FACTORS INFLUENCING THE PERFORMANCE OF NATIONAL RESERVES: A CASE OF LAKE BOGORIA NATIONAL RESERVE, KENYA

BY

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DECLARATION

This research project report is my original work and has not been presented for an award in any other university.

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DEDICATION

This work is dedicated to my late father Kaibos Chemalan, who inculcated and inspired me the value of education during my tender years.

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ABBREVIATIONS AND ACRONYMS

CBO	-	Community-Based Organization
CCB	-	County Council of Baringo
CCK	-	County Council of Koibatek
EAPRO	-	Eastern Africa Regional Programme Office
ICDP	-	Integrated Conservation and Development Projects
IUCN	-	International Union for Conservation of Nature
KWS	-	Kenya Wildlife Service
LBNR	-	Lake Bogoria National Reserve
NCST	-	National Council of Science and Technology
PA	-	Protected Area
SPSS	-	Statistical Package for Social Scientists
SPSS	-	Statistical Package for Social Scientists
UNDP	-	United Nations Development Programme
US	-	United State
USD	-	United States Dollar
WCMD	-	Wildlife Conservation and Management Department
WCPA	-	World Commission on Protected Areas
WWF	-	World Wide Fund

ABSTRACT

Worldwide, natural resources have increasingly been conserved by designating as protected areas. In effect, integrated management plans have been developed for protected areas. This is because management planning is thought of as an effective tool for promoting sustainable conservation. However, there is limited research on the extent to which implementation of such plans have created impact to the environment and people.
This study assessed the factors influencing the performance of national reserves in Kenya, where management plans have been developed and focused on Lake Bogoria National Reserve. In particular, the study sought to establish the influence of management factors; community participation, socio-economic factors and resources factors on the performance of national reserves. The study adopted descriptive survey research design. The target population for the study comprised 16,495 households spread within 13 administrative locations in the five districts that fall within the Lake Bogoria catchment area. Multi-stage sampling techniques were adopted to select 375 households from which an adult respondent was interviewed. In addition, 42 LBNR staff and 12 key informants from the major stakeholder organizations/departments/institutions were purposively selected to participate in the study. Primary data was collected using the household and LBNR employees' questionnaires and an interview guide for the key informants. The instruments were reviewed by both the management staff of the LBNR involved in the management of the IMP and the supervisor from the University of Nairobi for expert judgment and review of content and face validity. A pilot survey was conducted using a sample of 10 households in Mugurin Location to determine the feasibility of obtaining the relevant data before the actual data collection process was conducted. The data collected form a pilot study with a sample of 10 households was analyzed to check the reliability of the instrument. Reliability analysis produced an alpha of 0.77. Quantitative data collected using the questionnaires was edited, coded and then entered into computer. Data analysis was done with the aid of the Statistical Package for Social Scientists software. Quantitative analysis of the influence of the various factors on the performance of the reserves was done using percentages, simple means and standard deviations and the findings presented in tables. The percentage scores from addition of scores of Likert-like scale items were used to conduct the Pearson's Product Moment Correlations (PPMC) to determine the relationships between each of the independent variables and the dependent variables. Qualitative data obtained from the open-ended questions in the questionnaires and key informant interviews was extracted, organized and discussed under the main objective areas of the study. The study established that management planning aspects of the LBNR were generally sound/strong, but there were weaknesses in community involvement and in management decision-making and as well as community participation in conservation, which affected the performance of the reserve. The study also established that resource-factors of the LBNR were the weakest, yet all the other factors depend on resources if the goals of biodiversity conservation and socio-economic benefits are to be realized. The study therefore recommends that the management of the LBNR needs to scale up efforts to mobilize adequate resources, both financial and human resources to strengthen the other factors that rely on these resources to realize the goals of biodiversity conservation.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The World Database on Protected Areas enumerates 113,851 protected areas worldwide covering about 19.65 million km^2or about 13 percent of the Earth's terrestrial surface (World Database on Protected Areas, 2006). Unfortunately, many of them do not meet their stated objectives of protecting biodiversity (Oates, 1999; Terborgh, 1999).Putting land under special legal protection might be a precondition for its effective conservation, but it is not sufficient as, globally as well as locally, socio-economic pressures on natural resources, ecosystems goods and services are rising, such as demands for forest products, arable land, and drinking water to name just the most prominent examples. At the same time, there is a severe mismatch between the current levels of global spending on conservation and the actually needed expenditure levels in terms of protected area budgets and staff (Balmford *et al*., 2003; James *et al.,* 1999). Consequently, the effective implementation of functioning management systems in already existing protected areas will be the foremost challenge for in-situ conservation in the years to come (Stoll-Kleemann, 2006).

Although the last decade has seen growing concern over the protection and sustainable use of natural resources, most biodiversity - especially in tropical regions is unlikely to survive without receiving more concrete and effective protection (Bruner *et al.,*2001; Myers *et al.,*2000; Baillie and Groombridge, 1996). Many factors are responsible for this decline and the root causes are invariably some forms of human activity, such as habitat destruction and fragmentation, overharvesting, and pollution accompanied by the absence or failure of management and governance structures and processes to deal with these developments (Pimm and Raven, 2000; Myers and Knoll, 2001; Novacek and Cleland, 2001; Brooks *et al.,* 2002; Singh 2002).

Over the last 15 years, conservationists have begun looking beyond park boundaries and taking more of a landscape approach toward conservation, working with local communities

and other stakeholders to further conservation objectives. This approach was emphasized in the "Beyond Boundaries" theme of the 2003 World Parks Congress. Although projects still typically focus on building capacity and necessary infrastructure within parks, there is an increasing emphasis on activities to mitigate and reduce threats emanating from the surrounding production landscape (Alers *et al.,* 2007).Many of these projects can be classed as Integrated Conservation and Development Projects (ICDPs). This term has been applied to a diverse range of initiatives, all with a common goal: linking biodiversity conservation with local social and economic development (Wells and Brandon, 1992; Wells *et al.,* 1999). Most ICDPs target both the protected area (by strengthening management) and local communities and other stakeholders, often by providing incentives such as additional development opportunities to reduce pressures on natural habitats and resources. ICDPs have proven popular with donors. They offer an almost irresistible combination of potential gains, including biodiversity conservation, increased local community participation, more equitable sharing of benefits, and economic development for the rural poor.

ICDP projects have evolved over time (Hughes and Flintan, 2001), partly in response to a more critical examination of their impacts. As long ago as 1992, a review of ICDPs by Wells and Brandon (1992) noted that: Most projects lack adequate understanding of the socioeconomic context; there was a general failure to specify exactly how ICDP development activities were expected to lead to enhanced protected area management; few projects have identified viable alternatives to the extensive resource-use practices that threaten many protected areas; the social and economic benefits flowing to local people as a result of IDCP development activities are difficult to identify and are unevenly - sometimes narrowly – distributed and that links between subsidized community services, such as schools and health clinics, and protected area management objectives have not always been clear.

The conservation literature has continued to question the success of ICDPs in achieving either appreciable conservation or development objectives (Brandon *et al.,* 1998; Larson *et al.,* 1998; Oates, 1999; Wells *et al.*, 1999; UNDP, 2000; MacKinnon, 2001; McShane and Wells, 2003). Critical questions have also been asked about the value of promoting

alternative livelihoods to modify community behaviors in park buffer zones, especially whether such interventions are designed more to defuse local opposition than to improve livelihoods (Neumann, 1997). Newmark and Hough (2000), in a review of 50 projects in 15 African countries, identified several challenges to promoting conservation through development, including: provision of additional livelihood opportunities is based on the unproven assumption that increasing income or improving livelihoods will change behaviors and reduce pressures on protected areas; incentives to communities in the form of public goods (schools, roads, etc) will often not be effective in changing individual behavior; the groups within the communities who benefit from incentives may not be those that generate threats and that communities may not embrace conservation objectives even if benefiting from incentives, either because of the poor linkage between incentives and conservation or weak social cohesion within stakeholder groups.

Nevertheless, ICDPs have continued to be a key element in donor strategies to deliver conservation as part of an overall agenda to promote development and poverty alleviation. The results have been mixed. A study of 16 rain forest conservation projects in 11 countries in Africa found that 80 percent included an ICDP like approach, yet less than half of those projects improved incomes for the local stakeholders by more than 2.5 percent, and some resulted in no improvement at all (Struhsaker *et al.*, 2005). The same study found no correlation between the adoption of an ICDP approach and the quality of conservation achieved. However, protected areas in Tanzania, which routinely allocated 7.5 percent of their revenues to community projects, reported higher levels of favorable relations between park management and local stakeholders.

During the 4th World Park Congress held in Caracas in 1992, delegates identified effective management as one of the four major issues of global concern influencing the effectiveness of natural resource conservation through designation of protected areas. Consequently, the IUCN's WCPA established a taskforce to explore issues related to the effectiveness in the management of protected areas in1995 and developed an overall assessment framework to provide a consistent approach to assessing protected area management effectiveness (Hockings *et al.*, 2000).The development and implementation of integrated management plans for protected areas is thought of as an effective tool for promoting sustainable

conservation. However, there is limited research on the extent to which implementation of such plans has created impact to the environment and people, and the factors that militate against the achievement of conservation objectives.

In Kenya, Lake Bogoria National Reserve (LBNR) is an example of a protected area under integrated management plan implementation. LBNR is known regionally, nationally and locally for important wildlife species, including the flamingo and the greater kudu. The Reserve has unique physiographic features and geothermal manifestations due to its geological history. The combination of landforms, biodiversity content, availability of water and forage makes this site important at community, national and global levels. It was designated as a National Reserve in 1974. In 2002 it was listed as a wetland of international importance under the Ramsar Convention (WWF, 2005). Revenue from tourism related activities and other natural resources in the Reserve continue playing an important role in the socio-economic development of the area.

Despite LBNR being a wetland of international importance it is currently at risk from environmental degradation arising from unsustainable resource exploitation and ecologically negative catchment-wide processes. The root causes of these problems are poverty, poor land use, overstocking, weak traditional management approach and unsustainable farming systems witnessed within its catchment (WWF, 1995). In addition, perceived lack of benefits by people living adjacent to the National Reserve continues triggering a community-reserve authority conflict over the sharing of revenues. In response to this, not long ago, a strategic intervention was initiated to mitigate the catchment wide environmental problems and also resolve emerging resource use conflicts amongst stakeholders. The IMP approach to conservation was intended to promote sustainable livelihoods, create new socio-economic opportunities while harnessing existing ones, and safeguard the conservation of the National Reserve and its environs (County Council of Baringo, (CCB) County Council of Koibatek (CCK) and World Wide Fund for Nature (WWF), 2007).

The IMP provides a framework for different stakeholders to identify areas where their intervention is needed and their linkages with other stakeholders (CCB, CCK&WWF,

2007). The plan is in its second phase of implementation. However, in spite of the implementation of the IMP for LBNR, conflicts over revenue and environmental degradation continue at unprecedented rates. It was, therefore, important to evaluate the factors that influence the success of the IMP for LBNR implementation in meeting its objectives to ensure that appropriate decisions are made in future conservation efforts. In view of this imperative, this study sought to investigate the factors influencing the performance of national reserves in Kenya, focusing on Lake Bogoria National Reserve.

1.2 Statement of the Problem

Today, protected areas are increasingly expected to deliver social and economic benefits in addition to conserving biodiversity. Assurances that protected areas will provide such benefits are often crucial to attracting the support needed for their creation. But delivering on these promises is seldom easy. Success of Integrated Conservation and Development Projects in achieving either appreciable or development objectives have been questioned (Brandon *et al.,* 1998; Larson *et al.,* 1998; Oates, 1999; Wells *et al.*, 1999; UNDP, 2000; MacKinnon, 2001; McShane and Wells, 2003). Efforts to align protected areas and poverty reduction have continued for some time and have a mixed history; while some social programmes associated with protected areas have worked well, there have also been plenty of failures (Dudley et al., 2008). Meanwhile the political pressure to show that conservation and poverty reduction can co-exist is growing and some governments are questioning commitments to protection in the face of present economic or social pressures. As investors seek more guarantees or predictability of joint socio-economic and conservation success, implementing agencies are – rightly - being held more accountable for results.

Lake Bogoria National Reserve plays important socio-economic roles at communal, county, national and international levels. However, the continued significance of the Reserve is threatened by environmental degradation and socio-economic pressures within its catchment. The long standing conflicts between the local community, county councils and other stakeholders and their roles and privileges in the exploitation and conservation of the Reserve aggravate the situation (WWF, 2005). As an alternative, LBNR adopted an

IMP so as to address these shortcomings of the previous approaches. The IMP approach aims at reducing conflicts and enhancing the overall effectiveness in the management and conservation efforts through inclusiveness and consensus building, but the purpose of the IMP is not being realized. Therefore, unless we understand and publicize the challenges that protected areas face in meeting their objectives, we risk not only reducing the chances of new protected areas being created but even of seeing some existing protected areas being degazetted and their values lost. It is against this background that this study is designed to assess the factors influencing the performance of the Lake Bogoria National Reserve.

1.3 Purpose of the Study

The purpose of this study was to assess the factors influencing the performance of national reserves in Kenya, focusing on Lake Bogoria National Reserve.

1.4 Research Objectives

The study was guided by the following objectives:

1. To establish the influence of management factors on the performance of national reserves.
2. To assess the influence of community participation on the performance of national reserves.
3. To assess the role of socio-economic factors on the performance of national reserves.
4. To determine how the resources factors influence the performance of national reserves.

1.5 Research Questions

The study sought to answer the following research questions:

1. In what ways do management factors influence the performance of national reserves?

2. To what extent does community participation influence the performance of national reserves?

3. How do social-economic factors influence the performance of national reserves?

4. To what extent do resource-factors influence the performance of national reserves?

1.6 Significance of the Study

Effective and efficient management of national reserves would result in more sustainable use and increase the socio-economic benefits accrued from these natural resources. Integrated Management Planning offers a new and promising approach to manage national reserves that aims at reducing conflict and enhancing consensus building through more inclusiveness among stakeholders. However, few studies have reported the challenges that this approach faces in attaining its intended goals. The findings contained this study may therefore be important in informing the effective design, implementation and continuous improvement of management of natural resources.

This study was intended to inform our understanding of participation by the local communities in development programmes. The study's findings contribute to the body of knowledge and literature on factors affecting the performance of protected areas, generally, and community participation in conservation/development projects, including integrating local communities in the overall management of natural resources. It is hoped that the findings espoused in this study will contribute to the effective implementation of IMP approaches within and beyond LBNR and provide baseline information for further research on the factors that may leverage or hamper the implementation of IMP for effective natural resource conservation.

1.7 Basic Assumptions of the Study

In conducting the study, it was assumed that the management of the LBNR and key stakeholders played their roles as defined in the integrated management plan. The study also assumed that the IMP strategies and activities had been implemented so as to provide a basis upon which this study would assess the factors that work against its implementation

and performance. Finally, it was assumed that the management of LBNR, stakeholders and the community would generally cooperate and provide all the relevant information that would be used in arriving at valid conclusions and recommendations of the study.

1.8 Limitations of the Study

The greatest challenge that this study encountered was the distance and terrain covered during data collection, since LBNR catchment area is vast and covers five administrative districts spread out in three counties. To ease the problem of coverage of the area, sampling method was used to select a representative sample of the target population and research assistants conversant with the geographical dynamics of the areas recruited from the local community to assist in data collection. Secondly, the data collection exercise was conducted during the month of May 2013, during which massive incidences of flooding were reported, with the area of study experiencing a minimum of such incidences. This would have posed challenges in movement and traversing the study area, but effort was made to ensure that the data collection exercise was carried out in early hours of the day guided by the rainfall pattern that indicated that usually, heavy rains fell in the afternoon in the study area.

The final challenge was that some respondents from the target communities had low literacy levels hence seemed to deviate from the constructs of the study during interviews. To minimize on the effects of such deviation, the study team judiciously avoided irrelevant information while upholding respect for the concerned respondents, exercising due patience to ensure that relevant data was collected.

1.9 Delimitation of the Study

This study was specific to the extent that it investigated factors that influence the performance of Lake Bogoria National Reserve. Therefore, the study focused mainly on influence of management factors, community participation, social-cultural factors and resource-factors on the performance of the LBNR. The study covered 13 administrative locations spread within the 5 administrative districts that form the catchment of LBNR. These are the same locations that were targeted by the IMP.

1.10 Definition of Terms Used in the Study

The following terms assumed the stated meanings in the context of the study.

Community participation: referred to the involvement of members from the catchment community in any action related to the conservation of the protected areas. In this study, community participation was assessed in terms of involvement decision-making, their cooperation with reserve management as well as the community's voluntary and self-directed actions to conserve biodiversity.

Conservation: referred to the protection, preservation, management, or restoration of natural environments and the ecological communities that inhabit them. It included the management of human use of natural resources for current public benefit and sustainable social and economic utilization**.**

Management effectiveness evaluation: was used to mean the assessment of how well the LBNR was managed – primarily the extent to which it was protecting values and achieving goals and objectives.

Management factors: referred to factors related to the execution of managerial functions to achieve the set goals of a national reserve. In this study, management factors were evaluated in terms of execution of the IMP and related project plans and management decisions, availability of management skills and research, evaluation and monitoring of the project progress.

Ramsar site: is a wetland of international importance, recognized globally due to the Ramsar Convention, which is an international treaty for the conservation and wise use of wetlands. The wetland is important for the conservation of global biological diversity and for sustaining human life through the maintenance of their ecosystem components, processes and benefits/services

Resources factors: referred to factors related to human resources such as adequacy of staff and skills, financial resources and infrastructural resources that are required to implement the management plans of the protected areas.

Socio-economic factors: referred to the community's perceptions of the social benefits of the protected areas, the degree of economic stratification in the catchment community and the level of education of participants.

Stakeholders: referred to individuals, non-governmental organizations, ministries, government departments, academic institutions, corporate and other entities that in one way or the other were involved in the implementation of the LBNR IMP for strategic reasons.

Performance: referred to the general achievement of biodiversity conservation and socio-economic indicators of the integrated management plan for the national reserve. In this study, performance was evaluated in terms of reduced threats and pressures to biodiversity conservation, support for conservation by the local/indigenous people, changes in revenue levels form ecotourism activities and improvement in community/human wellbeing.

1.11 Organization of the study

This research proposal contains three chapters, while the research project report contains five chapters. Chapter one provides an introduction which is under: the background of the study; statement of the problem; purpose of the study; the research objectives; research questions that will guide the study; significance of the study; delimitations and limitations of the study; the basic assumptions of the study, definitions of significant terms used in the study and the organization of the study.

Chapter two is the review of literature related to the factors that influence the performance of protected areas. The chapter is broadly discussed under sub-sections of: management factors and performance of national reserves, socioeconomic factors and performance of national reserves, community participation and performance of national reserves and resource factors and performance of national reserves. The chapter also provides the theoretical and conceptual frameworks that inform the study.

Chapter three was a description of the research methodology to be used in executing the study. The research design and target population is described; the sample size and sample selection; research instruments and their validity and reliability; data collection procedures and the operationalization of the variables and data analysis techniques are all described in this section.

Chapter four presented the findings of the study based on the analysis of data collected using the research instruments as described in chapter three. The findings will be organized as per the objectives of the study and will also include interpretation of the findings and discussions as they relate to literature reviewed.

Chapter five summarized of the study's findings, conclude and recommend what could be done to improve on the performance of national reserves based on the findings of the study. The chapter also suggested areas for further study and summarize the contribution of the study to the body of knowledge on factors influencing the performance of national reserves.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is the review of literature related to integrated management planning of protected areas and the indicators of management effectiveness of integrated management approaches. The purpose of this chapter is to identify the knowledge gaps that the study seeks to fill. The chapter is discussed under sub-headings of: management factors and performance of national reserves; socio-economic factors and performance of national reserves community participation and performance of national reserves, and resource factors and performance of national reserves. The later sections of the chapter provide the theoretical and conceptual frameworks that inform the study.

2.2 Management Factors and Performance of National Reserves

Well-planned and supported protected areas need sound management processes if they are to be effective. A range of accepted procedures can help, along with standards of good management. In the past, many protected areas were managed by people with excellent knowledge of ecology and wildlife but no training in management. This sometimes led to problems as staff numbers increased and expectations were raised. Today, managers are expected to deal with an increasing range of issues, including some - such as community relations, workplace safety and management of sacred sites within protected areas – that have gained a greater emphasis in the last few years. In addition, higher levels of accountability are often expected. Management processes may not have kept up with all these changes (Hockings, Stolton, Leverington, Dudley, and Courrau, 2006).

Recognition of the critical role that management needs to play to secure biodiversity within protected area networks created a flurry of interest in the assessment of management effectiveness using more rigorous approaches. Much of the initial work took place in Latin America, for example in Brazil (Ferreira *et al.,* 1999) and Costa Rica (Cifuentes *et al,* 2000) where systems focused particularly on management processes and technical capacity. Adoption of the best possible management processes and systems is essential for

good management. The assessment of management processes focuses on the standard of management within a protected area system or site and requires definition of what systems and standards are acceptable and which are 'best practices' (benchmarks); decisions about which of these will be required in particular systems and individual protected areas and investigation of whether systems are being implemented and standards are being met (Hockings *et al.*, 2006).

Management planning as an attribute is poorly addressed in scholarly literature (Dudley *et al.*, 2007). In the limited research examining the management process itself, management planning as an attribute has scored poorly in studies that correlate attribute implementation with PA effectiveness (Leverington *et al.*, 2010). Management plans internationally have been beset with problems such as little "attention to budgets; unrealistic assumptions of management capacity; poorly formulated objectives; excessive detail deferred for further study; failure to allocate responsibilities for implementing plans (making subsequent monitoring impossible); undue emphasis placed on specific aspects of management; institutional instability; and absence of systematic procedures for producing management plans" (Clarke, 1999). Many articles cite methods for improving management planning; however, there are none that show any empirical success (Clarke, 1999; Aung, 2007).

Business and financial plans are created as organizational tools for decision-making and are a way of addressing the issues unique to that zone or region (Stem *et al.*, 2005). Conservation plans use and require a multitude of data that includes ecological distributions and dynamics, the potential impacts of threatening processes, as well as the socioeconomic and geopolitical circumstances that affect the conservation area planned. Conservation planning may also weigh estimated costs and benefits of various actions (Grantham *et al.*, 2008).

Business and financial planning allows long-term oversight through direction, objectives, and budgets. However, the strategies of how conservation planning is approached are just as critical to conservation success as the existence of the plans themselves. One meta-study created four outcome measures to determine the success of conservation projects to account for the diversity of plans. The four criteria established were ecological, economic,

attitudinal, and behavioral (Brooks *et al.,* 2006a). The results showed that social-science strategies such as "utilization, decentralization, and market access" were successful planning strategies in conservation (Brooks *et al.*, 2006a).

One challenge to using the existence of financial and business plans as indicators of success emerge from the sense that it is not simply the presence of plans, but whether they address the multitude of concerns unique to each PA. This can only come from trust in the management, well-trained staff, and an engaged community (Brooks *et al.*, 2006b). There have also been found to be diminishing returns in conservation planning, which emphasizes the importance of distributing the available funding to areas that can give the strongest response to the area (Gratham *et al.*, 2008). One study points out the importance of funding to keep plans in place, but suggests that further investment is better used elsewhere once the plans have been established. Finding the tipping point at which investment and return is maximized is a major challenge for conservation planning.

Most management processes in Europe score higher than the international average. In their report on Protected Area Management Effectiveness Assessment in Europe, Nolte, Leverington, Kettner, Marr, Nielsen, Bomhard, Stolton, Stoll-Kleemann and Hockings (2010) report that indicators related to the "process" of management ranged from strongly positive (adequacy of enforcement and effectiveness of administration) to very weak programmes of community benefits. Where law enforcement also considered the adequacy of staff and systems, it rated more poorly and was mentioned as a weakness of management in seven of the 15 reports reviewed. In Scotland, Jill Mathews (2009) cited in Nolte *et al.,* (2010) reported that involvement of the police greatly assists in protected area law enforcement. In Croatia, law enforcement was considered a significant weakness (Poorej and Rajkovic, 2009).

Nolte *et al,* (2010) further report that effectiveness of administration systems was strong in nine reports and was weak in three. This aspect of management was relatively strong though distribution of finances was sometimes problematic. Good and transparent decision-making was mentioned in a number of reports (Piscevic and Orlovic-Lovren, 2009). On the other hand, governance issues including leadership, coordination and the

relationship between park management and other agencies were rated requiring improvements. In England, the analysis of National Park Authority performance suggested that more consistency in governments among the various authorities would be advantageous (Solace Enterprises, 2006).

Management of visitors and their impacts is an important issue in protected area management in Europe, as recreational impacts and developments associated with tourism are significant threats to biodiversity (Pullin *et al*, 2009), especially in the Alpine and Black Sea bioregions and in the Mediterranean, which is the world's most important tourism destination (EEA, 2009a). The visitor management headline indicator is not adequately addressed in plans. In Montenegro, visitor management was considered adequate (Stanisic, 2009), but in Slovakia facilities were considered inadequate and were not managed by the park agency (Ervin, 2004a) while in Bulgaria, they were generally inadequate (WWF, 2004). In Italian marine parks surveyed, visitor information and communication scored highly, but the control and management of visitors and waste was in need of improvement (Franzosini, 2009). In England, no reports of visitor management being a particular problem are given, in spite of there being more than 75 million visits to the National Parks every year (English National Park Authorities Association, 2009).

2.3 Community Participation and Performance of National Reserves

Local community participation embraces giving the local people more opportunities to participate effectively in development activities, empowering people to mobilize their own capacities, be social actors rather than passive subjects, manage their resources, make decisions and control their lives (Sproule, 2000). Interaction with local communities is essential to the success of PAs (Heinen, 2010). Establishing a bidirectional communication line from PAs to locals helps decrease instances of poaching, illegal logging, and other deleterious exploitations within the protected area.

Many investigations of community involvement, namely through community based management and ecotourism, have been carried out to evaluate the effectiveness of the process and to analyze the outcome of deforestation prevention. Community-based management has proved an effective management tool whereby initiating and maintaining

communication with locals, calling upon their services to achieve conservation goals, and providing them economic incentives to invest time and energy into the project (Altrichter, 2008). Locals must feel that they are not being abused or undermined, but rather involved and respected in order to develop their active support and a positive outlook for the establishment of the neighboring PA. When the local communities surrounding PAs are called upon to be advocates of the environment, the necessity for funding by outside management is reduced and the economic benefits, along with the various social and environmental incentives, can be locally realized and utilized. There are over 2.2 billion people living in the 45 countries that supported 89% of tropical forests in 2000, and if their incentives are met and they possess the knowledge and skills necessary to carry out their duties, these locals can be and should be considered valuable resources in the management of protected resources (Colchester, 1994). Nonetheless, for conservation efforts to succeed at the local level, communities cannot feel restrained by the establishment of the neighboring PA but rather develop and grow as a society in a manner that is sustainable and reflects social justice (Colchester, 1994).

This success in utilization of locals is demonstrated by the ecotourism industry in the Grande Riviere. Here, the forestry department plays an active role in regulating human activities; however, much of the success of leatherback turtle preservation is attributed to the locals who filled a majority of the jobs surrounding local tourism and the efforts to save the endangered leatherback turtle (Waylen, 2009). Once locals were informed of the dangerous condition of the species, consumption of turtle meat became rare in the region, and local guides made sure that the beaches remained safe from visitors during hatching season (Waylen, 2009). In this community, conservation has become a way of life for the participants and it is likely that their successful projects will carry on through the generations.

Ecotourism is an increasingly attractive option facilitating the inclusion of local people into conservation efforts as active participants. Ecotourism provides the economic incentives for local people to efficaciously conserve biodiversity due to the inclusion of the communities in the benefits of the process (Ervin, 2003; Stronza & Gordillo, 2008; Van der Duim & Caalders, 2002). Moreover, ecotourism provides the concomitant benefits of

an inflow of money, personnel assistance, and technical expertise, which serve to further bolster conservation efforts (Stronza & Gordillo, 2008). Evidence of the weighty and intertwined roles of money and community involvement in conservation is provided in Central America, where it has been demonstrated that a heavy influx of international remittances to El Salvador is correlated with a decrease in deforestation through a reduction of pressure to capitalize upon and plunder natural resources to provide a source of income (Hecht & Saatchi, 2007; Wells & Brandon, 1993). Furthermore, with respect to adequate training, education plays a fundamental role in shaping conservation outcomes. In particular, meshing regional conservation education initiatives, which are broad and often lack the specificity to be pragmatically adopted by locals, with local conservation initiatives, which may be too narrow to address the larger picture issues surrounding regional conservation needs, promotes cooperation across multiple levels of management and increases the chances of project success (Fernàndez -Juricic, 2000).

Mwafunzwaini (2003) argues that tourism in South Africa has a poor history of involving the local communities and previously neglected groups in tourist related activities. Smit (1990) noted that many ecotourism initiatives operate in rural areas but the few of the local communities from a meaningful part of the entrepreneurial base. In the former Northern Province of Limpopo Province, community-based tourism activities are perceived not to have benefited the people for whom these projects were intended.

Samuel (1986) identified several objectives of community participation process in its broadest sense, and indicated that community participation may be thought of as an instrument of empowerment. It reflects the involvement/participation of local communities in the formal decision-making process that constitutes the formulation and implementation of the projects and programmes affecting them. Marisa and Ghoguill (1996) argued that community participation must not be seen as a means to enable people to influence decisions in the political arena about the issues that affect them, but as a means to fostering mutual-help initiatives.

It is now recognized in parts of Africa that local people should be compensated for the loss of access to resources that they suffer when wildlife sanctuaries and parks are created

(Scheyvens, 1999). According to Sindiga (1995), the Narok County Council which has jurisdiction over Masai Mara Park, puts money into a trust fund that is used to finance schools, cattle dips and health services to benefit entire communities. In New Zealand, Maori communities are using ecotourism as a mean of sustaining their livelihood by utilizing the physical resources at their disposal in a way that can provide employment options. However, Woodwood (1997) notes that even the most enlightened South African ecotourism operators involve local communities primarily in terms of their public relations value. There is little commitment to support the rights of rural communal people to benefit from their land and wildlife. According to Poon (1996), involving local people is undoubtedly one of the missing ingredients undermining the success of many tourist destinations.

Local community participation ranges from inclusion in the planning and development stage of a venture to the ownership and operation of the business. In addition, members of the local community could sit on advisory boards and tourism planning committees, and could participate directly in the management of a project (Pinnock, 2000). The local community tends to evaluate the level of success of an ecotourism venture according to the level of involvement. Passive involvement includes menial jobs and handouts, moving across a continuum towards a more successful and active involvement, which represents a level resulting in equitable partnership, planning and participation (Pinnock, 2000).

There are a number of advantages to be gained by consulting with a host community: tour operators are able to gain access to local villages, while local people receive an income and the elders within the community are spreading the knowledge of their culture. In this way, the tourists consume the local community's culture, whereas the local people are improving the quality of their lives and enhancing their self-esteem by maintaining their social and religious values (Zeppel, 1997).

Not only do local communities provide a valuable source of labor, they also make economic contributions to promote conservation success in established PAs. CI's involvement in various projects has led to the investment of 104 million dollars in leveraged grants by outside stockholders (Conservation International, 2010b). These

stockholders include conservation organizations of various sizes, private donators, as well as local communities investing in the PA for returned economic and environmental benefit. This large sum of money has promoted success in deforestation, but it is crucial that relations with stockholders be maintained for these grants to continue activity.

At the December 2009 United Nations Convention on Climate Change, a new management plan to mitigate global climate was discussed through reducing emissions from deforestation and forest degradation (REDD) (Sasaki, 2010). This plan requires that the "the roles and responsibilities of all stakeholders" are clearly outlined in order to conduct effective management in a manner that respects and accounts for the cultural and social uses of forests according to unique preferences of indigenous tribes (Sasaki and Yoshimoto, 2010). This management plan was implemented in Cambodia when a forest-dependent community engaged in deciding which types of trees should be planted for harvesting, since it directly impacts their cultural livelihood. Additionally, the local community was given a portion of the "carbon-based revenues" as payment for their efforts and added incentives to continue responsible management (Sasaki and Yoshimoto, 2010). As stakeholders are given more of the carbon-based revenues with increased involvement in REDD-plus projects, greater incentive for locals to support carbon trading and a decrease in logging and carbon emissions has ensued (Sasaki and Yoshimoto, 2010). Local communities have insight and expertise that outsiders lack, and sharing this information in a collaborative environment will give back to all of the stakeholders, including the locals. Typically, when locals are trusted with management duties, there are additional incentives to carry out their responsibilities. This, coupled with environmental results of their efforts and feedback on ways to improve, provide sample motivation for the local communities to stay involved, keep up monetary investments in the site and preserve their neighboring land.

2.4 Socio-economic Factors and Performance of National Reserves

By global mandates, protected areas are now supposed to do far more than conserve biological diversity. These areas are charged with improving social welfare, guarding local security, and providing economic benefits across multiple scales, objectives traditionally

relegated to the development sector. The mission of protected areas has expanded from biodiversity conservation to improving human welfare. Many initiatives now aim to link protected areas to local socioeconomic development. Some of these initiatives have been successful, but in general expectations need to be tempered regarding the capacity of protected areas to alleviate poverty (Naughton-Treves *et al.,* 2005).

Conservationists, although often accused of being unconcerned with social issues, have significantly altered their approach in an attempt to meet the new mandate for protected areas. In many cases, conservation organizations formed new partnerships with development agencies and institutions, as well as citizens' groups. Together they have pursued an array of strategies linking conservation with development that generally fall into three broad groups: community-based natural resource management, community-based conservation, and integrated conservation and development projects (ICDPs) (Naughton-Treves*et al.*, 2005). Unlike community-based conservation or community-based natural resource management, ICDPs focus primarily on protected areas.

The term ICDP was introduced in a study of 23 projects linking development activities to conservation at 18 parks in 14 countries (Wells and Brandon, 1992). Since then ICDPs have proliferated around parks scattered throughout developing countries, and they have captured a sizeable portion of support for conservation (McShane and Wells, 2004). ICDPs vary considerably in form and size between sites, but the underlying model throughout is to establish "core" protected areas in which uses are restricted and, in the surrounding areas (often labeled "buffer zones"), promote socioeconomic development and income generation compatible with park management objectives. Specific economic activities promoted in ICDPs range from ecotourism to agro forestry to sustainable harvest of biological resources. Some ICDPs have made notable achievements in improving forest management outside parks and raising support for conservation among specific communities (Chicch´on, 2000). However, reviews of ICDPs consistently have found that despite their appeal, it is hard to identify substantial achievements either in improving social welfare or in protecting biodiversity (Kiss, 2004).

To succeed, ICDPs need to truly devolve authority to communities over biological resources so that they have a vested interest in protecting them. Some conservation biologists argue that development and conservation are ultimately incongruent goals (Oates, 1999). On a more encouraging note, other conservation biologists believe that development and conservation are intertwined goals, but their scale of integration is inappropriate in ICDPs (Robinson and Redford, 2004).

Beyond small-scale efforts to incorporate local communities in protected area management, biodiversity conservation today is challenged to engage with the most important UN Millennium Goal, which is to eradicate extreme poverty and end hunger. As the development community has increasingly focused on this goal, biodiversity funding has been linked more often, and more directly, to poverty alleviation (Lapham and Livermore, 2003). In entering this arena, conservationists face formidable challenges, given the uneven record of poverty alleviation projects promoted over the past half century by agencies and organizations exclusively devoted to this task (Sanderson, 2004).

There is considerable debate regarding the causal explanations for the overlap of high biodiversity and poverty, and this leads to very different opinions about how to address rural poverty in areas of high biodiversity. But from the mid-1990s on, the development community has continually pushed poverty alleviation goals into conservation funding and action. Conservation programmes are only valid and sustainable when they have the dual objective of protecting and improving local livelihoods and ecological conditions (Ghimire and Pimbert, 1997). The impact of raising incomes on biodiversity is shaped by complex sociopolitical and ecological conditions. One revealing study demonstrated that biodiversity outcomes of increased incomes can vary even within the same Amazonian community, e.g., increased income led some households to diminish their extraction of forest products and invest in agro forestry gardens, whereas others bought chain saws and cleared forest even faster (Coomes, Grimard and Burt, 2000).

The fact that many parks today retain higher levels of biological resources than surrounding areas has led some prominent development groups to call on these areas to contribute substantially, and directly, to rural poverty alleviation (e.g., the U.K.

Department for International Development (Dep. Int. Dev., 2002). These arguments gain greater significance as the area under protection expands. Yet some conservationists fear this will lead to cashing in on park resources, and they believe there should be more attention toward effective management outside of parks by communities, indigenous peoples, private sector, or other interests. It is urgent to promote the environmental agenda beyond protected area boundaries as it is to promote economic development inside parks (Brandon, 1994; 1997).

Even conservation actions that may not appear to be directly linked to poverty alleviation may contribute because the poor are most reliant on natural and wild resources. If the ecological base upon which the rural poor depend becomes seriously degraded, then their livelihoods are likely to diminish as well. Only recently have studies emerged showing the tangible economic benefits of protected areas. One study of 41 reserves, covering approximately 1.5 million ha in Madagascar, found that the economic rate of return of the protected area system was 54% (Carret and Loyer, 2003). The main benefits were from watershed protection, although ecotourism benefits were significant and expected to increase over time, providing greater returns to surrounding communities. The study also confirmed other findings, e.g., there are often winners and losers from conservation, even among groups of poor. In this example, 265,000 poor rice-farming households (average of 1.5 ha per household) benefited, as did the 25,000 urban households receiving potable water. But 50,000 shifting agriculturalists (also known as "slash-and-burn" farmers) were deprived of the land within the parks.

Conservationists have also been working to demonstrate tangible economic benefits of conservation outside of protected areas. In South Africa, the Working for Water Program, is enhancing water security and improving ecological integrity by eliminating invasive species, restoring degraded lands, and promoting sustainable use of natural resources (Work Water (WFW), 2005). It has employed over 42,000 people in less than four years. The landless movement in the Atlantic Forest of Brazil has stopped targeting reserves and remaining forest lands for invasion, recognizing their low value for agriculture and ecological degradation; many formerly landless are supporting restoration activities (Cullen *et al.,* 2005). Yet there are important semantic differences that relate to what

expectations are realistic from parks specifically, and the conservation sector, more generally. The development community asks the conservation sector to alleviate poverty, to essentially buy into their mission. The development community often assumes that sustainable use of biotic resources can lift people from poverty. Sustainable management of biotic resources, such as non-timber forest products, fish, wildlife and other resources, can support rural lives and livelihoods, but it rarely provides a sufficient surplus to allow the poor to move out of poverty. Broader investments and reforms are needed (Arnold, 1999). Local projects in and around protected areas cannot alleviate poverty for a substantial number of people if they are in fact made poor by the workings of a broader economic system that constrains their ability to acquire goods (Sen, 1981). Similarly, improving the security of the rural poor may entail reform in government policies favoring powerful interest groups (e.g., subsidies for industrial soybean farming in the Amazon). Protected areas in Madagascar safeguard the agricultural practices and provide employment from tourism for many people - very successfully. But they do not provide the development interventions that are often most important: education for women, health care, and infrastructure (Naughton-Treves, Holland and Brandon, 2005)

Conservation cannot solve poverty, but it can significantly help to prevent and reduce poverty by maintaining ecosystem services and supporting livelihoods. More fundamentally, there is a need to take a look at the serious set of problems that plague the rural sector in most tropical countries (Gorenflo and Brandon, 2005;Brandon *et al.,*1998;Brandon, 2000). The emphasis on the conservation sector has shifted attention away from the large-scale actors and policies that often lead to biodiversity loss and greater poverty. Without reshaping poverty alleviation strategies, biodiversity will pay the price for development yet again (Sanderson and Redford, 2003).

There is a correlation between high levels of primary education and the amount of protected land across countries. In countries where its populace has high levels of primary education, land is protected quicker than in countries with medium or low levels of primary education (McDonald & Boucher, 2011).

Moreover, higher levels of education are associated with higher environmental awareness and understanding, as well as more positive attitudes toward conservation (Keane *et al*., 2010, Tomićević *et al*., 2010, Liu *et al.,* 2010). For instance, levels of awareness regarding protected areas are measurably higher in individuals with higher education levels, a connection to tourism, and involvement in resource management at the community level (Keane *et al*., 2010). Additionally, in a case study of Madagascar, individuals with higher education levels proved more competent at correctly classifying protected species into legal categories and thus had higher knowledge of the legal aspects surrounding conservation (Keane *et al.,* 2010). Furthermore, pro-ecological beliefs and favorable attitudes toward conservation were correlated with higher levels of education (Kean et al. 2010, Tomićević *et al.,* 2010). Moreover, one study documented that individuals with less education were more likely to have dissatisfied attitudes toward protected area management, a more negative perception of the relationship between the protected area and the community, and a higher likelihood of having conflicts with the conservation (Liu *et al*., 2010).

The implications of education levels are particularly relevant in a discussion of local input into management decisions. If the local people are educated and possess the necessary knowledge and skills to fulfill their duties as conservationists, as well as an understanding of the environmental and social incentives at play in the community and nation as a whole, then they are a potentially valuable resource as staff and disseminators of information to the community (Colchester, 1994). Moreover, when the local population possesses the education and expertise to be effective conservationists, the need for outside funding and management is reduced, and because funding is a scarce resource, this benefit is substantial (Colchester, 1994).

Hence, in this manner, broad socioeconomic factors such as education influence conservation efforts through its correlation with the establishment of more protected areas, the speed at which the protected areas are established, the molding of more positive attitudes toward conservation, the heightening of conservation awareness, and the implications upon the incorporation of indigenous populations as conservation staff.

2.5 Resources Factors and the Performance of National Reserves

Financial support is the fundamental cornerstone of the effectiveness of a conservation zone (Strategy, 2009). An estimated $\$277/km^2$ is required for effective management, yet the average funding in developing country PAs is around $\$100/km^2$ (Walker, 2009). Investment is not only needed for the establishment of areas, but also needs to be consistent to successfully sustain the indicators that have shown to be of clear importance, contained in the elements of inputs, processes, outputs, and outcomes (Stolton *et al*., 2007). As a recent study illustrated, the cost to monitor and enforce areas effectively is continually increasing, yet the available funding has leveled off (Walker, 2009).

A key determinant of the success of PAs is allocation of funding and infrastructural resources, where longer term commitments on both of these frontiers are associated with more successful sites and higher levels of sustainable practices (Leverington *et al.,* 2010). Nonetheless, though adequate funding is highly correlated with the success or failure of a PAs, a majority of PAs, namely sixty percent, lack adequate funding to meet basic management necessities, such as properly trained individuals, relevant equipment, and other infrastructure requirements (Leverington *et al*., 2010). Moreover, a 1994 global review of PAs conducted by the IUCN revealed that inadequate funds were reported as a threat in nine of the fourteen regions (Hockings, 2003).

Furthermore, even when adequate funds are present, there is a pressing need for specificity when allocating the money (Ervin, 2003; Leverington *et al*., 2010). Conservation goals are better met when the planning process is clear with money directed toward enforcing specific laws (Leverington *et al.,* 2010). For example, Business and financial plans are used to organize the distribution of expected funding (Stem *et al.,* 2005).

Since the 1990s, ecotourism has been touted as the win-win solution to both poverty alleviation and conservation funding shortfalls (Ferraro & Hanauer 2010; Butcher 2010). Studies have shown that the presence of tourism at PAs has significant positive effects on finances (funding, budget plans), park infrastructure, and the legal status of parks. The socio-economic benefits of ecotourism vary from nil to significant, depending on the financial plan in place at the individual PAs.

Tourism and funding for PAs are highly related (Kangas *et al*., 1995; Butcher, 2010). Parks frequently move from operating in the red (monetary loss), to turning a profit shortly after tourism programs are implemented. For example, the Protected Area at Possum Point, Belize saw economic inputs skyrocket in the two years after implementing an ecotourism program. The site's net cash balance of income and outputs jumped from -$6670 to +$4811 over that two year period (Kangas *et al*., 1995). Funding from tourism comes in the form of permit fees, camping fees, entrance fees, guide hiring, lodging costs, as well as donations from tourists. Volunteer ecotourism also is a source of income and labor. Funding is one of the most important factors in the survival of conservation areas, with the "success or failure of PAs correlates highly with funding availability (Leverington *et al*., 2010). Funding allows PAs to hire more staff, repair and construct infrastructure, and conduct monitoring.

Funding provides a means for the improvement of most attributes associated with PAs; however, other attributes are directly enhanced by tourism as well, such as infrastructure. According to McNeely *et al*. (1992), "there is no doubt that the introduction of tourism to parks increases infrastructure." Tourists require adequate lodging with amenities, well-maintained roads and trails, and an aesthetically pleasing experience. Because of these needs, infrastructure improvements are inherent in a PA that caters to tourists.

Additionally, parks are enhanced legally by tourism. For instance, site boundaries are better delineated, maintained, and respected when tourism is incorporated into site plans. These sites are more likely to have a binding contract for protection of biodiversity, and formally declare conservation of biodiversity as an official goal (Buckley &Wang, 2010). Sites with tourism are also more likely to be legally gazetted (legally publicized). In one extensive survey study, researchers found that "legal support capability" was significantly enhanced by tourism inputs (Buckley &Wang, 2010). The business of ecotourism generates contracts and financial agreements with a myriad of entities. The practice of reimbursing local communities for their land/aid is not uncommon, and contracts almost always facilitate these transactions. Agreements with the PA and third party tourism companies are also contract-based (Nelson, 2010). Tourism, as with any business venture, requires contracts and legal support.

Nonetheless, within the PA literature, there is controversy over whether tourism presents a net benefit or net harm to conservation efforts. Experts seem to be split. On the one hand, tourism provides funding which can enhance conservation and promote sustainable development (Reed, 2008). On the other, tourism can significantly increase foot traffic into fragile ecosystems, pollute pristine areas with waste, and even introduce invasive species (Buckley & Wang, 2010).

2.6 Theoretical Framework

The study will be guided by the management effectiveness evaluation framework developed by IUCN-WCPA. This framework is based on six major elements: context, planning, input, process, outputs and outcomes which address the design, appropriateness of management system and process and delivery of protected area objectives. These elements are related to each other. Figure 1 illustrates how these elements are linked to each other.

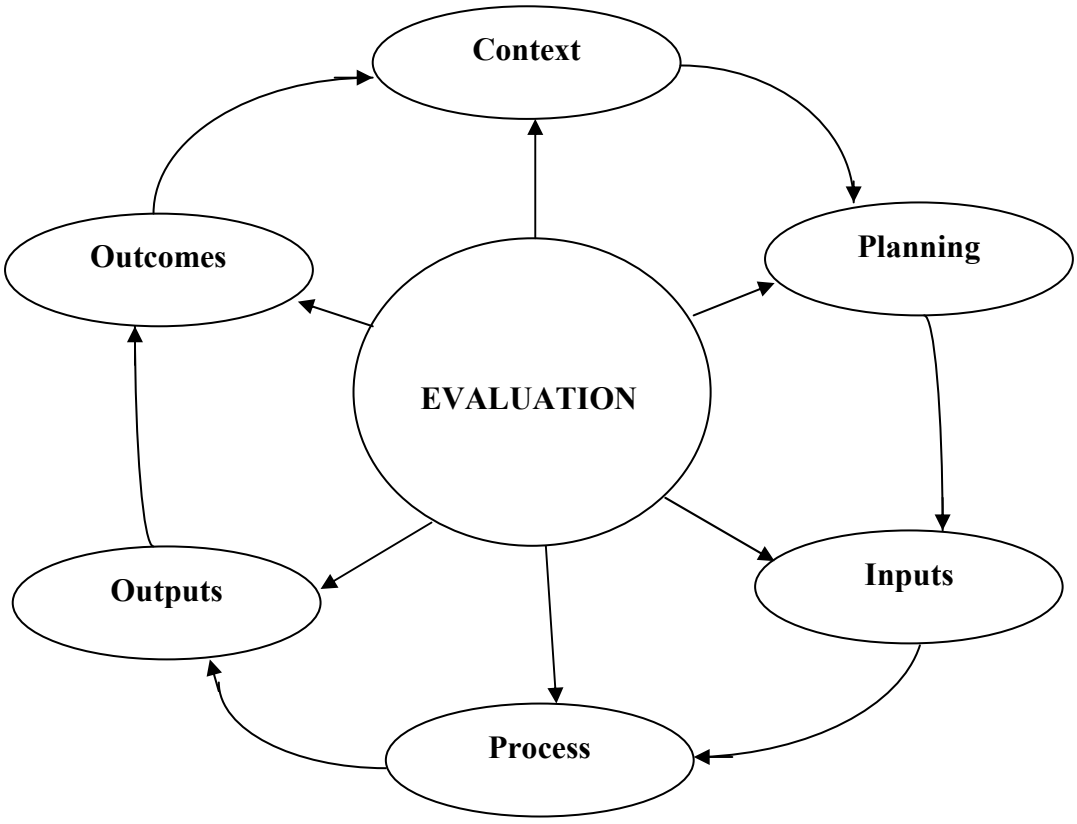

Figure 1: IUCN/WCPA's Management Effectiveness Evaluation Framework

The Framework is based on the principle that good protected area management should follow a cyclical process with six stages or elements. Good management needs to be rooted in a thorough understanding of the individual conditions related to a protected area, be carefully planned and implemented and include regular monitoring, leading to changes in management as required. The management cycle identifies six important elements in this process that should, ideally, all be assessed if effectiveness of management is to be fully understood. Management begins with understanding the **context** of the protected area, including its values, the threats that it faces and opportunities available, its stakeholders, and the management and political environment; progresses through **planning**: establishing vision, goals, objectives and strategies to conserve values and reduce threats; allocates **inputs** (resources) of staff, money and equipment to work towards the objectives; implements management actions according to accepted **processes**; and eventually produces **outputs** (goods and services, which should usually be outlined in management plans and work plans) that result in impacts or **outcomes**, hopefully achieving defined goals and objectives.

The various elements in the Framework are evaluated on the basis of various indicators. For example, the context is evaluated based on the indicators such as biological importance, socio-economic importance and vulnerability which affect the status and threats of a protected area. Similarly, input is evaluated in terms of number and capacity of staff, budget and quality and quantity of infrastructures. Input assessments investigate the adequacy of resources – human capacity, facilities, information, operational money and equipment – for effective management. The assessment of management processes focuses on the standard of management within a protected area system or site while assessment of outputs looks at the number or level of products and services delivered; and the extent to which stated actions, tasks and strategies were implemented. Outcome assessment measures the real effects of management actions: whether management is maintaining the core values for which the protected area was established. Outcome assessment asses the condition of values including biodiversity; whether socio-economic and cultural conditions remained constant or improved; and whether specific management objectives were achieved and threats abated.

2.7 Conceptual Framework

The conceptual framework was informed by the evaluation framework and shows the linkage between the input-process-output. Figure 2 shows the conceptual of the study.

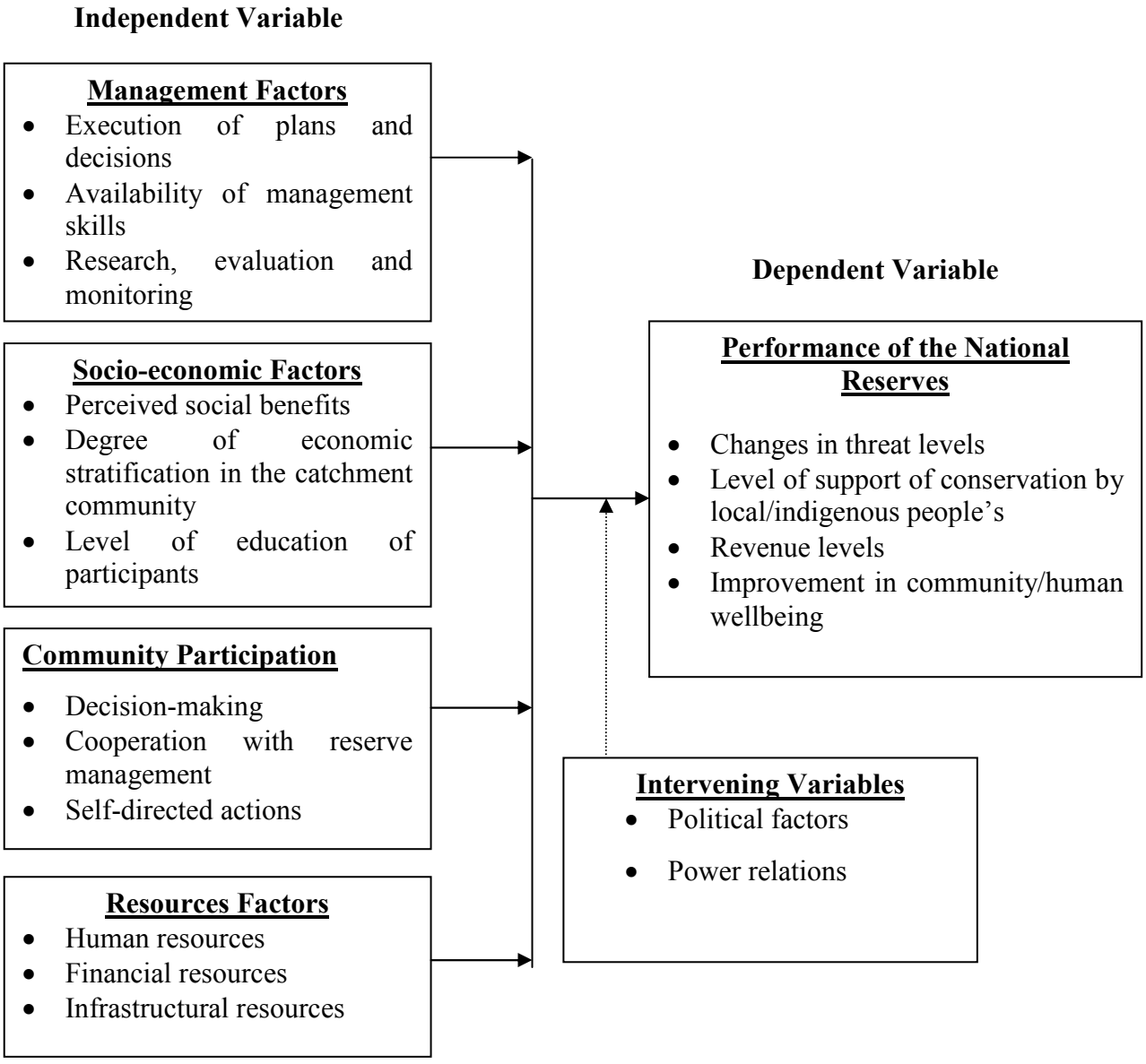

Figure 2: Conceptual Framework of the Study

The conceptual framework in Figure 2 shows the linkage between the independent and dependent variables of the study. The independent variables are factors which are likely to impact on the performance (dependent variable) of the national reserves. Although there may be various factors that may affect the performance of national parks, the factors

considered in the conceptual framework were management factors, socio-economic factors, community participation and resources factors.

The management factors were conceptualized to constitute the execution of plans and decisions that the management of the national reserves come up with, availability of relevant management skills required to implement the integrated management plans as well as research, evaluation and monitoring to ensure that the necessary steps were taken to adjust management processes towards the achievement conservation objectives.

Socio-economic factors related to the social and economic circumstances of the catchment community that may impact the performance of the national reserves either positively or negatively. These factors included the community's perceptions of the social benefits of the protected areas, the degree of economic stratification in the catchment community and the level of education of participants. It was hypothesized that community's positive perceptions of the social benefits, economic stability and higher levels of education would correlate positively with the performance of the protected areas.

Community participation was conceptualized as the involvement of a significant number of persons from the catchment communities in any action related to the conservation of the protected areas such especially in decision-making. Community participation would be aimed at enhancing their well- being, for example, their income, security, or self- esteem which thus cultivating their cooperation with reserve management as well as undertaking self-directed actions to conserve biodiversity.

Resources factors related to human resources such as adequacy of staff and skills, financial resources and infrastructural resources. To enforce biodiversity conservation measures as well as implement the integrated management plans, the management of the protected areas relies heavily on the adequacy of these resources. Therefore, variances in the projected requirements may negatively impact on the performance of the protected area.

2.8 Summary of Literature Review

The literature reviewed indicated that the critical role that management of PA plays in secure biodiversity within protected areas has been recognized. Studies that have evaluated the management effectiveness of protected areas (for example Ferreira *et al.,* 1999d and Cifuentes *et al,* 2000) have reported that adoption of the best possible management processes and systems is essential for good management and performance of protected areas. However, management planning as an attribute is poorly addressed in scholarly literature (Dudley *et al.*, 2007). The review showed that most management processes in Europe score higher than the international average. Various studies (Nolte *et al.,* 2010; Poorej and Rajkovic, 2009; Piscevic and Orlovic-Lovren, 2009; Solace Enterprises, 2006 among others) have reported varied performance results with respect to management of protected areas in different parts of Europe. However, whereas most of these studies specifically assessed management effectiveness and not the influence of management factors on the performance of protected area, there is scanty information about the same in an African context. This study will therefore assess the influence of management factors on the performance of national reserves in Kenya, with special focus on Lake Bogoria National Reserve.

Reviewed literature also showed that protected areas were charged with not only conserving biodiversity but also improving social welfare, guarding local security, and providing economic benefits across multiple scales. The literature showed that since biodiversity conservation was linked to the socio-economic dynamics of the catchment communities, the socio-economic processes within the community may influence biodiversity conservation either positively or negatively. Empirical evidence indicated that there is a correlation between high levels of education and the amount of protected land across countries. In countries where its populace has high levels of primary education, land is protected quicker than in countries with medium or low levels of primary education (McDonald & Boucher, 2011). Higher levels of education are associated with higher environmental awareness and understanding, as well as more positive attitudes toward conservation (Keane *et al*., 2010, Tomićević *et al*., 2010, Liu *et al.,* 2010). Such evidence on the influence of socio-economic factors on performance of National reserves is scanty

in Kenya, a gap which this study sought to fill with reference to Lake Bogoria National Reserve.

With respect to community participation and performance of national reserves, the literature suggested that interaction with local communities was essential to the success of PAs (Heinen, 2010). Establishing a bidirectional communication line from PAs to locals helps decrease instances of poaching, illegal logging, and other deleterious exploitations within the protected area. Community-based management has proved an effective management tool whereby initiating and maintaining communication with locals, calling upon their services to achieve conservation goals, and providing them economic incentives to invest time and energy into the project (Altrichter, 2008).This success in utilization of locals is successfully demonstrated by the ecotourism industry in the Grande Riviere (Waylen, 2009; Ervin, 2003; Stronza & Gordillo, 2008; Van der Duim & Caalders, 2002). Local community participation ranges from inclusion in the planning and development stage of a venture to the ownership and operation of the business. In addition, members of the local community could sit on advisory boards and tourism planning committees, and could participate directly in the management of a project (Pinnock, 2000). Not only do local communities provide a valuable source of labor, they also make economic contributions to promote conservation success in established Pas. This study investigated the role of community participation on the performance of the Lake Bogoria National Reserve.

Adequacy of resources was shown to be the most critical factor determining the success of conservation efforts in PAs. Financial support is the fundamental cornerstone of the effectiveness of a conservation zone (Strategy, 2009). Investment of resources is not only needed for the establishment of areas, but also needs to be consistent to successfully sustain the indicators that have shown to be of clear importance, contained in the elements of inputs, processes, outputs, and outcomes (Stolton *et al*., 2007). A key determinant of the success of PAs is allocation of funding and infrastructural resources, where longer term commitments on both of these frontiers are associated with more successful sites and higher levels of sustainable practices (Leverington *et al.,* 2010). This study, therefore,

analyzed the influence of resource factors on the performance of Lake Bogoria National Reserve, Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter is a description the research methodology followed in executing the study. The chapter is discussed under sub-sections, namely: research design; target population; sample size and sampling procedures; instrumentation and their validity and reliability; data collection procedures; data analysis and presentation.

3.2 Research Design

This was a survey study. Descriptive research design was, therefore, used for descriptive purposes. This is a kind of design is used in studies that have individual people as the units of analysis. It involves some individual persons who must serve as respondents or informants. Descriptive research design can be used when collecting information about peoples' attitudes, opinions according to feelings or any of the variety of education or social issues (Orodho and Kombo, 2002). Descriptive research is useful in describing the characteristics of a large population. This helps the researcher to ask many questions that provides considerable flexibility in the analysis.

3.3 Target Population

A target population is that population to which a researcher wants to generalize the results of the study (Mugenda and Mugenda, 2003). The Lake Bogoria Catchment Area spreads across 5 administrative districts within the former Rift Valley province i.e., Baringo, Koibatek, Nakuru, Nakuru North and Laikipia West Districts. The catchment area is stratified into 3, Lower, Middle and Upper catchments. The Lower catchment covers 6 administrative locations, 3 in Baringo and 3 in Koibatek districts. The Middle catchment covers 3 administrative locations within Koibatek districts while the Upper catchment spreads across 2 locations in Nakuru North district and 1 location in each case for Nakuru and Laikipia West Districts. The 2009 population census provided a total listing of 16,495 households spread within the 13 administrative locations that form the LBNR catchment.

Therefore, the target population constituted the 16,495 households, 54 employees of LBNR (42 permanent and 12 temporary) and other stakeholder organizations and institutions. This formed the sampling frame from which a representative sample was selected for study. Table 3.1 shows the distribution of the households per location in the 5 Districts.

Table 3.1: Distribution of the Target Households per District and Per Location

Catchment Unit	District	Location	No. of Households
Lower catchment	Baringo	Loboi	446
	Baringo	Sandai	456
	Baringo	Kapkuikui	215
	Koibatek	Koibos	655
	Koibatek	Mugurin,	316
	Koibatek	Kamar Locations	226
Mid catchment	Koibatek	Olkokwe	288
	Koibatek	Kapnosgei	122
	Koibatek	Sinende	257
Upper catchment	Nakuru North	Subukia	7396
	Nakuru	Waseges	1800
	Laikipia West	Igwamiti	3294
	Nakuru North	Subukia Central	1024
TOTAL			**16,495**

Source: Population Census, 2009

Although the geographical spread of the LBNR catchment reflects the cosmopolitan composition of the target population, the study recognized was alive to the fact that the Endorois community extensively occupies 90% of the lower and mid catchments. Preceding this study, the community had had a long standing legal battle with the government of Kenya over their eviction from their traditional land in Lake Bogoria for tourism development. This culminated in a ruling in favour of the Endorois community by the African Commission in May 2009, which accepted that the community had lived in the area surrounding Lake Bogoria since "time immemorial" and the lake was the centre of their religion and culture, with their ancestors buried nearby. In the ruling, the Commission had directed Kenya government to take steps to return the Endorois land, ensure that the

community had unrestricted access to Lake Bogoria and surrounding sites for religious and cultural rights and for herding their cattle and pay adequate compensation to the community for all the loss suffered, pay royalties to them from existing economic activities and ensure that they benefit from employment possibilities within the reserve.

3.4 Sample Size and Sampling Procedures

This section describes the sample size and the procedures used in picking the sampled subjects for the study.

3.4.1 Sample Size

The household sample size for the study was calculated using Creative Research Systems' (2003). This formula was preferred for calculating the study's sample size because it gave a sample size that when drawn randomly from a finite population size, was such that the sample proportion would be within ±.05 of the population proportion at a 95% confidence level. The formula is given by:

$$SS = \frac{Z^2 p(1-p)}{c^2}$$

Where:

SS=sample size

Z=1.96 (for 95% confidence level)

p=percentage picking a choice, expressed as decimal (*p*=0.5 in this case as this yields the maximum possible sample size required)

c=confidence interval, expressed as decimal (0.05 in this case giving an interval of ±5). Subsequent to this, a correction for finite population was made as follows:

$$New\ SS = \frac{SS}{1 + \frac{SS - 1}{pop}}$$

Where *pop*=population.

Applying the formula: $SS = \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2}$ **SS = 384.16**

$$\text{New SS} = \frac{384.16}{1+\frac{384.16-1}{16,495}} \qquad = \mathbf{375}$$

Therefore, the target population of 16,495 gave a sample size of 375 households. In addition, all the 42 permanent employees of LBNR (9 managers) and 12 representatives of the 12 stakeholder organizations were sampled and included in the study.

3.4.2 Sampling Procedures

Multi-stage sampling techniques were used to select the study's sample of the population. Since the target population for the study was not homogenous, stratified random sampling was adopted to ensure that data was gathered from the lower, middle and upper catchment stratifications. Kathuri & Pals (1993) recommend the use of this procedure when the population from which to sample is not homogenous in terms of certain required characteristics as this leads to representative samples. The target community in this case is heterogeneous with respect to ethno-cultural backgrounds, with diverse socio-economic livelihood practices. However, from the onset, the lower and middle catchments of the study area were selected for study on "purpose" due to their proximity to Lake Bogoria. In addition, majority of the residents in this area are the Endorois community whose socio-cultural practices and economic livelihoods have for a long time conflicted with conservation initiatives of the reserve.

The second stage involved cluster sampling based on the administrative locations of the two main districts that form the lower and middle catchments, where each of the locations was considered as a cluster. Through simple random sampling, 4 and 3 locations were picked from the lower and middle catchments respectively for study. As a control, one location was picked on "convenience" from the upper catchment and included in the sample. This brought the total number of locations studied to 8 out of the 13 that form the catchment area, thus covering approximately 62% of the study area. Applying proportionate to size of the sample size to the sub-populations of the sampled locations, the probabilistic simple random sampling method was then used to sample the 375 households from which an adult subject was interviewed/ The preferred respondents were the household head/spouse of the household head or in their absence, their child of age 18

years and above. Table 3.2 shows the distribution of the sample size per district per location.

Table 3.2: Distribution of the Sample size Per District per Location

Catchment Unit	District	Location	No. of Households	Sub-sample Size
Lower catchment	Baringo	Loboi	446	50
	Baringo	Sandai	456	51
	Koibatek	Koibos	655	73
	Koibatek	Kamar Locations	226	25
Mid catchment	Koibatek	Olkokwe	288	32
	Koibatek	Sinende	257	29
Upper catchment	Nakuru North	Subukia Central	1024	115
TOTAL			**3352**	**375**

In addition to the household respondents, all the 42permanent employees of Lake Bogoria National Park, and 12 representatives from the stakeholder organizations/institutions were targeted for inclusion in the study. The rationale for sampling all the 42 employees of LBNR was due to their small population. According to Orodho, (2004) small populations can form samples and be studied as distinct cases.

The representatives of the 12 stakeholders were purposively included in the study. The organizations/institutions include: Baringo and Koibatek county councils; Forest Department; Ministry of Water and Irrigation; District Environmental Committee; District Development Committee; Local provincial administration; National Museum of Kenya; Non-governmental organizations; Community-based organizations; Agriculture Department and the Kenya Wildlife Service.

3.5 Data Collection Instruments

The main tools for primary data collection were the questionnaires and key informant interview guide. Two sets of the questionnaire, that is, household and LBNR employees' questionnaires were developed for data collection. The household questionnaire collected data on demographic characteristics of the households and the specific questions on community participation, perceived social impacts and socio-economic factors affecting the performance of LBNR. Moreover, the questionnaire evaluated the community's support for conservation of the reserve.

The LBNR employees' questionnaire contained items related to infrastructural and management factors of the reserve as well as performance in relation to threat reduction and socio-economic benefits. In constructing the instruments, reference was made to the Management Effectiveness Tracking Tool (METT) (Stolton, Hockings, Dudley, MacKinnon, and Whitten, 2007).

Key informant interview guides were designed for conducting interviews with the key respondents from the stakeholder organizations/institutions/departments in and the management staff of the National Reserve. The purpose of the interviews was to clarify various issues relating to the spatial interactions between the National Reserve and the catchment community.

3.5.1 Pilot testing

A pilot survey was conducted in Mugurin Location to determine the feasibility of obtaining the relevant data before the actual data collection process was conducted. The pilot survey aimed at verifying the understanding of the questionnaires to be used for the purpose of undertaking a successful study. The participants were encouraged to make comments and suggestions concerning the instructions, clarity of questions asked and their relevance to the study (Mugenda and Mugenda, 2003). The results from the pilot-study were used in validating the instruments by revising the items accordingly.

3.5.2 Validity of the instruments

According to Saunders *et al.* (2007) validity is the extent to which data collection method accurately measure what they are intended to measure. It indicates the degree to which an instrument measures the construct under investigation (Gall. et al., 2003). Saunders *et al.* (2007) stresses that the questions have to be understood in the way that was the purpose from the researcher, it has to be answered in the way that was thought from the researcher and the answer must be interpreted by the researcher in the way intended by the respondent. Therefore, in constructing the instrument items, simple English language that was easily comprehensible to the respondents was used. Effort was made to ensure that the items were clear and precise without any ambiguity, ensuring that the items addressed the objectives of the study. The instruments were reviewed by both the management staff of the LBNR involved in the management of the IMP and the supervisor from the University of Nairobi for expert judgment and review of content and face validity.

3.5.3 Reliability of the Instruments

Reliability is the level of internal consistency or stability over time (William, 2006). Reliability has to do with the accuracy and precision of a measurement procedure (Kothari, 2004).The reliability of the questionnaire items was determined using the Cronbach alpha coefficient. Cronbach alpha provides a good measure of reliability because holding other factors constant the more similar the test content and conditions of administration are, the greater the internal consistency reliability (Chong, 2012).The data collected form a pilot study with a sample of 10 households was analyzed to check the reliability of the instrument. Reliability analysis produced an alpha of 0.77, thus meeting the threshold for acceptable reliability of alpha ≥ 0.70.

3.6 Data Collection Procedures

Clearance to proceed with the survey was sought from the University of Nairobi. This was succeeded by securing a research permit from the National Council of Science and Technology (NCST).Further permission was sought from the LBNR, after which exploratory visits to the catchment areas were made to meet with local community leaders

who would assist in mapping out the area to identify the households that would participate in the study. This was followed by actual field work which entailed collecting primary data from the sampled household respondents, LBNR employees and key informants.

The researcher, with the help of research assistants who had been trained on basic research techniques prior to the exercise, conducted the research on the subjects through the distribution and administration of questionnaires on the participants. At the same time, the researcher conducted interviews with the key informants where extra information was needed.

The 375 household respondents to whom the questionnaires were administered were given time to complete them voluntarily and their involvement treated with utmost confidentiality. During the administration of the questionnaires, respondents were given opportunity to give additional information verbally where they felt that the questionnaires did not have enough questions to allow them to give sufficient information. This was done in the course of constructive interviews in which the answers were recorded. The next step involved administering the LBNR employees' questionnaires, which were delivered, left for them to fill in their responses and collected the next day. However, those who were in position to fill in immediately were allowed to do so and the filled in questionnaires collected immediately. Interviews with the key informants were conducted at agreed times and venues after prior appointments with the identified persons had been made.

3.7 Data Analysis Techniques

Both quantitative and qualitative data analysis methods were adopted to analyze the data collected by the research instruments. The collected data collected using the questionnaires were coded after validation and editing, and then entered into the computer. Data analysis was done with the aid of the Statistical Package for Social Scientists (SPSS). Quantitative analysis of the influence of the various factors on the performance of the reserves was done using percentages and simple means and standard deviations and the findings presented in tables. Responses to the Likert-like scale per variable were scored and total scores and their percentages obtained. The percentage scores were used to conduct the Pearson's

Product Moment Correlations (PPMC) to determine the relationships between each of the independent variables and the dependent variables.

Qualitative data obtained from the open-ended questions in the questionnaires and key informant interviews was extracted, organized and discussed under the main objective areas of the study.

3.8 Operationalization of the Study's Variables

The variables of the study were operationalized as shown in Table 3.3.

Table 3.3: Operationalization of the study variables

Variable	Type of variable	Indicators	Measure	Measurement scale	Tools for data collection	Tools of data analysis
Performance of the Reserve	Dependent	– Reduced threats and pressured to biodiversity conservation – Local/indigenous people's support for conservation – Economic benefits	– No. of threats to biodiversity – % of locals supporting conservation – Revenue levels	-Nominal -Ratio -Ratio	Questionnaire, observation	Percentage and Frequencies
Management Factors	Independent	– Reference to IMP – Organization structure – Research, evaluation and monitoring	– Level of utilization of MP – Nature of project management – Level of management skills in research and M&E	Nominal Nominal Ordinal	Questionnaire, observation	Percentage and Frequencies
Resources Factors	Independent	– Human resources – Financial resources – Infrastructural resources	– Competencies of personnel – Ratio of income to expenditure – Level of infrastructure	Ordinal Ratio Ordinal	Questionnaire, observation	Percentage and Frequencies
Social-economic Factors	Independent	– Social benefits – Economic stratification in the catchment community – Education of participants	– Perceived social benefits – Degree of economic stratification in the catchment community – Level of education of participants	Nominal Ratio Ordinal	Questionnaire, observation	Percentage and Frequencies
Community Participation	Independent	– Decision-making – Cooperation – Self-directed action	– Level of community involvement in decision making – Level of community cooperation with reserve management – Level of community self driven action in conservation	Nominal Ordinal Nominal	Questionnaire, observation	Percentage and Frequencies

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

The purpose of this study was to assess the factors influencing the performance of national reserves in Kenya, with a special focusing on LBNR. Data was collected using the household questionnaire for the catchment community, LBNR employees' questionnaire and the stakeholders' interview guide. This chapter, therefore, is the presentation, interpretation and discussion of the findings from the data collected for the research study. The chapter is divided into: response rate; background of the respondents; management factors and performance of the LBNR, community participation and performance of the LBNR, social-cultural factors and performance of the LBNR and resource-factors and the performance of the LBNR

4.2 Response Rate

To ensure that a satisfactory response rate was achieved, the researcher and his team of the research assistants used two strategies: One, they administered the questionnaires to the household respondents with considerable literacy levels, waited for them to fill in their responses and collected immediately. Secondly, for the respondents with low literacy levels, the questions were read out to them and interpreted in the local language without changing their meanings. Face to face interviews were held with the key informants. Table 4.1 shows the response rates.

Table 4.1: Response Rates

Group	Designated Sample size	Number Achieved	Response Rate
Household	375	329	88%
LBNR Employees	42	34	81%
Key Informants	12	11	92%
Total	**429**	**374**	**87%**

Three hundred and twenty nine (329) household and 34 LBNR employees' questionnaires out of designated sample sizes of 375 households and 42 LBNR employees were returned. In addition, 11 interviews were successfully conducted with identified key informant stakeholders out of the targeted 12. These figures represented response rates of 88%, 81% and 92% respectively for the households, LBNR employees and key informants, representing an average response rate of 87%. According to Necamaya (1996), a response return rate of more than 75% is enough for the study to continue. Therefore, the achieved response rate was considered credible enough to provide the basis for arriving at the conclusions of the study.

4.3 Background of the Respondents

This section discusses the respondents' sex and their relationships with the household head, marital status, level of education, occupation and the average household income. Whereas these personal and socio-demographic variables may influence the respondent's participation in conservation activities, they also had bearing on the ability of the respondents to provide valid information that enabled the study to reach its conclusions.

4.3.1 Distribution of the Respondents by Sex

The respondents (both household and LBNR employees) were asked to indicate their sex. The household respondents were also required to indicate their relationship with the household head. Table 4.2 shows the distribution of the respondents by sex.

Table 4.2: Distribution of the Respondents by Sex

Sex	Household Respondents		LBNR Employee	
	Frequency	**Percentage**	**Frequency**	**Percentages**
Male	244	74.2	28	82.4
Female	85	25.8	6	17.6
Total	**329**	**100.0**	**34**	**100**

A total of 244 (74%) male and 85 (26%) female respondents responded to the household questionnaire. On the other hand, 82% of the LBNR employees who participated in the study were male compared to only 18% female respondents that responded to the LBNR employees' questionnaire. Regarding the relationship of the respondents with the household heads, 53% of the household male respondents were household heads themselves, 34% were parents, 7% spouses, 4% children of the household heads aged above 18 years while 2% were relatives to the household head. Of the female household respondents, 33% were spouses of the household heads, 29% mothers of the household heads, 22% were children aged above 18 years, 14% were household heads while only 1% was a relative of the household head.

The combined percentages of male household respondents who were ether household heads themselves, parents to the household heads or spouses of the household heads (94%) as well as the combined percentages of female respondents with similar relationships with the household heads (76%) in addition to those who were children to the household heads indicates that the study largely interviewed the targeted individuals, ensuring the validity of the information obtained to reach valid conclusions of the study. The high percentage of household male respondents is attributed to the fact that in the catchment community, male dominance over women is still held with high regard which makes males the ultimate spokespersons for their families. The same patterns are depicted with respect to the LBNR employee respondents where the gender segregated response percentages indicating more male than female respondents is a reflection of more male employees than females.

4.3.2 Distribution of the Respondents by their Level of Education

Both the household and LBNR employee respondents' were asked to indicate their highest level of education. The findings revealed that 38% of the household respondents had secondary education, 33% primary education, 23% tertiary college education and 6% had not received any formal education. With regard to the LBNR employees, 32% had tertiary education, 30% primary education, 24% secondary education, 9% were university graduates, while 3% in each case had either post-graduate training or no formal education at all. Table 4.3 shows the distribution of the respondents by their levels of education.

Table 4.3: Distribution of the Respondents by their Level of Education

Sex	Household Respondents		LBNR Employee	
	Frequency	**Percentage**	**Frequency**	**Percentages**
No formal education	19	5.8	1	2.9
Primary education	109	33.1	10	29.5
Secondary education	126	38.3	8	23.5
Tertiary college	75	22.8	11	32.4
University graduate	-	-	3	8.8
Postgraduate	-	-	1	2.9
Total	**329**	**100.0**	**34**	**100**

The low level of education among the community members is a clear indication of the need for the management of the LBNR to invest in capacity building of the community if conservation efforts are to be successful. However, it is positive to note that the management of LBNR has provided employment opportunities to the local community members irrespective of their education backgrounds. This is evidenced by the fact that 65% of the employees reported to have come from Koibatek district while 35% indicated their home district as Baringo. More so, 85% of the employees serve as general workers, 9% as supervisors and 6% as managers. The capacity of the employees to effectively fulfill their responsibilities as far as the IMP is conserved should be enhanced through training and capacity building since a larger percentage has low levels of education.

4.3.3 Marital Status of the Household Respondents

The household respondents were required to state their marital status. Marital status ascribes a higher level of responsibility and social status on an individual which may influence their involvement in community development matters and by extension, conservation of the environment. The household respondents' marital status is presented in table 4.4.

Table 4.4: Distribution of Household Respondents by Marital Status

Marital status	Frequency	Percentage
Married	257	78.1
Single	68	20.7
Divorced	3	0.9
Widowed	1	0.3
Total	**329**	**100.0**

The findings indicate that the majority of the household respondents, (78%) were married, 21%were single, 1%divorced while less than 1% were widowed. The high percentage of married household respondents reflects the community's social family values that provide the social capital for successful conservation of the protected area.

4.3.4 Occupation of Household Respondents

The household respondents were asked to indicate their respective occupations. The occupations of the respondents were shown in Table 4.5.

Table 4.5: Occupation of Household Respondents

Occupation	Frequency	Percent
Formal employment	34	10.3
Informal employment (casual labor)	48	14.6
Self-employed/business	102	31.0
Agriculture farming	97	29.5
Livestock keeping	45	13.7
Other	3	0.9
Total	**329**	**100.0**

The percentages in Table 4.6 indicate that 31% of the household respondents were self-employed and engaged in business activities, 30% and 14% were agriculture and livestock farmers respectively, 15% were casual labourers, 10% in formal employment and about 1% was engaged in other unspecified occupations. A higher percentage of the households

(46%) had an average monthly income of less than Ksh. 5,000 compared to only 2% who had an average monthly income of more than Ksh. 20,000. Another 41% had an average monthly income of between Ksh. 5,000 and 10,000, 9% had an average of 10,000-15,000 monthly income while 2% had earned Ksh. an average of 15,0001-20,000 per month. Table 4.6 shows the respondents' average household from all economic activities of the households.

Table 4.6: Average Household Monthly Income

	Average Monthly Income	**Percentage**
i.	Less than 5,000	46.2%
ii.	5,001-10,000	41%
iii.	10,001-15,000	8.5%
iv.	15,001-20,000	1.8%
v.	20,001 and above	2.4%
Total		**100%**

The findings reveal that only a small segment of the catchment community is able to adequately sustain their livelihood from formal employment and a higher monthly household income. The majority of the community that is either in self-employment and/or agricultural activities could be an indicator of dependence on the reserve for their economic livelihoods, thus posing potential human-wildlife conflicts as well as conflicts with the reserve management. This justifies the need for the protected area management to work towards enhancing the economic well-being of the community to ensure effectiveness of IMP implementation. Most often, damages result to protected areas comes from rural population pressure and the financial inadequacy to maintain proper protection of these natural areas. Ozturk *et al*. (2010) argue the populations living around protected areas are generally the poorest section of the rural population and the common belief is that natural forest resources are free to the benefit of everyone, which exacerbates damaging effects on the protected areas.

4.4 Management factors and performance of the LBNR

Management factors of the LBNR were assessed as a set of management functions that was directed towards the accomplishment of conservation goals as set out in the IMP. The management factors assessed were in terms of the execution of plans and decisions that the management of the national reserve, availability of relevant management skills required to implement the integrated management plans as well as research, evaluation and monitoring to ensure that the necessary steps are taken to adjust management processes towards the achievement conservation objectives. Management-related data was collected using the LBNR employees' questionnaire items 3.1 to 3.21. The employees' responses to the various practices related to the various dimensions of management were rated as: No=0; Mostly No=1; Mostly Yes=2 and Yes =3 and used for correlation analysis.

The data collected was analyzed in percentages where the employee response percentages based on headline indicators varied on a continuum, from no management at all to high management standards. Where the employee responses' total percentages for "yes" and "mostly yes" to the various aspects of management planning fell within the lowest third of the continuum (below 33%), this meant that such aspect of management was is clearly inadequate. Percentage scores between 33% and 67% indicated that, while that particular basic management is in place, considerable improvement is still needed. However, this score category may further be split into those between 33% and 50% indicating basic but with major deficiencies, and those between 50% and 67%. Generally a "sound/strong" level of management would begin at a score of around two-thirds 67%.Percentages above this level would imply that the reserve is being managed relatively well. These cut-off points accord with the meaning of the most common assessment systems that adopted across the globe (Foina *et al.,* 2010).This section, therefore presents the findings of the data collected on aspects of management including: management planning; communication and information; management decision making and research, evaluation, and monitoring.

4.4.1 Management planning

The respondents to the LBNR employees' questionnaire were asked respond to a set of management planning statements by indicating the response that best described their

opinions on the performance of the actions related to the statements. The findings were as shown in Table 4.7.

Table 4.7: Management Planning

	Management Planning	Yes	Mostly Yes	Mostly No	No	**Total**
i.	There is a comprehensive, relatively recent written management plan	61.8%	29.4%	2.9%	5.9%	**100%**
ii.	There is a comprehensive inventory of natural and cultural resources	52.9%	23.5%	20.6%	2.9%	**100%**
iii.	There is an analysis of, and strategy for addressing, LBNR threats and pressures.	35.3%	35.3%	8.8%	20.6%	**100%**
iv.	A detailed work plan identifies specific targets for achieving management objectives.	58.8%	35.3%	2.9%	2.9%	**100%**
v.	The results of research and monitoring are routinely incorporated into planning	70.5%	14.7%	11.8%	2.9%	**100%**

The results in the table indicate that management planning aspects of the LBNR were generally sound/strong. This was due to the fact that more than 67% of the employees answered "yes" or "mostly yes" to all the statements related to the various dimensions of management planning (Fiona *et al*., 2010; Ervin, 2003). For instance, at least 92% responded "yes" or "mostly yes" to there being a comprehensive, relatively recent written management plan, 76% to the existence of a comprehensive inventory of natural and cultural resources, 71% to the presence of an analysis of, and strategy for addressing, LBNR threats and pressures, 94% to the existence of a detailed work plan that identifies specific targets for achieving management objectives and 85% to the results of research and monitoring being routinely incorporated into planning. These ratings may be attributed to the 2007-2012 IMP that describes the conservation and management objectives of the LBNR and the strategies to actualize the IMP. To a large extent, the findings indicate that

the employees are informed and incorporated in the management planning process which is requisite to the achievement of conservation and management objectives of the reserve.

4.4.2 Communication and information

The LBNR employees' responses to communication and information practices were as shown in Table 4.8.

Table 4.8: Communication and Information

	Communication and Information	Yes	Mostly Yes	Mostly No	No	Total
i.	There are adequate means of communication between field and office staff.	47.1%	38.2%	8.8%	5.9%	**100%**
ii.	Existing ecological and socio-economic data are adequate for management planning	52.9%	26.5%	14.7%	5.9%	**100%**
iii.	There are adequate means of collecting new data	64.7%	5.9%	20.6%	8.8%	**100%**
iv.	There are adequate systems for processing and analyzing data	64.7%	2.9%	17.6%	14.7%	**100%**
v.	There is effective communication with local communities	32.3%	29.4%	5.9%	32.4%	**100%**

The findings in the table indicate that at least 85% of the employees responded "yes" or "mostly yes" to the existence of adequate means of communication between field and office staff, which reflects teamwork and synergistic human resource relationship that is critical in translating the IMP strategies into practical conservation activities. At least 79% of the employees responded "yes" or "mostly yes" to the fact that existing ecological and socio-economic data were adequate for management planning, 71% to the adequate means of collecting new data and 67% to there being adequate systems for processing and analyzing data. These findings implied that sound communication systems with respect

collection and processing of relevant management planning data were in place, a reflection of strong communication and information management systems. However, notable weakness was with respect to the effectiveness in communication with local communities, where only 62% of the employees agreed that such communication was not effective thus pointing to basic achievements in this dimension of communication and information management that has minor deficiencies, hence need for improvement.

4.4.3 Management Decision Making

The study sought to establish whether the decision making processes for the LBNR were participatory. The employees' responses to management decision-making practices were as shown in Table 4.9.

Table 4.9: Management Decision Making

	Management Decision-Making	Yes	Mostly Yes	Mostly No	No	Total
i.	There is clear internal organization	70.6%	26.5%	2.9%	-	**100%**
ii.	Management decision making is transparent	61.7%	26.5%	2.9%	8.8%	**100%**
iii.	LBNR staff regularly collaborates with partners, local communities and other organizations.	47.1%	44.1%	2.9%	5.9%	**100%**
iv.	Local communities participate in decisions that affect them	35.3%	26.5%	23.5%	14.7%	**100%**
v.	The results of research and monitoring are routinely incorporated into planning	55.9%	23.5%	14.7%	5.9%	**100%**
vi.	There is effective communication between all levels of LBNR staff and administration	47.1%	29.4%	11.8%	11.8%	**100%**

The percentages in table reveal that the management of LBNR performs effectively in almost all the management decision-making areas except in involving the local

communities in making decisions that affect the communities. There were sound decision making practices in with respect to clarity in internal organization (97%), regular collaboration of staff with partners, local communities and other organizations (91%),transparency in management decision making (87%), incorporation of the results of research and monitoring into planning (79%)and effective communication between all levels of staff and administration (74%). However, local communities' participation in decisions that affects them scored 62%, consistent with the earlier finding on communication and information where a similar percentage, which is considerably weak, indicated that there was effectiveness in communication with local communities.

4.4.4 Research, Evaluation and Monitoring

The findings on LBNR employees' responses to the various dimensions of research, evaluation and monitoring were as shown in Table 4.10.

Table 4.10: Research, Evaluation and Monitoring

	Research Evaluation and Monitoring	Yes	Mostly Yes	Mostly No	No	Total
i.	The impact of legal and illegal uses of the LBNR are accurately monitored and recorded	47.1%	35.3%	8.8%	8.8%	**100%**
ii.	Research on key ecological issues is consistent with the needs of the LBNR	67.6%	14.7%	5.9%	11.8%	**100%**
iii.	Research on key social issues is consistent with the needs of the LBNR.	50%	32.4%	8.8%	8.8%	**100%**
iv.	LBNR staff members have regular access to recent scientific research and advice	47.1%	20.6%	17.6%	14.7%	**100%**
v.	Critical research and monitoring needs are identified and prioritized.	44.1%	29.4%	17.6%	8.8%	**100%**

The findings in the table reveal that all the practices related to research, evaluation and monitoring by the LBNR management were highly rated, ranging from the 82% for the

strongest to 74% indicated sound management with respect to this management dimension. The highest percentages 82% were respectively related to accurate monitoring and recording of the impact of legal and illegal uses of the LBNR, consistency in research on key ecological and social issues with the needs of the LBNR. The lowest percentage of 74% was attributed to identification and prioritization of critical research and monitoring needs by the LBNR. On a general scale, research, evaluation and monitoring aspects of the LBNR were sound and largely consistent with the management and conservation objectives.

4.4.5 Effect of Management factors on the Performance of the LBNR

The study sought to determine the performance of the LBNR in relation to the effect of the management factors. Performance was evaluated in terms of the employees' views on reduction in threats and pressures to biodiversity conservation as well as the socio-economic benefits accruing to the catchment community. The employees' responses on reduction in threats to biodiversity were rated as follows: Not reduced at all=0; Somehow reduced=1, Reduced=2 and Reduced completely = 3. On the other hand, responses to socio-economic benefits were rated as: No=0; Mostly No=1; Mostly Yes=2 and Yes =3. Each of the scores was converted into a percentage score by dividing by three and the means for the various dimensions of biodiversity conservation and socio-economic effects analyzed.

The findings on biodiversity conservation with respect to reduction in threats indicated that the means ranged from 0.95 (95%) to 0.4 (40%). In line with Fiona *et al.,* (2010), there was strong performance with respect to reduction in threats in areas that had means of at least two thirds, that is, 0.67 (67%). These included reduction in environmental destruction by tourist activities (0.95), pollution of the lake water by agro-chemicals (0.95), wildlife mortality (0.89), soil erosion from the neighboring farms (0.67), deforestation in the catchment areas (0.67) and vegetation species extinction (0.67). The lowest performance was observed in reduction in erosion along livestock trails (0.4) which is closely related to grazing in the reserve with a performance mean of 0.46. Other low performances were noted in invasion by unwanted vegetation species and siltation of the lake with a mean of

0.66 in each case. Table 4.11 shows the means of the respondents' ratings of reduction in threats to biodiversity.

Table 4.11: Biodiversity Conservation

	Reduced effects	N	Mean	Std. Deviation
i.	Environmental destruction by tourist activities	34	.9510	.26121
ii.	Pollution of the lake water by agro-chemicals	34	.9495	.26512
iii.	Wildlife mortality such as flamingos	34	.8922	.25585
iv.	Soil erosion from the neighboring farms	34	.6667	.18349
v.	Deforestation in the catchment areas	34	.6667	.18349
vi.	Vegetation species extinction	34	.6667	.18349
vii.	Siltation of the lake	34	.6569	.19219
viii.	Invasion by unwanted vegetation species	34	.6569	.19219
ix.	Grazing in the reserve	34	.4608	.18376
x.	Erosion along livestock trails	34	.4020	.13681

The findings on the socio-economic benefits revealed that LBNR performed below the widely acknowledged sound/strong mean performance of 0.67 (67%). The only area in which performance reached this mean mark was in the implementation of programmes that seek to enhance community welfare, while conserving protected area resources with a mean of 0.68, which was only slightly above the 0.67 achievement mark. As indicated in the table, the rest of the areas scored between the means of 0.57 and 0.44, implying that the performance of LBNR in terms of socio-economic benefits and community support was generally weak and in need of major improvements. The means and standard deviations of the respondents' scores were as shown in Table 4.12.

Table 4.12: Socio-Economic Benefits and Community Support

	Socio-economic benefits and community support	N	Mean	Std. Deviation
i.	Programmes to enhance community welfare, while conserving protected area resources are being implemented.	34	.6765	.33318
ii.	Local and/or indigenous people actively support the protected area	34	.5686	.29047
iii.	Specific management programmes are being implemented to address threats to biodiversity	34	.5490	.24457
iv.	Entry fees or fines are used in the implementation of conservation activities	34	.5392	.32839
v.	Cultural values associated with LBNR are preserved	34	.5294	.27362
vi.	LBNR is providing economic benefits to local communities, e.g. income, employment, payment for environmental services	34	.5000	.23570
vii.	Activities to maintain key biodiversity, ecological and cultural values are a routine part of LBNR management	34	.4608	.21734
viii.	Commercial tour operators contribute to protected area Management	34	.4412	.28094

4.4.6 Correlations Between Management Factors, Socio-Economic Benefits and Community Support

The means for the four dimensions of management, (management planning, communication and information, management decision-making and research, evaluation and monitoring) were computed alongside the means for the dependent variables (biodiversity conservation and socio-economic benefits and community support) and used to conduct the Pearson's Product Moment Correlation to determine whether there were significant relationships between the variables. The findings were as shown in Table 4.13

Table 4.13: Correlation Between Management Factors, Socio-Economic Benefits and Community Support

		BC	SEB	MP	CI	MDM	RE & M
BC	Pearson's (r)	1					
	P-values						
SEB	Pearson's (r)	.047	1				
	P-values	.795					
MP	Pearson's (r)	.083	-.556**	1			
	P-values	.648	.001				
CI	Pearson's (r)	.123	-.567**	.483**	1		
	P-values	.495	.000	.004			
MDM	Pearson's (r)	.104	-.630**	.462**	.625**	1	
	P-values	.565	.000	.006	.000		
RE & M	Pearson's (r)	.130	-.681**	.351*	.608**	.660**	1
	P-values	.470	.000	.042	.000	.000	

***. Correlation is significant at the 0.01 level (2-tailed);*
**. Correlation is significant at the 0.05 level (2-tailed).*
Key: BC=Biodiversity conservation; **SEB** =Socio-Economic Benefits; **MP**=Management planning; **CI**=Communication and Information; **MDM**=Management decision-making; **RE&M**=Research, Evaluation & Monitoring

The correlations in the table indicate that the relationship between biodiversity conservation and all the management aspects (MP, CI, MDM and RE & M) remained insignificant. However, significant negative relationships of moderate strength to strong existed between socio-economic benefits and the management dimensions of the LBNR. The relations between socio-economic benefits and the management aspects were MP ($r = -0.56$, $n=34$, $p<0.01$) CI ($r = -0.57$, $n=34$, $p<0.01$), MDM ($r = -0.63$, $n=34$, $p<0.01$) and RE & M ($r = -0.68$, $n=34$, $p<0.01$). On the other hand, all the management dimensions were

positively and significantly correlated with each other, indicating the synergistic relationship in the management of LBNR.

4.5 Community Participation and Performance of the LBNR

The study sought to establish the level of community participation in the decision-making on reserve management issues aimed at biodiversity conservation and how this influences community support for conservation of LBNR. Community participation was, therefore, evaluated in terms of involvement of persons from the catchment communities in any action related to the conservation of the LBNR especially in decision-making. This section, therefore, presents and discusses the level of community participation in the management under sub-sections of participation in decision-making, consultation of the community by the LBNR management and information sharing between LBNR management and the catchment communities. The section further analyzes the relationship between the community participation in management and their support of conservation activities of the LBNR.

4.5.1 Community Participation in Decision-Making at LBNR

The household respondents were asked to indicate whether, in the previous 5 years before the study, they had or any member of their household had ever participated in any meeting organized by the LBNR management where key decisions were made. Their responses were as shown in Table 4.14.

Table 4.14: Community Participation in Decision-Making at LBNR

Participation in decision-making	Frequency	Percentage
Yes	69	21.0
No	260	79.0
Total	**329**	**100.0**

The percentages in the table indicate that 21% of the household respondents had or at least a member of their households had participated in a meeting at which key decisions related to the management of LBNR were taken. This may seem a paltry percentage with respect to the sample size, but it would be critical to acknowledge that community participation in decision-making processes is, in most community development efforts exercised through community leaders elected/nominated by the community. Practitioners in development believe that in order for projects to succeed, communities need to actively take part in designing, implementing and shaping the projects that affect them, (Ann *et Al*, 2001).

4.5.2 Consultation of the Community by the LBNR Management

The household respondents were required to indicate whether the management of the LBNR had ever consulted them or any other member of the community that they knew about any issue related to the park. Their responses were as shown in Table 4.15.

Table 4.15: Consultation of the Community by the LBNR Management

Consulted	Frequency	Percentage
Yes	88	26.7
No	241	73.2
Total	**329**	**100.0**

The findings indicate that at least 27% of the household respondents or members of their families had been consulted at some point by the management of the LBNR. Consultation of the community means inviting comments on plans which are already taking shape. The most familiar methods of consultation include public meetings, notices, newsletters, etc. Zeppel (1997) posits that some of the advantages that would accrue by consulting with a host community would include tour operators being able to gain access to local villages, while the elders within the community are spreading the knowledge of their culture. This helps the local people in enhancing their self-esteem by maintaining their social and religious values.

4.5.3 Information Sharing Between the Community and LBNR Management

The household respondents were asked to indicate how often the management of the LBNR held meetings with the community to discuss issues related to the management of the reserve. In addition, the respondents were required to indicate how often the management of LBNR informed the community about what was happening in the reserve. The responses were analyzed and the findings presented in Table 4.16.

Table 4.16: Information Sharing Between the Community and LBNR Management

	Information sharing	Never	Rarely	Often	Total
i.	LBNR hold meetings with the community to discuss issues related to the management of the reserve	38.6%	56.2%	5.2%	**100%**
ii.	Management of LBNR inform the community about what is happening in the reserve	38.3%	53.5%	8.2%	**100%**

More than half of the household respondents in each case indicated that LBNR management rarely held meetings with the community to discuss issues related to the management of the reserve (56%) and informed the community about what was happening in the reserve (54%). On the other hand, significant percentages (39% and 38%) indicated that the LBNR management ever practiced the two respective undertakings in keeping the community informed. This validates the earlier findings from the reserve employees of the weak LBNR management communication strategies with the local communities which could have detrimental effects to the conservation and management objectives of the reserve.

4.5.4 Effect of Community Participation on Support for Conservation of LBNR

The study sought to determine the extent to which community participation in the management of LBNR affected the communities support for conservation efforts. Community support for conservation was evaluated in terms of their trust in the

management team to adequately manage the reserve, the value the community attached to the conservation of the reserve, willingness to get involved in the conservation efforts of the reserve and the extent to which they had voluntarily been involved in activities to conserve the reserve. The respondents' responses were rated on a 4- point scale of 1 = "Not at all"; 2 = "To a limited extent"; 3 = "To a moderate extent" and 4 = "To a large extent". The respondents' ratings were converted into percentages by dividing by 4 to get the percentage ratings and then analyzed descriptively to obtain the means of each dimension of community support for conservation of LBNR. The means for the four dimensions of community support were as shown in Table 4.17.

Table 4.17: Community Support for Conservation of LBNR

	Community Support for Conservation of LBNR	N	Mean	Std. Deviation
i.	Willingness to get involved in the conservation efforts of the reserve	329	.8397	.20920
ii.	Value attached to the conservation of the reserve by the community	329	.7074	.23364
iii.	Trust in the management team to adequately manage the reserve	329	.6216	.23106
iv.	Voluntary involvement in activities to conserve the reserve	329	.5509	.19685

The highest mean of 0.84 (84%) was realized in the community's willingness to get involved in the conservation efforts of the reserve, followed by the value attached to the conservation of the reserve by the community at 0.71 (71%). These two dimensions of community support depicted strong community support for conservation of the reserve, having surpassed the 2-thirds threshold (67%) indicative of strong support as per Fiona *et al.,* (2010). On the other hand, the community' trust in the management team to adequately manage the reserve had a mean of 0.62 (62%) which implied that the trust need a minor boost. The lowest mean of 0.55 (55%) related to voluntary involvement in activities to conserve the reserve by the community, which could be explained by the low trust that the community has in the management and exacerbated by the frequent conflicts between the

LBNR management and the community, as well as perceived low participation of the community in the management of the reserve.

4.5.5 Correlation Between Community Participation and Support for Conservation

To analyze the relationships between the variables, a composite score for community participation in the management of LBNR was first computed. Two scoring strategies were adopted for different response categories: with regard to community participation in decision-making and consultation by the LBNR, the scores were "No"= 0 and "Yes"=1 while for information sharing, the scores were "Never"=0; "Rarely" = 1 and "Often" = 2.The means for the composite score of community participation in management per respondent were obtained by adding decision making to consultation and information sharing then diving the total scores by the highest possible total score of 6. These means were then used together with the means for community support for conservation of LBNR to conduct the PPMC to determine whether there were significant relationships between the variables. The findings were as shown in Table 4.18.

Table 4.18: Correlation Between Community Participation in Management and Support for Conservation

		CPM	TMT	VAC	WIC	VIA
TMT	Pearson's (r)	.237**	1			
	P-values	.000				
VAC	Pearson's (r)	.203**	.421**	1		
	P-values	.000	.000			
WIC	Pearson's (r)	.086*	.062	.074	1	
	P-values	.018	.266	.178		
VIA	Pearson's (r)	.137*	.174**	.259**	.203**	1
	P-values	.013	.002	.000	.000	

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

*Key: **CPM** = Community participation in management; **TMT**= Trust in the management team to adequately manage the reserve; **VAC**=Value attached to the conservation of the reserve by the community; **WIC**= Willingness to get involved in the conservation efforts of the reserve; **VIA**= Voluntary involvement in activities to conserve the reserve*

The PPMC analysis revealed that there were significant positive relationships between community participation in management (CPM) and all the dimensions of community support for conservation: trust in the management team to adequately manage the reserve (TMT) ($r=0.24$, $n=329$, $p<0.01$); value attached to the conservation of the reserve by the community (VAC) ($r=0.20$, $n=329$, $p<0.01$); willingness to get involved in the conservation efforts of the reserve (WIC) ($r=0.09$, $n=329$, $p<0.05$) and voluntary involvement in activities to conserve the reserve (VIA) ($r=0.014$, $n=329$, $p<0.05$). These indicate that the more the community members felt that they were involved the management, the stronger their support for conservation of the LBNR.

4.6 Social-economic Factors and Performance of the LBNR

The study sought to assess the role of socio-economic factors on the performance of national reserves. Socio-economic factors were evaluated in terms of the community's perceptions of the social impacts, economic benefits, degree of economic stratification in the catchment community and the level of education of participants. This section presents findings on the community's perceptions of the social impacts and economic benefits of LBNR and analyzes the relationship between the socio-economic factors and the community's support for conservation.

4.6.1 Perceived Social Impacts

The respondents were asked to give their opinions on the impacts of various conservation initiatives of the Lake Bogoria National Reserve. Response categories with their score ratings included: Yes = 0, Mostly Yes = 1, Mostly No = 2 and No= 3. The respondents' scores or every perceived impact were then divided by 3 to get the percentage scores for each of the perceived social impacts. The means were added to obtain a composite score for perceived social impacts and used for further correlation analysis.

According to the scoring strategy adopted where a "No" response indicating disagreement with the negative opinions towards the social effects of conservation was highly scored against a "Yes" response, the percentages in Table 4.19 reveal that the highest percentage (66%)of those who responded at least "mostly no" was in relation to the statement

"Negative visitor industry impacts on the natural environment" while the lowest (55%) was related to "conservation of the LBNR has caused congestion of people in the area" and "increased conflicts by community members who use the open areas in the LBNR". The respondents' responses were as shown in Table 4.19.

Table 4.19: Perceived Social Impacts

	Perceived Social Impacts	Yes	Mostly Yes	Mostly No	No	Total
i.	Conservation initiatives have led to loss of customary access to traditional cultural sites and impeded cultural practices	21.9%	17.0%	11.2%	49.8%	**100%**
ii.	Conservation of the LBNR has caused congestion of people in the area	33.1%	12.5%	4.3%	50.2%	**100%**
iii.	Increased conflicts by community members who use the open areas in the LBNR	36.8%	8.2%	9.1%	45.9%	**100%**
iv.	Negative visitor industry impacts on the natural environment	28.3%	5.8%	12.2%	53.8%	**100%**
v.	Loss of traditional way of life due to conservation of the LBNR	29.8%	11.9%	8.8%	49.5%	**100%**

The percentages in the table generally implied that while the community's had positive perceptions of the impacts of the conservation of the reserve, such perceptions needed considerable improvement. This is equally in view of the significant percentages of at one third of the respondents who responded on the affirmative, and perceived the conservation in light of negative social impacts to the community.

4.6.2 Economic Benefits

The household respondents were asked to indicate some of the economic benefits they had enjoyed from LBNR in the previous 5 years before the study. Their responses were as shown in Table 4.20.

Table 4.20: Economic Benefits from LBNR

Economic Benefits	Yes	No	Total
i. Management of LBNR allow the community to use the reserve for grazing	76.9%	23.1%	100%
ii. Previous benefits of monetary worth from LBNR	44.1%	55.9%	100%
iii. Benefits from tourists to the community	49.8%	50.2%	100%

The findings indicate that majority of the respondents (77%) were allowed to graze in the reserve, validating the findings from prior sections where the employees had reported that grazing in the reserve as a threat to biodiversity conservation had not reduced. On the contrary, more than half of the household respondents and at least half of them respectively reported that they had not received benefits of monetary worth from LBNR in the previous five years and benefits from tourists accruing to the community. Those who had benefitted in monetary worth reported having benefited from mainly school bursaries and casual employment. When asked to indicate to what extent they had benefited from the money collected by the Lake Bogoria National Reserve from tourism activities, the highest percentage (42%) had not benefitted at all, 40% had benefited to a very limited extent while 18% had benefited only to a moderate extent.

4.6.3 Correlation between Socio-economic Factors and Community Support for Conservation

Four socio-economic factors namely level of education, economic stratification (measured by level of income); perceived social impacts and economic benefits were considered for correlation analysis with community support for conservation. Scores were adopted for education category levels where: Never attended school=0, Primary education=1, secondary education = 2, Secondary education=3 and Post- secondary college = 4. For the

level of income categories, the scoring strategy adopted was: Less than Ksh. 5,000 = 1, Ksh. 5,001 – 10,000 = 2, Ksh. 10,001 – 15,000=3, Ksh. 15,001 – 20,000=4 and Ksh. 20,001 and above=4. The composite score for economic benefits was computed by adopted 0 for "No", 1 for "Yes", 0 for "Not benefited at all", 1for "To a very limited extent", 2 for "To a moderate extent" and 3 for "To a great extent" responses, then adding them and dividing by 6 (maximum possible score) to get the percentage scores. These scores were then used to compute the PPMC to determine the relationships between economic factors and the performance of the LBNR with respect to community support for conservation. The findings were as shown in Table 4.21.

Table 4.21: Correlation between Socio-economic Factors and Community Support for Conservation

		Community Support for Conservation	Perceived Social Impact	Economic Benefits	Education level
Perceived	Pearson's (r)	.085	1		
Social Impact	P -Value	.125			
Economic	Pearson's (r)	.355**	.229**	1	
Benefits	P -Value	.000	.000		
Education	Pearson's (r)	.103	-.129*	.021	1
level	P -Value	.036*	.019	.704	
Level of	Pearson's (r)	.683	.010	.253**	.229**
Income	P -Value	.023*	.861	.000	.000

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

The PPMC analysis revealed that there were significant positive relationships between community support for conservation and economic benefits ($r=0.36$, $n=329$, $p<0.01$), education level ($r=0.36$, $n=329$, $p<0.05$), and level of income ($r=0.68$, $n=329$, $p<0.05$). However, the relationship between community support for conservation and perceived social impacts remained insignificant. 4.7 Resource-Factors and the Performance of the LBNR

4.7 Resource Factors and the Performance of LBNR

The last objective of the study was to determine how the resources factors influence the performance of national reserves. Resources factors included infrastructural resources, financial resources and adequacy of staff and skills. This section, therefore, presents and discusses findings on the resources factors under infrastructural, financial resources and staffing, then relates these resources to the performance of the reserve.

4.7.1 Infrastructural Resources

The employees were asked to indicate, on a scale of Yes, Mostly yes, Mostly no and No, their opinion on the adequacy and appropriateness of the various infrastructural facilities at the LBNR. Similar scores as in the preceding sections were adopted for the responses and percentage scores computed for each response. The means and standard deviations of the employees' responses were determined and presented in Table 4.22.

Table 4.22: Infrastructural Resources

	Infrastructure	N	Mean	Std. Deviation
i.	Maintenance and care of equipment is adequate to ensure long-term use.	34	.7157	.36820
ii.	Transportation infrastructure is adequate to perform critical management activities	34	.7059	.35547
iii.	Visitor facilities are appropriate to the level of visitor use.	34	.5784	.39618
iv.	Field equipment is adequate to perform critical management activities	34	.5686	.38950
v.	Staff facilities are adequate to perform critical management activities	34	.5000	.38708

The findings show that there was sound maintenance and care of equipment to ensure long-term use, with a mean of 0.72 (72%) and adequate transport infrastructure to perform

critical management activities with a mean of .071 (71%). However, the rest of infrastructural resources depicted weaknesses that needed major improvements. These were visitor facilities (0.58) which could be inappropriate for the level of visitor use, inadequate field equipment to perform critical management activities (0.57) and inadequate staff facilities (0.5). These weaknesses may be attributed to weaknesses in funding as shown discussed in the subsequent section.

4.7.2 Financial Resources

The means and standard deviations of the employees' responses to the financial situation of the LBNR were computed and the findings were as shown in Table 4.23.

Table 4.23: Financial Resources

	Financial Resources	N	Mean	Std. Deviation
i.	Financial management practices enable efficient and effective LBNR management	34	.6377	.27735
ii.	Funding in the past 5 years has been adequate to conduct critical management activities.	34	.6178	.28658
iii.	The long-term financial outlook for the LBNR is stable	34	.6176	.37723
iv.	Funding for the next 5 years is adequate to conduct critical management activities	34	.5787	.25143
v.	The allocation of expenditures is appropriate to LBNR priorities and objectives.	34	.5193	.26257

The general picture depicted by the means in the table is that there were weaknesses in the financial resources of the reserve. In particular, major weaknesses were realized in the allocation of expenditures to meet the priorities and objectives of the reserve with a mean of 0.52. There were also weaknesses in funding both in the previous 5 years prior to the study (mean=0.62) and in their forecast for the subsequent 5 years (0.58). In addition, the long-term financial outlook was not as stable as it should practically be as the mean was

0.62, while the financial management practices that would enable efficient and effective management of the reserve scored a mean of 0.64. These financial standing indicates that the reserve could be having the basic financial resources that need a major boost. Inadequate funding has led directly to a myriad of other management problems, including inadequate field equipment, transportation, and facilities. James and colleagues (2001) have reported that underfunding of protected areas appears to be systemic problems in other areas of the world and that across Africa and Latin America, PAs are managed on less than US$150 per square kilometer (km^2), far less than the generally accepted US$250 per km^2 needed to adequately manage the parks.

4.7.3 Staffing

The findings on the staffing conditions at the LBNR were as presented in Table 4.24.

Table 4.24: Staffing

	Staffing	N	Mean	Std. Deviation
i.	Staff performance and progress on targets are periodically reviewed.	34	.8529	.22006
ii.	Staff employment conditions are sufficient to retain high-quality staff	34	.8137	.18697
iii.	The level of staffing is sufficient to effectively manage the area.	34	.6471	.21620
iv.	Training and development opportunities are appropriate to the needs of the staff	34	.5686	.20969
v.	Staff members have adequate skills to conduct critical management activities	34	.3333	.23210

The findings revealed the major staffing weaknesses were in the capacity staff that did not have adequate skills to conduct critical management activities with a mean of 0.33 (33%) and lack inappropriate training and development opportunities to the needs of the staff with a mean of 0.57 (57%). The level of staffing was not a major problem though the mean of 0.65 fell below the 0.67 mark to qualify for strong staffing levels as per Fiona *et al. (*2010),

indicating that it was a minor deficiency that needed strengthening. Rao *et al.* (2002) reported that 5% of Myanmar's parks had no staff at all, while 40% had some staff but not enough to adequately perform management duties. Similarly, Singh (1999) reported that 10% of India's national parks and 13% of its wildlife sanctuaries did not have staff allocated to them. Other studies such as Brandon *et al.*(1998), Terborgh *et al.*(2002) corroborate that inadequate staffing is a widespread phenomenon in many protected area systems.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The purpose of this study was to assess the factors influencing the performance of national reserves in Kenya. This chapter therefore presents a summary of findings, conclusions and recommendations. The chapter further summarizes the contribution of the study to the existing body of knowledge and finally gives suggestions for further research.

5.2 Summary of the findings

The study utilized responses of 329 household and 34 LBNR employees' questionnaires as well as information from 11 key informants, representing an average response rate of 87%. Generally, 74% of the household subjects were male and 26% were female, while 82% of the LBNR employees male compared to only 18% female. The study established that 38% of the household respondents had secondary education, 33% primary education, 23% tertiary college education and 6% had not received any formal education, while among the LBNR employees, 32% had tertiary education, 30% primary education, 24% secondary education, 9% were university graduates, while 3% in each case had either post-graduate training or no formal education at all. Occupation-wise, 31% of the household respondents were self-employed and engaged in business activities, 30% and 14% were agriculture and livestock farmers respectively, 15% were casual labourers, 10% in formal employment and about 1% was engaged in other unspecified occupations. A higher percentage of the households 46% had an average monthly income of less than Ksh. 5,000 compared to only 2% who had an average monthly income of more than Ksh. 20,000.

With respect to the management factors of the reserve, the study established that management planning aspects of the LBNR were generally sound/strong. The highest rating was related to the existence of a comprehensive, relatively recent written management plan, while the lowest, which was still strong related to the presence of an analysis of, and strategy for addressing, LBNR threats and pressures. Communication and

information aspects also remained strong while in respect of management decision making, the study established that the management of LBNR performed effectively in almost all the management decision-making areas except in involving the local communities in making decisions that affect the communities. All the practices related to research, evaluation and monitoring by the LBNR management were highly rated, ranging from the 82% for the strongest to 74%, largely consistent with the management and conservation objectives. However, the relationship between biodiversity conservation and all the management aspects remained insignificant, while significant negative relationships of moderate strength to strong existed between socio-economic benefits and the management dimensions of the LBNR. All the management dimensions were positively and significantly correlated with each other, indicating the synergistic relationship in the management of LBNR.

As relates to community participation and performance of the LBNR, the study established that 21% of the household respondents had or at least a member of their households had participated in decision-making processes related to the management of LBNR, with at least 27% of them or members of their families being consulted at some point by the management of the LBNR. However, more than half of the household respondents in each case indicated that LBNR management rarely held meetings with the community to discuss issues related to the management of the reserve (56%) and informed the community about what was happening in the reserve (54%). Despite the low community participation,84% of the community indicated their willingness to get involved in the conservation efforts of the reserve while 71% had strong value attachment to the conservation of the reserve. On the other hand, 62% of the community's had trust in the management team to adequately manage the reserve while 55% had previously been voluntarily involvement in activities to conserve the reserve by the community. Significant positive relationships existed between community participation in management and all the dimensions of community support for conservation: trust in the management team to adequately manage the reserve ($r=0.24$, $n=329$, $p<0.01$); value attached to the conservation of the reserve by the community ($r=0.20$, $n=329$, $p<0.01$); willingness to get involved in the conservation efforts of the reserve ($r=0.09$, $n=329$, $p<0.05$)and voluntary involvement in activities to conserve the reserve ($r=0.014$, $n=329$, $p<0.05$).

With regard to influence of social-economic factors on the performance of the LBNR, the study established that the community had positive perceptions of the social impacts of the conservation of the reserve although there was need for considerable improvement. Majority of the respondents (77%) were allowed to graze in the reserve, but about half reported that they had not received any economic benefits from LBNR in the previous five years. Those who had benefitted in monetary worth reported having benefited from mainly school bursaries and casual employment. The study established that significant positive relationships existed between community support for conservation and economic benefits ($r=0.36$, $n=329$, $p<0.01$), education level ($r=0.36$, $n=329$, $p<0.05$), and level of income ($r=0.68$, $n=329$, $p<0.05$). However, the relationship between community support for conservation and perceived social impacts remained insignificant. Whereas the significant positive correlations implied that community support for conservation was associated with high levels of education, income and higher economic benefits, the perceived social benefits varied randomly within the community leading to insignificant relationship with their support for conservation.

Finally, as regards resource-factors, the study established that there was sound maintenance and care of equipment to ensure long-term use and adequate transport infrastructure to perform critical management activities but major weaknesses in visitor facilities, inadequate field equipment to perform critical management activities and inadequate staff facilities. There also very serious weaknesses in the financial resources of the reserve. In particular, major weaknesses were realized in the allocation of expenditures to meet the priorities and objectives of the reserve. In addition, funding both in the previous 5 years prior to the study and for the subsequent 5 years was inadequate to meet the objectives of the reserve, although the financial management practices that would enable efficient and effective management of the reserve needed only a minor boost. With regard to staffing, major weaknesses were in the capacity staff that did not have adequate skills to conduct critical management activities and lacked appropriate training and development opportunities to the needs of the staff. The level of staffing was not a major problem but needed strengthening.

5.3 Discussion of Findings

The negative relationships between socio-economic benefits and the management dimensions implied that despite the management aspects being rated strongly as per the findings in sections 4.5.1 to 4.5.4, this did not translate into better performance in respect to socio-economic benefits to the catchment communities. The relationship between management and socio-economic benefits is such that there seems to be overconcentration on management, which, as earlier noted is largely devoid of adequate community involvement whose consequence is little contribution to the socio-economic wellbeing of the community. This, on the other hand, leads to insignificant realization of biodiversity conservation objectives as spelt out in the IMP. The insignificant relationships may be attributed to the poor revenue collections as reported by the various stakeholders interviewed, which barely meets the expectations of the community that eventually exacerbates conflicts between the management of the LBNR on one hand and the community on the other. Dimitrakopoulos *et al.* (2010) report that oftentimes, when local communities outside the boundaries of protected areas are not included in the conservation planning process, conflicts between conservation goals and community wants and needs arise. These conflicts result from constraints imposed by the protected area management on land use and natural resource extraction. Restrictions regarding access to the protected area, agricultural activities, timber extraction, hunting or other such activities, are just some of the most frequent sources of protected area-local community conflicts in the existing literature (Brandon et al. 2005).This ultimately causes people to hold negative perceptions toward the protected area (Hulme and Murphree 2001).

Interaction with local communities is essential to the success of PAs (Heinen, 2010). The associations between the community participation in management were weak in strength as a result of the low scores in the frequency of consultative and information sharing meetings, which also translated to low support for conservation of the reserve. This concurs with Pinnock (2000) who reported that the local community tends to evaluate the level of success of a venture according to the level of involvement. Passive involvement includes menial jobs and handouts, moving across a continuum towards a more successful and active involvement, which represents a level resulting in equitable partnership,

planning and participation. In this study, voluntary involvement in activities to conserve the reserve correlate positively with all the other variables indicating the readiness of the community members to participate in conservation irrespective of the nature of benefits reaped, provided that the necessary conditions are created for the community to do so including adequate participation in management. Marisa and Ghoguill (1996) argued that community participation must not be seen as a means to enable people to influence decisions in the political arena about the issues that affect them, but as a means to fostering mutual-help initiatives. It may be thought of as an instrument of empowerment and reflects the involvement/participation of local communities in the formal decision-making process that constitutes the formulation and implementation of the projects and programmes affecting them (Samuel, 1986).

Whereas the significant positive correlations between socio-economic factors and community support for conservation implied that community support for conservation was associated with high levels of education, income and higher economic benefits, the perceived social benefits varied randomly within the community leading to insignificant relationship with their support for conservation. The findings concurred with other studies in a number of ways; for instance, McShane and Wells (2004) reported that since the adoption of ICDPs, a sizeable portion of support for conservation has been captured from the catchment communities. Some ICDPs have made notable achievements in improving forest management outside parks and raising support for conservation among specific communities (Chicch´on, 2000). With regard to economic benefits, Coomes *et al.* (2000) reported that increased income led some households in the Amazonian community to diminish their extraction of forest products and invest in agro forestry gardens, whereas others bought chain saws and cleared forest even faster. Carret and Loyer (2003) established that the economic rate of return of the protected area system was 54%, with the main benefits emanating from watershed protection, although ecotourism benefits were significant and expected to increase over time, providing greater returns to surrounding communities.

The implications of positive correlation between education and support for conservation is that when the local people are educated and possess the necessary knowledge and skills to

fulfill their duties as conservationists, as well as an understanding of the environmental and social incentives at play in the community and nation as a whole, then they can be resourceful in the disseminators of information to the community (Colchester, 1994). As Keane *et al*., (2010), Tomićević *et al*., (2010), and Liu *et al.,* (2010) report, higher levels of education are associated with higher environmental awareness and understanding, as well as more positive attitudes toward conservation. Levels of awareness regarding protected areas are measurably higher in individuals with higher education levels, a connection to tourism, and involvement in resource management at the community level (Keane *et al*., 2010). In a case study of Madagascar, individuals with higher education levels proved more competent at correctly classifying protected species into legal categories and thus had higher knowledge of the legal aspects surrounding conservation (Keane *et al.,* 2010).

5.4 Conclusions

The managerial aspects of the LBNR were generally sound, but there seemed to be a disconnect between the management factors and the actual performance of the reserve with respect to reducing biodiversity threats and socio-economic benefits from the reserve to the catchment community. There were strong practices related to management planning, communication and information, and research, evaluation and monitoring by the LBNR management but notable weaknesses existed in the area of management decision-making especially in terms of involving the local communities in making decisions that affect the communities. Although the positive correlations between the management dimensions depicted the synergistic relationship in the management practices of LBNR, there is need to link this to the achievement of the goals of the reserve while addressing the missing linkage in as far as community involvement is concerned.

Community participation in the management of the reserve was very weak, although the community appreciates the economic importance of the reserve. The low participation makes the community to have weak perceptions especially on the socio-economic benefits of the reserve. This leads to weak support of the management in conservation of biodiversity, in spite of the community's willingness to cooperate and improve the performance of the reserve.

There were significant relationships between socio-economic factors and the performance of the LBNR. Higher levels of education among members of the catchment community correlated positively with their support for conservation, while community segments that seemed to be economically strong also had strong support for biodiversity conservation. In addition, the positive perceptions of the community of the social impacts of conservation activities provide good social capital to scale up conservation efforts while improving on such perceptions which vary randomly within the community, if a positive relationship between community support for conservation and perceived social impacts is to be significant.

Resource factors of the LBNR were the weakest, yet all the other factors depend on resources if the goals of biodiversity conservation and socio-economic benefits are to be realized. Despite the fact that there was sound maintenance and care of equipment to ensure long-term use and adequate transport infrastructure to perform critical management activities but the major weaknesses noted in terms of visitor facilities, inadequate field equipment to perform critical management activities and inadequate staff facilities, which was closely linked to the weaknesses in the financial resources of the reserve. It is imperative that adequate resources are mobilized given that all the other factors can only be strengthened by a strong resource base to realize the goals of biodiversity conservation.

5.5 Recommendations

The study has brought to the fore the urgent need for the managerial to consolidate community support for the biodiversity conservation of the reserve. The management needs to bring the community on board to participate in all decision-making processes especially in areas that touch on the community itself. Deliberate efforts should equally be made to maintain the existing strong managerial practices while filling the gaps in areas that have possible weaknesses.

The management of the LBNR should take advantage of the positive perceptions of the community and their willingness to participate in biodiversity conservation, mainstream and institutionalize community participation in the management of the reserve so as to

boost the community's perceptions of the socio-economic benefits that are critical in enlisting their support.

There is need for the management of the reserve to direct efforts towards improving the socio-economic well-being of the catchment community through capacity building, educational support and designing an integrated approach through rights-based initiatives to improve the economic status and living conditions of the community. This would have a long term effect on the performance of the reserve as the study has already highlighted the positive relationships between socio-economic factors and the community's support for conservation.

The management of the LBNR needs to scale up efforts to mobilize adequate resources, both financial and human resources to strengthen the other factors that rely on these resources to realize the goals of biodiversity conservation.

5.6 Suggestions for Further Research

The following are suggestions for some of the areas where further research may be done:

1. Similar studies to in other national reserves so as to enable generalization of the findings to a wider scope

2. There may be other factors that were not covered by this study due to its limited scope, yet they have potential to influence the performance of national reserves in Kenya. It is therefore important that such factors are explored to ensure that any corrective measure instituted address the factors holistically

5.7 Contribution to Body of Knowledge

Table 5.1 shows the contribution of the study to the body of Knowledge

Table 5.1: Contribution of the Study to the Body of Knowledge

	Objective	Contribution to Body of Knowledge
1.	To establish the influence of management factors on the performance of national reserves.	The managerial aspects of the LBNR were generally sound, but there seemed to be a disconnect between the management factors and the actual performance of the reserve with respect to reducing biodiversity threats and socio-economic benefits from the reserve to the catchment community. There were strong practices related to management planning, communication and information, and research, evaluation and monitoring by the LBNR management but notable weaknesses existed in the area of management decision-making especially in terms of involving the local communities in making decisions that affect the communities.
2.	To assess the influence of community participation on the performance of national reserves.	Low participation of the community makes the community to have weak perceptions especially on the socio-economic benefits of the reserve. This leads to weak support of the management in conservation of biodiversity, in spite of the community's willingness to cooperate and improve the performance of the reserve.
3.	To assess the role of socio-economic factors on the performance of national reserves.	Higher levels of education among members of the catchment community correlated positively with their support for conservation, while community segments that seemed to be economically strong also had strong support for biodiversity conservation. In addition, the positive perceptions of the community of the social impacts of conservation activities provide good social capital to scale up conservation efforts while improving on such perceptions which vary randomly within the community.
4.	To determine how the resources factors influence the performance of national reserves.	Resource factors of the LBNR were the weakest, yet all the other factors depend on resources if the goals of biodiversity conservation and socio-economic benefits are to be realized. Despite the fact that there was sound maintenance and care of equipment use and adequate transport infrastructure to perform critical management activities but the major weaknesses noted in terms of visitor facilities, inadequate field equipment to perform critical management activities and inadequate staff facilities, which was closely linked to the weaknesses in the financial resources.

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APPENDICES

Appendix I: Household Questionnaire

Questionnaire No._____

SECTION 1: INTRODUCTION AND CONSENT

Hallo, My name is ----------. We are conducting a survey on the factors influencing performance of national reserves, with special focus on the Lake Bogoria National Reserve to determine the implementation of Integrated Management Planning achieving its objectives. Your household has been selected by chance from all households in the area, as your views are considered important to the survey.

I would like to ask you some questions related to general livelihood. Despite the recording of the interview responses, the information you give will be kept strictly confidential and will not be disclosed to anyone else. However, you are under no obligation to answer any question that you feel uncomfortable to answer and I would urge that you provide as honest answers as possible without fear.

Participation in the survey is voluntary, and you can choose not to take part. If you have any question please feel free to ask otherwise if you accept to participate please sign below.

SECTION 2: HOUSEHOLD AND LOCALITY IDENTIFICATION

S/No	Subject	Response (Enumerator)
2.1	County	1. Nakuru 2. Baringo 3. Laikipia
2.2	District	1. Baringo 2. Koibatek 3. Nakuru 4. Nakuru North 5. Laikipia west
2.3	Division	
2.4	Location / Sub-location	
2.5	Village	
2.6	Household Number	

SECTION 3: HOUSEHOLD DEMOGRAPHICS

S/No	Subject	Response (Enumerator)
3.1	Respondent's gender	1: Male 2: Female
3.2	Relationship to H/H head	1. Self 2. Spouse 3. Child > 18 years 4. Parent (mother / father) 5. Other
3.3	Marital status of H/H head	1: Married 2: Single 3: Divorced 4: Widowed
3.4	Highest education by H/H head	1. No formal education 2. Primary education 3. Secondary education 4. Tertiary college.
3.5	Occupation of H/H head	1. Formal employment 2. Informal employment (casual labour) 3. Self -employed / business 4. Agricultural farming 5. Livestock keeping 6. Other

SECTION 4: COMMUNITY PARTICIPATION IN RESERVE MANAGEMENT

S/No	Subject	Response	Comments
4.1	In the last 5 years, have you ever participated in any activities of the park?	1. Yes 2. No	***List the activities:***
4.2	Has the management of the LBNR ever consulted you or any other member of your community that you know about any issue related to the park?	1. Yes 2. No	***If yes, issues consulted on:***
4.3	How often does the management of the LBNR hold meetings with the community to discuss issues related to the management of the Reserve?	1. Never 2. Rarely 3. Often	
4.4	How often does the management of LBNR inform the community about what is happening in the reserve:	1. Never 2. Rarely 3. Often	

SECTION 5: COMMUNITY BENEFITS FROM THE RESERVE

S/No	Subject	Response	Comments
5.1	Does the management of LBNR allow the community to use the Reserve for grazing?	1. Yes 2. No	
5.2	In the last 5 years, have you would you say you have received any benefits from the LBNR?	1. Yes 2. No	***Type of benefits:***
5.4	To what extent do you trust the management of the LBNR to manage the Reserve adequately?	1. Not at all 2. To a limited extent 3. To a moderate extent 4. To a large extent	
5.5	How important is the conservation of LBNR important to you general livelihood?	1. Not important at all 2. Somehow Important 3. Important 4. Very Important	
5.6	To what extent would you be willing to get involved in the conservation of the LBNR?	1. Not at all 2. To a limited extent 3. To a moderate extent 4. To a large extent	

What problems have you noticed in relation to the management of the LBNR in the last five years?

_____

_____

_____

Thank you for your participation in this survey

Appendix II: LBNR Employees' Questionnaire

SECTION 1: INTRODUCTION AND CONSENT

The purpose of this survey is to determine the factors influencing the performance of national reserves in Kenya, focusing on the Lake Bogoria National Reserve. You have been selected by chance to respond to this questionnaire, as your views are considered important to the survey. However, participation in the survey is voluntary, and you can choose not to take part. You are not required to fill in your names. All information given will be treated with utmost confidentiality.

S/No	Subject	Response (Enumerator)
3.1	Respondent's gender	1: Male 2: Female
3.3	Indicate your age bracket	1. 18 to 24 Years 2. 25 to 29 Years 3. 30 to 34 Years 4. 35 to 39 Years 5. 40 to 44 Years 6. Above 45 Years
3.4	Highest education	1. No formal education 2. Primary level incomplete 3. Primary level complete 4. Secondary level incomplete 5. Secondary level complete 6. Tertiary College 7. University graduate 8. Postgraduate
3.5	Position in the management of the reserve	1. General worker 2. Supervisor 3. Manager
3.6	What is your home District?	1. Baringo 2. Koibatek 3. Nakuru 4. Nakuru North 5. Laikipia west

SECTION 2: Management Factors and Performance Of National Reserves

In this section, the statements in the tables relate to various dimensions of management of the Lake Bogoria National Reserve. Indicate with a tick (√) the response that best describes your opinion from the responses provided in the right hand side of the tables from among: ***Yes, Mostly Yes, Mostly No and No***

	MANAGEMENT PLANNING	**Yes**	**Mostly Yes**	**Mostly No**	**No**
a.	There is a comprehensive, relatively recent written management plan				
b.	There is a comprehensive inventory of natural and cultural resources				
c.	There is an analysis of, and strategy for addressing, PA threats and pressures.				
d.	A detailed work plan identifies specific targets for achieving management objectives.				
e.	The results of research and monitoring are routinely incorporated into planning				
	COMMUNICATION AND INFORMATION	Yes	Mostly Yes	Mostly No	No
a.	There are adequate means of communication between field and office staff.				
b.	Existing ecological and socio-economic data are adequate for management planning				
c.	There are adequate means of collecting new data.				
d.	There are adequate systems for processing and analyzing data				
e.	There is effective communication with local communities				

	MANAGEMENT DECISION MAKING	Yes	Mostly Yes	Mostly No	No
a.	There is clear internal organization				
b.	Management decision making is transparent				
c.	PA staff regularly collaborates with partners, local communities and other organizations.				
d.	Local communities participate in decisions that affect them				
e.	The results of research and monitoring are routinely incorporated into planning				
f.	There is effective communication between all levels of PA staff and administration				

	RESEARCH, EVALUATION, AND MONITORING	Yes	Mostly Yes	Mostly No	No
a.	The impact of legal and illegal uses of the PA are accurately monitored and recorded				
b.	Research on key ecological issues is consistent with the needs of the PA				
c.	Research on key social issues is consistent with the needs of the PA.				
d.	PA staff members have regular access to recent scientific research and advice				
e.	Critical research and monitoring needs are identified and prioritized.				

Section 3: Resource Factors and Performance of National Reserves

	INFRASTRUCTURE	Yes	Mostly Yes	Mostly No	No
a.	Transportation infrastructure is adequate to perform critical management activities				
b.	Field equipment is adequate to perform critical management activities				
c.	Staff facilities are adequate to perform critical management activities				
d.	Maintenance and care of equipment is adequate to ensure long-term use.				

e.	There is effective communication with local communities				
f.	Visitor facilities are appropriate to the level of visitor use.				

	FINANCES	**Yes**	**Mostly Yes**	**Mostly No**	**No**
a.	Funding in the past 5 years has been adequate to conduct critical management activities.				
b.	Funding for the next 5 years is adequate to conduct critical management activities				
c.	Financial management practices enable efficient and effective PA management				
d.	Maintenance and care of equipment is adequate to ensure long-term use.				
e.	The allocation of expenditures is appropriate to PA priorities and objectives.				
f.	The long-term financial outlook for the PA is stable				

	STAFFING	**Yes**	**Mostly Yes**	**Mostly No**	**No**
a.	The level of staffing is sufficient to effectively manage the area.				
b.	Staff members have adequate skills to conduct critical management activities				
c.	Training and development opportunities are appropriate to the needs of the staff				
d.	Staff performance and progress on targets are periodically reviewed.				
e.	Staff employment conditions are sufficient to retain high-quality staff				

Section 4: Performance of the National Reserve

		Yes	Mostly Yes	Mostly No	No
a.	Programmes to enhance community welfare, while conserving protected area resources, are being implemented.				
b.	Local and/or indigenous people actively support the protected area				
c.	Is the protected area providing economic benefits to local communities, e.g. income, employment, payment for environmental services?				
d.	Are visitor facilities adequate				
e.	Do commercial tour operators contribute to protected area management?				
f.	If fees (i.e. entry fees or fines) are applied, do they help protected area management?				
g.	The assessment of the condition of values is based on research and/or monitoring				
h.	Specific management programmes are being implemented to address threats to biodiversity, ecological and cultural values				
i.	activities to maintain key biodiversity, ecological and cultural values are a routine part of park management				

What other challenges have you faced in the last 5 years of the implementation of the Lake Bogoria National Reserve Integrated Management Plan?

_____

_____

_____

_____

_____

Thank you for your time and participation in this survey

Appendix III: Stakeholders' Interview Guide

Hallo, My name is ----------. We are conducting a survey on the Effectiveness of the Lake Bogoria National Reserve Integrated Management Plan in achieving its objectives. You have been selected to participate in the study as your views are considered important to the survey, given that your organization/department/institution is an important stakeholder in the implementation of the IMP. You are under no obligation to answer any question that you feel uncomfortable to answer and I would urge that you provide as honest answers as possible without fear. However, participation in the survey is voluntary, and you can choose not to take part. If you have any question please feel free to ask. If not, may I proceed to ask you a few questions?

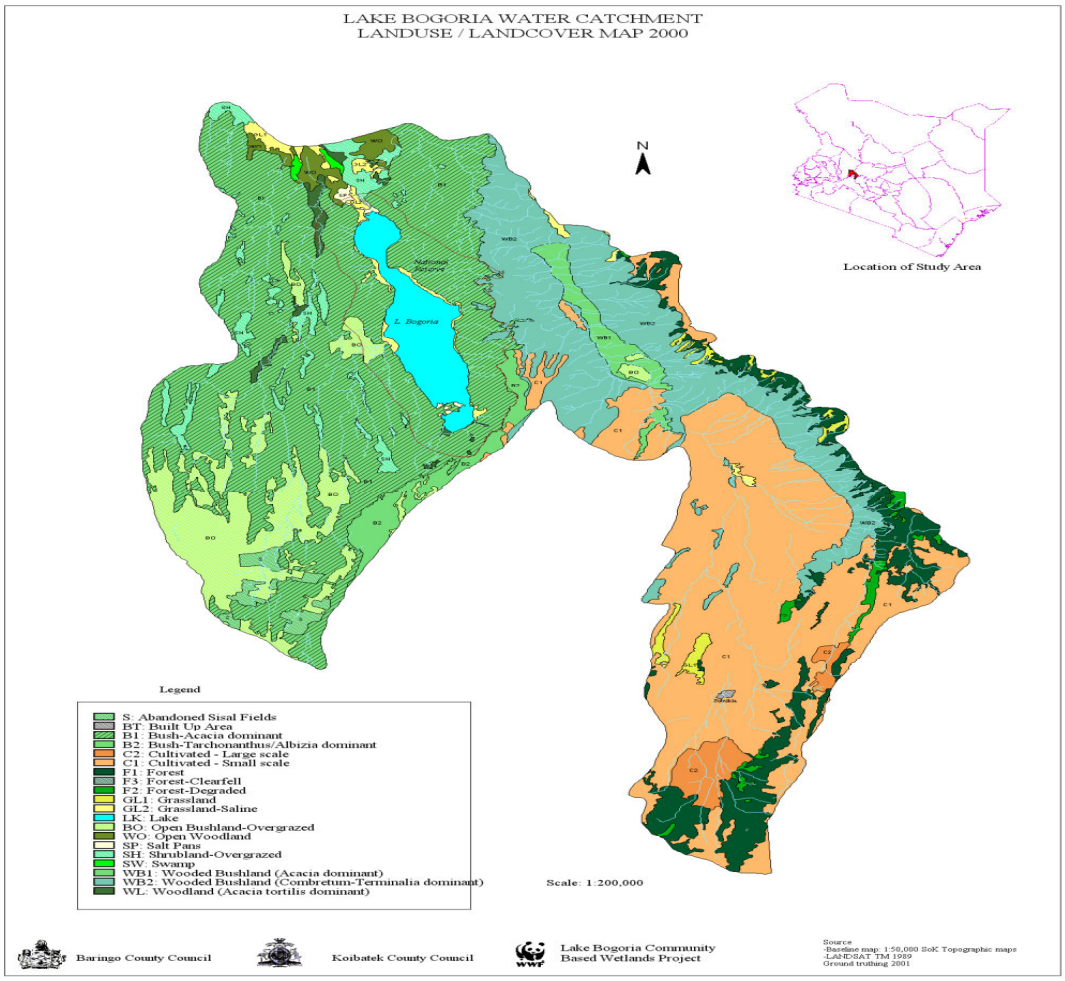
Organization/Department/Institution_____

Your position in the organization/department/institution_____

1. Was your organization involved in the drawing of the LBNR IMP? Comment on the level of your organization's participation
2. Has your organization/department/institution been involved in the implementation of the IMP? What has been your organization/department/institution's contribution to the implementation?
3. When decisions are made by the management of the LBNR, how often are the views of your organization/department/institution sought? What is your comment on the level of your organization/department/institution's participation in the decision-making?
4. To what extent would you say the management of LBNR has succeeded in conserving biodiversity of the IMP over the last 5 years?
5. To what extent has the local community benefited from the implementation of the LBNR IMP? Mention some of the benefits.
6. What is the local community's attitude towards the management of the LBNR?
7. Can you cite any challenges/weakness in the management of the LBNR over the last 5 years? How can these challenges/weaknesses be addressed?

Thank you for taking you time to respond to the questions

Appendix IV: Map of the Study Area



Appendix V: Letter of Transmittal

Department of Extra Mural Studies
University of Nairobi
P. o Box 1120
Nakuru

The Chief Warden
Lake Bogoria National reserve
P.O Box 64
Marigat.

Dear Sir

Re: Research Study

I am a student of the University of Nairobi, pursuing a Master of Arts Degree in Project Planning and Management. Currently I am in the process of undertaking research on the factors influencing performance of national reserve: a case of Lake Bogoria National Reserve.

The purpose of this letter, therefore, is to request your office to grant me permission to carry out the proposed study.

Yours faithfully,
Douglas Murei Kaibos.

Appendix VI: Letter of Authorization from University of Nairobi

UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA - MURAL STUDIES

Tel 051 - 2210863

P. O Box 1120, Nakuru
10th May 2013

Our Ref: *UoN/CEES/NKUEMC/1/12*

To whom it may concern:

RE: DOUGLAS MUREI KAIBOS-L50/63323/2013

The above named is a student of the University of Nairobi at Nakuru Extra-Mural Centre Pursuing a Masters degree in Project Planning and Management.

Part of the course requirement is that students must undertake a research project during their course of study. He has now been released to undertake the same and has identified your institution for the purpose of data collection on "Factors Influencing Performance of National Reserves". A case of Lake Bogoria National Reserve, Kenya.

The information obtained will strictly be used for the purpose of the study.

I am for that reason writing to request that you please assist him.

Yours Faithfully,

EXTRA - MURAL CENTRE
RESIDENT LECTURER
P.O. Box 1120
NAKURU
UNIVERSITY OF NAIROBI

Joseph C. Mungai
Resident Lecturer, University of Nairobi
Nakuru Extra-Mural Centre

Appendix VII: Letter of Authorization from the NCST

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349, 254-020-2673550
Mobile: 0713 788 787 , 0735 404 245
Fax: 254-020-2213215
When replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: **NCST/RCD/14/013/969**

Date: **11th June 2013**

Douglas Murei Kaibos
University of Nairobi
P.O Box 30197-00100
Nairobi.

RE: RESEARCH AUTHORIZATION

Following your application dated **31st May, 2013** for authority to carry out research on ***"Factors influencing the performance of National Reserves: A case of Lake Bogoria National Reserve, Kenya."*** I am pleased to inform you that you have been authorized to undertake research in **Mochongoi and Mogotio Districts** for a period ending **31st August, 2013.**

You are advised to report to **the District Commissioners, District Education Officers, Mochongoi and Mogotio Districts and the Chief Warden Lake Bogoria National Reserve** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:
The District Commissioners
The District Education Officers
Mochongoi District.
Mogotio District.

"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development".

Appendix VIII: Research Permit

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THIS IS TO CERTIFY THAT:
Prof./Dr./Mr./Mrs./Miss/Institution
Douglas Murei Kaibos
of (Address) University of Nairobi
P.O Box 30197-00100, Nairobi.
has been permitted to conduct research in

Location
Mochogio & Mogotio
Rift Valley
Districts
Province

on the topic: Factors influencing the performance of National Reserves: A case of Lake Bogoria National Reserve, Kenya.

for a period ending: 31st August, 2013.

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Research Permit No. *NCST/RCD/14/013/969*
Date of issue *11th June, 2013*
Fee received *KSH. 1000*

Applicant's Signature

For Secretary
National Council for Science &Technology