport *et al*., 2012).

Benefits accruing from conservation are not just for home consumption but are also important in terms of cash saving. Being able to collect and use wild natural resources to

meet daily needs for energy, shelter, food, and medicine allows scarce cash resources to be used to secure other household needs and the accumulation of assets towards a more secure livelihood. These include education of children, investment in agricultural tools, capital for income generation activities, and the like (Shackleton and Shackleton, 2004). The magnitude of the cost saving is however, greater to poorer households than for wealthier households simply by virtue of the reduced total income sources and sizes for poor households (Cavendish 2000; Shackleton and Shackleton 2006) with the share of total household income to the poorest households in a community obtained from wild natural resources can be two to six times higher than the case for wealthy households within the same community (Shackleton *et al*., 2008, Kamanga *et al*., 2009).

Moreover, the cost saving has benefits not only at the household level, but also the national level (Shackleton *et al*. 2007). The role of the daily use of wild natural resources in the provision of energy, food, medicine and shelter to the rural poor alleviates some of the costs that the government would incur had it to provide these services in rural areas (although at a higher social cost). Thus, the government has a stake in ensuring the sustainable supply and use of these resources. Conservation, therefore, is a tool for achieving poverty reduction (Adams *et al*., 2007).

Wild resources have been employed by households either as a coping strategy or to buffer negative impacts such as death, chronic illness, crop pests or livestock diseases, floods, fires, and retrenchment, and thus wild resources act as safety nets. In the absence of viable coping or adaptive strategies manifested through benefits from conservation, affected households or communities may subside into deeper or acute poverty as described by Shackleton and Shackleton (2004).

There is increasing evidence that wild biological resources are indeed crucial in times of shock for many households, especially among rural and poorer communities. McGarry and Shackleton (2009a, b) reported a significant increase in hunting and consumption of wild animal protein (including small mammals, insects, birds, and reptiles) by children in HIV/AIDS vulnerable households relative to non-vulnerable households, while Hunter *et al*.,(2011) revealed increased natural resource use in the face of adult mortality from HIV/AIDS. From these findings it can be inferred that conservation of wildlife and other natural resources can cushion vulnerable households against diseases and shocks brought by both natural and human induced factors. Hence community participation can provide a means to promoting conservation as well as access to natural resources like wild fruits, game meat and herbs among others.

Poverty can undermine biodiversity, and biodiversity loss can exacerbate poverty (Sunderlin, *et al*., 2005; Perrings and Gadgil, 2003). Sanderson and Redford (2004) noted the potential for linking conservation with changes in commodity production. They argued that any productive landscapes not only contain large amounts of biodiversity but often have more potential than traditional protected areas and forests in contributing to poverty reduction. Similarly, natural resources play a significant role in contributing to food security and sustainable local livelihoods (Naughton –Treves *et al*., 2005). Consequently, conservation of wildlife and other natural resources plays a significant role in alleviating poverty (De Koning *et al*., 2011) and any wildlife and natural resource conservation strategy that recognizes this link between community involvement and poverty alleviation not only contributes to the long-term sustainability of resources, but

also improves rural livelihoods with ease than other by most costly welfare grants (Terry, 1999).

2.7 Challenges to integrating local communities in wildlife and natural resource conservation and measures adopted to mitigate them

2.7.1 Challenges faced in involving local communities in conservation

Although straightforward in principle, community-based natural resource management in practice faces various obstacles and complications, and projects implemented in the field have an uneven record of success (Songorwa, 1999; Twyman, 2000; Emerton, 2001). From a broader perspective, community-based conservation is viewed as an alternative to the more exclusionary protectionist policies of the past, which often alienated rural people from conservation efforts. This approach acts in making rural people advocators for wildlife and therefore active supporters of wildlife protection. However, involving local communities in conservation is met by challenges of severe social and economic problems such as poverty, long-standing economic stagnation, rapid population growth, and environmental deterioration (Hackel, 1999).

The issue of integrating conservation and development among rural communities appears to fall into categories, characterized by deep divisions among participants regarding social, economic, and environmental priorities; inherent complexity and uncertainty in predicting social and ecological outcomes; and the absence of optimal solutions (Berkes, 2004; Stewart *et al*., 2004). Despite this, governments and policy makers began to

recognize the important role communities can play in policy development and efforts were made to allow them to become more involved in the policy-making process (Dolowitz and Marsh, 2000). However, in spite of these efforts, there are still many barriers and challenges that stand in the way of community involvement (King *et al*., 1998). Understanding and anticipating these barriers and challenges is important when a community is being organized for or involved in conservation. This understanding can help individuals and organizations to more effectively affect the policy-making process (Ashley and Roe, 1998).

Local settlements are culturally heterogeneous and economically stratified, boundaries are porous and social cohesiveness is fragile and unlike the way they might be thought to be small-scale human groupings socially bound by a common cultural identity, living within defined spatial boundaries, interacting on a personal rather than bureaucratic basis and having an economic interest in the common pool interests of the area (Nygren, 1999) are posing a challenge to resource custodians on how to integrate the heterogeneous entity in conservation (Waylen *et al.,* 2010).

Another problem with community natural resource conservation is benefit sharing (Agrawal and Gibson, 1999). It has been argued that the collective benefit can run into tens or even hundreds of thousands of U.S. dollars, but the individual or household benefits are very small or underestimated. In many instances, the local people feel that the most important benefit is to secure employment rather than benefit sharing opportunities (Fabricius *et al*., 2002).

Protected area entry fees are an important source of income for communities in East Africa. In Uganda, communities living adjacent to national parks receive 20% of the gate fees (Archabald and Naughton-Treves, 2001), in Kenya 25% of entry fees is given by. Kenya Wildlife Service with neighboring communities (Manyara and Jones, 2007). However, the main problem with lease and gate fees is deciding who should share in the benefit.

In Kenya, natural resources are managed under different laws and statutes and each of the various types of resource custodians is faced by challenges that have affected the status of these natural resources. The challenges include; ownership, control and access to resources especially in environments where resources are claimed as state property by government resource agencies like forestry, water, fisheries and other wildlife (Kituyi, 1990), resulting in a conflict of interest among the stakeholders (Kabiri, 2010).

Local communities living around most protected areas in Kenya consider the government to have grabbed their traditional land, which they depended on for economic and cultural purposes (Klopp, 2000). This is because there were no consultations and involvement of these communities in planning. To the people who have been living in the areas, it connotes that they are deprived of their means of livelihood (Chambers and Conway, 1992).These perceptions have detrimental influences to community-based conservation in the long run.

In developing countries, larger protected areas require a proportionally large amount of investments, and usually, such countries constantly face funding deficits (James *et al*., 1999, Bruner *et al*., 2004, Dudley *et al*., 2007). In addition, according to James *et al*.,

(1999), protected area managers are likely to invest more on staffing with their available budget. For instance, major obstacles in the establishment of CCAs along the Kenyan coast have emerged and this include: lack of land ownership, loss of fishing grounds to conservation, lack of compliance, lack of alternative sources of livelihoods, lack of funds, conflict of interest between resource users, conflicting management authorities and lack of knowledge and awareness by communities on proper procedures, particularly legal, in setting up CCAs (Maina *et al*., 2011).

People's access to natural resources which they have been customarily using for many centuries is restricted. This is really a problem for local or indigenous peoples since they have no other means of livelihood. There is need to find out a way, and therefore, integrating conservation with the needs of local people to secure their means of livelihood and to contributing to their poverty reduction is critical (Sunderlin *et al*., 2005). Instead, they are forcefully evicted without any compensation (Ogada, 2015). Consequently, protected area surroundings have continuously faced challenges of degradation from these communities who seek for alternative forms of livelihoods (Ichikawa *et al*., 2014).

Millions of local people depend heavily on forest resources for fuels, food, medicine, tools and ornaments, and other material culture. Hence, the problem is how to reconcile these opposing interests; in the global concern for conservation on the one hand, and interests of local people in maintaining and improving their livelihood, on the other (Borrini-Feyerabend, 1999).

It should be recognized that while local communities in many instances pay the bulk of the cost of conservation, the benefits are often experienced by governments and visitors (Dixon and Pagiola, 2001). The cost of living with wildlife includes damage to crops and livestock, the opportunity cost of land, the opportunity cost of being separated from neighboring communities, and the cost of lack of access to resources because of agreements (Kiss, 1990). At Bharatpur National Park in India, the cost of conservation to local people (in the form of lost opportunities) was estimated at US$60 000 per year in 1996, but the benefits went almost entirely to private tourism operators and government (Goodwin, 2002). The cost of participation and the opportunity cost of labor are often overlooked, as is the fact that participation often precipitates new conflicts in communities. At the Richtersveld National Park in South Africa, communities participate passively in the management of the park because they would like to minimize the cost of participation (Fabricius *et al*., 2013).

Wildlife has been affected by a reduction in home ranges due to human encroachment and environmental degradation because of unsustainable land use practices within and around wildlife corridors. A study by Mijele *et al* (2013) reveals that because of this, numerous cases of human-wildlife conflicts are reported with many wildlife deaths caused by local communities in revenge for damages done to their property. As a result, biodiversity loss and poverty are linked problems. Resource custodians should ensure stakeholders are equitably compensated by the flow of revenues from protected areas (Adams, *et al*., 2004). This phenomenon of compensation is lacking in developing countries (Board, 2001). The problem is compounded by illiteracy levels which have a serious implication on economic growth natural resource conservation (Owubah, *et al*.,

2001). This is viewed as a serious barrier to conservation in Kenya (Okech, 2010; Thenya, 2001; Gomes, 1984).

Local elites tend to capture the benefits from conservation-development projects, resulting in a less equitable distribution of power and assets. These changes in the distribution of resources reinforce the alienation and increase the historical and contemporary elite control of resources like land or water (Berkes, 2004) which results in displacement is one of the most complex and controversial impacts of protected areas on people. Protected areas generate resettlements in those cases were the model for conservation favors the idea that nature should be preserved in a pristine form, without any human presence. This policy tends to exclude all activities inside the protected areas hence the displacement of its population to other places (Neumann, 1998). Further, due to competition for space and resources (Amos and Balmford *et al*., 2001), increasing interactions between people and wildlife heighten human-wildlife conflicts (Sillero-Zubiri 2001). Despite this, there has been increasing recognition that local communities must be actively involved in conservation, and their needs and aspirations considered if biodiversity is to be conserved (Kellert 1985; Gadgil 1992; McNeely 1993).

Conservation of wildlife and other natural resources is faced with the challenge of the tragedy of the commons (Smith, 1981; Dietz, 2003). The tragedy of the commons refers to a particular type of uncontrolled communal property management system (open access) where individuals try to gain as much as possible, in the short-term, without taking longer-term needs and the needs of the group into account (Bromley, 1992). In an open access situation, resources invariably become degraded through overuse by

individuals who put their own interests first. The result is acrimony and reluctance to participate in conservation.

Based on the foregoing observations, it has been argued that if local communities are empowered to sustainably manage resources, they will use their local knowledge to manage their natural resources under a regime of sustainable use (du Toit, 2004). Although the terms of engagement then had an emphasis on local custodianship of nature, ecologists participating indirectly have been attempting to influence the behavior of resource users (Byers, 2000). It has now emerged, however, that, under many circumstances, local residents do not reinvest in nature or exercise self-restraint in the use of scarce communal resources, even when deriving immediate and tangible benefits (Milner-Gulland *et al*., 2003 and Alvard, 1993) and so the underlying assumption of community-based conservation might be flawed (Fabricius and Ferrero and Kiss, 2002 and Fabricius *et al*., 2002). Issues such as who has the right to the custody of nature are now being widely debated and the shrinking reserves of biodiversity are increasingly being viewed as global assets for which everyone has a right to be concerned (Terborgh *et al*., 2002).

2.7.2 Measures adopted to mitigate challenges faced in promoting community-based conservation.

Recent efforts to persuade local people to live with wildlife have generally incorporated a combination of the various strategies among them: reduction of the costs of living with wildlife for example, through controlled resource use in conservation areas and improved control of problem animals; alternative income-generating strategies to reduce the

conversion of wildlife habitats for agriculture or grazing lands, and/or reduce the unsustainable exploitation of natural resources such as bush meat and fuelwood (Boyd *et al*.,1999).

Challenges encountered in community participation can be mitigated by means that may generally not confer direct financial gain, but do gain them from a number of other indirect benefits, such as improved security (due to radios purchased with income, patrols and cooperation with neighbours), improved transport to health care, and protection of a wilderness area from over-grazing without loss of access during drought seasons (Elliott and Mwangi, 1997)

Main challenges to involving local communities in conservation can be reduced by increasing access to valued grazing and water resources, where efforts are made to mitigate crop damage, predation and disease transmission (Campbell *et al*., 2000). Increasing benefits of living with wildlife through avenues such as; revenue sharing and support to local development projects, and enhancement of rural livelihood strategies through involving local communities in wildlife-related enterprises (Mbaiwa, and Stronza, 2011). In spite of these efforts, the central pillar of a participatory approach is the creation of a cooperative relationship with all stakeholders, and building relationships based on voluntary compliance rather than draconian enforcement (Lane and Holland 2001, Mascia 2003). This does not mean that enforcement must not exist, it has to be promoted through participatory decision making with all stakeholders involved (Aswani *et al*., 2004). Promoting local community participation in a PA's decision-making process can be a powerful strategy to enhancing compliance with natural resource conservation (Andrade and Rhodes, 2012).

Challenges to integrating local residents in conservation can also be mitigated through economic community empowerment. Fostering the economic development of local communities improves their livelihoods and at the same time reduces the exploitation of natural resources inside the reserves (Hansen and DeFries, 2007). For example, in Kilum-Ijim Forest in Cameroon, since an income livelihood project began in 1987 through a participatory approach, the park's boundaries have been respected, and the local community now has a positive attitude toward the conservation program (Abbot *et al*., 2001). Likewise, capacity-building strategies have been used to mitigate challenges experienced in conservation. Capacity building initiatives to conservation include environmental education and training in technical aspects such as financial management, agriculture improvements, and marketing (Abbot *et al*. 2001; Fu *et al*. 2006; Kaltenborn *et al*. 2008). Capacity building must also be extended to protected area personnel, thus improving their natural resource management, conservation planning, and social skills in conflict resolution and diplomacy (Akama *et al*., 1995, Ban *et al*., 2009).

Alternative income generation has also been used as a means of reducing pressure on natural resources and must be aligned with capacity building, which is likely to play an important role in ensuring long-term sustainability through attitudinal change. According to Pretty and Smith (2004), promoting positive changes in attitudes toward conservation strategies can bring long-term conservation.

The exploitation of certain natural resources inside PAs on a sustainable basis often improves the living conditions of local populations and, at the same time, can diminish conflicts between locals and PA authorities (Anthony, 2007). For example, in Batang Ai National Park, Malaysia permission was granted for indigenous groups to harvest natural

resources inside the park under certain conditions (Horowitz, 1998). This is evidence of paradigm shift, where PA managers are noticing the advantages of working with locals and understanding their needs without jeopardizing the ecological integrity of PAs. Further, establishment of buffer zones around PAs that often have dual roles: conservation, provision of additional protection of core conservation zones from disturbances, and development, benefiting local communities economically has been widely used (Wells and Brandon 1993, Lynagh and Urich 2002). Buffer zones may also enhance compliance (Andrade and Rhodes, 2012)

For developing countries, due to limited financial resources, equipment, and staff, patrolling and enforcing policies for large PAs may often be difficult (Horowitz 1998, Gelcich *et al*., 2005, Ban *et al*. 2008, 2009). However, patrolling and management costs of such big areas can be reduced with local community collaboration, wherein local residents could voluntarily act as local law enforcers thereby inhibiting and reducing outsiders' illegal activities in PAs (Horowitz 1998, Aswani *et al*., 2004, Pretty and Smith 2004, Ban *et al*., 2009). Such stewardship can only take place if local communities feel included in the decision-making process, securing their livelihoods and natural resources that they rely upon. Allowing more active local participation in protected area decision-making processes means that PA financial resources can be better invested in improving governance, local capacity building, participation, and outreach programs rather than draconian measures. For instance, patrolling and management costs could be reduced with local collaboration (Boissière *et al*., 2009).

The recognition of the dependence of adjacent communities on some natural resources inside PAs has revealed to decision makers the real downside of the conventional

command-and-control management systems (Fu *et al*. 2004). Thus, the importance of collaborative management to enhance biodiversity protection has become critical for the long-term success of PAs (Webb 2007, Kaltenborn *et al*. 2008). Coupled with the foregoing, resident communities living close to protected areas need to be educated to be involved in decision making and kill the stigma of 'charity'-where local communities view conservation as something done for 'free-for others'(Catley, 1999). Local residents need to be involved in decision-making, programme implementation, and sharing the benefits of development and evaluating the programs (Catley, 1999).

Considering that, a great percentage of Kenya's natural resources occur outside the formal protected areas such as on communal and private lands (Nelson& Agrawal, 2008), Bonjoge National Reserve is a case in point. It is, therefore, worth to examine ways in which the local community can be involved in conservation to foster tolerance and appreciation to conservation as well as mitigate degradation of ecosystem, curb poaching and human-wildlife conflict which are the key challenges facing wildlife conservation in Kenya (Okello & Kiringe, 2004).

Ideally, community participation should lead to community economic development, which calls for citizens to shape their local economies and employment opportunities in their own backyards (Markey *et al*., 2010). It is, therefore, worthwhile to develop measures that encourage intended beneficiaries to be at the forefront and participate in their own development, by mobilizing their own resources, making their own decisions and defining their own needs and how to meet them (Sebele, 2010). It is envisaged that involving communities in conserving wildlife and other natural resources will secure protected areas and enhance their sustainability.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study area

3.1.1 Location and size

Bonjoge is a designated National Reserve of 21.4 km^2 area, located between longitude 34^O 48'07.92"E and 34^o51.31''E and latitude 0^O 00'23.58''N and 0 ^{O}01'33.53''S at altitude between 1230m and 1715m above sea level. The area occupied by BNR is an undulating upland atop the Nandi Escarpment, only 15 km north of Kisumu. The reserve is located in Nandi South Sub County bordering Kisumu East to the south and Vihiga County to the west. The Reserve is best accessed through the Kaptumek entrance because it offers the added advantage of a visit to Nandi Rock. However, the other entrances include Kajulu (14 km from Kisumu city) and Kesengei (10 km south of Serem market) (Figure 3.1).

Bonjoge National Reserve was a fertile area of great biodiversity, with rivers, swathed in riverine woodland, flowing down to the Victoria Lake Basin. However, in recent times, it is characterized by exploitation and depletion of its natural resources due to detrimental human activities. Land in this area is a prime resource due to its potential for agriculture settlement and industrial development. This coupled with high population growth has resulted in increased natural resource degradation. Therefore, poverty and population pressure possess a threat to conservation of wildlife and other natural resources in the area.

3.1.2 Climate and physical feature

The hilly and undulating topographical features of Bonjoge national reserve with a high rainfall between 1,600mm and 2000mm per annum makes it an ideal place for natural resources to flourish. The Southern half is affected by the lake basin atmospheric conditions receiving as high as 2,000mm per annum.

The long rains start in early March and continue up to end of June while short rains start in mid- September and end in November. Rarely is there a month without some rainfall. The dry spell is usually experienced from end of December to mid-March.

Due to the reliability of the rainfall in the entire county, Nandi has a high potential to produce various wildlife habitats with the most conspicuous being the hilly landscapes, wetland and forested habitats.

3.1.3 Wildlife and biodiversity

Despite, the millions of stones, rocks and boulders that litter the landscape, wildlife presence still remains eminent particularly in the remaining patches of forest and open-glade grassland. The major wildlife attractions include Olive Baboons, Vervet, Colobus, Red-tailed and De-brazza's monkeys, Bush Duiker, Bush Pig, Aardvark, Genet Cat and jackal, Gabon vipers, hyenas and leopards.

3.2 Materials

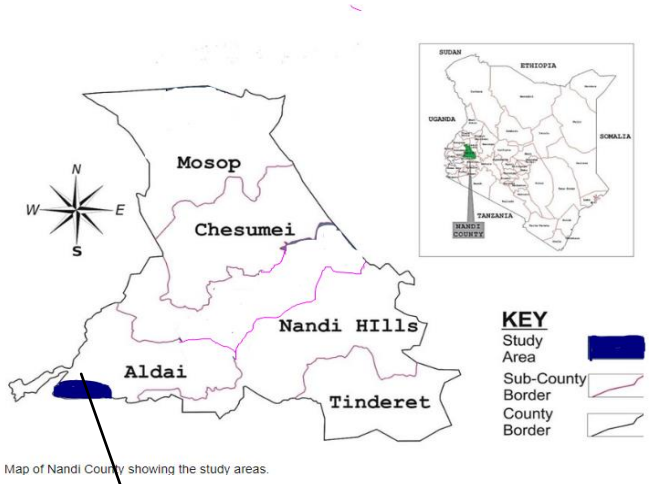
Materials used during the study included stationery, global positioning device (GPS), camera and protective gear such as gumboots and heavy clothing.

3.3 Research design

The exploratory and descriptive research designs were employed to guide this study. An exploratory research design is defined as a study design that seeks to find out how people get along with the setting under question with the aim of providing meaning to their actions and issues concerning them. Often conducted about a research problem when there are few or no earlier studies to refer to. Descriptive research design is a design depicting the respondents' characteristics or phenomena under investigation in an accurate way through observations and field surveys. The former design assisted the researcher to explore the new phenomena of involving local residents in conservation of BNR by providing insights and a better understanding of the problem and the feasibility of a more extensive study or best methods to be used in subsequent study. The later helped in determining the respondents' characteristics and assessment of local community involvement in conservation through observations, brief interviews and focus group discussions.

3.3 Target population

The target population for the study constituted the local communities living adjacent to Bonjoge National Reserve and key informants drawn from KFS, KWS and the County government among others.



Map of Nandi County showing the study areas.

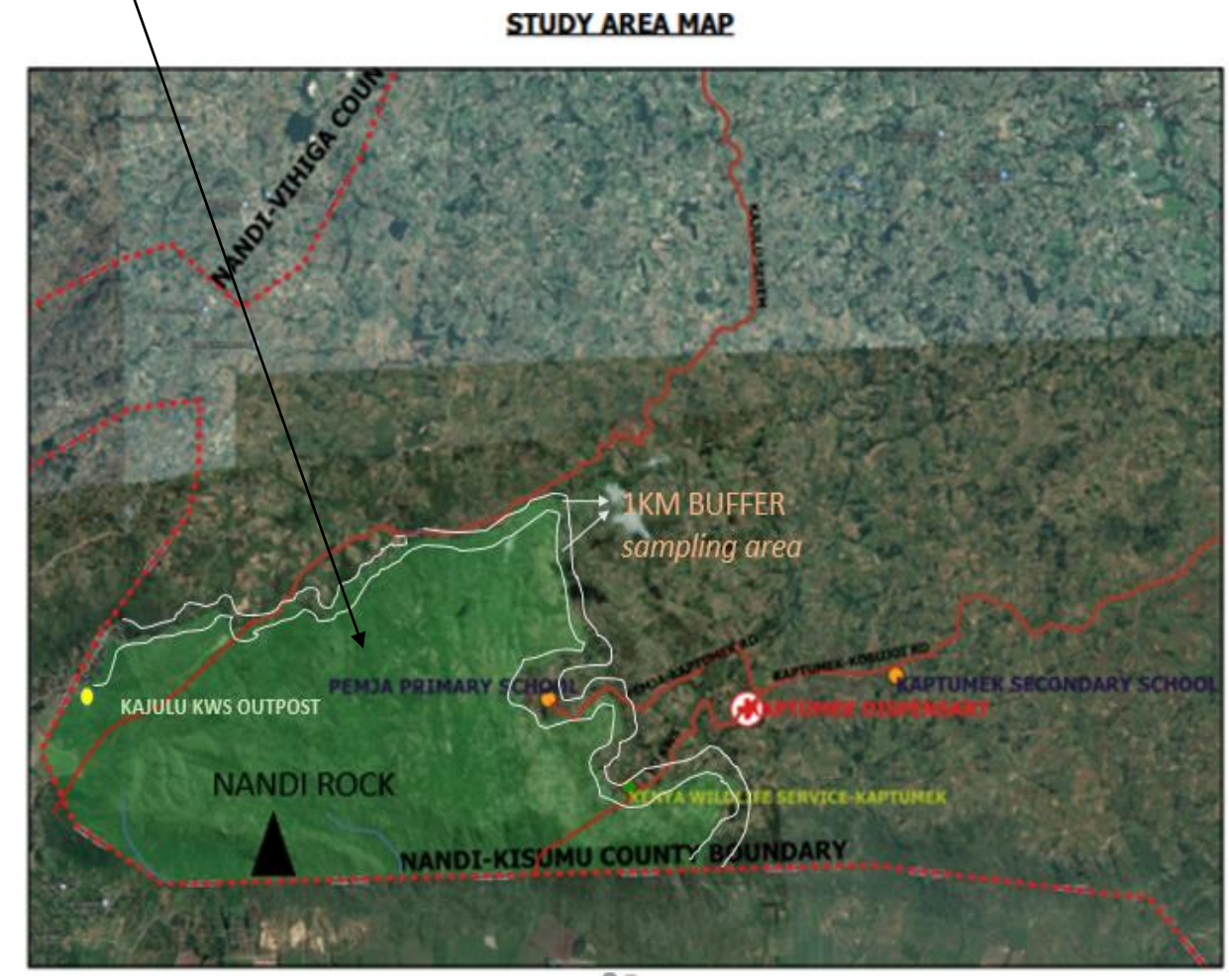


Figure 3.1: Study area map (Source : Author, 2019)

3.4 Sampling procedures, sample selection and sample size

The study sampled 250 individuals from local residents living adjacent to Bonjoge National Reserve. Bonjoge National reserve is located in Kemeloi – Maraba ward with 6521 households (KNBS and SID., 2013).

According to Yamane (1967), sample size n will be

$$n = \frac{N}{1 + N(e)^2} \qquad n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where n is the sample size, N is the population size, and e is the level of precision.

N = (6521/5 every 5^{th} household)

e = 0.05

Then the number of every fifth household to be sampled, n, will be 248.78≅ 250

The study area was divided into three strata based on existing administrative boundaries and in relation to their location to the Reserve namely Eastern, Western, and Northern. Sample sizes in the three strata were proportionally selected. Households and their respective respondents were selected using systematic random sampling where every fifth household was chosen and the respondent therein issued with a questionnaire to fill. Prior to the actual study, the questionnaire and other research instruments were pre-tested on 20 individuals residing at proximities of Nandi North forest to determine their validity and reliability. An observation schedule was dully filled and multidimensional poverty index was used to obtain the weighted score for each individual. Multidimensional

Poverty Index (MPI) is a measure of acute poverty. It measures poverty by capturing the severe deprivations that each person faces at the same time with respect to education, health and living standards at the individual level (Figure 3.2). If someone is deprived in a third or more of ten (weighted) indicators, the index identifies them as 'MPI poor', The MPI can be used to make comparisons between groups, households and community characteristics (Alkire and Roche 2010). The indicators for health are nutrition and child mortality; Education, (years in school and number of children of school age not attending school; Living Standards was measured using; the type of cooking fuel, conditions of sanitary facility, time spent to and from water points, availability of electricity, sheltering state such the flooring conditions and ownership of assets such as television radio or mobile.

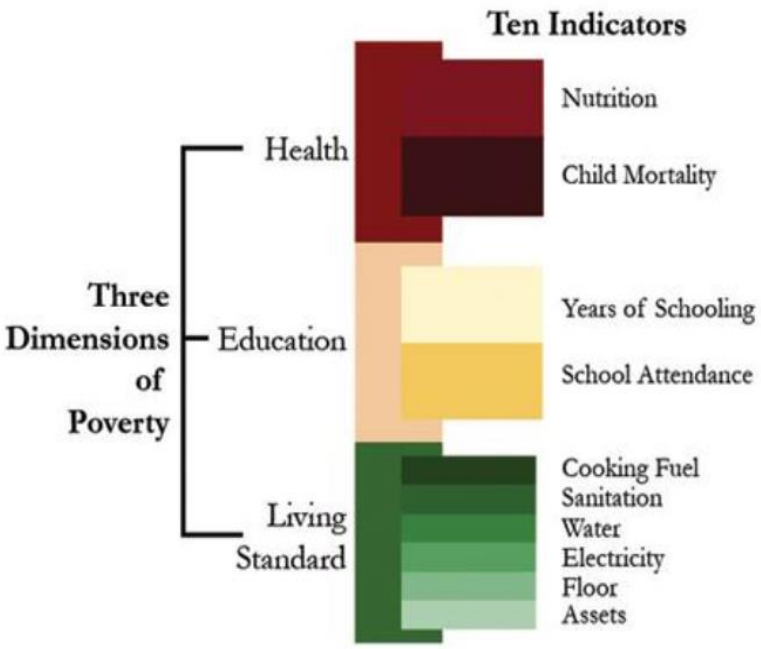


Figure 3.2: Dimensions of poverty (Source: Alkire and Roche 2010).

Each of the indicators were assigned 0% or 100% depending on either there is no deprivation or there is deprivation in that indicator respectively in accordance with Alkire & Roche (2012).

Weighted score =∑ ((indicators weights) × (100% or 0% depending either deprived or not deprived respectively)).

3.5 Data collection

Both primary and secondary data were collected. Primary data was sourced using questionnaires, interviews, focus group discussions and field observations. Details on the methods are discussed below.

3.5.1 Questionnaire

Questionnaires were used to collect data from sampled respondents in households located adjacent to the reserve. Households located in close proximity to BNR were used as units of analysis, and consequently heads of the sampled households or their representatives were targeted in the questionnaire survey.

3.5.2 Interviews

Interviews were conducted with KWS and KFS staff, the local administration including the sub-chiefs, chief and personnel in other organizations that have activities in BNR and its surroundings. These interviews solicited opinions on community involvement in wildlife and natural resource conservation to alleviate poverty. Information gathered was also used to validate responses given by local residents. Other key informants such as the

County Chief officers in charge of tourism, environment and natural resources, as well as the area warden and sub-county administrators were also interviewed to shed more light on the topic under study.

3.5.2 Focus group discussions

Eight focus group discussions with a ratio of male to female being 5:3 were conducted with selected members of the community among them village elders. The session aimed at assessing their opinion on the involvement of local communities in the conservation of the reserve and management of its resources.

3.5.3 Field observations

Indicators of poverty which included sanitation, accessibility to clean water, cooking fuel and the status of the households (the floor conditions) were keenly observed and an observation schedule dully filled.

3.5.4. Secondary data

Secondary data collection involved gathering information from sources already been documented by other researchers. The study employed extensive library usage and internet search, use of records, magazines, articles from Kenya Wildlife Service, books, journal papers and other published and unpublished works.

3.6 Validity and reliability

3.6.1 Validity

Validity as noted by Bolarinwa (2015) is the degree to which results obtained from the analysis of the data actually represents the phenomenon under study. Validity was ensure by having objective questions included in the questionnaire and interview guide. This was achieved by pre-testing the instrument to be used to identify and change any ambiguous, awkward, or offensive questions and technique as emphasized by Willis (2004). Supervisors and other lecturers were requested to comment on the representativeness and suitability of questions and give suggestions of corrections to be made to the structure of the research tools. This helped to improve the content validity of the data that was collected.

3.6.2 Reliability

Reliability on the other hand refers to a measure of the degree to which research instruments yield consistent results (Mugenda and Mugenda, 2003). In this study, reliability was ensured by pre-testing the questionnaire, Pre-testing of focus group discussion and interview schedules was done on 20 individuals residing at proximities of southern part of Nandi North.

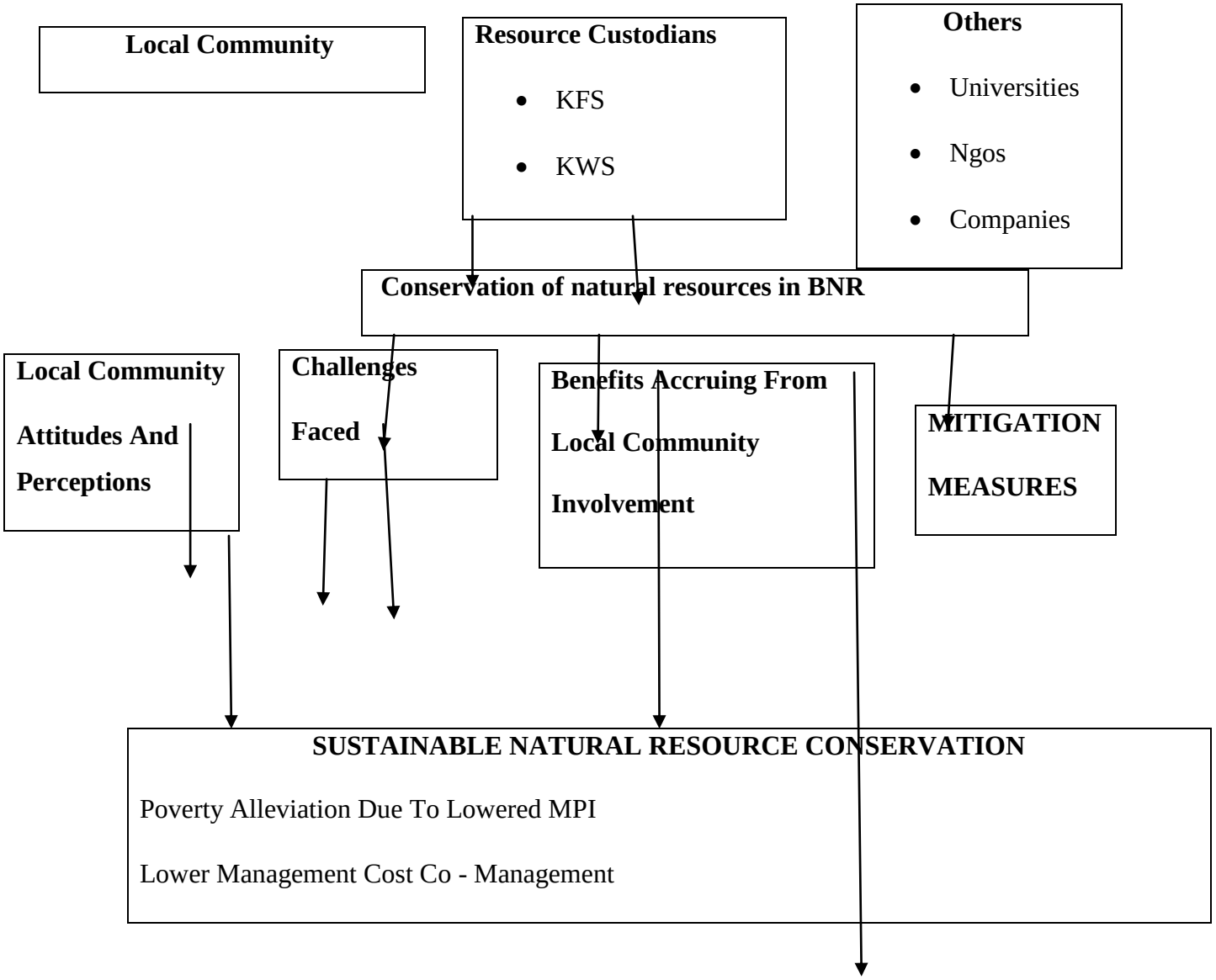
3.6.3 Results of Validity and Reliability

The instruments were void of any ambiguous, awkward and offensive questions. The questions were consistent and yielded consistent results, suitable for the collection of data to inform this research.

3.7 Data analysis and presentation

Data was analyzed using descriptive and inferential statistics including cross tabulation, Chi-square goodness of fit test and regression analysis. Responses on attitudes and perception questions on local community participation and benefits accrued were rated on a Likert scale and their frequencies and percentages determined prior to further analysis, while Chi-square has been used to analyze discrete responses on the challenges that are experienced in involving local communities in conservation of natural resource management and other appropriate variables. The weighted score for those involved and not involved in conservation of natural resources was compared using t-test. Results are presented in tables and charts.

CONCEPTUAL FRAMEWORK



CHAPTER FOUR

RESULTS

4.1 Respondents Socio – demographic Characteristics

Majority of the respondents were aged between 26 – 50 years and this accounted for 66.4%. Majority (64%) were married with a gender ratio about 1:1. There was a significantly higher proportion ($\chi 2=135.424$, df=1, $p<0.005$) of those with below tertiary education (86.8%) compared to those above tertiary education (13.2%). The level of education amongst the respondents was alarmingly low with only 13.2% having attained tertiary education (Table 4.1).

Table 4.1. Socio-economic characteristics of the respondents

No.	VARIABLE	RESPONSE	PERCENTAGE
1.	**Age**	18-25	22.8
		26-35	31.6
		36-50	34.8
		Above 50	10.8
2.	**Gender**	Male	49.2
		Female	50.8
3.	**Education**	Did not attend school	14.0
		Primary	52.8
		Secondary	20.0

		College	12.0
		University	1.2
		Single	29.6
4.	**Marital status**	Married	64.0
		Widowed	5.2
		Separated/Divorced	1.2

Objective 1. Ways of involving the local community in wildlife and natural resource conservation and management.

More than half of the respondents (64%) had not been involved in conservation of natural resources in Bonjoge National Reserve as compared to 36% who had been involved. From the results it was evident that there was a significant difference between those who are involved in conservation and those not the involved (χ^2=18.496, df=1, p<0.005) (Figure 4.1)

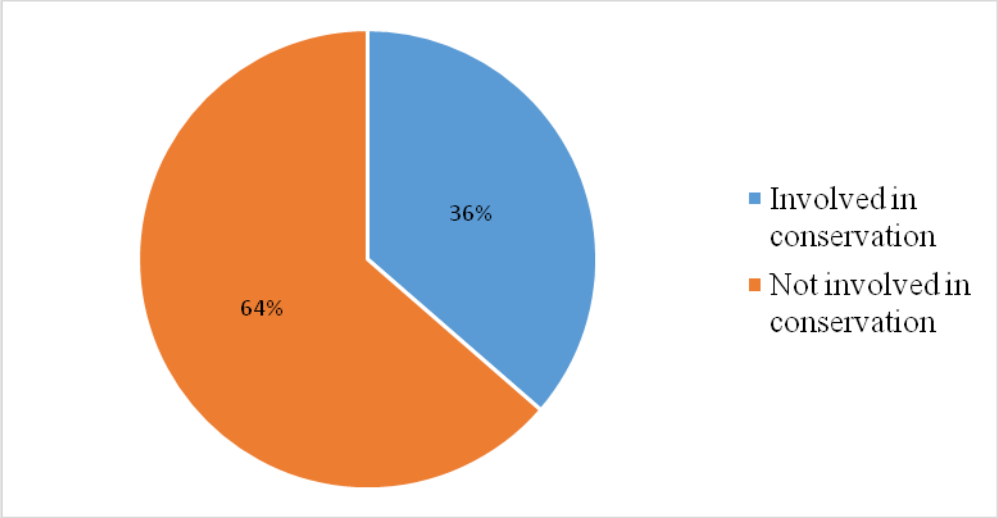


Figure 4.1: Respondents involvement in natural resource conservation

Results showed that 36% of the respondents had been included in conservation of resources within and around BNR in various ways among them: establishment of nature-based enterprises (45 %), strengthening of local institutions (40 %), tour guiding (36%), patrols (34 %) and through education (21 %) (Figure 4.2).

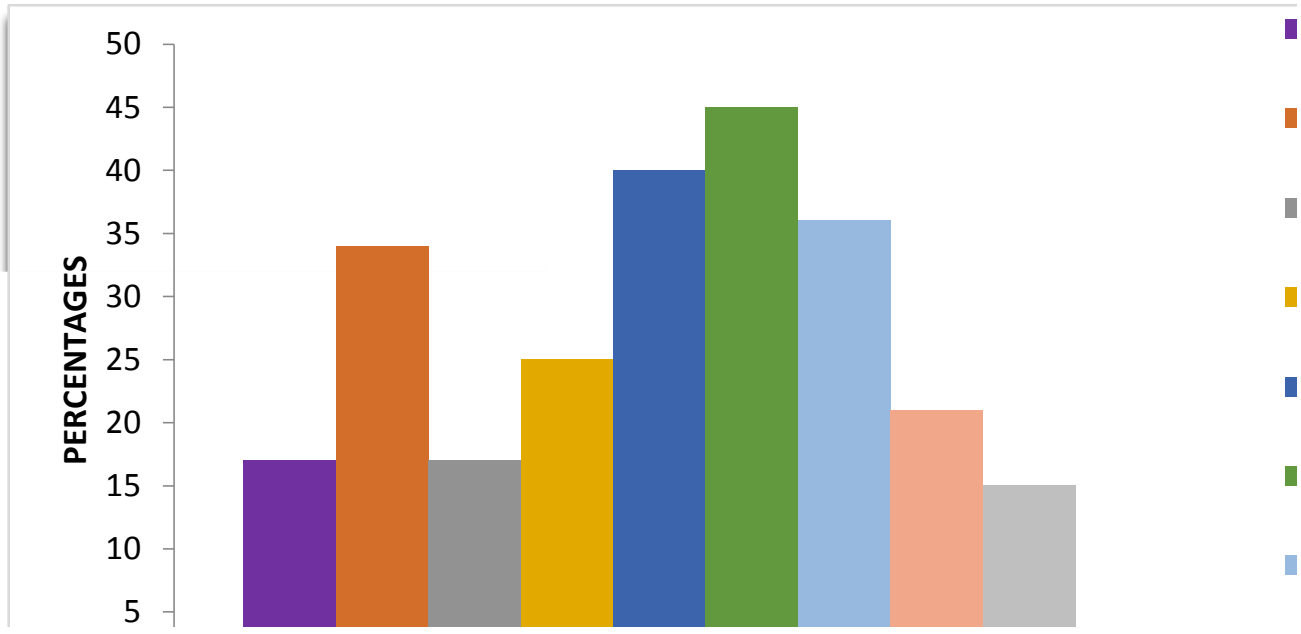


Figure 4.2: Ways respondents are involved in conservation

Objective 2. Attitudes and perceptions towards Bonjoge National Reserve and its management

Eighty-eight percent of the respondents had positive attitudes and perceptions towards BNR and resources within and around it. Using a Likert scale of 1- 5, 32% of the respondents expressed their attitudes and perceptions towards conservation of natural resources being to a great extent and 28% indicated to a very great extent. There was a

positive correlation between attitudes and perceptions towards conservation of wildlife and other natural resources and education ($r_{s} = .196$, p =.002). Likewise, there also exists a strong association (Cramer's V=0.42, p<0.005) between attitudes and perceptions and local community involvement in conservation (χ^2 =43.231, df= 4, p < 0.05) (Figure 4.3).

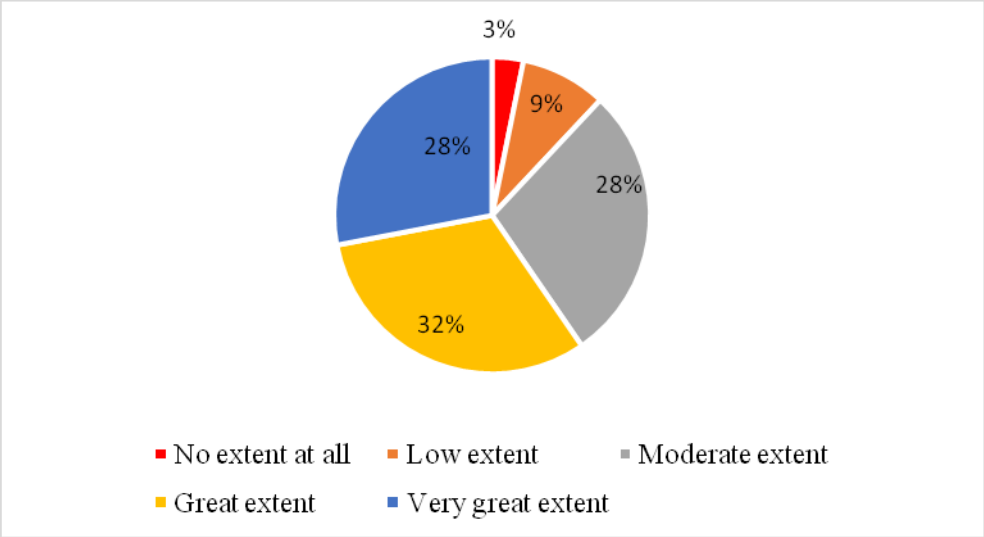


Figure 4.3: Local community attitudes and perceptions to conservation

Objective 3. Benefits accruing from local community involvement in wildlife and natural resource conservation

Results showed that it was beneficial when local residents are involved in conservation since there was creation of an alternative source of income generating activity (24.4%), it co-management of resources in understaffed conservation areas (21.6%), it minimized incidences of human-wildlife conflicts (14.4%) and promoted a sense of stewardship to conservation (17.6%) (Figure 4.4)

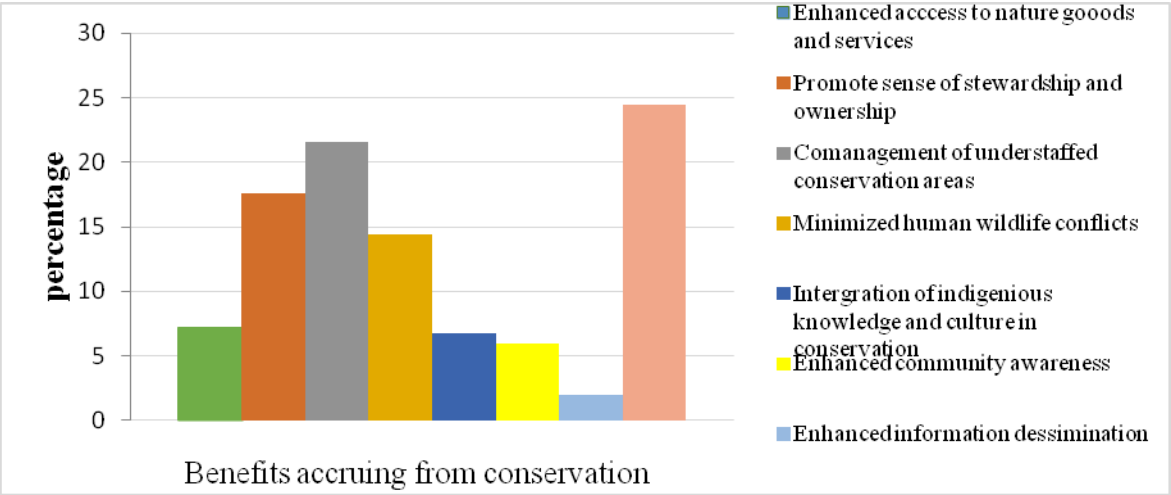


Figure 4.4: Benefits accrued from community involvement in conservation

Objective 4. Role of community involvement in alleviating poverty natural resource conservation

Majority of the respondents (75%) agreed that community involvement in conservation plays a significant role in alleviating poverty while 12% disagreed and 13% undecided. From the results it is evident that there is a significantly higher proportion of respondents who agreed as compared to those who disagreed with the statement that community involvement in conservation of natural resource alleviates poverty ($\chi 2=78.140$, df=2, $p<0.005$) (Figure 4.5 and 4 6).

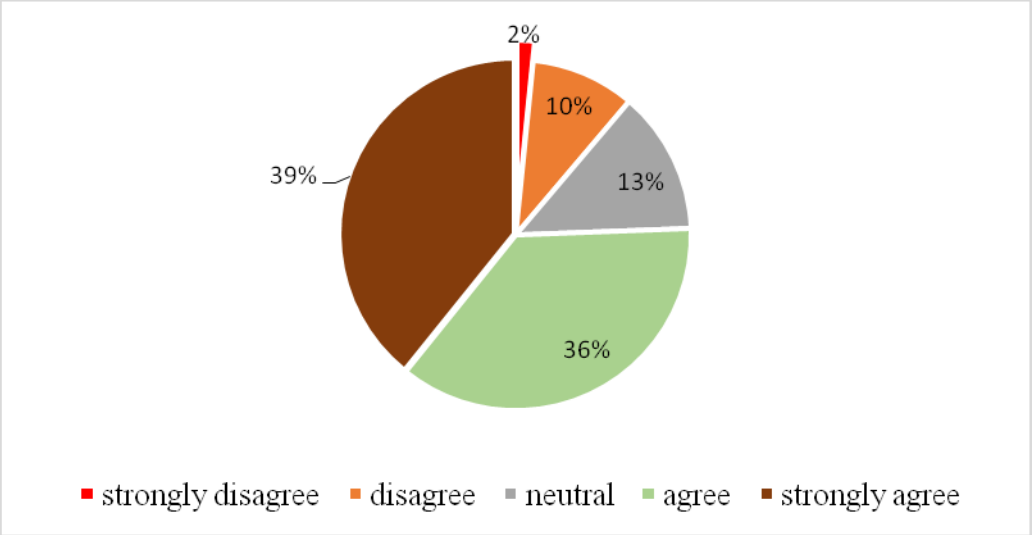


Figure 4.5: Opinion on if community involvement in conservation alleviates poverty

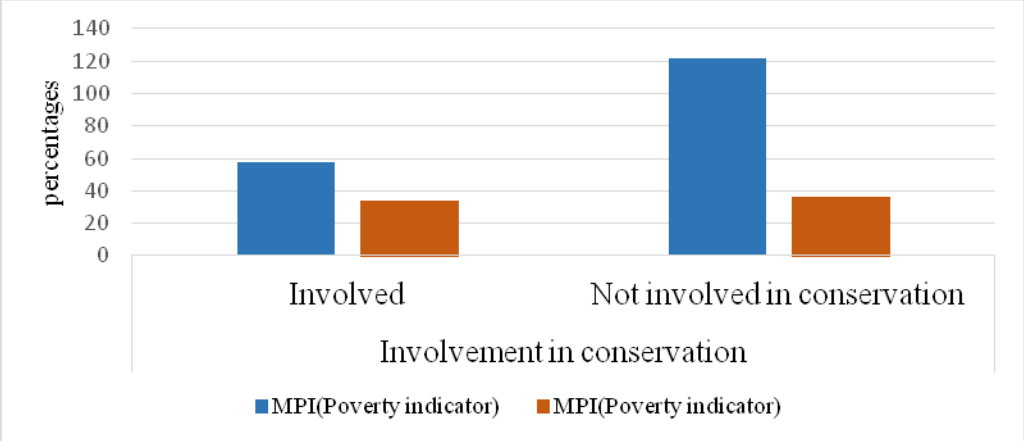


Figure 4.6: Opinion on relationship between involvement and poverty (MPI status)

Results of a t-test analysis between the weighted scores (means) for those involved and those not involved in conservation showed a statistically significant difference (t =2.129, df= 248, P=0.03) thus implying that the incidence of poverty amongst the those not involved tends to be more prevalent than among those involved in conservation. The

difference in prevalence was however, significantly different ($\chi 2=21.121$, df=1, $p<0.005$), and this a good indicator that the prevalence between the groups did not occur by chance.

Objective 5. Challenges experienced in involving local community in conservation

Local community involvement in conservation has been encountered by various challenges that include; high incidences of human-wildlife conflicts (24.85%), poverty and lack of alternative sources of income (13.2%), alarming high illiteracy levels (12.8%), conflicting interests between the various natural resource custodians (12%), unclear compensation scheme (8%), land disputes (5.2%) and lack of community awareness (4.4%) (Figure 4.7).

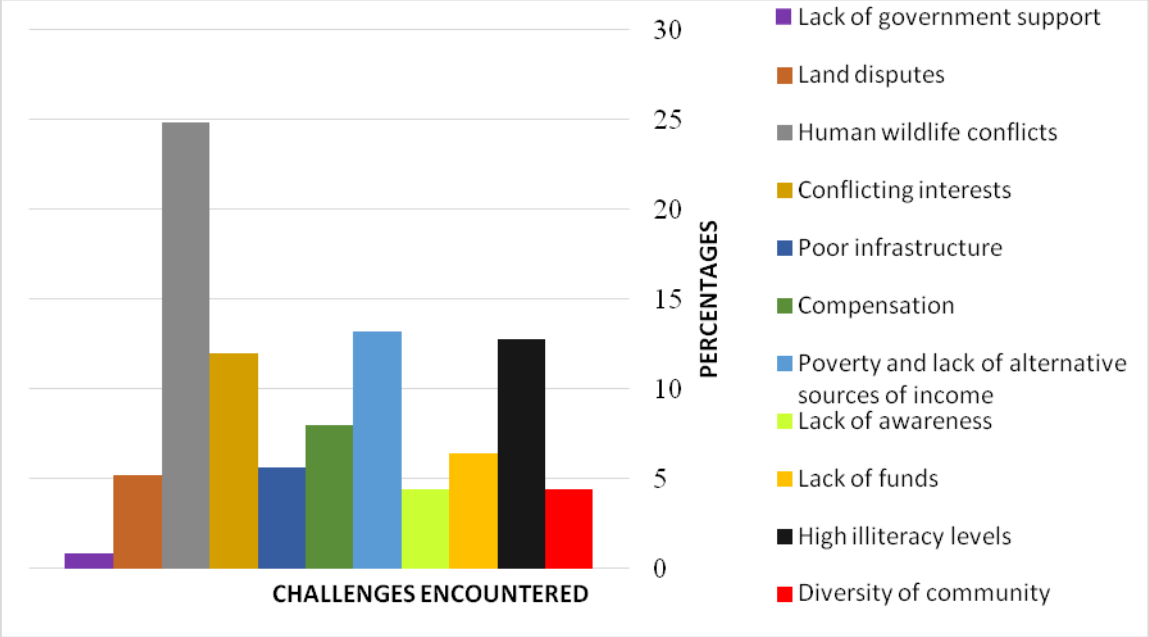


Figure 4.7: Challenges experienced when involving local residents in conservation

Objective 6. Measures to mitigating challenges encountered in conservation

Results revealed that challenges encountered in promoting local community participation in conservation can be mitigated by promoting education (22.4%), creating employment and alternative sources of income (18%), demarcating clear boundaries (16.4%), enhancing capacity building (10.%) and improving security (14%)(Figure 4.8).

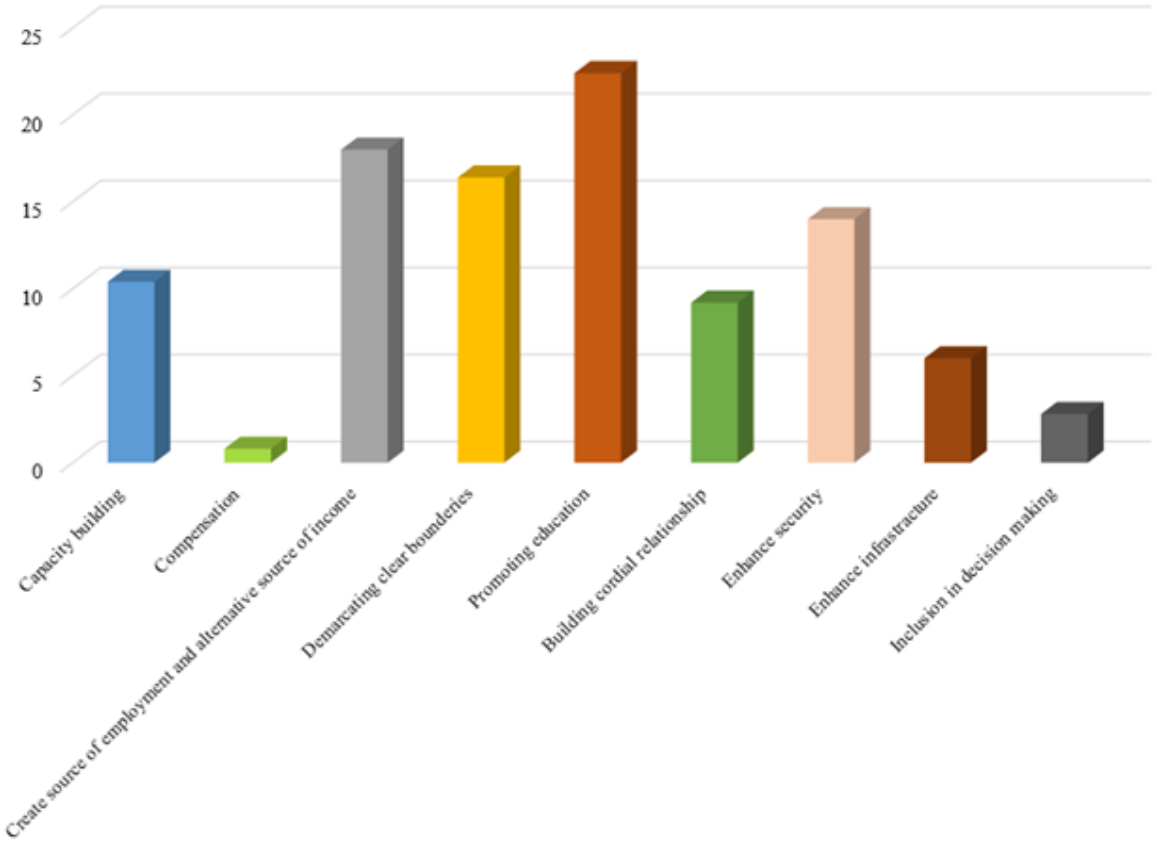


Figure 4.8: Measures to mitigate challenges to community involvement in conservation

4.8 Summary of results from Focus Group Discussions (FGDs)

The FGDs targeted Community Based Enterprise representatives, women collecting thatching grasses from BNR, neighbouring schoolteachers and tour guiding firms.

4.8.1 Community involvement in conservation

Majority of members in FGDs (71%) were not involved in conservation. However, they stated the ways they could have otherwise been involved and included among them tour guiding, traditional dances and income generating activities

4.8.2 Community attitudes and perceptions

The FGDs members reported positive attitudes and perceptions towards natural resource conservation in Bonjoge National Reserve.

4.8.3 Benefits accruing from community involvement in Natural resource conservation

Benefits accrued from community involvement include; access to grazing fields, land for cultivation as well improvement in infrastructure such as roads, class rooms and a cattle dip built by KWS.

4.8.4 Challenges faced in promoting community involvement and mitigation measures

The major challenge encountered according to FGD members was human-wildlife conflict. Baboons and leopards attacked goats and sheep. The other challenge was lack of a clear boundary between the reserve and private lands adjoining the reserve. However, unanimously agreed that these challenges can be eradicated by fencing round the reserve

and involving them in its conservation because most of them reported having cultural linkages to reserve.

4.8.5 Summary of results from observations

It was noted that local inhabitants had deprivations in sanitation, cooking fuel, and accessibility to clean water and electricity.

CHAPTER FIVE

DISCUSSION

Ojective 1. Ways of involving local communities in wildlife and natural resource conservation and management.

Most protected areas have not involved local residents in the conservation of its wildlife and other natural resources. Despite this, for those who have been involved a number of ways have been used to enhance their participation among them establishment of nature-based enterprises, strengthening of local institutions, tour guiding, patrols and through education.

Nature-based enterprises are ventures that can be exploited to support conservation and enhance community livelihoods. Nature-based enterprises encompass activities such as ecotourism, apiculture, nature photography, hiking, cultural dances, nature walks, seed collection, pot making (pottery), weaving, beadwork and butterfly farming. Some of these nature-based enterprises have been established in Bonjoge National Reserve and include cultural dances and nature walks. Nature-based community enterprises are not only effective tools for managing relationships between people and wildlife, but also a sustainable source of livelihood for communities living in wildlife areas as reported by Hussein and Nelson (1998). Although depletion of natural resources coupled with climatic unpredictability heightens prevalence of poverty among communities living close to protected areas like BNR and their resources, community involvement in conservation through nature-based enterprises has potential to promote sustainable

resource management and alleviate poverty. This view is supported by findings of a study conducted in Matinyani in Kenya where community livelihoods were enhanced through nature-based enterprises (Chiteva *et al*., 2016).

Local institutions associated with natural resource conservation include community-based organizations, community forest associations, community wildlife associations, integrated farmers associations, women and youth groups, religious groups, traditional leadership, sacred sites and community-based natural resource management. Local institutions provide the impetus of large groups being involved in conservation. Information sharing is eased when local institutions are used as avenues to involve local communities in conservation and enhance perpetuity of resources. This observation concurs with those documented in a study by Andersson (2002) which recognized the importance of local institutions in realizing the goals of conservation of natural resource dependent communities. Findings by Andersson (2004) further support results of the current study that found that well-functioning local institutions attract promote outcomes as well as local community responsibilities in the conservation of natural resources.

Local residents understand their surroundings very well and this notion has motivated resource custodians to involve them through tour guiding. Tour guiding occupies youths and provides an alternative to poaching and joblessness especially among majority of young and energetic local residents as reported by Obonyo and Fwaya (2014) who conducted a study on as strategies for integrating tourism in rural development in western Kenya. Tour guiding has the potential to influence, modify and correct visitor behavior to ensure that it is environmentally responsible and contributes to environmentally sensitive attitudes (Armstrong and Weiler, 2002; Forestell, 1993; Kimmel, 1999), and is thus

critically important (Cohen, 1985; Holloway, 1981; Orams, 1999). Tour guiding can however, be limited by education as alluded by Ap and Wong (2001)

Education is viewed as a tool of improving the ability of local communities to conduct sustainable and equitable management of their natural resources, based on local knowledge and formal knowledge acquired through training and workshops. Respondents reported that they have been involved in conservation through workshops and exchange programs facilitated by resource custodians such as KWS and Nature Kenya. Kenya Wildlife Service in collaboration with other stakeholders has built classrooms in areas around BNR in a bid to foster education. Educating local residents about wildlife and natural resource conservation has a dual capability of fostering community participation in conservation and improving solutions to local environmental problems such as crop raids and poaching which in the long run could be impediments to conservation. These study findings were consistent with findings of Miller and Hobbs (2002) who stated that there have been great strides in community involvement in conservation through education and outreach.

Objective 2. Attitudes and perceptions of local communities towards the reserve and its management

Information about local people's attitudes, knowledge and perceptions about conservation are important in wildlife conservation and in evaluating the success of conservation projects (Kuriyan, 2002). Further, understanding and acknowledging residents' attitudes and perceptions about wildlife conservation is an important part of a process of engaging with local communities and building constructive relationships between residents and protected area management as underscored by Andrade and Rhodes (2012).

Respondents' attitudes and perceptions are critical towards conservation of natural resources. In BNR and its surroundings these two community virtues can be attributed to the benefits local residents perceive from the conservation of the reserve and its resources including wildlife. Previous studies have shown that benefits accrued affect attitudes and perceptions of local people towards wildlife (Andereck *et al*., 2005 ;Gadd, 2005; Naughton-Treves and Treves, 2005; Waylen *et al*., 2007; Romanach *et al*., 2007; Morzillo *et al*., 2010; Mutanga *et al*., 2015). Positive attitudes held by communities may be explained by the economic benefits derived from a park (Odebiyi *et al*., 2015), and more importantly when revenue is shared equitably (Groom and Harris, 2008). On the contrary, negative conservation attitudes prevail among people suffering from costs of conservation (Naughton-Treves, *et al*. 2003; Gadd, 2005).

This study established that there was an association between attitudes and perceptions and local community involvement in conservation. This result concurs with that of Kariuki (2013) that lack of community participation in park management has made local people feel marginalized making them detest wildlife resulting in low participation in wildlife conservation and management. Involving local communities in wildlife management is a good approach that would not only minimize the cost of conservation and management but also helps in changing the attitudes and perceptions of local people towards conservation of wildlife and natural resources. As reported by Mehta and Heinen (2001) community based conservation approach has potential to shape favorable local attitudes and that these attitudes will be mediated by some personal attributes. Further statistical analysis revealed that there was a strong positive correlation between attitudes and perceptions towards conservation of wildlife and other natural resources and

education ($r_{s\ =.}$196, p=.002). This finding is in tandem with results by various studies (Vodouhê, 2010; Badola, 1998; Salafsky *et al*., 1999; Stem *et al*., 2003; Gadd, 2005; Shibia, 2010; Spiteri and Nepal, 2012; Mir *et al.,* 2015; Ngonidzashe *et al.,* 2015) that indicate that less educated residents perceived protected areas more negatively. Like in the current study, Kaltenborn *et al*., (1999) and Kideghesho *et al*., (2007) reported that community members with higher levels of education have more positive perceptions of PAs and conservation than those with lower levels of education. Further, other studies have reported a positive association between education, conservation and attitudes (Kideghesho *et al*. 2007; Lise, 2000; Shrestha and Alavalapati, 2006; Ngonidzashe *et al.,* 2015; Shafie *et al.,* 2017). This is contrary to Gadd (2005) and Mutanga *et al*., (2013) that showed that there is no significant correlation between community perceptions and levels of education because of outlook for those not educated and deep-rooted memories of the losses they incurred as the park evolved, including loss of land and detachment from traditional ceremonies and sacred places.

Objective 3. Benefits accruing from local community involvement in wildlife and natural resource conservation

Community involvement in the conservation of wildlife and natural resource can enhance access to nature ‘s goods and services that are locked up in protected areas. PAs confer several goods including and not limited to firewood, timber, thatching grass, pasture for livestock, water, weaving materials, dried leaves for manure and mulching matter. Extremely important are honey and medicinal products. This nature based goods go a long way in providing cheap prerequisites in their daily lives. Conservation areas also provide ecological services which include gases like Carbon dioxide, oxygen nitrogen

and water vapor and the continuous flow of these gases as well as providing a serene environment for humanity's cultural and spiritual activities. Bonjoge National Reserve encompasses the Nandi Rock (*Kigirgei*) which is a sacred site for the Nandi community. This rock is believed to be nearer to the creator and unauthorized activities are not condoned here. The caves dotting the area act as ritual sites for notable cultural practices. The hills have significant attachments associated with them.

Local community involvement in natural resource conservation can negate this vice of lack of diverse sources of income for rural communities by enabling local communities to have access to alternative income generating activities such as tour guiding, cultural dances, providing security, running and maintenance of curio shops given demographic implications like reduction in land for farming and settlement. Other potential income generating activities requiring less capital, less land space and labour that include butterfly and apiculture farming would also be beneficial (Morris *et al*., 1991; Albers and Robinson, 2011).

Owing to limited resources, most protected areas are understaffed hence employees in these parks and reserves are overwhelmed by conservation issues such as poaching and monitoring of emerging trends such as desertification, manifestation of diseases and invasive flora and fauna. Local communities possess inherent conservation knowledge and skills. With minimal training, local residents can be involved in wildlife and natural resource management to offset the challenges of conservation and management especially those linked to understaffing as observed in most PAs including BNR. As evidenced by findings of this study, knowledge is power, and the use of local and traditional ecological knowledge is a mechanism for co-management and empowerment to eradicate poverty.

Study findings tally with those of Granek and Brown (2005). Those communities can benefit through co-management of understaffed PAs while increasing their participation in conservation and integration of traditional conservation knowledge which has stood the test of time cannot be overemphasized.

Co-management provides an opportunity to address biodiversity conservation issues and partially mitigate cultural, economic, and political concerns. This flexible and adaptive approach can address a multitude of factors affecting conservation efforts, including limited scientific information despite Wells *et al*. (1992) noting that measurable progress with co-management has been rare especially in developing countries of Asia, Africa and South America and in areas of low level of awareness (Andrew *et al*., 2007) and the unrecognition of local community's capacity for governance and natural resource management (Sunderlin, 2006).

Conflicts between humans and wild animals occur when either the need or behaviour of wildlife impact negatively on human livelihoods or when the humans pursue goals that impact negatively on the needs of wildlife. In Kenya, for instance, with much of the wildlife living outside protected areas, one of the real challenges to conservation is how to enhance and sustain co-existence between people and wild animals. Local residents have had indigenous strategies that are used to control wildlife menace and these include making noise using objects like metal objects, scarecrows, burning of hot pepper, cow dung and rubber, and fire, dogs , spears and , traps . These methods though ad hoc can be employed by resource custodians and with the help protected area surrounding communities who may offer the service skillfully and cheaply. Concerted efforts between resource managers and local communities may drastically minimize human-wildlife

conflict. Strategies employed should however, ensure that the community benefits economically for it to be sustainable in the long run. The local community can provide security and surveillance to deter straying wildlife.

Human-wildlife conflict in the study area can be managed by two strategies: prevention and mitigation. Preventive measures are those that can prevent or minimize the risk of conflicts arising between people and animals and include the extreme one of completely removing either the people or the animals, physically separating the two by the use of barriers, and employing a variety of scaring and repelling tactics. Although preventive measures are appealing they are expensive and reactive approach are required after human-wildlife conflict has occurred.

A rather different approach to dealing with conflicts between local communities, wildlife and conservation authorities involves changing the attitudes of affected communities towards wildlife and conservation institutions (Western, 1989; Adams and Hulme, 2001; Muruthi, 2005). This can be achieved by ensuring that the affected communities and individuals are active participants in conservation, and enjoy tangible benefits from wildlife management. Such initiatives, according to Hulme and Murphree (2001) and Mulder and Coppolillo (2005) may include education programs, consolation payments and broader sharing of benefits associated with the presence of wildlife and channeling these funds to local community level benefits such as the construction of social amenities like hospitals, water supply projects, cattle dips and classrooms for schools (KWS, 1992). This approach is not only sustainable and cheaper, but also promotes a sense of ownership and stewardship.

Objective 4. Role of community involvement in alleviating poverty through natural resource conservation.

Community involvement in natural resource conservation plays a significant role in alleviating poverty. Community involvement has potential to eradicate poverty amongst local residents through three aspects namely: enhanced livelihoods, health improvement and enhancing education. A discussion on each of these aspects is given in subsequent sections below.

5.1 Improving community livelihoods

Community involvement in conservation provides an avenue for enhanced living standards. Through community involvement, anticipation in conservation has positive implications to livelihood indicators such as employment opportunities, access to natural goods and services that act as substitutes to expensive non nature-based products and infrastructural development.

5.1.1 Employment

Natural resource conservation provides employment opportunities in areas of tour guiding, field assistants, researchers, providing security, maintenance of infrastructure, running reserve establishments such as curio shops, performing traditional dances and other associated cultural tourism activities, which concurs with findings by Kiss (2004) and Snyman (2012). Nature-based enterprises can confer employment opportunities to the local residents. This will not only boost the livelihood standards but also reduce habitat fragmentation since the profits from such ventures are correlated to the wholesomeness of the natural resources. As indicated by studies from other countries women locate their nature-based enterprises either inside or at the entrance of protected

areas (Ashley *et al*., 2000; Naidoo and Adamowicz, 2005; Spenceley and Goodwin, 2007).

5.1.2 Access to nature's goods and services

Nature is rich in goods and services vital to human survival. Without these goods and services human beings are in prink of acute poverty. Reduction in biodiversity has resulted in high susceptibility to poverty among communities residing in wildlife areas. Community involvement necessitates poverty reduction since it gives a compromised access to nature's goods and services which include non-timber forest products among others. These study findings are in tandem with those of Lawes *et al*. (2004) and Davenport *et al*. (2012).

5.1.3 Infrastructural development

Efforts by conservation custodians result in infrastructural development in areas such as accessible road network, water systems, electricity, establishment of recreation facilities and waste disposal mechanisms that ensure a healthier population thus lowering child mortalities and increasing the birth rate Shackleton *et al*. (2002). From these observations it can be inferred that if the local community living around BNR are involved in wildlife conservation and natural resource management this will stimulate development and enhance access to diverse benefits.

5.2 Enhancing Health

Community participation contributes significantly to augmenting health through access to medicinal products from forests, and air purification hence mitigating airborne diseases as well as sustaining a supply of clean water to households in tandem with Lemieux *et al.*

(2012) that the risk of malaria and certain other diseases are reduced because un degraded watersheds provide cleaner water than more degraded watersheds. A third of the world's hundred largest cities draw a substantial proportion of their drinking water from forest protected areas Stolton *et al*. (2015). These benefits are often barely recognized and treated simply as free goods. Wild fruits and medicinal plants have been noted for their high nutritious value. Conservation goals such as curbing climate change through lowered CO_2 emissions drastically reduce incidences of skin diseases and cancerous causing factors. Physical activity in Victorian parks avoids A$ 200 million in health costs, while also generating more than a third of the State's water run-off, Marsden Jacob Associates (2018). The assumption is that good health is expected to play an important role in boosting economic growth, poverty reduction and the realization of social goals. The rampant conservation awareness campaign can be used to augment health through attaching conservation to health.

5.3 Education and security

5. 3.1 Education

Community involvement in conservation tends to enhance education. Education is improved since involvement in conservation involves training and awareness creation though exchange programs and seminars. Through these programs and with the support of local residents and resource custodians education will be enhanced and greater efforts to alleviating poverty will be fostered. To realize these efforts, conservation education should be integrated into primary and secondary syllabuses to increase the student's knowledge, interest, and skills to enable them protect and conserve natural resources and also inculcate a culture of biodiversity conservation. This makes learning enjoyable and

interesting thus minimizing incidences of school drop outs. An increase in education level results in lowered Multi-dimensional poverty and thus poverty reduction. These results corroborate with those of Kipkeu (2014) as well as those of Gamassa (2001) who argues that education remains the doorway to effective community participation and empowerment in conservation.

5.3.2 Security

An insecurity incident is a major deterrent to human development. Insecurity is marked by high human-wildlife prevalence, lawlessness, and idleness caused by lack of unemployment. Community involvement in conservation can reduce this vice by creating income generating activities and employment opportunities. Lawlessness is curbed by heightened security through regular patrols and training.

Struhsaker *et al*. (2005) argues that contrary to expectations, the success of a protected area was not directly correlated with employment benefits for the neighboring community, conservation education, conservation clubs, or with the presence and extent of integrated conservation and development programs. They, however, recommend that studies are needed to better understand what shapes positive public attitude towards protected areas since none of the conventional public outreach programs undertaken have not correlated with public attitude.

Objective 5. Challenges experienced in involving local communities in conservation

Despite the numerous benefits that local residents to a protected area can accrue due to their involvement in natural resource conservation, there are serious impediments to achieving their involvement. These challenges include; human-wildlife conflicts, land

disputes, poor infrastructure, and lack of government support and compensation. Human-wildlife conflict arises when human beings and wildlife compete for resources from one geospatial context. In Bonjoge National Reserve the phenomenon is rampant. Baboons and leopards attack cattle evoking retaliations from the local residents. The conflict is heightened by poisonous and non-poisonous snake bites. A local resident reported having been bitten twice and nothing was done. Consequently, they have vowed to kill snakes on sight to minimize the bites. Conflicts between human beings and wildlife are numerous. During drought periods and food scarcity, monkeys and baboons make their way to the granaries eating and destroying what has been stored. Several cases were reported about baboons looting market centres and from people carrying on transit carrying foods stuff to and from the market. Although this is disruption of local economies, questions remain about what actually happened to wildlife habitats. Human-wildlife conflicts will continue to be rampant as human population increases and lack of substantial local community involvement in conservation continues. This result is consistent with findings of Dickman (2010).

Lack of a clear demarcation of land creates disputes that not only warrant retaliation but also generate hatred towards the opposing party. As land disagreements still characterize the relationship between resource custodians and the local community, local community participation in conservation remains blurred. Local residents distant themselves from conservation of natural resources in this area claiming that the eviction process was marred by corruption and those lawful evictees were not fully compensated. They threatened to return to their ancestral land if they do not receive any attention. Hence, land continues to pose great challenges to conservation in the study area. Local residents

perceive that being involved in conservation implies more of their land will go. From the responses given, it was evident that some misunderstood the question thus eliciting the extent of their attitudes and perception towards conservation to mean an extension of the reserve to incorporate their private lands. From field observations and informal discussions with respondents, it was clear that majority of the respondents still live inside the reserve and any attempt to be queried by an 'outsider' stirs land-related thoughts.

Findings showed that land disputes in the study area are occasioned by conflict in land uses. The local community prefers utilizing their land for agriculture rather than conservation. To support this, a respondent stated that:

> "*It is better we remain in our fertile land and plant maize. What is that conservation, we even don't earn anything from it. They only come around to harass us. They are not feeding our children*."

The majority of the respondents stated that there was poor infrastructure in the study area. This makes it difficult for local communities to reach the authorities due to poor roads. Poor infrastructure undermines tourism which could have been a major source of income to the local community and resource custodians mandated with the conservation of pristine areas. Lack of water supply system in the area forces local residents to collide with the BNR authorities as it becomes difficult for them to distinguish between a logger coming out of the forest and a person who had gone there to fetch water. This day to day battle goes a long way in tainting the cordial relationship expected between the resource custodians and local residents and if not mitigated will continue to undermine local community participation in conservation.

The government needs to come out strongly and support conservation of natural resources within and around BNR and other protected areas. Resource custodians are government parastatals and it is nearly impossible to effectively manage resources if they are not facilitated, and this has some rippling effect on the local community. A government that does not consider the livelihood standards of its people contributes to high poverty prevalence and in the long run a high proportion of MPI poor citizens Odusote (2016). This puts at stake the stability of such a government and therefore calls for an inclusive approach that integrates communities in natural resource conservation and management.

Objective 6. Measures to mitigate challenges encountered in conservation

Challenges facing natural resource conservation and management seem inevitable in this era of increasing human and wildlife population against limited resources. Despite this, these challenges can be mitigated by measures such as compensation, creating a source of alternative income for local residents, promoting education, enhancing security and promoting inclusivity and capacity building in conservation.

Respondents indicated that most of the challenges faced can be curbed if the local community is given a relentless education and awareness creation. Challenges such as human-wildlife conflict could be eased if a problematic animal control units established as well as the local community being educated on the preventive measures like fencing around their gardens, planting unpalatable vegetation to buffer their crops and keeping bees.

It has been noted that local communities are good in dispensing wildlife through guarding, vigilance and using active methods such as burning fires and banging tins and

drums as connoted by Sitati *et al*. (2005). The local community in the study area has lived with wildlife and they have traditional methods of obscuring wildlife damages which is an effort that should be recognized by resources custodians to ensure their full participation and commitment to conservation.

From the results, majority of the respondents decried the lack of compensation for wildlife attacks and damages. Respondents complained that they had made reports injury and loss of property claims to the relevant authorities but nothing was being done. With the advent of County Wildlife Conservation and Compensation Committees, they expected an improvement but that has been an endeavor in futility. To drive this point home, respondent who was a leader of a community-based conservation group remarked:

> *We are at loggerheads with wildlife in our daily activities. I have been bitten by a snake. I lost my sheep and goats when they went to graze in the forest. One time I found a leopard in my sheep pen. We have made claims but up to now, we've not received any compensation. I don't keep sheep any longer, goats are a bit adaptive.*

In order to counter the losses, the local community needs to be compensated. Compensation does not mean local livelihoods are reinstated by issuing cash but to counterbalance losses with benefits and foster community-based conservation in tandem with what has been suggested by Obunde *et al*. (2005). Compensation will increase tolerance to problematic animals and minimize retaliatory killings. Bulte and Rondeau (2005) however, disagree with these findings and allude that although compensation may actually lead to a reduction of the human-wildlife conflicts there

is need for a much scrutiny of prevailing biological and social conditions before a compensation program is implemented.

Creation of alternative sources of income was suggested as a means to solve most of the challenges encountered when involving local communities in conservation both by the local community respondents and the key informants. It was suggested that alternative income generating activities will minimize poverty, which is a driver of natural resource exploitation by local residents. Lack of income and engagement in an activity results in idleness, unnecessary resource exploitation and extirpate poverty. This in turn leads to unsustainable resource management and poor livelihoods.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Success in conservation is through Community involvement in conservation and can be involved through nature-based enterprises, tour guiding, patrols and education. Involvement of the local community results to a success in conservation as the local community has the indigenous knowledge of the conservation area and when this knowledge is enhanced through formal education. Nature based enterprises will solve the economic related problems.

Community involvement has the capacity to alleviate poverty. Community involvement has potential to eradicate poverty amongst local residents through aspects such as enhanced livelihoods, health improvement and enhancing education. Positive implications to livelihood is realized through employment opportunities, access to natural goods and services that act as substitutes to expensive non nature-based products and infrastructural development lowering Multi-dimensional poverty and thus poverty reduction.

Attitudes and perceptions are linked to involvement, benefits and education level. Community involvement confers benefits that overshadows the cost of conservation and deep-rooted memories of the losses they incurred as the park evolved, including loss of land and detachment from traditional ceremonies and sacred places. The mocking and marginalization of the less educated residents generates negative attitudes and perception

on protected areas while their educated counterparts conceive natural resource conservation positively.

Conservation confers benefits vital to human survival. It provides firewood, timber, thatching grass, pasture for livestock, water, weaving materials, dried leaves for manure and mulching matter, ecological services, honey and medicinal products. Enhancing health and alternative income generating activities such as tour guiding, cultural dances, providing security, running and maintenance of curio shops given demographic implications like reduction in land for farming and settlement.

It is inevitable to dissociate local communities in conservation. Efforts should be geared towards ways of promoting their participation in conservation, acknowledging the role that community involvement can play in conservation and the benefits it offers the local community living with wildlife resources. Challenges experienced while involving local community in conservation need to be known such that appropriate measures can be employed to ensure the smooth running of the natural resources within and outside the formally established protected areas.

6.2 Recommendations

6.2.1 Policy and management recommendations

- Natural resource custodians like KWS and KFS should nurture positive attitudes and perceptions among local communities and address the possible determinants of negative perceptions in order to improve community involvement in conservation.

- Conservation agencies need to enhance community involvement and benefits from natural resource conservation by promoting education, strengthening local institutions, enhance access to nature's goods and services, and reduce human-wildlife conflicts

6.2.2 Recommendations for further research

Further research should be done on the following:

- Role of indigenous knowledge in conservation.
- Avenues through which learning institutions contribute to conservation

REFERENCES

Abbot, J. I., Thomas, D. H., Gardner, A. A., Neba, S. E., and Khen, M. W. (2001). Understanding the links between conservation and development in the Bamenda Highlands, Cameroon. *World Development*, 29(7), 1115-1136.

Adams, M. D., Celniker, S. E., Holt, R. A., Evans, C. A., Gocayne, J. D., Amanatides, P. G., and George, R.A. (2000). The genome sequence of Drosophila melanogaster. *Science*, 287(5461), 2185-2195.

Adams, W. M., & Hutton, J. (2007). People, parks and poverty: political ecology and biodiversity conservation. *Conservation and society*, *5*(2), 147.

Adams, W. M., and Hulme, D. (2001). If community conservation is the answer in Africa, what is the question? *Oryx*, *35*(3), 193-200.

Adams, W. M., Aveling, R., Brockington, D., Dickson, B., Elliott, J., Hutton, J. and Wolmer, W. (2004). Biodiversity conservation and the eradication of poverty. *Science*, *306*(5699), 1146-1149.

Agrawal, A., & Gibson, C. C. (1999). Enchantment and disenchantment: the role of community in natural resource conservation. *World development*, *27*(4), 629-649.

Akama, J. S., Lant, C. L., and Burnett, G. W. (1995). Conflicting attitudes toward state wildlife conservation programs in Kenya. *Society and Natural Resources*, *8*(2), 133-144.

Akech, M. (2014). *Evaluating the Impact of Corruption Indicators on Governance Discourses in Kenya*. Available at SSRN 2701198.

Alcala, A. C., & Russ, G. R. (2006). No-take marine reserves and reef fisheries management in the Philippines: a new people power revolution. *AMBIO: A Journal of the Human Environment*, *35*(5), 245-255.

Alexander, S. E. (2000). Resident attitudes towards conservation and black howler monkeys in Belize: the Community Baboon Sanctuary. *Environmental Conservation*, *27*(04), 341-350.

Alkire, S. (2002). Dimensions of human development. *World development*, *30*(2), 181-205.

Alkire, S., Conconi, A., and Roche, J. M. (2012). *Multidimensional Poverty Index 2012: Brief Methodological Note and Results.* University of oxford, Department of International Development, oxford Poverty and Human Development Initiative, oxford, UK.

Allendorf, T., Swe, K. K., Oo, T., Htut, Y., Aung, M., Allendorf, K., and Wemmer, C. (2006). Community attitudes toward three protected areas in Upper Myanmar (Burma). *Environmental Conservation*, *33*(04), 344-352.

Alvard, M.S. (1993) Testing the 'Ecologically Noble Savage' Hypothesis: interspecific prey choice by Piro hunters of Amazonian Peru. *Hum. Ecol*.21, 355 – 38713.

Ambrose-Oji, B. 2003. The contribution of NTFPs to the livelihoods of the 'forest poor': evidence from the tropical forest zone of south-west Cameroon. *International Forestry Review* 5, 106-117.

Amos, W., and Balmford, A. (2001). When does conservation genetics matter? *Heredity*, *87*(3), 257-265.

Andereck, K. L., Valentine, K. M., Knopf, R. C., & Vogt, C. A. (2005). Residents' perceptions of community tourism impacts. *Annals of tourism research*, *32*(4), 1056-1076.

Andrade, G. S., and Rhodes, J. R. (2012). Protected areas and local communities: An inevitable partnership toward successful conservation strategies? *Ecology and Society*, *17*(4), 14.

Andrew, N. L., Béné, C., Hall, S. J., Allison, E. H., Heck, S., and Ratner, B. D. (2007). Diagnosis and management of small-scale fisheries in developing countries. *Fish and Fisheries*, *8*(3), 227-240.

Andrew-Essien E. (2014). Resource development versus conservation conflict-forces in the Cross River National Park, Nigeria. *IOSR Journal of Humanities and Social Science* (IOSR-JHSS), 19(8): 55-58.

Anthony, B. (2007). The dual nature of parks: attitudes of neighbouring communities towards Kruger National Park, South Africa. *Environmental Conservation* 34(3):236-245.

Anyonge-Bashir, M., and Udoto, P. (2012, January). Beyond philanthropy: community nature-based enterprises as a basis for wildlife conservation. In *The George Wright Forum* (Vol. 29, No. 1, p. 67). George Wright Society.

Archabald, K.,and Naughton-Treves, L. (2001). Tourism revenue-sharing around national parks in Western Uganda: early efforts to identify and reward local communities. *Environmental conservation*, *28*(02), 135-149.

Ashbolt, N. J. (2004). Microbial contamination of drinking water and disease outcomes in developing regions. *Toxicology*, *198*(1), 229-238.

Ashley, C., & Roe, D. (1998). *Enhancing community involvement in wildlife tourism: issues and challenges* (Vol. 11). IIED.

Assessment, M. E. (2005). *Ecosystems and human well-being*(Vol. 5). Washington, DC:: Island press.

Aswani, S., and Hamilton, R. J. (2004). Integrating indigenous ecological knowledge and customary sea tenure with marine and social science for conservation of bump head parrotfish (*Bolbometopon muricatum*) in the Roviana Lagoon, Solomon Islands. *Environmental Conservation*, *31*(01), 69-83.

attitudes of local people in Western Serengeti, Tanzania. *Biodiversity and Conservation*, *16*(7), 2213-2230.

Badola, R. (1998). Attitudes of local people towards conservation and alternatives to forest resources: a case study from the lower Himalayas. *Biodiversity & Conservation*, *7*(10), 1245-1259.

Bajracharya, S. B., (2004). *Community Involvement in Conservation: An Assessment of Impacts and Implications in the Annapurna Conservation Area, Nepal*. PhD Thesis, Edinburgh, Scotland: University of Edinburgh.

Bajracharya, S.B., Furley, P. and Newton, A. (2005). Effectiveness of Community Involvement in Delivering Conservation benefits to the Annapurna Conservation Area, Nepal. *Environmental Conservation*, 32(3): 239-247.

Balmford, A., Bruner, A., Cooper, P., Costanza, R., Farber, S., Green, R. E. and Munro, K. (2002). Economic reasons for conserving wild nature. *Science*, *297*(5583), 950-953.

Ban, N. C., Picard, C. R., and Vincent, A. C. (2009). Comparing and integrating community-based and science-based approaches to prioritizing marine areas for protection. *Conservation Biology*, *23*(4), 899-910.

Barrow, E., & Fabricius, C. (2002). Do rural people really benefit from protected areas-rhetoric or reality?. *Parks*, *12*(2), 67-79.

Basnet, K. 2007. *Biodiversity Database of Protected Areas of Nepal.* Draft report submitted to National Trust for Nature Conservation, Kathmandu.

Berkes, F. (2004). Rethinking community-based conservation. *Conservation biology*, *18*(3), 621-630.

Blum, C. (2009). *Community-based wildlife management models: A joint vision for future protection of wildlife and rural livelihoods.* Discussion Paper Series No. 04/09.

Board, S. (2001). Risks to health care workers in developing countries. *N Engl j Med*, *345*(7).

Boissière, M., Sheil, D., Basuki, I., Wan, M., and Le, H. (2009). Can engaging local people's interests reduce forest degradation in Central Vietnam? *Biodiversity and Conservation*, *18*(10), 2743-2757.

Bolarinwa, O. A. (2015). Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. *Nigerian Postgraduate Medical Journal*, *22*(4), 195.

Borrini-Feyerabend, G. (1999). *24 collaborative management of protected areas. Partnerships for protection*: New strategies for planning and management for protected areas, 224.

Boyd, C., Blench, R., Bourn, D., Drake, L., and Stevenson, P. (1999). *Reconciling Interests Among Wildlife, Livestock and People in Eastern Africa:* a Sustainable Livelihoods Approach. ODI.

Brandon, K. E., and Wells, M. (1992). Planning for people and parks: design dilemmas. *World Development*, *20*(4), 557-570.

Brandon, K. E., and Wells, M. (1992). Planning for people and parks: design dilemmas. *World Development*, *20*(4), 557-570.

Bromley, D. W. (1992). The commons, common property, and environmental policy. *Environmental and Resource Economics*, *2*(1), 1-17.

Brown, D. (1998). Participatory biodiversity conservation rethinking the strategy in the low tourist potential areas of tropical Africa. *Journal of Environmental Management*, *76* (1), 1-13.

Brown, H. (2003). Local perceptions of Waza National Park, northern Cameroon. *Environmental Conservation* 30(2):175-181.

Brown, K. (1998). The political ecology of biodiversity, conservation and development in Nepal's Terai: Confused meanings, means and ends. *Ecological Economics*, **24(**1), 73-87.

Bulte, E. H., and Rondeau, D. (2005). Research and management viewpoint: why compensating wildlife damages may be bad for conservation. *Journal of Wildlife Management*, *69*(1), 14-19.

Byers, B. (2000) *Understanding and Influencing Behaviors: A Guide*, WWF.

Campbell, B.M., Jeffery, S., Kozanayi, W., Luckert, M., Mutamba, M. and Zindi, C. 2008. *Household livelihoods in semi-arid regions: options and constraints*. CIFOR, Bogor. 153 pp.

Campbell, D. J., Gichohi, H., Mwangi, A., and Chege, L. (2000). Land use conflict in Kajiado district, Kenya. *Land use Policy*, *17*(4), 337-348.

Campbell, L. M., Haalboom, B. J., and Trow, J. (2007). Sustainability of community-based conservation: sea turtle egg harvesting in Ostional (Costa Rica) ten years later. *Environmental Conservation*, *34*(02), 122-131.

Catley, A. (1999). *Methods on the Move:* A review of veterinary uses of participatory approaches and methods focusing on experiences in dryland, Africa.

Cavendish, W. (2000). Empirical regularities in the poverty-environment relationship of rural households: Evidence from Zimbabwe. *World Development*, *28*(11), 1979-2003.

Chambers, R., and Conway, G. (1992). *Sustainable rural livelihoods: practical concepts for the 21st century.* Institute of Development Studies (UK).

Chiteva, R., Mayunzu, O., Lukibisi, M., and Wachira, N. (2016). Enhancing Community Livelihoods through Nature-based Enterprises: Case of Matinyani Women Group, Kitui, Kenya. *Environment and Ecology Research*, *4*(1), 30-35.

Christensen, J. (2004). Win-Win Illusion. *Conservation in Practice*, 5(1): 12-19.

Davenport, N. A., Shackleton, C. M., & Gambiza, J. (2012). The direct use value of municipal commonage goods and services to urban households in the Eastern Cape, South Africa. *Land Use Policy*, *29*(3), 548-557.

De Boer, W. F., & Baquete, D. S. (1998). Natural resource use, crop damage and attitudes of rural people in the vicinity of the Maputo Elephant Reserve, Mozambique. *Environmental Conservation*, *25*(3), 208-218.

De Koning, F., Aguiñaga, M., Bravo, M., Chiu, M., Lascano, M., Lozada, T., and Suarez, L. (2011). Bridging the gap between forest conservation and poverty alleviation: the Ecuadorian Socio Bosque program. *Environmental Science and Policy*, *14*(5), 531-542.

DFID (2002) *Wildlife and Poverty Study. DFID Livestock and Wildlife Advisory Group,* London, UK. Stories from Eden: Case studies of community-based wildlife management. Biodiversity and Livelihoods Group, International Institute for Environment and Development, 2001.

Dickman, A. J. (2010). Complexities of conflict: the importance of considering social factors for effectively resolving human–wildlife conflict. *Animal Conservation*, *13*(5), 458-466.

Dietz, T., Ostrom, E., and Stern, P. C. (2003). The struggle to govern the commons. *Science*, *302*(5652), 1907-1912.

Dixon, J. A., and Pagiola, S. (2001). Local costs, global benefits: valuing biodiversity in developing countries. *Valuation of Biodiversity Studies*, 45.

Dolowitz, D. P., and Marsh, D. (2000). Learning from abroad: The role of policy transfer in contemporary policy-making. *Governance*, *13*(1), 5-23.

Du Toit, J. T., Walker, B. H., and Campbell, B. M. (2004). Conserving tropical nature: current challenges for ecologists. *Trends in Ecology and Evolution*, *19*(1), 12-17.

Dudley, N., Higgins- Zogib, L., & Mansourian, S. (2009). The links between protected areas, faiths, and sacred natural sites. *Conservation Biology, 23*(3), 568-577

Elliott, J., & Mwangi, M. (1997). Making wildlife "pay" in Laikipia, Kenya. *African Wildlife Foundation*.

Emerton, L., (2001). The nature of benefits and the benefits of nature: Why wildlife conservation has not economically benefited communities in Africa. In: Hulme, D., Murphree, M. (Eds.), African Wildlife and Livelihoods: The Promise and Performance of Community Conservation. *James Currey, Oxford*, UK, pp. 227–243

Fabricius, C., Koch, E., Turner, S., and Magome, H. (Eds.). (2013). *Rights resources and rural development: community-based natural resource management in southern Africa*. Routledge.

Ferraro, P. J., and Simpson, R. D. (2002). The cost-effectiveness of conservation payments. *Land Economics, 78*(3), 339-353.

Fiallo, E. A., and Jacobson, S. K. (1995). Local communities and protected areas: attitudes of rural residents towards conservation and Machalilla National Park, Ecuador. *Environmental Conservation*, *22*(03), 241-249.

Fu, B., Wang, K., Lu, Y., Liu, S., Ma, K., Chen, L., & Liu, G. (2004). Entangling the complexity of protected area management: the case of Wolong Biosphere Reserve, southwestern China. *Environmental Management, 33*(6), 788-798.

Gadd, M. E. (2005). Conservation outside of parks: attitudes of local people in Laikipia, Kenya. *Environmental Conservation*, *32*(1), 50-63.

Gadgil, M. (1992). Conserving biodiversity as if people matter: a case study from India. *Ambio*, 266-270.

Gelcich, S., Edwards-Jones, G. A. R. E. T. H., and Kaiser, M. J. (2005). Importance of Attitudinal Differences among Artisanal Fishers toward Co-Management and Conservation of Marine Resources. *Conservation Biology*, *19*(3), 865-875.

Gibbs, C.J. and Bromely, D.W. (1990). Institutional arrangements for management of rural resources: community-property regimes. In: Common Property Resources: Ecology and Community-Based Sustainable Development, ed. *F. Berkes*, pp. 22–33. London: Belhaven Press.

Gibson, C.C. and Marks, S.A. (1995). Transforming rural hunters into conservationists: an assessment of community-based wildlife management programs in Africa. *World Development* **23**(6): 941–57

Gillingham, S., and Lee, P. C. (1999). The impact of wildlife-related benefits on the conservation attitudes of local people around the Selous Game Reserve, Tanzania. *Environmental Conservation*, *26*(03), 218-228.

Glew, L., Hudson, M. D., & Osborne, P. E. (2010). Evaluating the effectiveness of community- based conservation in northern Kenya: A report to The Nature Conservancy. *Centre for Environmental Sciences, University of Southampton: Southampton, UK*.

Gomes, M. (1984). Family size and educational attainment in Kenya. *Population and Development Review*, 647-660.

Goodwin, H. (2002). Local community involvement in tourism around national parks: opportunities and constraints. *Current Issues in Tourism*, *5*(3-4), 338-360.

Grainger, J. (2003). 'People are living in the park'. Linking biodiversity conservation to community development in the Middle East region: a case study from the Saint Katherine Protectorate, Southern Sinai. *Journal of arid environments*, *54*(1), 29-38.

Grieg-Gran, M., Porras, I., and Wunder, S. (2005). How can market mechanisms for forest environmental services help the poor? Preliminary lessons from Latin America. *World Development*, *33*(9), 1511-1527.

Grossman, D. and P. Holden. 2006. Contract Parks in South Africa. Paper prepared for IUCN Southern Africa Sustainable Use Specialist Group.

Grumbine, R. E. (1994). What is ecosystem management? *Conservation Biology*, *8*(1), 27-38.

Hackel, J. D. (1999). Community conservation and the future of Africa's wildlife. *Conservation Biology*, *13*(4), 726-734.

Hall, R., (2004). A Political Economy of Land Reform in South Africa. *Review of African Political Economy*, No. 100, 213-227.

Hamilton, A., Cunningham, A., Byarugaba, D., and Kayanja. (2000). Conservation in a Region of Political Instability: Bwindi Impenetrable Forest, Uganda. *Conservation Biology* 14(6):1722-1725.

Hansen, A. J., and DE Fries, R. (2007). Ecological mechanisms linking protected areas to surrounding lands. *Ecological Applications*, *17*(4), 974-988.

Heinen, J. T. (1993). Park–people relations in Kosi Tappu Wildlife Reserve, Nepal: a socio-economic analysis. *Environmental Conservation*, *20*(01), 25-34.

Hemson, G., MacLennan, S., Mills, G., Johnson, P., and Macdonald, D. (2009). Community, lions, livestock and money: a spatial and social analysis of attitudes to wildlife and the conservation value of tourism in a human–carnivore conflict in Botswana. *Biological Conservation*, *142*(11), 2718-2725.

Horowitz, L. S. (1998). Integrating indigenous resource management with wildlife conservation: a case study of Batang Ai National Park, Sarawak, Malaysia. *Human Ecology*, *26*(3), 371-403.

Hughes, S., Yau, A., Max, L., Petrovic, N., Davenport, F., Marshall, M. and Cinner, J. E. (2012). A framework to assess national level vulnerability from the perspective of food security: The case of coral reef fisheries. *Environmental Science and Policy*, *23*, 95-108.

Hulme, D., and Murphree, M. (2001). *African wildlife and livelihoods: the promise and performance of community conservation*. James Currey Ltd.

Hunter, L. M., Twine, W., and Johnson, A. (2011). Adult mortality and natural resource use in rural South Africa: Evidence from the Agincourt Health and Demographic Surveillance Site. *Society and Natural Resources*, *24*(3), 256-275. Ikire, S. (2002). Dimensions of human development. *World Development*, 30: 181-205. In Africa (Vol. 4). Univ of California Press.

Jim, C., and Xu,S.(2002). Stifled Stakeholders and Subdue Participation: Interpreting Local Responses Toward Shimentai Nature Reserve in South China. *Environmental Management* 30(3):327-341.

Jones, B. T. B. (1999). Community management of natural resources in Namibia. IIED Issue Paper No. 90 regions. *Toxicology*, *198*(1), 229-238.

Kabiri, N. (2010). The political economy of wildlife conservation and decline in Kenya. *The Journal of Environment and Development*, *19*(4), 424-445.

Kaltenborn, B. P., Nyahongo, J. W., Kidegesho, J. R., and Haaland, H. (2008). Serengeti National Park and its neighbours–Do they interact? *Journal for Nature Conservation*, *16*(2), 96-108.

Kaltenborn, B. R. P., Andersen, O., Nellemann, C., Bjerke, T., and Thrane, C. (2008). Resident attitudes towards mountain second-home tourism development in Norway: The effects of environmental attitudes. *Journal of Sustainable Tourism*, *16*(6), 664-680.

Kamanga, P., Vedeld, P., and Sjaastad, E. (2009). Forest incomes and rural livelihoods in Chiradzulu District, Malawi. *Ecological Economics*, *68*(3), 613-624.

Kariuki, P. N. (2013). *Local Residents' Attitudes and Perceptions Towards Tourism Development:* A Study of Lake Nakuru National Park and Its Environs, Kenya. A Masters Thesis Department of tourism management, Moi University.

Kellert, S. R. (1985). Public perceptions of predators, particularly the wolf and coyote. *Biological Conservation*, *31*(2), 167-189.

Kepe, T., R. Wynberg, and W. Ellis. 2005. Land Reform and Biodiversity Conservation in South Africa: complementary or in conflict? *International Journal of Biodiversity Science and Management* 1(1), 3-16.

Kideghesho, J. R., Røskaft, E., and Kaltenborn, B. P. (2007 Avilés, J. M., Stokke, B. G., Moksnes, A., Røskaft, E., Åsmul, M., and Møller, A. P. (2006). Rapid increase in cuckoo egg matching in a recently parasitized reed warbler population. *Journal of Evolutionary Biology*, *19*(6), 1901-1910.).

Kideghesho, J. R., Røskaft, E., and Kaltenborn, B. P. (2007). *Factors influencing conservation*

King, C. S., Feltey, K. M., & Susel, B. O. N. (1998). The question of participation: Toward authentic public participation in public administration. *Public Administration Review*, 317-326.

Kipkeu, M. L., Mwangi, S. W., & Njogu, J. A. M. E. S. (2014). Incentives for enhanced community participation in wildlife conservation in Amboseli, Kenya. *Natural and Social Sciences*, *2*, 75-86.

Kiss, A. (1990). *Living with wildlife: wildlife resource management with local participation in Africa*. The World Bank.

Kiss, A. (2004). Is community-based ecotourism a good use of biodiversity conservation funds? *Trends in Ecology and Evolution*, *19*(5), 232-237.

Kituyi, M. (1990). *Becoming Kenyans: socio-economic transformation of the pastoral Maasai.* African Centre for Technology Studies.

Klopp, J. M. (2000). Pilfering the public: the problem of land grabbing in contemporary Kenya. *Africa Today*, *47*(1), 7-26.

KNBS & SID. (2013). *Exploring Kenya's Inequalities; Pulling Apart or Pooling Together; Water and Sanitation.*

Kollmuss, A., and Agyeman, J. (2002). Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, *8*(3), 239-260.

Kuriyan, R. (2002). Linking local perceptions of elephants and conservation: Samburu pastoralists in northern Kenya. *Society &Natural Resources*, *15*(10), 949-957.

KWS (1992), *Kenya Wildlife Service*: Report of the Proceedings of Strategic Planning Workshop for the Community Wildlife Service Department, 29th June-1st July 1992. Nairobi, Kenya.

Lane, A., and Holland, S. (2001). A Comparison of attitudes towards state-led conservation and community-based conservation in the village of Bigodi, Uganda. *Society and Natural Resources* 19:609-623.

Lawes, M. J. (2004). Conservation of fragmented populations of Cercopithecus mitis in South Africa: the role of reintroduction, corridors and metapopulation ecology. In *The Guenons: Diversity and adaptation in African monkeys* (pp. 375-392). Springer, Boston, MA.

Lea, J. P. (1993). Tourism development ethics in the Third World. *Annals of Tourism Research*, *20*(4), 701-715.

Lemieux, C. J., Eagles, P. F., Slocombe, D. S., Doherty, S. T., Elliott, S. J., & Mock, S. E. (2012). Human health and well-being motivations and benefits

associated with protected area experiences: An opportunity for transforming policy and management in Canada. *Parks*, *18*(1), 71-85.

Low, B., Sundaresan, S. R., Fischhoff, I. R., and Rubenstein, D. I. (2009). Partnering with local communities to identify conservation priorities for endangered Grevy's zebra. *Biological Conservation*, *142*(7), 1548-1555.

Lynagh, F. M., and Urich, P. B. (2002). A critical review of buffer zone theory and practice: A Philippine case study. *Society and Natural Resources*, *15*(2), 129-145.

MA Millennium Ecosystem Assessment [MA] (2005). *Ecosystems and human well-being: Biodiversity synthesis.* A report of the Millennium Ecosystem Assessment. Washington, D.C.: World Resources Institute.

Maina G, Samoilys MA and Osuka K.E. (2011). *Review of current and Potential community-based marine conservation projects on the Tana Delta-Pate Island coast of Kenya.* Report to Fauna and Flora International.

Manyara, G., and Jones, E. (2007). Community-based tourism enterprises development in Kenya: An exploration of their potential as avenues of poverty reduction. *Journal of Sustainable Tourism*, *15*(6), 628-644.

Markey, S., Connelly, S., and Roseland, M. (2010). 'Back of the Envelope': Pragmatic Planning for Sustainable Rural Community Development. *Planning, Practice and Research*, *25*(1), 1-23.

Mascia, M. B. (2003). The human dimension of coral reef marine protected areas: recent social science research and its policy implications. *Conservation Biology*, *17*(2), 630-632.

Marsden Jacob Associates (2018). *The economic impacts of active recreation in Victoria.* Report prepared for Sport and Recreation Victoria

Mbaiwa, J. E., and Stronza, A. L. (2011). Changes in resident attitudes towards tourism development and conservation in the Okavango Delta, Botswana. *Journal of Environmental Management*, *92*(8), 1950-1959.

Mbile, P., Vabi, M., Meboka, M., Okon, D., Arrey-Mbo, J., Nkongho, F., and Ebong, E. (2005). *Linking management and livelihood in environmental conservation:* case of the Korup National Park Cameroon.

McGarry, D. K., and Shackleton, C. M. (2009). Children navigating rural poverty: Rural children's use of wild resources to counteract food insecurity in the Eastern Cape, South Africa. *Journal of Children and Poverty*, *15*(1), 19-37.

McGarry, D. K., and Shackleton, C. M. (2009). Is HIV/AIDS jeopardizing biodiversity? *Environmental Conservation*, *36*(01), 5-7.

McNeely, J. A. (1993). Economic incentives for conserving biodiversity: lessons for Africa. *Ambio*, 144-150.

Mehta, J. N., and Heinen, J. T. (2001). Does community-based conservation shape favorable attitudes among locals? An empirical study from Nepal. *Environmental Management*, *28*(2), 165-177.

Mijele, D., Obanda, V., Omondi, P., Soriguer, R. C., Gakuya, F., Otiende, M. and Alasaad, S. (2013). Spatio-temporal distribution of injured elephants in Masai Mara and the putative negative and positive roles of the local community. *PloS one*, *8*(7), e71179.

Milner-Gulland, E. J., and Bennett, E. L. (2003). Wild meat: the bigger picture. *Trends in Ecology & Evolution*, *18*(7), 351-357.

Mir, Z. R., Noor, A., Habib, B., & Veeraswami, G. G. (2015). Attitudes of local people toward wildlife conservation: a case study from the Kashmir Valley. *Mountain Research and Development*, *35*(4), 392-401.

Morris, M. G., Collins, N. M., Vane-Wright, R. I., and Waage, J. (1991). The utilization and value of non-domesticated insects. *The Conservation of Insects and their Habitats*, 319-49.

Mulder, M. B., and Coppolillo, P. (2005). *Conservation: linking ecology, economics, and culture*. Princeton University Press.

Mugenda, O. &Mugenda A.(2003). *Research methods: quantitative and qualitative approaches*.

Murphy, M. J. (1985). Demographic and socio-economic influences on recent British marital breakdown patterns. *Population Studies*, *39* (3), 441-460.

Muruthi, P. (2005). Human wildlife conflict: Lessons learned from AWF's African heartlands. *African Wildlife Foundation. Washington, DC*.

Mutanga, C. N., Vengesayi, S., Gandiwa, E., and Muboko, N. (2015). Community perceptions of wildlife conservation and tourism: A case study of communities adjacent to four protected areas in Zimbabwe. *Tropical Conservation Science*, *8*(2), 564-582.

Mutanga, C. N., Vengesayi, S., Muboko, N., & Gandiwa, E. (2015). Towards harmonious conservation relationships: A framework for understanding protected area

staff-local community relationships in developing countries. *Journal for Nature Conservation*, *25*, 8-16.

Naidoo, R., and Adamowicz, W. L. (2005). Biodiversity and nature-based tourism at forest reserves in Uganda. *Environment and Development Economics*, *10*(02), 159-178.

Naughton-Treves, L., Holland, M. B., and Brandon, K. (2005). The role of protected areas in conserving biodiversity and sustaining local livelihoods. *Annu. Rev. Environ. Resour.*, *30*, 219-252.

Nelson, F., and Agrawal, A. (2008). Patronage or participation? Community-based natural resource management reform in sub-Saharan Africa. *Development and Change*, *39*(4), 557-585.

Neumann, R. P. (1998). *Imposing wilderness: struggles over livelihood and nature preservation*

Nkhata, B. A., and Breen, C. (2010). A framework for exploring integrated learning systems for the governance and management of public protected areas. *Environmental Management*, *45*(2), 403-413.

Nygren, A. (1999). Local Knowledge in the Environment–Development Discourse From dichotomies to situated knowledges. *Critique of Anthropology*, *19*(3), 267-288.

Obonyo, G. O., and Fwaya, E. V. O. (2014). *Integrating tourism with rural development strategies in western Kenya.* Citizen Participation in Decision Making: Towards Inclusive Development in Kenya, 160.

Obunde, P., Omiti, J., and Sirengo, A. N. (2005). *Policy dimensions in human-wildlife conflicts in Kenya: Evidence from Laikipia and Nyandarua Districts*. Institute of Policy Analysis and Research.

Odebiyi, B. R., Ayeni, S. M., Umunna, M. O., and Johnson, J. J. (2015). Communities attitudes towards conservation in Gashakagumti National Park Nigeria. *Journal of Research in Forestry, Wildlife and Environment, 7*(2), 67-80.

Odusote, A. (2016). Nigeria: The matrix between fragility of livelihoods and conflict. *Journal of Global Initiatives: Policy, Pedagogy, Perspective*, *10*(2), 3.

Ogada, M. O. (2015). HWC 2003+ 10 Years: Carnivore–Livestock Conflicts, Tourism, Donors, Compensation: What About the Human Dimensions? *Human Dimensions of Wildlife*, *20*(4), 329-332.

Okech, R. N. (2010). Wildlife-community conflicts in conservation areas in Kenya. *African Journal on Conflict Resolution*, *10*(2), 10-11

Okello, M. M., and Kiringe, W. J. (2004). Threats to biodiversity and their implications in protected and adjacent dispersal areas of Kenya. *Journal of Sustainable tourism,* Vol. 12 No. 1 pp: 55-69.

Otto, J., Zerner, C., Robinson, J., Donovan, R., Lavelle, M., Villarreal, R. and Pearl, M. (2013). *Natural connections: perspectives in community-based conservation.* Island Press.

Owubah, C. E., Le Master, D. C., Bowker, J. M., and Lee, J. G. (2001). Forest tenure systems and sustainable forest management: the case of Ghana. *Forest Ecology and Management*, *149*(1), 253-264.

Pearce, D., & Moran, D. (2013). *The economic value of biodiversity*. Routledge.

Pimbert, M. P., & Pretty, J. N. (1997). Parks, people and professionals: putting 'participation'into protected area management. *Social change and conservation*, *16*, 297-330.

Pollini, J., Hockley, N., Muttenzer, F. D., and Ramamonjisoa, B. S. (2014). The transfer of natural resource management rights to local communities. *Conservation and Environmental Management in Madagascar. IR Scales (ed.)*, 172-192.

Pretty, J., and Smith, D. (2004). Social capital in biodiversity conservation and management. *Conservation Biology*, *18*(3), 631-638.

Rao, K. and Geisler, C. (1990). The social consequences of protected areas development for resident populations. *Society and Natural Resources* **3**: 19–32

Reddy, S. R. C., and Chakravarty, S. P. (1999). Forest dependence and income distribution in a subsistence economy: evidence from India. *World Development*, *27*(7), 1141-1149.

Reed, M. S. 2008 Stakeholder participation for environmental management: a literature review. *Biological Conservation*141:2417–2431.

Ricketts, T. H., Daily, G. C., Ehrlich, P. R., and Michener, C. D. (2004). Economic value of tropical forest to coffee production. *Proceedings of the National Academy of Sciences of the United States of America*, 101(34), 12579-12582.

Roe, D., and Jack, M. (2001). Stories from Eden: Case studies of community-based wildlife management. *Evaluating Eden*, (9), 62.

Roe, D., J. Mayers, M. Grieg-Gran, A. Kothari C. Fabricius, and R. Hughes, 2000, '*Evaluating Eden: Exploring the Myths and Realities of Community-based Wildlife Management', Evaluating Eden Series,* Vol.8, London: International Institute of Environment and Development.

Ruuska, E. (2013). Unsustainable charcoal production as a contributing factor to woodland fragmentation in southeast Kenya. *Fennia - International Journal of Geography*, *191*(1), 58-75.

Sah, J. P., and Heinen, J. T. (2001). Wetland resource use and conservation attitudes among indigenous and migrant peoples in Ghodaghodi Lake area, Nepal. *Environmental Conservation*, *28*(04), 345-35

Salafsky, N., & Wollenberg, E. (2000). Linking livelihoods and conservation: a conceptual framework and scale for assessing the integration of human needs and biodiversity. *World development*, *28*(8), 1421-1438.

Salafsky, N. (1999). *Evaluating linkages between business, the environment, and local communities: final analytical results from the biodiversity conservation network*. Biodiversity Support Program.

Sanderson, S. and Redford, K. (2003) Contested relationships between biodiversity conservation and poverty alleviation. *Oryx*, 37, 389–390.

Sanderson, S., and Redford, K. (2004). The defence of conservation is not an attack on the poor. *Oryx*, *38*(02), 146-147.

Scherr, S. J. (2000). A downward spiral? Research evidence on the relationship between poverty and natural resource degradation. *Food Policy*, *25*(4), 479-498.

Scheyvens, R. (2000). Promoting women's empowerment through involvement in ecotourism: Experiences from the Third World. *Journal of Sustainable Tourism*, *8*(3), 232-249.

Sebele, L. S. (2010). Community-based tourism ventures, benefits and challenges: Khama rhino sanctuary trust, central district, Botswana. *Tourism Management*, *31*(1), 136-146.

Shackleton, C. M., and Shackleton, S. E. (2000). Direct use values of secondary resources harvested from communal savannas in the Bushbuckridge lowveld, South Africa. *Journal of Tropical Forest Products*, *6*(1), 28-47.

Shackleton, C. M., Shackleton, S. E., and Cousins, B. (2001). The role of land-based strategies in rural livelihoods: the contribution of arable production, animal husbandry and natural resource harvesting in communal areas in South Africa. *Development Southern Africa*, *18*(5), 581-604.

Shackleton, C. M., Shackleton, S. E., Buiten, E., and Bird, N. (2007). The importance of dry woodlands and forests in rural livelihoods and poverty alleviation in South Africa. *Forest Policy and Economics, 9(5), 558-577.*

Shackleton, C., and Shackleton, S. (2004). The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa. *South African Journal of Science*, *100*(11-12), 658-664.

Shackleton, S., Campbell, B., Lotz-Sisitka, H., and Shackleton, C. (2008). Links between the local trade in natural products, livelihoods and poverty alleviation in a semi-arid region of South Africa. *World Development*, *36*(3), 505-526.

Shackleton, S., Campbell, B., Wollenberg, E., and Edmunds, D. (2002). Devolution and community-based natural resource management: Creating space for local people to participate and benefit. *Natural Resource Perspectives*, *76*, 1-6.

Shibia, M. G. (2010). Determinants of attitudes and perceptions on resource use and management of Marsabit National Reserve, Kenya. *Journal of Human Ecology*, *30*(1), 55-62.

Sibanda, B. M., and Omwega, A. K. (1996). Some reflections on conservation, sustainable development and equitable sharing of benefits from wildlife in Africa: the case of Kenya and Zimbabwe. *South African Journal of Wildlife Research*, *26*, 175-181.

Sifuna, D. N. (2005). Increasing access and participation of pastoralist communities in primary education in Kenya. *International review of education*, *51*(5-6), 499-516.

Sillero-Zubiri, C., and Laurenson, M. K. (2001). Interactions between carnivores and local communities: Conflict or co-existence? .*Conservation biology series-cambridge-*, 282-312.

Sitati, N. W., Walpole, M. J., and Leader-Williams. (2005). Factors affecting susceptibility of farms to crop raiding by African elephants: using a predictive model to mitigate conflict. *Journal of Applied Ecology*, *42*(6), 1175-1182.

Smith, R. J. (1981). Resolving the tragedy of the commons by creating private property rights in wildlife. *Cato J.*, *1*, 439.

Snyman, S. L. (2012). The role of tourism employment in poverty reduction and community perceptions of conservation and tourism in southern Africa. *Journal of Sustainable Tourism*, *20*(3), 395-416.

Songorwa, A.N., (1999). Community-based wildlife management (CWM) in Tanzania: Are the communities interested? *World Development* 27(12), 2061–2079.

Southgate, C. R. (2006). Ecotourism in Kenya: The vulnerability of communities. *Journal of ecotourism*, *5*(1-2), 80-96.

Karanth, K. K., & Nepal, S. K. (2012). Local residents perception of benefits and losses from protected areas in India and Nepal. *Environmental management*, *49*(2), 372-386.

Spiteri, A., and Nepalz, S. K. (2006). Incentive-based conservation programs in developing countries: a review of some key issues and suggestions for improvements. *Environmental Management*, *37*(1), 1-14.

Stem, C. J., Lassoie, J. P., Lee, D. R., Deshler, D. D., & Schelhas, J. W. (2003). Community participation in ecotourism benefits: The link to conservation practices and perspectives. *Society &Natural Resources*, *16*(5), 387-413.

Stewart, R.E., Walters, L.C., Balint, P.J., Desai, A., (2004). *Managing wicked environmental problems.* USDA Forest Service, Pacific Southwest Region, Sacramento, CA.

Stolton, S., Dudley, N., Avcioglu Çokçaliskan, B., Hunter, D., Ivanic, K. Z., Kanga, E. and Wong, M. (2015). *Values and benefits of protected areas*. ANU Press.

Sunderlin, W. D. (2006). Poverty alleviation through community forestry in Cambodia, Laos, and Vietnam: An assessment of the potential. *Forest Policy and Economics*, *8*(4), 386-396.

Sunderlin, W. D., Angelsen, A., Belcher, B., Burgers, P., Nasi, R., Santoso, L., and Wunder, S. (2005). Livelihoods, forests, and conservation in developing countries: an overview. *World Development*, *33*(9), 1383-1402.

Terborgh, J., van Schaik, C., Davenport, L., & Rao, M. (Eds.). (2002). *Making parks work: strategies for preserving tropical nature*. Island Press.

Thenya, T. (2001). Challenges of conservation of dryland shallow waters, Ewaso Narok swamp, Laikipia District, Kenya. *Hydrobiologia*, *458*(1-3), 107-119.

Toillier, A., Serpantié, G., Hervé, D., and Lardon, S. (2011). Livelihood strategies and land use changes in response to conservation: Pitfalls of community-based forest management in Madagascar. *Journal of Sustainable Forestry*, *30*(1-2), 20-56.

Tosun, N., Sucsuz, N., and Yigit, B. (2006). The effect of computer assisted and computer based teaching methods on computer course success and computer using attitudes of students. *TOJET: The Turkish Online Journal of Educational Technology*, *5*(3).

Twyman, C., (2000). Participatory conservation? Community-based natural resource management in Botswana. *The Geographical Journal* 166 (4), 323–335.

Vodouhê, F. G., Coulibaly, O., Adégbidi, A., & Sinsin, B. (2010). Community perception of biodiversity conservation within protected areas in Benin. *Forest Policy and Economics*, *12*(7), 505-512.

Watts, S., and Faasen, H. (2009). Community-Based Conflict Resolution Strategies for Sustainable Management of the Tsitsikamma National Park, South Africa. *South African Geographical Journal* 91(1):25-37.

Waylen, K. A., Fischer, A., McGowan, P. J., Thirgood, S. J., & Milner-Gulland, E. J. (2010). Effect of Local Cultural Context on the Success of Community-Based Conservation Interventions. *Conservation Biology*, *24*(4), 1119-1129.

Webb, E. L. (2007). Rural household participation in illegal timber felling in a protected area of West Sumatra, Indonesia. *Environmental Conservation*, *34*(01), 73-82.

Wells, M. and Brandon, K. (1992). *People and Parks: Linking protected area management with local communities.* Washington, DC: The World Bank.

Wells, M. P., and Brandon, K. E. (1993). The principles and practice of buffer zones and local participation in biodiversity conservation. Los principios y la práctica de las zonas de amortiguamiento y la participación local en la conservación de la biodiversidad. *Ambio.*, *22*(2/3), 157-162.

Wells, M. P., and McShane, T. O. (2004). Integrating protected area management with local needs and aspirations. *AMBIO: A Journal of the Human Environment*, *33*(8), 513-519.

Wells, M., McShane, T.O., Dublin, H.T., O'Connor, S. and Redford, K.H. (2004). *The future of integrated conservation and development projects: Building on what works.* In: T. Mc Shane.

West, P., Igoe, J., and Brockington, D. (2006). Parks and peoples: the social impact of protected areas. *Annu. Rev. Anthropol.*, *35*, 251-277.

Western, D., and Pearl, M. C. (1989). *Conservation for the Twenty-first Century*. Oxford University Press.

Western, D., Wright, R.M. and Strum, S.C. (eds). (1994) *Natural Connections: Perspectives in Community-based Conservation. Washington*, DC, USA: Island Press: **581** pp

Willis, G. B. (2004). *Cognitive interviewing: A tool for improving questionnaire design*. Sage Publications.

Wittemyer, G., Elsen, P., Bean, W. T., Burton, A. C. O., and Brashares, J. S. (2008). Accelerated human population growth at protected area edges. *Science*, *321*(5885), 123-126.

Woodley, A. (1993). *Tourism and sustainable development: The community perspective.*

Waylen, K. A., McGowan, P. J., Milner-Gulland, E. J., & Pawi Study Group. (2009). Ecotourism positively affects awareness and attitudes but not conservation behaviours: a case study at Grande Riviere, Trinidad. *Oryx*, *43*(3), 343-351.

Yamane, Taro. 1967. *Statistics, An Introductory Analysis*, 2nd Ed., New York: Harper and Row.

Zhang, W., Ricketts, T. H., Kremen, C., Carney, K., and Swinton, S. M. (2007). Ecosystem services and dis-services to agriculture. *Ecological Economics*, *64*(2), 253-260.

APPENDICES

APPENDIX I: LOCAL COMMUNITY QUESTIONNAIRE

Questionnaire No. _____ Date:

interview_____

I am a student at the University of Eldoret, pursuing a Master of Science Degree in Wildlife Management. I am conducting a study on assessing local community involvement in natural resource conservation as a means of alleviating poverty amongst communities living around Bonjoge National Reserve. This questionnaire is meant to gather information for this study. Kindly fill the questionnaire honestly and to the best of your knowledge. This is purely for academic purposes and all responses given will be handled with absolute confidence, and will be used solely for the purpose of this study.

SECTION A: PERSONAL DETAILS

1. Age of respondent	[1] 18 – 25 years	[2] 26 – 35 years	
	[3] 36 – 50 years	[4] Above 50 years	
2. Gender	[1] Male	[2] Female	
3. Education level	[1] Did not attend school	[2] Primary	[3] Secondary
	[4] College	[5] University	
4. Marital status	[1] Single	[2] Married	
	[3] Widowed	[4] Separated/ Divorced	

SECTION B: LOCAL COMMUNITY INVOLVEMENT IN WILDLIFE AND NATURAL RESOURCE CONSERVATION AND MANAGEMENT

5. Are you aware of Bonjoge National Reserve? Yes [1] No [2]

6. (a) Are you involved in the conservation of Bonjoge National Reserve and its resources?

Yes [1] No [2]

(b). If yes above, in which way (s) are you involved

……

(c) If no, explain why you are not involved

…….....

7. If fully involved in conservation how will you help in managing wildlife and other natural resources in the Reserve?

…….....

SECTION C: ATTITUDES AND PERCEPTIONS TOWARDS THE RESERVE AND ITS MANAGEMENT

8. How can you rate the extent of your attitudes and perception towards the conservation of Bonjoge National Reserve? (Tick one)	No extent at all	Low extent	Moderate extent	Great extent	Very great extent
	[1]	[2]	[3]	[4]	[5]

9. Community involvement in conservation helps in alleviating poverty (Tick one).	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	[1]	[2]	[3]	[4]	[5]

SECTION D: BENEFITS ACCRUING FROM LOCAL COMMUNITY INVOLVEMENT IN WILDLIFE AND NATURAL RESOURCE CONSERVATION

10 a). Do you benefit from the conservation of Bonjoge National Reserve and its resources?

[1] Yes [2] No

b). If yes above, what benefits accrue to you from the Reserve and its resources?

.....

.....……

….....

11. a).Do you think the involvement of the local community in the conservation of Bonjoge National Reserve and its resources is of any benefit? Yes [1]

No [2]

b). If yes above, what is the nature of the benefits that accrue from them (Tick appropriately).

Monetary [1] Goods and services [2] Socio-cultural [3] Aesthetic benefits [4]

SECTION E: CHALLENGES EXPERIENCED AND MEASURES TAKEN TO MITIGATE THEM

12. (a) Are you aware of any challenges that are encountered in involving the local community in the management of the reserve and the conservation of its resources?

Yes [1] No [2]

(b) If yes above, list the challenges experienced ……

…….....

…….....

13. (a) Are you aware of any measures put in place to mitigate the challenges you have listed above? Yes [1] No [2]

(b) If yes above, state the measures adopted to mitigate the challenges listed above.

.....……

……

……

14. What is your suggestion about enhancing community involvement in conservation in this area?

……

……

…….....

15. (a) In your opinion have the measures that have been adopted to mitigate the challenges faced been effective?

Yes [1] No [2] Do not know [3]

16. In your opinion, what other measures should be adopted to mitigate the challenges faced?

.....

.....

.....

17. What is your view on the future of Bonjoge National Reserve?

Very good [1] Good [2] Fairy good [3] Bad [4] Very bad [5]

Thank you very much for your time and participation!

APPENDIX II: INTERVIEW GUIDE QUESTIONS FOR KEY RESPONDENTS

Organization---------- Designation..... Interview Date.....

1. In what way are you involved in the conservation of Bonjoge National Reserve and its resources?
2. What are some of the benefits that accrue from community involvement in the conservation of the reserve and its resources?
3. Do the benefits accrued play a role in alleviating poverty among residents living adjacent to Bonjoge National Reserve?
4. What challenges are experienced in involving the local community in the conservation of Bonjoge National Reserve and its resources?
5. What measures have been adopted to mitigate the challenges faced?
6. What action has Nandi County taken to promote local community involvement in the conservation of Bonjoge National Reserve and its resources?
7. How do you describe the attitudes and perceptions of the local community towards community based conservation in this area?
8. Does the involvement of a local community in conservation help in alleviating Poverty?
9. If yes in question 8 above, explain how it helps in alleviating poverty.
10. If no, state why it does not help in poverty alleviation.
11. How would you describe the future of Bonjoge National Reserve and its resources?

APPENDIX III: FOCUS GROUP DISCUSSION GUIDE QUESTIONS

1. Are you all aware of Bonjoge National Reserve?
2. Are local residents living around Bonjoge National Reserve (BNR) involved in the conservation of the reserve and its resources?
3. How are the residents involved in the conservation of wildlife and other resources in BNR?
4. How would you describe the attitudes and perceptions of local residents towards BNR and its resources?
5. Is local community involvement in the conservation of wildlife and other resources in BNR of any benefit?
6. What benefits accrue to the local community from conserving BNR and its resources?
7. Do the benefits accrued from the conservation of wildlife and other resources in BNR play any role in alleviating poverty among local residents?
8. What challenges are encountered in involving the local community in conserving wildlife and other natural resources in BNR?
9. What measures have been adopted to mitigate the challenges experienced?
10. What is your opinion on the issue of community based natural resource conservation?

APPENDIX IV: SIMILARITY INDEX/ANTI-PLAGIARISM REPORT

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