

**COMMUNITY LIVELIHOOD CHANGES AND THEIR IMPLICATIONS ON
SUSTAINABLE CONSERVATION OF KITULO NATIONAL PARK ECOSYSTEM,
TANZANIA.**

BY

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ABSTRACT

This study examined how the establishment of Kitulo National Park (NP) affected community livelihoods and its implications on sustainable conservation in Makete District Tanzania. Specifically, the study concentrated on community attitude towards establishment of Kitulo NP; documenting livelihood changes before and after Kitulo NP. Also, it focused on determining suitability of new livelihood options to the community after establishment of Kitulo NP and hence evaluating potential impacts of new livelihood options after establishment of Kitulo NP and their sustainability. A cross sectional research design and multi-stage sampling were adopted during data collection. Divisions, wards and villages were purposively selected. Checklist, direct observation and PRA techniques were also employed for data collection. Primary data were collected through a questionnaire which was administered to a sample of 120 household heads. Qualitative data were subjected to content analysis. Descriptive statistics and index scales were used to measure attitudes and perception of respondents towards establishment of Kitulo NP. Statistical Package for Social Sciences (SPSS) software was used to analyse quantitative data. Multiple regression models were developed to explore relationship between sustainability of Kitulo NP and changes of the livelihoods of adjacent communities after establishment of the park. Study revealed that adjacent communities would facilitate both sustainability of Kitulo NP and livelihoods of local communities. Establishment of Kitulo NP improved biodiversity conservation in the southern highlands of Tanzania. Furthermore it contributed in constructing development projects and enhancing livelihoods of neighbouring communities. It is recommended that conservation projects should be designed on appropriate and adequate incentive packages which will be suitable for motivating communities to participate effectively in conservation activities. Also it is recommended that there should be deliberate efforts to strengthen education, sensitization and awareness

creation to adjacent communities before establishing conservation activities. Deliberate measures should be taken to design proper community and participatory strategies for establishment of conservation activities.

DECLARATION

I, SEBASTIAN WILLIAM SANGA, do hereby declare to the Senate of Sokoine University of Agriculture, that this dissertation is my own original work and that it has neither been submitted nor being concurrently submitted for degree award in any other institution.

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Date

The above declaration confirmed

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(Supervisor)

Date

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LIST OF ABBREVIATIONS

| | | |
|---------|---|---|
| AIDS | - | Acquired Immune Deficiency Syndrome |
| ASL | - | Above Sea Level |
| CBC | - | Community Based Conservation |
| CBNRM | - | Community Based Natural Resources Management |
| CCS | - | Community Conservation Services |
| DC | - | District Commissioner |
| DED | - | District Executive Director |
| DFID | - | Department for International Development |
| FBD | - | Forestry and Beekeeping Division |
| FGD | - | Focused Group Discussion |
| FR | - | Forest Reserve |
| HIV | - | Human Immunodeficiency Virus |
| IRS | - | Iringa Region Secretariat |
| IUCN | - | International Union for the Conservation of Nature and Natural Resources (World Conservation Union) |
| km | - | Kilometres. |
| KNP | - | Kitulo National Park |
| MDC | - | Makete District Council |
| MDG | - | Millennium Development Goals |
| MKUKUTA | - | Mpango wa Kukuza Uchumi na Kupunguza Umaskini Tanzania |
| MLHUD | - | Ministry of Land, Housing and Urban Development |
| mm | - | Millimetres |
| NP | - | National Park |
| NSGPR | - | National Strategy for Growth and Poverty Reduction |

| | | |
|--------|---|--|
| PAs | - | Protected Areas |
| PRA | - | Participatory Rural Appraisal |
| QBI | - | Questionnaire Based Interview |
| SCIP | - | Support for Community Initiated Projects |
| SPSS | - | Statistical Package for Social Sciences |
| TANAPA | - | Tanzania National Parks Authority |
| TAS | - | Tanzanian Shillings |
| URT | - | United Republic of Tanzania |
| USA | - | United States of America |
| WCED | - | World Conservation and Environmental Development |
| WCPA | - | World Commission on Protected Areas |
| WMA | - | Wildlife Management Areas |

CHAPTER ONE

1.0 INTRODUCTION

1.1 Overview

This chapter is divided into eight sections. The first section covers the background information of the study while the second part explains the problem statement of the study and the third section contains the justification of the study problem. The fourth section provides general objective of the study. Specific objectives of this study are covered in section five. Section six comprises the research questions of the study meanwhile section seven covers the conceptual framework of the study. The last section explains the limitations of the study.

1.2 Background Information

Colonialists introduced conservation activities in Africa after 1885. These conservation activities increased after different countries gained their independence in the 1960s (Maganga, 1999, Kideghesho, 2006). Historically, when Protected Areas (PA) were established in Africa and at global level they were restricted to or completely excluded from access for use of wildlife and other forest resources by local communities whose livelihood formerly depended on them (Baldus, 1994; Colchester, 1995; Kideghesho, 2006). It is well known that accessibility to land resources and opportunities may change the livelihood of an individual or household or the entire community due to changes in norms and events in the social and institutional arrangement of their surroundings (Ellis, 2000). In this context the livelihood of most Africans who depend largely on crop farming and animal husbandry, with other activities including exploitation of forestry products, wildlife, and small scale income generation activities were affected as a result of conservation approach in wildlife (Maitima *et al.*, 2004; Madaka, 2007).

However, during the 1907 to 1960s, conservation activities were associated with management of natural resources that were necessary for livelihood such as timber, water and game animals (Bolen and Robinson, 1995). The approach was popularly referred as 'fences and fines' or 'fortress conservation' (Ntiamoa-Baidu, 2000). This approach was ineffective due to lack of attention to human needs and aspirations of local knowledge and management system and resulted into increased encroachment, serious poaching and wild habitat sabotage in various parts of Africa and especially in East Africa (Maganga, 1999; Ghai, 1995 cited in Roe *et al.*, 2000; Brockington, 2004; Agrawal and Redford, 2006). In the 1970s, the concept broadened to include natural resources with obvious values to human beings and the entire ecosystem (Bolen and Robinson, 1995). In the mid 1980s and early 1990s, conservation projects recognized that conserving wild resources is not only an

ecological issue but also a social, political and economic one as well (Rudge *et al.*, 2000; Borrini-Feyerabend *et al.*, 2004). The recognition has forced conservation development projects to adopt dual goals of conserving biodiversity and improving human welfare. Also PAs by global mandates are supposed to guard local security and providing economic benefits across multiple scales apart of those dual basic goals (Rudge *et al.*, 2000; Naughton-Treves *et al.*, 2006).

Unfortunately, the establishment of Kitulo National Park (Kitulo NP) like other protected areas in Africa resulted in restriction to access into protected area where law enforcement was instituted. Its establishment resulted into new livelihood options of the evacuated and adjacent communities with unknown implications for sustainable conservation of the Kitulo and entire ecosystem (Mwakilema and Davenport, 2005). The adjacent communities in Kitulo NP are particularly important groups that were affected by conservation measures because they were closely linked to the PAs in both time and space (Shyamsundar and Kramer, 1997).

1.3 Problem Statement and Justification

1.3.1 Problem statement

In Tanzania, there are various categories of conservation areas (PAs) basing on the level of the conservation measures. In these categories, NP ranks the highest with the primary role being conservation and it is more of preservation than conservation (URT, 1998a). NPs form the core of conservation for protected ecosystems, which have been set aside to preserve the country's rich natural heritage. It provides secured breeding grounds where the fauna and flora can thrive, safe from the conflicting interests of a growing human population (TANAPA, 2004). More than a quarter of Tanzania mainland is covered by gazetted protected areas (Walsh, 2006).

The Government of Tanzania has over years established new NPs from one in 1959 to 15 in 2005 including Kitulo which was established in 2002. Kitulo area was formerly occupied by Kitulo Dairy Farm and local community whose livelihoods depended on it. The establishment of Kitulo NP resulted into new livelihood options of the evacuated and adjacent communities with unknown implications for sustainable conservation of the ecosystem. Therefore, it remained unknown as to what extent the adjacent communities had to adopted to these new changes that affected their livelihoods including income generating activities. Furthermore, the sustainability of the livelihoods and its implication on conservation of Kitulo NP was little understood. Against this background, the need to assess the effects brought by the interventions on the livelihood of surrounding communities and sustainability of Kitulo NP was necessity.

1.3.2 Justification

Wildlife policy of 1998 advocates involvement of stakeholders in natural resources planning and participation of local communities in natural resource management. However, conservation has not been developed to its full potential especially outside protected area and rural communities have benefited little from those forms of wildlife utilization taking place in settled land (URT, 1998a). This study intended to assess the livelihood changes of adjacent communities of Kitulo NP after the establishment of the park and its implications for sustainable conservation. The information generated is expected to assist stakeholders in improving new livelihood strategies to address the existing challenges facing adjacent communities and conservation of the Kitulo NP. The beneficiaries of this study include government of Tanzania, Tanzania National Parks (TANAPA), non-governmental organisations, researchers and local people.

The study is in line with the Millennium Development Goals (MDGs) number one and seven which call for eradication of extreme poverty, hunger and ensuring sustainability of the environment. Also the study is in line with National Strategy for Growth and Reduction of Poverty (NSGRP) Cluster Number two, goal number three which call for improving the livelihood of the community and environmental conservation.

The major part of the study provides understanding of the challenges in the study area and thus better equips the stakeholders in addressing the challenges that are in place. The findings of this study also will be helpful to the Tanzania government planners, for policy makers, and other important information for Kitulo NP management.

1.4 Objectives

1.4.1 General objective

The general objective of this study was to assess the community livelihood changes and its implication for sustainable conservation of Kitulo National Park.

1.4.2 Specific objectives

- i. To examine the community attitude towards the establishment of Kitulo National Park
- ii. To document livelihood changes before and after the establishment of Kitulo National Park
- iii. To determine the suitability of livelihoods options to community wellbeing after the establishment of Kitulo National Park.
- iv. To evaluate the potential impacts of the new livelihood options after the establishment of the Park on the sustainability of Kitulo National Park.

1.5 Research Questions

- i. What is the attitude of the community towards the establishment of the Kitulo National Park?
- ii. How sustainable are the new livelihood options?
- iii. Who has lost and who has gained what

1.6 Conceptual Framework

According to Katani (1999), a conceptual framework binds facts together and provides guidance towards the collection of appropriate data or information. The conceptual framework applied in this research is the Department For International Development (DFID) asset pentagon (sustainable livelihoods framework) but some modification have been made in order to cope with the study of assessment of Kitulo NP after the changes of livelihood assets of local communities.

This study adopts the conceptual framework developed by DFID in 1999. This conceptual framework was adopted because it resembles issues that are dealt with this study. The conceptual framework of this study entails the livelihood assets which change and influence the transformations of structures which lead to changes of strategies of different livelihoods. The transformed structures lead to the formulation of new options of livelihoods due to new regulations, rules and structures of the area concerned.

The assets like human capital (labour) were assessed in order to determine the knowledge, and housing and health services. The assessment of natural capital was concentrated on land, water, livestock, forestry and wildlife. For social capital, community association were assessed in order to determine net working (groups), leadership and empowerment. The physical capital was assessed in order to determine transport facilities, market, types of

houses, and individual farm equipments (Machetes, hoes etc), utensils and furniture. Moreover, financial capital was assessed in order to determine the income of the people before and after the changes of their livelihoods. Therefore, the sustainability of Kitulo NP depends on the impact of its establishment and the changes of people's livelihood assets and the consequence of this change on conservation.

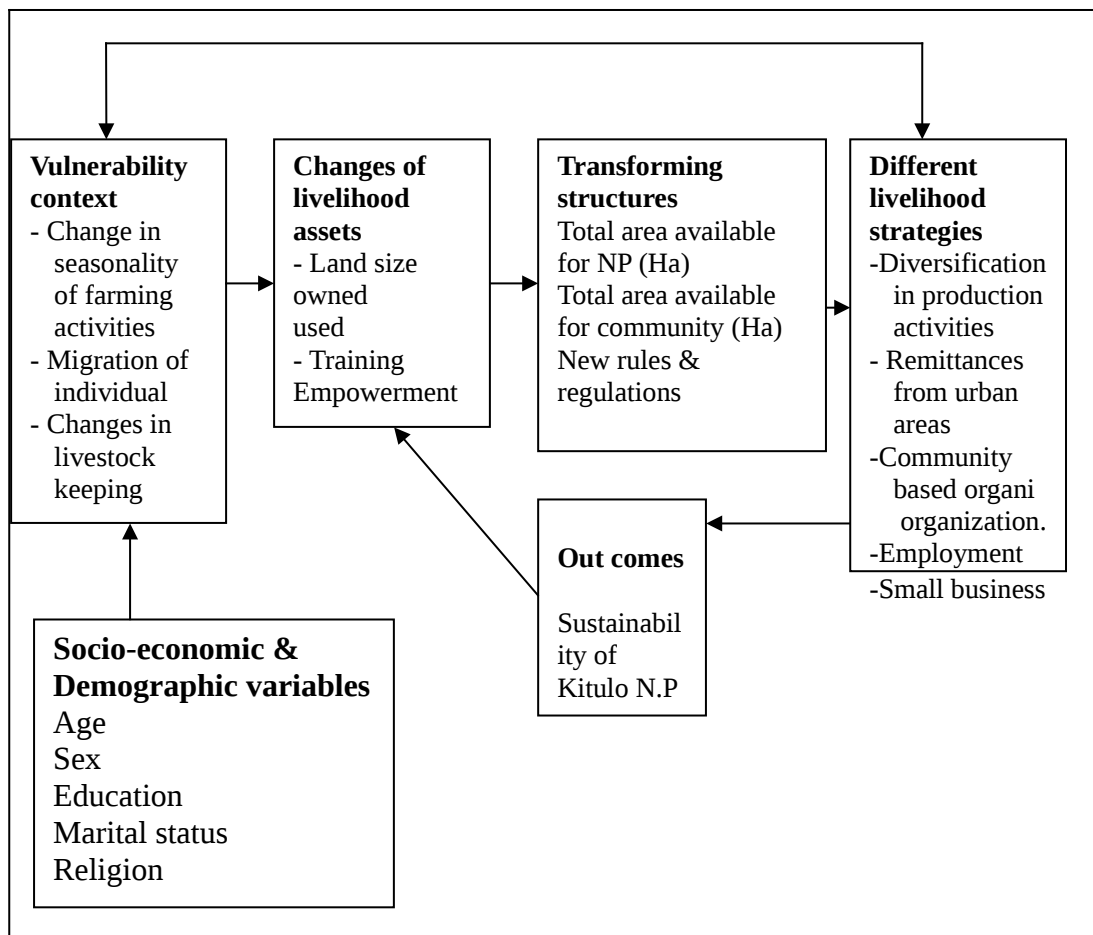


Figure 1: Conceptual framework of the study (DFID, 1999)

1.7 Limitations of the Study

In the course of conducting this study the researcher encountered the following limitations:

- i). First, the majority of the people had low level of education which created difficulties during the interviewing process. This was counteracted by participant observation and exhaustive clarification was provided.
- ii). Another problem experienced was data recalling which depended on the respondent's capacity to remember past events. For example, there were notable difficulties for respondents to give the date or year when the Kitulo Dairy Farm was established and how the process was conducted in terms of compensation and how boundaries were set in general. This problem was minimized by clarification obtained from PRA techniques, literature review, key informants, focused group discussion and direct observation. Furthermore, Kajembe (1988) as cited by Kigula (2006) pointed out that, the information based on memory cannot be reliable but if no records exist it may be the only way to get at least an idea of change.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

This chapter is divided into seven sections with the first one covering definition of key concepts. The second section gives a review of conservation strategies in the world and in Tanzania. The third section explains human activities and natural resources conservation. Meanwhile, the fourth section explains conservation and livelihood. The fifth section describes the effects of establishment of protected areas on local communities. The sixth section describes the protected areas and poverty reduction. The last section explains the status of livelihood and conservation research in the world and in Tanzania.

2.2 Definition of Key Concepts

2.2.1 Conservation

Conservation means the act of protecting and sustainable utilising biodiversity (URT, 1998a). According to IUCN (1980) conservation is defined as the management of human use of biosphere that may yield the greatest sustainable benefit to the present generation while maintaining its potential to meet the needs and aspirations of the future generations. Thus conservation involves sustainable land use systems, the preservation of species with actual potential benefits to human beings and conservation for non-economical reasons (URT, 1997). To achieve the above objectives, the world has come up with conservation strategies aimed at maintaining essential ecological processes and life-supporting systems on which human survival and development depend through preservation of genetic resources and ensuring sustainable utilization of species and ecosystems (IUCN, 1980, 1991).

Therefore conservation is the wise maintenance and utilization of the earth's surfaces whereby there is a need to plan for resources management on the basis of accurate inventory and the need to take protective measures to ensure that resources do not become exhausted. The definition was adopted in the study because the new livelihood options in the study area need to plan and utilize resources with carefully management of small pieces of land they had in order to sustain their livelihoods within their areas. In addition to that conservation in Kitulo NP it lead to the presence of forests which enhances water flow from the mountains or highlands of the area throughout the year due to vegetation cover, which act as the sponge, storing, preserving and releasing water gradually (Lovett *et al.*, 1996). Therefore the improvement in conserving environment will automatically change the climatic condition which will lead to stabilization of hydrological function, soil protection, and preservation of traditional and cultural values and maintenance of a quality living environment.

2.2.2 Livelihood

Livelihood is defined as the activities, assets, and access that jointly determine the living gained. Assets include human, physical, social, financial, and natural capital (Carney, 1998; Ongugo *et al.*, 2008). Carney (1998) further states that, rural livelihood diversification is the process by which household diverse portfolio of activities and social support capabilities for survival in order to improve their standard of living.

Carney (1998) suggested that in promoting sustainable livelihoods, the concentration of current livelihoods and future livelihoods should be observed. Further, he suggested that the concept of sustainable community livelihoods is normative, it start with people, and does not compromise on the environment. However, conservation of environmental resources can be improved in areas where social factors which influence people interaction

with environment are well addressed, such as access to natural resources, level of decision making and empowerment (Ghai, 1994).

Generally livelihood deals with lives of the people, their resources and what they do with the resources to improve their living standards. Therefore, sustainable livelihood is one that can cope with and recover from stresses and shocks to maintain or enhance its capabilities and assets while not undermining the natural resource base (Carney, 1998). Generally livelihood in this work can be explained as the capabilities and assets which including both material and social resources as the activities required for a means of living. The definition was adopted as the study was dealing with lives of people on how they have changed their activities as the means of living after the establishment of Kitulo NP and how they could support the sustainability of the park.

2.2.3 Community

Community can be defined into two ways according to the needs. The first one is spatial community which is an entity usually bound by cultural identity living within a defined spatial boundary and having a common economic interest in the resources of an area (Hulme and Murphree, 2000). The second one is community of interest which is the one with different cultural identity living in different locality but having the common economic interest to the common resources which sometimes it is not near to their locality (Hulme and Murphree, 2000). For the case of this study, the first definition was adopted whereby community is a human group sharing a territory and involved in different and related aspects of livelihoods such as managing natural resources, producing knowledge and culture, and developing productive technologies and practices.

2.2.4 Sustainability

Sustainability could be twisted to consider only humans' interests and furthermore it could be defined in ways that force humans (*Homo sapiens*) out of the picture altogether, as in the observations of some "critical ecologists" who considers human as a cancer on the Earth through their actions (Prugh and Assadourian, 2003; Adams and Hutton, 2007). In spite of that, all people in all cultures try to improve their lives and conditions; the process is often termed as development and to achieve sustainability it requires sustainable development.

Sustainability and sustainable development are multi-disciplinary ideologies and have four key elements; economic, institutional, social and environmental, thus craft many different definitions. Despite of those controversies, definitions should incorporate the following; living within the limits and understanding the interconnections among economy, society, and environment. Also, it should incorporate equitable distribution of resources and opportunities (Prugh and Assadourian, 2003).

According to WCED (1987) cited by Bhalla (1992), a world accepted definition of sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Therefore, in this context, sustainability refers to the ability to maintain productivity when the ecosystem is disturbed. Environmental resources are the foundation for human survival and development. In addition using resources and maintaining the ecosystem in a sustainable way to satisfy basic human needs both now and in the future help to achieve sustainable development. Generally sustainable development requires people to adjust their lifestyle according to the requirements for sustainability and to control their own consumption on an ecological basis.

2.2.5 Protected areas

According to IUCN (1994), a protected area could be defined as “*an area of land or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means*”. Protected areas also can be defined as the means of an area set aside and managed under the appropriate legislation for wildlife and other biological natural resources conservation (URT, 1998).

In Tanzania, there are various categories of PAs which include; wildlife, forest and marine designated areas. According to FBD (2006) there are three types of wildlife designated areas which are national parks, game reserves and game controlled areas. National parks are reserves with high conservation status thus only non-consumptive utilisation are allowed which mean that the areas are set exclusively for conservation purposes. Non-consumptive utilisation allowed including wildlife viewing, photographic and walking safaris, research and educational expeditions. NPs are under central government through her parastatal “*Tanzania National Parks Authorities.*”

The second type is known as game reserves which are/were established for the conservation and sustainable utilisation of wildlife resources. It is in this category where tourist hunting is allowed within ‘hunting blocks’. The conservation type is governed by government through ministry of natural resources and tourism- wildlife department. The last type is termed as game controlled areas where despite of being under control of central government through wildlife department; people, livestock grazing apart of other utilisation of wildlife resources are allowed. There are about four options of forest designated areas in Tanzania which are further broken-down depending to the needs/interest of the country. These options are national forests with four types of reserves,

local authority forest reserves with two reserves and lastly are village forest reserves with three reserves and private forests with two options.

2.2.5.1 National parks

National park is defined as *natural areas of land and/or sea, designated to protect the ecological integrity of one or more ecosystems for present and future generations*. Moreover, NP excludes exploitation or occupation inimical to the purposes of designation of the area and provides a foundation for spiritual, scientific, educational and recreational and visitor opportunities, all of which must be environmentally and culturally compatible (IUCN, 1994).

National park is second among six categories of PAs based on IUCN (1994) management categories (is the first category in Tanzania) hence more restrictive management strategies and in most cases is governed by central government. The highest competent authority of the country which has jurisdiction over the NP usually take steps to prevent or eliminate exploitation or occupation in the area and enforce the respect of ecological, geomorphologic and aesthetic features that has led to its establishment. Because of that setting, local support is not necessarily vital for the survival of those types of protected areas. Conservation of these protected areas can be imposed despite local opposition and protected areas can flourish notwithstanding resistance to them (Brockington, 2004). Therefore, according to Brockington (2004) rural poverty and injustice do not undermine the foundations of conservation.

2.3 A Review of Conservation Strategies

2.3.1 A Review of conservation strategies in the world

According to Colchester (1995) and Kideghesho (2006), in the late 19th century in America, the conservation concept was viewed that wildlife areas should be set aside for

human enjoyment and livelihoods fulfilment. This concept laid the basis for national parks systems in the USA and the pattern of conservation globally. The concept was associated with the premise that no human being not even native ones, should live inside its borders.

This approach denies local people's traditional rights to access and use of natural resources in their vicinity. This management policy has been characterized by alienation policies. This type of conservation philosophy was against local communities and it excluded all human dimensions from most economical studies. The philosophy was mainly based on making PAs ecological entities (Baldus, 1994; Maganga, 1999; Brockington, 2004; Agrawal and Redford, 2006; Kideghesho, 2006). In the mid 1980s, the philosophy lost its validity in the face of changing social and economic circumstances. According to Arquiza (2004), community based management is becoming the most acceptable approach to PAs. The strategy allows people living in and around NPs to participate in management efforts, as opposed to the "fortress conservation" mentality of the past (Arquiza, 2004).

2.3.2 A review of conservation strategies in Tanzania

Historically, the Wildlife Act of 1974 marginalized local communities by depriving them of the benefits that could be accrued from wildlife (Sachedina, 2006). Also the extension of the fences and fines management approach into village land further creates a notion to villagers that Tanzania National Park (TANAPA) cares more about wildlife than human welfare (Maganga, 1999; Sachedina, 2006). The reality is that in most of the reserved areas community members do not directly benefit from co-existence with national parks. Failure of the reserve areas authorities to create opportunities and environment for their surrounding villager to access natural resources has forced the villagers to encroach the reserved land and exploits the resources (Maganga, 1999).

Due to those narrated consequences, TANAPA in 1991 established a park neighbourhood programme known as *Community Conservation Service (CCS)* under which social services are provided for communities near to the park such as the construction of school buildings, water schemes, health centres and infrastructures such as roads (TANAPA, 2007). Moreover, TANAPA in 1992 established a *Support for Community Initiated Projects (SCIP)* fund whereby the programmes work with communities surrounding the National Parks and stresses the support for community initiated projects. In these programmes National Park contributes up to 70% of the project cost and the community contributes the remaining 30% (TANAPA, 2007).

Again the government of Tanzania in 1998 established a wildlife policy in order to curb the situation. The Wildlife Policy of 1998 has suggested a number of strategies for protecting, conserving and managing biodiversity (URT, 1998). Integrating wildlife conservation and rural development is a key option. One of the strategies is the establishment of the new category of conservation area called Wildlife Management Areas (WMAs) for the purpose of promoting the community based conservation (CBC) (Sachedina, 2006).

WMAs are in the strict sense not protected areas but rather quasi-protected areas for which rural/local communities can obtain use rights in order to manage and utilise the wildlife. The practice initiative provides opportunity for communities to access natural resources and have sustainable utilisation for enhancement of rural development. It is estimated that 3.5 million people in 44 districts of Tanzania Mainland depend on areas that are pilot WMAs for part of their income (Severre, 2000). Currently, Tanzania has 15 national parks as shown in Table 1 below.

Table 1: National parks of Tanzania

| S/n | National Park | Area (km ²) | Height (Meters) | Vegetation (Type) | Designation (Year) |
|-----|-------------------|----------------------------|--------------------|---------------------------------|-----------------------|
| 1 | Arusha | 137 | 1525-4565 | Dense forest | 1967 |
| 2 | Gombe stream | 52 | 750-1 500 | Miombo forest; grassland | 1968 |
| 3 | Katavi | 2 253 | 900 | Miombo woodland | 1974 |
| 4 | Kitulo | 442 | 1600-2961 | Montane forest and grassland | 2002 |
| 5 | Lake Manyara | 325 | 960-1478 | Forest; grasslands | 1960 |
| 6 | Mahale Mountain | 1 613 | 780-2462 | Miombo woodland | 1985 |
| 7 | Mikumi | 3 230 | 500-1257 | Miombo; acacia | 1964 |
| 8 | Mkomazi | 3270 | 630-1630 | Open plains; thorn bushes | 2005 |
| 9 | Mount Kilimanjaro | 755 | 1830-5896 | Forest; moorland | 1973 |
| 10 | Ruaha | 23 000 | 750-1830 | Grassland; swamp; miombo | 1964 |
| 11 | Rubondo Island | 457 | 1130 | Evergreen forest | 1977 |
| 12 | Saadani | 1062 | 0 - 50 | Savannah; grassland | 2002 |
| 13 | Serengeti | 14 760 | 950-1850 | Grassland; acacia savannah | 1951 |
| 14 | Tarangire | 2 600 | 1100-1500 | Mixed zones | 1970 |
| 15 | Udzungwa Mountain | 1 000 | 300-2800 | Mixed forest | 1992 |

Source: MLHUD, 1999; University of Glasgow, 2001.

2.4 Human Activities and Natural Resources Conservation

Human activities vary depending on local conditions and type of society. Different societies behave and act differently basing on the prevailing traditions, beliefs, educational level and economic status (Kilahama, 2006). Communities rely on natural resources among many, for animal protein, pasture, agricultural products, timber, firewood and charcoal energy and recreational activities (Madaka, 2007). Well educated and wealthier societies act and perceive things differently compared to less educated and poor societies. These differences in perceptions over natural resources utilization are creating much pressure that impacts the ecosystem integrity.

In rural areas, the majority of its people are poor and illiterate or semi illiterate hence production and consumption patterns are mainly based on land resources with devastating impacts. Even on that, there is a difference in consumption pattern of the local communities in relation to local environment and its natural endowment. Their goods and

services produced by their daily activities are dedicated upon by prevailing environmental conditions (Bhalla, 1992; Kilahama, 2006). According to Bhalla (1992) the major causes of environmental destruction are poverty, population pressure, consumption pattern, energy and technology. All in all, poverty has been singled out to be the major cause of effect of global environmental problems as other factors mentioned are dependent on it in causal-effect relationship (Bhalla, 1992).

2.5 Conservation and Livelihoods

The World Parks Congress held in 2003 South Africa emphasized the link between the conservation of natural resources and sustainable livelihood to the extent that it called for the inclusion of cultural and spiritual values in parks preservation and maintenances. One of the suggested link is community based natural resources management (CBNRM) which involves the management of land and natural resources such as pastures, forests, fish, wildlife, and water by groups of rural people through their local institutions (Sachedina, 2006). This has been popularized as a mechanism for management of natural resources to safeguard livelihoods of local communities.

The importance of traditional knowledge in community based natural resources management can be illustrated by the *Sukuma* people living in Shinyanga region- Tanzania. The *Sukum*s have used traditional forms of conservation (*Ngitiri* system of land management) to restore the natural resources as well as the livelihoods of the rural community.

According to IUCN (2004), community based management system such as the one currently done in Palawan in the Philippines is becoming the most acceptable approach to protected areas. The strategy allows local people and the support of various institutions and local governments living in and around national parks to participate in management efforts

as opposed to the “fortress conservation” mentality of the past that often removed people from protected zones (Arquiza, 2004).

The involvement of local communities in conservation activities improved to reduce destructive activities in conserved areas. Cagayancillo in the Philippines has received more than Sterling Pound (£) 600 000/- since fees were collected (Arquiza, 2004). The money went to loans to seaweed farmers and other entrepreneurs, on condition that they will not engage in environmentally destructive activities. Some of the funds were also used to build a concrete farm-to-market road in the far-flung municipality.

Also, Kenya’s indigenous forests are home of many communities whose livelihoods depended on natural resources. Approximately 2.9 million people live adjacent to forests in Kenya (Wass, 1995). Recently it is internationally recognized that community participation in forests management can contribute to reduce the over exploitation of forest resources. Conservation of environmental resources can be improved in areas where social factors which influence people interaction with environment are well addressed, such as access to natural resources, level of decision making and empowerment (Ghai, 1994). Therefore, in Kenya there are some levels of community participation in forest management such as revenue sharing in NPs (only operate in a few parks) and permitted use under government control such as the forest reserve. According to (IUCN, 1986; IUCN, 2003) the Mpanga/Kipengere Game Reserve Project is currently undertaking the demarcation of reserve boundaries in order to provide patrols of the area and to develop Community Based Conservation (CBC) efforts in order to integrate the protection of natural resources with the future of local people. Public meetings and discussions with local community leaders have highlighted that Income Generating Activities that do not conflict with the conservation goal are possible (URT, 1998). These might include ecotourism, beekeeping,

gardening, timber-tree, crop, livestock and fish farming (Ghai, 1994; IUCN, 2003 and Brockington (2004). Building the capacities of Village Environmental Committees will allow them to establish and manage such alternative schemes as tree nurseries, reforestation initiatives and integration of environmental conservation with farming activities (IUCN, 1986; IUCN, 2003).

2.6 Effects of Establishment of Protected Areas on Local Communities

The World Conservation Union (IUCN, 1994), defines protected areas as “*areas of land or sea dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources, managed through legal or other effective means*”. In addition, PAs could be further classified into six management categories (I-VI), reflecting the broad purpose of designation.

These categories determine protected area status and governance as other PA restrict access whereas others allow sustainable use to resources. One of the PA with high status is called national park and according to World Conservation Union (IUCN, 1994) are “*relatively large areas, which contain representative samples of major natural regions, features, or scenery where plant and animal species, geomorphologic sites and habitats are of special scientific, educational and recreational interest*”. Usually, they contain one or several entire ecosystems that are protected from alteration by human exploitation or occupation.

Moreover, NP excludes exploitation or occupation detrimental to the purposes of designation of the area and provides a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible (WCPA, 2000). It has been determined that PAs designated under the more restrictive IUCN protected area management categories (I-II viz. Strict protection i.e. strict

nature reserve/wilderness area and ecosystem conservation and recreation i.e. national park respectively) are more effective at reducing habitat destruction than those which include a focus on sustainable use (V-VI) (Coad *et al.*, 2008a).

Actually, PAs represent the heart of the world's political and economic commitment to conserve biodiversity and other natural and related cultural resources (Borrini-Feyerabend *et al.*, 2004; Adams and Hutton, 2007). Also PAs is very important because it facilitates to protect the ecological integrity of one or more ecosystems for present and future generations. Moreover, PAs help to exclude exploitation or occupation of inimical to the purposes of designation of the area. Despite of that, protected areas have a long history of conflict with local communities largely because of exclusion to access to natural resources and/or forced relocation/displacement (Wanitzek and Sipel 1998; Igoe, 2006; Adams and Hutton, 2007).

The establishment of PAs especially those with more restrictive IUCN protected area management categories (categories I and II which are of high status) were and are more associated with what is termed as conservation displacement. Conservation displacement include two processes which are eviction/displacement and/or restriction to access and use of resources that had been freely available to local and indigenous communities through legislation, enforcement, and privatization (West, *et al.*, 2006; Brockington and Igoe, 2006; Adams and Hutton, 2007; Coad *et al.*, 2008b).

The above scenario could be elaborated to include loss of rights to residence, use land and resources, foreclosure of rights to future use and loss of non-consumptive use values, including access to places of religious or cultural value (Adams and Hutton, 2007). The situation leads to conflicts, economic loss, and destroy traditional land tenure systems

resulting in altering land-use rights (West *et al.*, 2006). In the process, the local traditions of resource conservation and management have been disrupted or broken down altogether.

Thus establishment of most NPs and PAs in general had tremendous negative effects on their prior inhabitants and sometime/ somehow to the environment in general. The tremendous negative effects are caused by the fact that, those people have to forcibly abandon their traditional way of living and adopting new life style, for example pastoralist and farmers who practiced shifting cultivation; had troubled in adapting a sedentary life (Borrini-Feyerabend *et al.*, 2004), with similarly tragic results, including for the ecology of the settlement areas.

Also communities had been disrupted and impoverished by being forced to abandon the use of resources upon which their livelihoods entirely depended, the action often taken without any redress through something like compensations (Borrini-Feyerabend *et al.*, 2004). Although, according to Scudder and Colson (1982) cited by Colchester (1995) compensation is usually inadequate and is compounded by the fact that people unused to land markets often squander cash compensation improvidently. Again no amount of money can compensate these losses as local communities depend entirely on the land and land resources for their dare survival (Colchester, 1995).

Furthermore, there are more direct impacts on livelihoods as a result of conservation displacement. Forced resettlement exposes both affected and receiving communities to a wide range of risks of impoverishment. These might include landlessness, economic marginalisation, joblessness, food insecurity, homelessness, increased morbidity and mortality, loss of access to common property and services and social dislodgment (Adams and Hutton, 2007; Coad *et al.*, 2008b).

These negative consequences of protected areas are part of a whole variety of social, economic and political consequences many of which are more positive (West *et al.*, 2006; Brockington and Igoe, 2006). Of course, PAs also bring benefits. Most fundamentally, perhaps, people locally and regionally can benefit through ecosystem services. The Millennium Ecosystem Assessment identified four kinds of service; provisioning services such as food, water, timber and genetic resources; regulating services such as waste treatment or the regulation of climate or flooding; cultural services such as recreation and aesthetic enjoyment; and supporting services such as soil formation, nutrient cycling and plant pollination (Adams and Hutton, 2007). Furthermore, PAs provides the symbols to unite and forge nations (West *et al.*, 2006; Brockington and Igoe, 2006).

There are problems associated with these advantages of conservation. These includes; most conservation costs are felt in terms of access to natural capital while for benefits, are experienced frequently in terms of financial and physical capital (Igoe, 2006). Because these advantages are not tangible and as local communities are very poor who are just seeking day bread for their survival they are just neglected and abandoned. In broad-spectrum the effects of conservation through PAs are too diverse merely to be categorised as 'good' or 'bad' (West *et al.*, 2006; Brockington and Igoe, 2006).

2.7 Protected Areas and Poverty Reduction

Despite of the negative consequences associated with the establishment and management of PAs to local communities, they could be useful in assisting poverty reduction to those affected communities. Among factors which could be utilized in the process might include; receiving a share of revenues from tourist fees and from related economic activities (e.g. tourist facilities) and direct employment. Also, may include, community equity or profit-share schemes, or independent locally owned commercial activities (such as selling

curios, food or cultural performances to tourists) (West *et al.*, 2006; Brockington and Igoe, 2006; Adams and Hutton, 2007).

Even though there are many opportunities available (as pointed above) to local communities to engage themselves in order to cover-up what was taken by the creation of PAs, they are unable to do so. Most of local communities failed to realise the potential benefits of conservation through PAs because they lack the ability to convert different kinds of capital (e.g., to use social capital to gain access to financial capital and sometimes vice versa) (Igoe, 2006). Also, according to Igoe (2006), social and human capitals are very important in this regard.

Uneven distribution of social and human capital within communities is likely to result in an uneven distribution of the benefits from community conservation interventions (especially if they are externally driven) (West *et al.*, 2006; and Coad *et al.*, 2008b). There are various hypotheses regarding these phenomena. The hypotheses are as follows;

- i) First, some groups within communities are likely to have experienced the costs of evictions more than others. First, between indigenous groups, some indigenous people are more indigenous than others. Secondly, indigenous people are not always the most marginal people displaced and impoverished by protected areas (West *et al.*, 2006; Igoe, 2006).
- ii) Secondly, evictions are likely to have unevenly affected different groups within households, especially as men are usually better positioned than women to take advantage of more distant types of economic opportunities, and as women are often directly dependent on access to natural resources for cooking fuel, building

materials, and traditional medicine while men control the use and marketing of the products and incomes (West *et al.*, 2006; Igoe, 2006; Coad *et al.*, 2008b). Also

Igoe (2006) has stipulated other hypothesis as follows:

- iii) Third, some groups within communities are better positioned to take advantage of conservation benefits than others, and these are often not the same groups who have borne the biggest costs of conservation.
- iv) Fourth, some communities are better positioned to take advantage of conservation benefits than other communities.
- v) Finally, conservation benefits do not usually strengthen the types of livelihoods that were weakened by exclusion from PAs.

As such, the possibility of the benefits of community conservation offsetting the costs of protected area exclusion depends on conditions allowing people to translate access to new kinds of capital into positive livelihood outcomes, and on people actually taking advantage of these conditions (Igoe, 2006). Nevertheless, regardless what have been narrated above, the local communities' relationships to the environment have profound implications for conservation especially conserving PAs (West *et al.*, 2006).

2.8 Status of Livelihood and Conservation Research

2.8.1 Status of livelihood and conservation research in the world

Conservation and livelihoods research in the world had been conducted in order to come up with better suggestion on how to utilize the resources without exhausted of resources. Arquiza (2004) conducting a research in Philippine for the purposes of addressing the study of local people as the key to thriving forests. The study revealed that in Philippine protected areas had been successfully due to participation of local communities and the support of various institutions such as academe, non governmental organizations and local

government as the result destructive activities like over harvesting of rattan, the cutting of wood for charcoal and collection of native orchids decreased.

Also Ongugo *et al.*, 2008 conducted a research concerning the livelihoods, natural resources entitlements and protected areas. The study was conducted in Mount Elgon forests in Kenya whereby approximately 2.9 million people live adjacent to the forests. They ended with the suggestions that there is a need to have participatory conservation between the government and local people. World Bank 1998 conducted a research on protected areas for biodiversity conservation which was conducted in western Uganda. The case study focus on the socio-cultural context of communities in and around protected areas as national parks and game reserves. In case of Bwindi-Mgahinga gorilla forests and Karuma game reserve ended by suggested that sharing of revenue and formulation of institutional reforms whereby socially and economically will be empowered. Also the study recommended that active involvement of communities that live in and around protected areas can play a vital role in the overall management of protected area. This work well if there is a degree of transparency in the management including revenue realised from protected areas. Local communities are better police to police themselves.

2.8.2 Status of livelihood and conservation research in Tanzania

Research in livelihood and conservation in Tanzania was conducted by Gillingham and Lee (1999). Their research looked on the impact of wildlife related benefits on the conservation attitudes of local people around the Selous game reserve in south eastern of Tanzania which intended to observe the relationship of conservation and local people. How they perceived conservation activities and how they benefited from conservation projects. Frontier Tanzania 2003 also conducted a research in southern highlands of Mpanga Kipengere game reserve which located in Njombe and Makete. The purpose of the research

was to know the exactly biodiversity value and how the local communities benefits from the conservation. Moreover Sachedina conducted a research in 2006 concerning conservation, land rights and livelihoods in the Tarangire NP ecosystem of Tanzania. The study was specifically addressing the issue of land for pastoralist with conservation activities.

The research ended by suggested the formulation of community based natural resource management for the betterment of the park and local communities. Therefore it is evident from the above studies that community livelihood changes and their implications for sustainable conservation were not well addressed. Many of studies cover on forest, biodiversity and pastoralists. These findings are also important in Kitulo NP whereby it addressed well the issue of community livelihood changes and their implications for sustainable conservation of Kitulo NP. The findings of this study are very crucial due to the fact that Kitulo NP is only seven years since its establishment and it is still in the processes of establishment.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Overview

This chapter is divided into six sections, the first section give a detailed account of the descriptions of the study area including location, climate, vegetation, wildlife, population characteristics, socio-economic activities and the history of establishment of Kitulo NP. The second section covers the research design which includes research phases and sampling strategies. Either the third section involved data collection methods which include FGD, checklist and questionnaire survey. The fourth section covered the secondary data meanwhile types of data are presented in section five. The last section covered by data analysis whereby qualitative and quantitative data analyses were processed.

3.2 Description of the Study Area

3.2.1 Location

Kitulo NP is located in the Southern highlands of Tanzania between the Poroto, Livingstone and Kipengere mountain ranges in two regions of Mbeya and Iringa. Administratively, it is located in three districts of Mbeya Rural and Rungwe (Mbeya region) and Makete (Iringa region) (Mwakilema and Davenport, 2005). This study was conducted in Makete district as it forms largest part of the Kitulo NP. Makete district is located between 80° 45' and 90° 45' E and 33° 45' and 34° 50' S with a total area of about 5000 km² (Mapunda, 2007). In Makete Kitulo NP spreads into three divisions namely Ikuwo, Magoma and Matamba and covers an area approximately 412 km². The park headquarters are situated at Matamba village approximately 100 km east of Mbeya City and 78 km from Chimala Township along Dar es Salaam-Lusaka highway (TANAPA, 2007).

Kitulo was selected for the study due to its potential ecological areas of floral and fauna. Therefore, due to its potentials in 2002 the government of Tanzania decided to establish it as a NP in order to conserve the area. The area is locally referred to as the *Bustani ya Mungu* (The Garden of God) while botanists have referred as the Serengeti of flowers, simply because the area hosts one of the great floral spectacles of the world, (Mwakilema and Davenport, 2005) Other important resources located in the area are well-watered volcanic soils which support the largest and most important montane grassland community in Tanzania, sources of rivers (watersheds for the Great Ruaha River). Also there are fauna resources such as Denham's bustard, Blue Swallow and the highland Mangabey Monkey, (TANAPA, 2004; Mwakilema and Davenport, 2005). The area was a general land even though part of the land was owned by Kitulo Dairy Farm Company since 1965. Generally the area was used by both the Company and local communities in the vicinity for various generating income activities (TANAPA, 2004; Mwakilema and Davenport, 2005).

3.1.2 Climate

Kitulo NP peak lies between altitudes 1600 m to 2961 m above sea level between the rugged peaks of the Kipengere, Poroto and Livingstone mountains (Mwakilema and Davenport, 2005). There is a single rainy season which starts in late November to April with the annual rainfall range of 1500 mm to 2900 mm per year (Frontier Tanzania, 2003; TANAPA, 2004). The minimum temperature is 10°C and the maximum temperature is 22°C. Frost is common on the highest altitudes between May and August. Due to its location in the highlands and higher amount of rainfall, Kitulo NP is recognized for its value as a water catchments area and its high biodiversity of flora and fauna (Frontier Tanzania, 2003; Mwakilema and Davenport, 2005).

3.1.3 Vegetation

The well-watered volcanic soils of Kitulo support the largest and most important Bamboo forest, montane forest and grassland community in Tanzania (Mwakilema and Davenport, 2005). Kitulo NP is a botanist and hikers paradise. It is the first national park in tropical Africa to be gazetted largely for its floral significance. As the newest national park, in Tanzania, Kitulo NP is indeed a rare botanical marvel, home to a full 350 species of vascular plants, including 45 varieties of terrestrial orchids, which erupt into a wildflower display and diversity during the rainy season of late November to April (TANAPA, 2004; Mwakilema and Davenport, 2005). Other valuable flowers include yellow-orange, red-hot poker and variety of aloes, protease, geraniums, giant lobelias, lilies and aster daisies, of which more than 30 species are endemic to southern Tanzania (TANAPA, 2004). Also, the area includes two of the neighbouring forest reserves namely Numbe Forest Reserve (FR) and Livingstone FR (Mwakilema and Davenport, 2005). Other natural resources available are fertile soil, water, forests, grasses (thatching materials and pasture) and local medicinal plants.

3.1.4 Wildlife

Big games are sparsely represented through a few mountain reedbuck and eland which still roam the open grassland as are the highly alluring birds. The park is the only home to rare Denham's bastard. There is also a breeding colony of the endangered blue swallow and other restricted species like mountain Marsh widow, Njombe cisticola and Kipengere seedeater. Endemic species of butterfly, chameleon, lizard and frog further enrich the biological wealth of the park (TANAPA, 2004; Mwakilema and Davenport, 2005).

3.1.5 Population characteristics

Makete District has a population of 105 775 of which 57 398 are females and 48 377 are males (URT, 2002). The average annual growth rate of population in the district is 0.2%

less than the Iringa regional rate which is 1.6% and that of the national average which is 2.9% (URT, 2002). The main reason for the low average growth rate is high prevalence of HIV/AIDS which is 16.9% while the average region prevalence rate is about 14.7% (IRS, 2008). Also, the average annual growth rate is low due to out-migration of the people to urban centres such as Njombe, Mbeya, Iringa and Dar es Salaam. Various ethnic groups found in this district such as Kinga, Wanji, Sangu, Bena, Safwa, Nyakyusa, Malila, Pangwa and Kissi but the major tribes are the Kinga and Wanji. The two divisions which are involved in this study have a population of about 36 140 people with Matamba having 25 448 and Magoma 10 692 people (URT, 2002).

3.1.6 Socio-economic activities

The district has two agro-ecological zones, namely the Highland and Lowland zones (Mapunda, 2007). The main economic activity in the district is agriculture whereby the majority of the people are subsistence peasants. Farming areas are often located around the homesteads and some located away from the family home in periodically with well-watered volcanic soils. The major means of survival for local people include agriculture, sale of forest products, livestock keeping, fishing activity, craft making, bee keeping and petty trading (Neil and Baker, 2008). Fishing activities are conducted in big rivers such as Luvanyina, Nyitula, Missi, Numbe, and Ndyuda by using local methods such as hooks. The peasants in this area cultivate both food crops and cash crops. Cash crops includes pyrethrum, coffee and exotic forests for timber while food crops include wheat, maize, beans, round potatoes, sweet potatoes, peas, millet and sorghum (Mwakilema and Davenport, 2005). Almost all the land in this area is cultivated by using hand hoes.

3.1.7 History of establishment of Kitulo NP

Kitulo National Park was established in 2002. The area is locally referred to as the *Bustani ya Mungu* (The Garden of God). It is home of the most important watersheds for the Great Ruaha River, which drives two hydroelectric power stations namely Kidatu and Mtera that supply over half of Tanzanian electricity (Mtahiko *et al.*, 2006). The area was a general land with part of it was owned by Kitulo Dairy Farm Company since 1965. According to Mwakilema and Davenport (2005), the area was used by the company and adjacent communities for various activities including grazing (mainly cattle, sheep, wool sheep, goats and horses), cultivation (mostly maize, pyrethrum and round potato), logging and charcoal burning. Other activities include collection of edible orchid tuber (locally known as *chikanda*) for consumption and served as one of the key produce for commercial purposes. The produces were exported to nearby country of Malawi and Zambia (Mapunda, 2007).

3.2 Research Design

A cross-sectional research design was adopted during data collection. Data were collected at a single point in time from selected samples of respondents to represent some large population as suggested by Kajembe (1994) and Bernard (1996). This design was adopted for the study because it is economical in time and funds. Also it is suitable for descriptive analysis and for determining the relationships among various variables.

3.2.1 Research phases

The study was carried out in two phases; namely reconnaissance survey and data collection. The purpose of reconnaissance survey was to familiarize with the study area and to conduct questionnaire pre-testing. Questionnaires were administered to eight households in Lumage village to examine its validity and reliability and finally necessary

modifications were made as suggested by Kajembe (1994). This phase was also useful in obtaining information on population size, ethnicity, socio- economic activities, and people biodiversity interaction was given special consideration in the study area. Therefore all the objectives of this study were considered in this preliminary survey.

Based on the list of villages from district offices and reconnaissance survey, a purposive sampling of five villages for interviews performed. Five villages namely Misiwa, Makwaranga, Mpangala, Kinyika and Ikungula, from Makete District were selected. In all five villages, both household questionnaire based interview (QBI) and focus group discussion (FGD) were conducted.

3.2.2 Sampling strategies

A multi-stage sampling procedure was employed. The two divisions in the district in which the park is located were purposively selected out of seven divisions. Three wards out of 17 were then purposively selected comprising one ward from Magoma division (Ipelele) and two wards from Matamba division (Matamba and Mlondwe). All five villages selected from the three wards were purposively selected because they were located adjacent to Kitulo NP. The villages included in the study were Misiwa, Kinyika, Ikungula, Mpangala and Makwaranga.

In this study, the household were treated as sampling units, whereby it is defined as a group of people eating from the same pot, cultivating the same land and recognizes the authority of one person, the household head who is the ultimate decision maker of the household (Poate and Daplyn, 1988 cited by Mbwambo, 2007). Also is a group of persons who lived together and shared living expenses. Usually these were husband, wife and children (URT, 2002). A simple random sampling technique was used to select the heads of households in

order to avoid bias. Therefore the formal survey questionnaire was carried out in all selected villages. The questionnaire was administered on individual household basis whereby the head of household whether husband or wife participated.

3.3 Data Collection Methods

3.3.1 Focused group discussion

Five focused group discussions were conducted; one in each village. A sample of 8 to 12 individuals was participated in each village including village chairperson and village executive officer. Composition in the FGD was almost equally represented by gender and all social groups (crop farmers, livestock keepers, elders, youth and community-based organisation) in each village was considered (Appendix 6). The FGD was useful in acquiring information on certain topics of interest to this study. PRA is useful methods whereby it uses simple participatory methods such as ranking, timeline and resources identification which can be handled by the villagers with low level of education and still yet provide useful information (Kessy, 1998).

3.3.2 Checklist

A checklist was also prepared to gather qualitative information from key informants (Appendices 2, 3 and 4) regarding all aspects of the study. A key informant is an individual who is knowledgeable, accessible and willing to discuss about the issues under the study concerned (Mbwambo, 2000). In this study, key informants included District Commissioner (DC), District Executive Director (DED), Ward Executive Officers (WEO), Kitulo NP Officials and Village government leaders. Therefore this method was applicable for all objectives of this study due to the fact that all important supplementary information was asked in the checklist.

3.3.3 Questionnaire survey

The second phase was the collection of quantitative data through questionnaire survey which was the main tool for data collection. This tool was used to collect primary data from household respondents using both structured and semi-structured questionnaires (open and close-ended) (Appendix 1). The total number of household heads in the study areas that were interviewed in the five villages was 120 as shown in Table 2. In this study five percent sampling intensity were employed as the minimum to select number of household affected by the establishment of Kitulo NP from five villages. The five percent sampling intensity is regarded to be a good representative sample in many social surveys (Kajembe and Luoga, 1996; Saunders *et al.*, 2007).

Table 2: Household sampled for questionnaire survey

| Village name | Total number of H/H | Household sampled | Percentage of total |
|---------------------|----------------------------|--------------------------|----------------------------|
| Kinyika | 665 | 35 | 5.2 |
| Ikungula | 300 | 21 | 7.0 |
| Mpangala | 351 | 22 | 6.2 |
| Makwaranga | 272 | 22 | 8.0 |
| Misiwa | 167 | 20 | 11.9 |

Under closed-ended questionnaires respondents were given alternatives answers while open-ended questionnaires helped to accommodate respondent's views, ideas and opinions through free explanation as suggested by Goldman and MacDonald (1987) and de Vaus (2002). Therefore open-ended questionnaires improved the purpose of disclosing the system of knowledge and structuring of ideas of respondents whereby own views concerning the study problems were discussed.

3.4 Secondary Data

Secondary data were used to supplement primary data. Among secondary sources of data were documents and records from TANAPA and Kitulo NP, Ministry of Natural Resources and Tourism, Sokoine National Agricultural Library, University of Dar es Salaam Library and the Internet.

3.5 Types of Data

Data for community livelihood changes after the establishment of Kitulo NP and its implications for sustainable conservation were collected from villages surrounding the park. Households' income-generating activities were assessed including agriculture, livestock, forest products and other crops. Other types of data collected were level of education of respondents, awareness on PA's management, accessibility and opportunities in the use of conservation areas, benefits gained by the communities from conservation products and level of community participation in conservation activities. Cultural practices of the community in relation to conservation resources were also assessed.

3.6 Data Analysis

3.6.1 Qualitative data analysis

Qualitative data were subjected to content analysis while findings from PRA were analyzed in the field with participants. Attitudes towards the establishment of Kitulo NP were measured by using likert type of scale which were intended to measure attitude and perception of respondents in the study area. In order to obtain a summary measure an index scale for attitudes towards the establishment of Kitulo NP was developed. There was positive and negative statement and responses were grouped into three categories which are agreeing, uncertain and disagree. For all positive statements every 'Agree' response was represented by 3 while 'Uncertain' was represented by 2 and 'Disagree' was represented by 1 and all negative statements every 'Agree' response was represented by 1 meanwhile

Uncertain was represented by 2 and 'Disagree' was represented by 3. Table 5 shows the attitude of the community towards the establishment of Kitulo NP.

3.6.2 Quantitative data analysis

Raw data were cleaned, coded, verified and summarized before analysis. Statistical Package for Social Sciences (SPSS) Software was employed for Quantitative data analysis. Descriptive statistics analysis was used to calculate frequencies, percentages, mean coefficient of variation and standard deviation. Cross tabulation involving chi-square test was used for bivariate analysis to test the association and relationships between different pairs of variables of livelihoods for local communities before and after the establishment of Kitulo NP. Multiple linear regression models was applied to find the relationship among the factors that were assumed to influence community livelihood changes after the establishment of Kitulo NP and its implications in the sustainability of both livelihood of the people and Kitulo NP. The variables of the models were expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \epsilon$$

Where Y (Dependent) = Sustainability of Kitulo National Park.;

β_i = Regression Coefficients (i = 1, 2, 3, n)

β_0 = Y Intercept

ϵ = Standard error

Independent Variables

X1 = Non farm generating Income of respondents

X2 = Farm income of respondents

X3 = Age of respondents

X4 = Farm size of respondents

X5 = Sex of respondents

X6 = Duration of residence in the areas

X7 = Household size of respondents

X8= Education of respondents

The regression model was applied to explain the relationship between the new livelihoods options of local communities and the sustainability of Kitulo NP. The variables included in the regression model were:-

Table 3: Variables definition and indicators

| Variable | Definition | Indicators |
|---|---|--|
| X1= Non farm generating income of respondents | All income out of farm activities that contributed to household income. It was hypothesized that respondents who receiving income from non farm activities will not depend much on land taken by Kitulo NP and will not demanding the land of Kitulo NP although they involved in cultivation. | Engagement in petty trade, timber business, charcoal extraction etc |
| X2= Farm income of respondents | All activities that involve production from household farm. It was assumed that farm income would decrease after establishment of Kitulo NP whereby part of the land area was taken by the park. | Crop farming, animal husbandry, beekeeping etc |
| X3= Age of respondents | A time of life in years of head of household/respondent It was assumed that the age of respondents in the study area will determine the working labour force that is the age of 15 to 64 years old. This means that the population aged below and above this age group is dependant (URT, 2002). | Dependants, working groups, appearance |
| X4= Farm size of respondents | Acreage where farming is taking place by the household. It was hypothesized that the large the farm sizes the more farming activities as the result increases in harvest products and the small farm sizes the decrease in output harvested. | Customary and statutory ownership |
| X5= Sex of respondents | Either of the two categories (male or female) of the head of household/respondent. It was assumed that both male and female involved in conservation and income generating activities. | Appearance, behaviour |
| X6= Duration of residence in the areas | Time in years that head of household/respondent has stayed in the area of study. This was assumed that settled in the same area for many years, their capable with an environment changes and can manage stress occurred in the establishment of Kitulo NP within the area. Also settled for many years allow respondent to own many farms. | Natives, migrants, presence of permanent structures |
| X7= Household size of respondents | Number of people staying in a household. It was assumed that the larger the household size, the more the labour would be available in the household for participating in income generating activities. Also more land is needed for production activities in order to sustain the people available. | Population, number of dependants, work force etc |
| X8= Education of respondents | Level of schooling of the head of household/respondent. The hypothesis in this case was that increase in education level it means increase in awareness in conservation activities. This is because educated people have enough knowledge concerning conservation matters. Also it was assumed that educated people have more alternatives means of getting their needs. Therefore there is a close relationship between education and poverty reduction, employment creation, environmental protection, women empowerment and social integration (URT, 2002). | None school attendants, , Primary education, secondary education, tertiary education |

Therefore the underlying assumptions for the model for the sustainability of Kitulo NP were determined by the way in which the project affects livelihoods of local communities' surrounding the area. The total income obtained by the communities adjacent to the park would determine the improvement of their livelihoods as the results would facilitate the sustainability of Kitulo NP. Also the sustainability of Kitulo NP will depend on acceptability of policy and guidelines set by Kitulo NP to the adjacent communities, accessibility of local communities in the conservation area for resources like tradition medicine, fire wood, thatching grasses and provision of conservation education to local communities are very important for sustainability of the park. More over supporting the local communities in terms of water services, health services, education facilities and road infrastructures will encourage the local people to recognize the park positively.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

The chapter is divided into five sections. The first section deals with background information of respondents on age, sex, household size, education and occupation. The second section covers the information on the community attitudes towards the establishment of Kitulo NP. On the other hand section three comprises the information on the livelihood changes before and after the establishment of Kitulo NP. Section four presents information on the sustainability of new livelihood options to community wellbeing after the establishment of Kitulo NP. The last section includes information on the potential impacts of the new livelihood options after the establishment of Kitulo NP on the sustainability of the Kitulo NP and local communities surrounding the park.

4.1.1 Demographic and socio-economic characteristics of respondents

The characteristics that were put into considerations were age, education, sex, household size and occupation. This provided the background information for other findings of the study. Table 4 showed the demographic characteristics of respondents (viz. sex, education, family size, age and occupation) involved in this study. The Table showed those characteristics in respect to each village.

Table 4: Demographic characteristics of respondents

| Sex | Statistics | Village | | | | | Total |
|------------------------|------------|---------|----------|----------|------------|--------|-------|
| | | Kinyika | Ikungula | Mpangala | Makwaranga | Misiwa | |
| Male | Frequency | 22 | 13 | 13 | 15 | 13 | 76 |
| | Percent | 63 | 62 | 59 | 68 | 65 | 63 |
| Female | Frequency | 13 | 8 | 9 | 7 | 7 | 44 |
| | Percent | 37 | 38 | 41 | 32 | 35 | 37 |
| Total | Frequency | 35 | 21 | 22 | 22 | 20 | 120 |
| | Percent | 100 | 100 | 100 | 100 | 100 | 100 |
| Education level | | | | | | | |
| Non | Frequency | 4 | 2 | 4 | 8 | 3 | 21 |
| | Percent | 11 | 10 | 18 | 36 | 15 | 19 |
| Std 4 | Frequency | 6 | 4 | 4 | 1 | 2 | 17 |
| | Percent | 17 | 19 | 18 | 5 | 10 | 12 |
| Std 7 | Frequency | 25 | 15 | 13 | 12 | 15 | 80 |
| | Percent | 71 | 71 | 59 | 55 | 75 | 67 |
| Sec | Frequency | 0 | 0 | 1 | 1 | 0 | 2 |
| | Percent | 0 | 0 | 5 | 5 | 0 | 2 |
| Total | Frequency | 35 | 21 | 22 | 22 | 20 | 120 |
| | Percent | 100 | 100 | 100 | 100 | 100 | 100 |
| Family size | | | | | | | |
| 1 -2 | Frequency | 7 | 2 | 5 | 3 | 5 | 22 |
| | Percent | 20 | 10 | 23 | 14 | 25 | 18.3 |
| 3 -5 | Frequency | 23 | 16 | 10 | 13 | 8 | 70 |
| | Percent | 66 | 76 | 45 | 59 | 40 | 58.3 |
| 6 -10 | Frequency | 5 | 3 | 7 | 6 | 7 | 28 |
| | Percent | 14 | 14 | 32 | 27 | 35 | 23.3 |
| Total | Frequency | 35 | 21 | 22 | 22 | 20 | 120 |
| | Percent | 100 | 100 | 100 | 100 | 100 | 100 |
| Age groupings | | | | | | | |
| Below 25 | Frequency | 0 | 2 | 0 | 1 | 1 | 4 |
| | Percent | 0 | 10 | 0 | 5 | 5 | 3 |
| 26-35 | Frequency | 12 | 5 | 6 | 7 | 5 | 35 |
| | Percent | 34 | 24 | 27 | 32 | 25 | 29 |
| 36-60 | Frequency | 18 | 14 | 13 | 12 | 11 | 68 |
| | Percent | 51 | 67 | 59 | 55 | 55 | 57 |
| Above 60 | Frequency | 5 | 0 | 3 | 2 | 3 | 13 |
| | Percent | 14 | 0 | 14 | 9 | 15 | 11 |
| Total | Frequency | 35 | 21 | 22 | 22 | 20 | 120 |
| | Percent | 100 | 100 | 100 | 100 | 100 | 100 |
| Occupation | | | | | | | |
| Farming | Frequency | 5 | 3 | 3 | 4 | 3 | 18 |
| | Percent | 14 | 14 | 14 | 18 | 15 | 15 |
| Livestock & farming | Frequency | 29 | 18 | 19 | 17 | 16 | 99 |
| | Percent | 83 | 86 | 86 | 77 | 80 | 83 |
| Non farm | Frequency | 1 | 0 | 0 | 1 | 1 | 3 |
| | Percent | 3 | 0 | 0 | 5 | 5 | 3 |
| Total | Frequency | 35 | 21 | 22 | 22 | 20 | 120 |
| | Percent | 100 | 100 | 100 | 100 | 100 | 100 |

i. Sex

Sex is the most fundamental characteristics of a population which can reflect the population dynamics and ratio of men and women in the area (URT, 2002). The study revealed that majority of the respondents involved in the study area were male (63%) and female were 37%. The observation made from the study indicated that women were not ready to be interviewed by the researcher due to cultural norms and values. Also this implies that women head of household were very few in the study area.

ii. Education level

Education is an important social factor in personal and national development. A person with education is more capable of handling his/her life socially and economically than a person without or with little formal education (URT, 2002). The results pointed out that 19% of the respondents had not attended formal education at all while only 12% have primary school up to standard four. Majority of the respondents 67% were primary school leavers and only two percent have secondary school education. These results imply that illiteracy was very high in area which hampers application of modern technology in various productive activities is very low. In this context the results shows that majority of the respondents used local technology in production.

iii. Family size

The findings revealed that the majority of households (58%) had 3 to 5 people in the family. The second group with 23% had 6 to 10 people in the family and the last group with 18% had 1 to 2 people in the family. The average household in the study area was 3.2 which is small than the average of the Makete district which was 3.5. The average size household of Iringa regional is 4.2 while average of rural household in Tanzania is 4.9 which is larger compared to the study area (URT 2002). Furthermore, findings from FGDs

revealed that majority of the family have few children and even the growth rate within the district is very low about 0.2%. This is due to presence of HIV/AIDS and migration.

iv. Age

The respondents' ages ranged between 21 and 76 years old while the mean average were 43 years old. The results revealed that the majority of the respondents were in the age group of 36 to 60 which makes 57%, age group of 26 to 35 accounted for 29%. People aged above 60 years old constitutes 11% and those below 25 years old comprises 3% of the respondents. These groups belonged to the group of economically productive (15-64 years) people who are engaged in productive activities. This argument concurred with Mandara (1998) and URT (2002) who argued that Tanzania economically productive group ranging from the age of 15 to 64 years old. The argument showed that working force in the study area is available and hence higher production was the expectation.

v. Occupations

The results indicated that farming activities and livestock production accounted for 83% of the respondents. The second occupation of the respondents which comprises 15% was practicing farming activities only. The last occupation which comprises 3% of the respondents was non-farm activities. The information implies that there were few people practicing in non-farm activities. Farming activities and livestock production were observed to be the dominant employer was expected since majority of the people who live in rural areas, agriculture is their main economic activity. This concurred with Kilahama (2006) and Coad *et al.* (2008a) who observed that majority of people in Africa were poor and illiterate or semi illiterate hence, production and consumption patterns were mainly based on land resources because they lack knowledge to participate in other productive activities.

4.2 Community Attitudes towards the Establishment of Kitulo NP

Community attitudes towards the establishment of Kitulo NP was measured by looking into various attributes which contributed in the understanding of the conservation activities took place in Kitulo NP. The results of various statements are presented in Table 5.

Table 5: Community attitudes towards establishment of Kitulo NP

| Statements | Strongly Agree Counts (%) | Agree Counts (%) | Uncertain Counts (%) | Disagree Counts (%) | Strongly disagree Counts (%) |
|--|---------------------------------|------------------------|-------------------------|---------------------------|------------------------------------|
| The establishment of Kitulo NP was done after agreement with community | 0 (0) | 1 (0.8) | 0 (0) | 4 (3.3) | 115 (95.8) |
| The establishment of Kitulo NP perceived positively by local community | 0 (0) | 1 (0.8) | 0 (0) | 10 (8.3) | 109 (90.8) |
| Sensitization and awareness rising sufficiently provided before establishment of Kitulo NP? | 0 (0) | 8 (6.7) | 40 (33.3) | 40 (33.3) | 32 (26.7) |
| Kitulo NP supports various development projects for surrounding community. | 1 (0.8) | 74(61.7) | 10 (8.3) | 12 (10.0) | 23 (19.2) |
| Kitulo NP support people displaced by the establishment of the park to improve their livelihoods | 0 (0) | 2 (1.7) | 25 (20.8) | 13 (10.8) | 80 (66.7) |
| The community surrounding Kitulo NP improved their livelihoods after the establishment of the park | 0 (0) | 9 (7.5) | 30 (25.0) | 34 (28.3) | 47 (39.2) |
| After the establishment of the park the infrastructures have not improved within the areas | 0 (0) | 0 (0) | 3 (2.5) | 21 (17.5) | 96 (80.0) |
| Kitulo NP provides capital for various CBOs involved in conservation and other production activities | 2 (1.7) | 70(58.3) | 20 (16.7) | 12 (10.0) | 16 (13.3) |
| After the establishment of the park, many people within the area have not been employed by the park | 1 (0.8) | 6 (5.0) | 53 (44.2) | 44 (36.7) | 16 (13.3) |
| The improvement of community | 29 (24.2) | 84(70.0) | 3 (2.5) | 2 (1.7) | 2 (1.7) |

livelihoods surrounding the park
has enhanced the sustainability of
Kitulo NP

4.2.1 The establishment of Kitulo NP was done in accordance to community agreement

Table 5 had shown about 96 % of the respondents pointed out that the establishment of Kitulo NP was not done in accordance to community agreement and were strongly disagreed. It also showed that the establishment of Kitulo NP was not participatory. Generally, the establishment of the park seemed to have been imposed to them by higher authorities and the local communities were required to accept the decision without questioning it.

This observation concurs with what Brockington (2004) commented about establishment of PAs. Brockington (2004) documented that conservation can be imposed despite local opposition and protected areas can flourish notwithstanding resistance to them. He further added that rural poverty and injustice do not undermine the foundation of conservation.

On the other hand, the effects observed to the surrounding villages were supported by Kilahama, (2006) who argued that different societies behave and act differently basing on prevailing traditions, beliefs, educational level and economic status, thus decides on what could be the better alternative for their survival.

4.2.2 The establishment of Kitulo NP perceived positively by local community

The results indicated that there was negative perception about the establishment of Kitulo NP since most of the respondents they strongly disagreed (90.8%) and 8.3% disagree. More over local communities condemned that they did not even want to know more about it. The misperceptions were probably caused by inadequate education and seminars to the adjacent communities in order to explain the importance of the NP to the area and national

at large. Through direct observation, focused group discussion and key informants the negative perception was caused by forceful measures applicable for those people did not agree the government order of living the area for Kitulo NP.

4.2.3 Community sensitization towards the establishment of Kitulo NP

The results (Table 5) had showed that there was no or little sensitisation of local community around the NP as 33% of interviewees were uncertain if it ever happened while 27% commented that there was no sensitisation. This approach differed with the argument made by Frontier Tanzania (2003) who emphasized on public meetings and discussion with local community leaders. Furthermore those should be done in order to highlight important issues of the affected communities to avoid conflicts between the community livelihoods and resources use with respect to sustainable conservation. The Frontier Tanzania (2003) also advocated capacity buildings to village natural resources committees which will allow them to establish and manage various alternative schemes and integration of environmental conservation with farming activities.

Similarly information from FGD pointed that, there were inadequate sensitization meetings, seminars and workshops involving surrounding communities to explain the purpose of establishing the park, its role to the communities and the role of the surrounding communities to the park. They further noted that, sensitization was supposed to be conducted by leaders from district and ward level such as Members of Parliament (MP), District Commissioner (DC), District Executive Director (DED, Ward councillors and other responsible officers. Also staff members from other conservation stakeholders like TANAPA and Wildlife Department.

4.2.4 Community participation in conservation activities of Kitulo NP

The results in Table 5 indicated that about 62% of respondents agree that Kitulo NP support varies development projects for surrounding community. Despite of that, 19% were opposing the scenario. During discussion with key informants from Kitulo NP indicated that in order for the park to support the project, community participation is a prerequisite condition.

Furthermore during FGD the results revealed that in Kinyika, Mpangala and Ikungula villages there were community-based organizations that participated in conservation activities such as bush clearing, making fire break and planting of indigenous trees for the purpose of conserving the environment and water sources. Involving the community in conservation activities concurred with Arquiza (2004) who emphasized that local communities in conservation activities reduced destructive activities in the conserved areas, and consequently increased the local people's benefits from the conserved areas such as fees collection from tourism. Also Sachedina (2006) emphasized on community-based natural resources management (CBNRM), which involves the management of land and natural resources such as pastures, forests, fish, wildlife and water by groups of rural people through their local institutions.

4.2.5 Infrastructure improved after the establishment of Kitulo NP

More than 80% of the respondents (Table 5) indicated that they strongly disagree that there was the improvement in the infrastructure after the establishment of the NP. While 18% disagree the statement and 3% were not certain. The secondary data obtained from various sources indicated that their several projects were undertaken by Kitulo NP in Matamba division through community conservation services. Those projects

include construction of one classroom, teacher's office and multipurpose hall at Matamba secondary school and house for Headmaster/Headmistress at Kitulo Secondary School in Ujuni village. Therefore the respondents in the study area they know that after the establishment of Kitulo NP various infrastructures have been improved.

4.2.6 Kitulo NP supported people displaced by its establishment

The results in Table 5 again had revealed that about 67% of interviewees strongly indicated that there were no any supports from TANAPA for displaced people. But 21% of them were uncertain while 11% just disagree. Despite of those results from questionnaire based interviews, FGD revealed that Kitulo NP through the Ministry of Natural Resources and Tourism provided money for construction of social infrastructure such as health, education and water services at Mwalusa Sub village of Ipelele. This area of Mwalusa was located for those people evicted from Kikondo village. More over the study revealed that the assistance was for public and not at household level. Therefore the observation made in the study area indicated that the support of the NP considered more at groups' level rather than at household level while local communities preferred more at household and individual level. Despite of that argument by local community, TANAPA was not eligible in supporting individual evicted from PA as were residing illegally.

4.2.7 Kitulo NP provides capital for various groups involved in conservation and other production activities

More than 58.3% (Table 5) of the respondents agree that Kitulo NP provided capital (financially or materially) for various groups involved in conservation and other production activities while 17% were not certain and 13% strongly disagree with the statement. Furthermore the FGD conducted in Mpangala, Kinyika and Ikungula village

showed that Kitulo NP supported several projects as alternative sources of income for the communities surrounding the NP. For instance, the NP had provided 14 dairy cattle for Ikungula Linda Mazingira Group (ILIMA), 20 pigs for MAGHANO Group in Mpangala and Kinyika, 13 dairy cattle for Kinyika Linda Mazingira Group (KILINDMA) as well as training on solar energy. Also, Kitulo NP provided various equipments used for undertaking the projects such as gumboot, spade, rain coat and capital for establishment of the projects.

4.2.8 Employment opportunities to Kitulo NP after its establishment

More than 44.2% of the respondents were uncertain about employment after establishment of the NP while 36.7% disagreed with the statement and only 5.0% of the respondents agree with the statement (Table 5). Results in Table 5 further showed that after establishment of Kitulo NP adjacent communities they are benefiting through casual and temporary employment as cultural labour. Therefore through direct observation the results indicated that due to low level of education majority of the people are only depended on cultural labourers. This argument concurred with that of World Bank (1998) concerning conservation and local community participation in conservation activities whereby local communities are better police to police themselves.

4.2.9 Impacts of the establishment of Kitulo NP to community livelihoods

Results in Table 5 indicated that about 39.2% of the respondents strongly disagree that after the establishment of Kitulo NP, the livelihoods of adjacent community were improved. Moreover 28.3% among respondents disagree while 25% were uncertain and only 8% agree with the statement. The results from FGD revealed that majority of the people in area were expecting to get assistance at household level. The findings revealed that local communities accept that there were improvement in community livelihoods

through improvement of infrastructure like road maintenances, health services and education facilities. Moreover they mentioned various projects which the NP had given to various socio-economic groups in various villages adjoining it. Therefore it was observed that the improvement of community livelihoods by the park is gradually considered for those surrounding villages and other areas within the district.

4.2.10 Improvement of community livelihoods to enhance the sustainability of Kitulo NP

The finding showed that 94.2% of respondents agrees (70% agree and 24.2% strongly agree) that the improvement of livelihoods to communities surrounding the NP would facilitate the sustainability of Kitulo NP (Table 5). The results tally with observation made by Arquiza (2004) that participation of local communities and the support of various institutions (such as academe, non governmental organizations and local government) decreases the destructive activities like over harvesting of natural resources (such as cutting of wood for charcoal and collection of native orchids). Moreover it was observed that the improvement of local communities' livelihoods would help to reduce dependence on the natural resources from the NP, consequently the adjacent community would be part and parcel of the NP.

4.2.11 Likert Scale of Community Attitudes towards the Establishment of Kitulo NP

The likert scale results (Fig. 2) had shown that 56% of the community had negative response towards the establishment of Kitulo NP while 44% showed positive response towards the establishment of the park. This could be attributed to the fact that the establishment of Kitulo NP did not involve the local community and in addition minimal or no sensitization was provided to the local people about the establishment of the park.

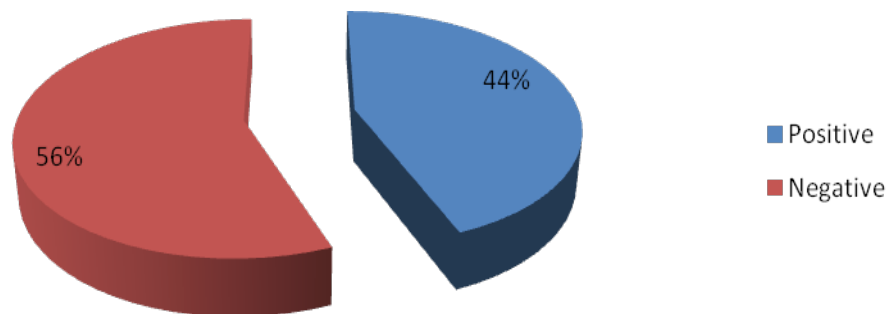


Figure 2: Attitude towards establishment of Kitulo NP

The index for likert scale ranging from 10 – 30 was constructed as the measure of attitude towards the establishment of Kitulo NP. The mean of the scale was 20.1 the score on the index was further divided in to negative and positive attitude. The scores above the index mean was grouped as positive attitude while the scores below the index mean was categorised as negative attitude.

4.3 Livelihood Changes Before and After the Establishment of Kitulo NP

Ujuni and Nkondo villages were not affected after establishment of NP in respect to livelihoods changes despite of being adjoining to it. The reason put forward by local communities, FGD and key informants was that, those villages were not seldomly depending biological resources from what now is NP. However, Kinyika, Mpangala, Ikungula, Missiwa and Makwaranga villages that encircle the NP have been affected differently from different utilization of the land owned by Kitulo Dairy Farm. The study revealed that the same activities that were undertaken before establishment of the park are still carried out. The activities conducted included crop cultivation, livestock keeping and non-farm activities such as small business.

Thus, various factors were considered to compare livelihoods changes before and after establishment of Kitulo NP. They included types of crops raised, income of the people, number of cattle kept and size of land in acres owned before and after the establishment of Kitulo NP.

4.3.1 Farm sizes

The results in Table 6 revealed that 61% of the people in the study area owned plots with area between 2.1 to 5.0 acres which were the majority while 18% own 5.1 to 10.0 acres. In addition, 16% owned farm sizes between 0.01 to 2.00 acres while 6% of the respondents owned 10.00 acres and above.

Table 6: Household Farm sizes

| Farm size (Acres) | Village | | | | | Total (%) |
|----------------------|-----------------------------|------------------------------|------------------------------|---------------------------------|----------------------------|----------------|
| | Kinyika Frequency (%) | Ikungula Frequency (%) | Mpangala Frequency (%) | Makwa Ranga Frequency (%) | Misiwa Frequency (%) | |
| 0.1– 2.0 | 3 (9) | 6 (29) | 3 (14) | 5 (23) | 2 (10) | 19 (16) |
| 2.1-5.0 | 25 (71) | 11 (52) | 13 (59) | 11 (50) | 13 (65) | 73 (60) |
| 5.1-10.0 | 5 (14) | 4 (19) | 3 (14) | 5 (23) | 4 (20) | 21 (18) |
| Above 10 | 2 (6) | 0 (0) | 3 (14) | 1 (5) | 1 (5) | 7 (6) |
| Total | 35 (100) | 21 (100) | 22 (100) | 22 (100) | 20 (100) | 120 (100) |

With respect to the methods of acquiring land (Table 6), the results revealed that inheritance comprises 34% and purchased land were the majority which comprises 40%. For the respondents who got free land through clearing the forests (virgin land) constitutes 20% and the last method were land offered by the village government which comprises 6%. When the FGD conducted in Mpangala village the results revealed that the land that was bought, offered by government village and through clearing forests and bushes were owned by Kitulo Dairy Farm. Due to laxity of the management of Kitulo Dairy Farm much

of the land was lost to the local communities which gradually invaded the area slowly and later registered the villages like what happened at Kikondo village.

Table 7: Methods of acquiring land

| Methods | Village | | | | | Total (%) |
|--------------------|-----------------|-----------------|-----------------|----------------|----------------|-----------------|
| | Kinyika | Ikungula | Mpangala | Makwa | Misiwa | |
| | Frequency (%) | Frequency (%) | Frequency (%) | Frequency (%) | Frequency (%) | |
| Inherited | 13 (38) | 8 (38) | 6 (27) | 8 (36) | 5 (25) | 40 (34) |
| Purchased | 14(41) | 11 (52) | 9 (41) | 9 (41) | 5 (25) | 48 (40) |
| Village government | 1 (3) | 0(0) | 1 (5) | 2 (9) | 3 (15) | 7 (6) |
| Free | 6 (18) | 2 (10) | 6 (27) | 3 (14) | 7 (35) | 24 (20) |
| Total (%) | 35 (100) | 21 (100) | 22 (100) | 22(100) | 20(100) | 120(100) |

Table 7 shows that before the establishment of Kitulo NP majority of the respondents owned the land between 5.1 to 10.0 acres which was 54% of the respondents. Also 39% of the interviewees owned land more than 10.0 acres while 7% owned land between 2.1 to 5.0 acres. After the establishment of Kitulo NP, land ownership decreased whereby 55% of the respondents owned of about 2.1 to 5.0 acres while 34% owned 5.1 to 10.0 acres and 11% owned land between 1.0 to 2.0 acres. Chi-square statistical test indicates a significant relationship ($\chi^2_{0.05} = 0.001$) between farm size owned before and after the establishment of Kitulo NP.

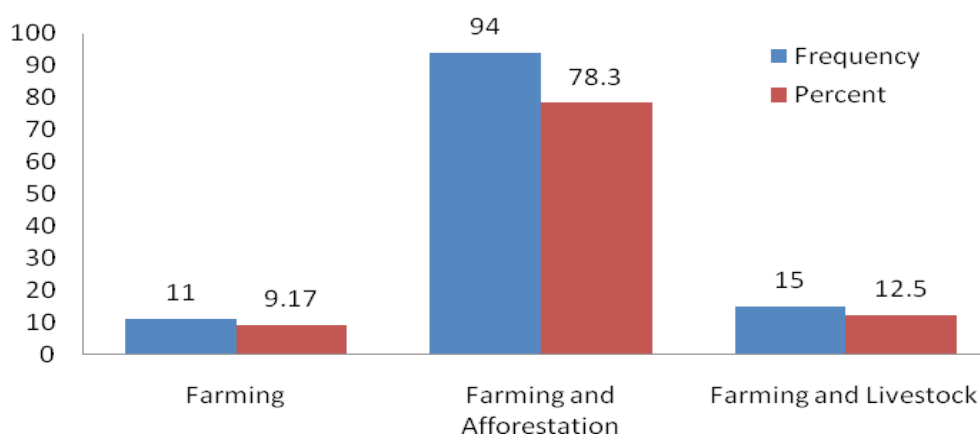
The mean of farm size before the establishment of Kitulo NP (mean \pm std error: 10.58 ± 9.87) was significantly large than that of farm size after establishment of Kitulo NP (4.64 ± 3.14). Furthermore, the maximum farm size before Kitulo NP was 100 acres while after was just below 20 acres. This implies that the land of Kitulo Dairy Farm that was utilized illegally by surrounding communities were big and contributed to practice shifting cultivation for the surround the communities.

Table 8: Farm sizes before and after the establishment of Kitulo NP

| Land size (acres) Groups | Period | | |
|-----------------------------|-----------------|------------------|------------------|
| | Before | After | Total (%) |
| 1.00- 2.00 | 0 (0) | 13(11) | 13 (5) |
| 2.01- 5.00 | 8 (7) | 66(55) | 74 (31) |
| 5.01- 10.00 | 65 (54) | 41(34) | 106 (44) |
| Above 10.00 | 47 (39) | 0 (0) | 47 (20) |
| Total (100) | 120(100) | 120 (100) | 240 (100) |

4.3.2 Land use

Fig. 3 showed that majority of the local communities surrounding Kitulo NP (78%) utilises their land for farming and afforestation activities. Farming and livestock activities comprise about 13% while farming activities only contain 9%. The results indicated that the local communities adjacent to Kitulo NP involve ed with mixed agriculture for the process of sustaining their livelihoods.

**Figure 3: Land use in areas adjacent to Kitulo NP**

Again the unutilised areas of land size were ranging from one to 10 acres. The results revealed that there is enough land in the study areas even after the establishment of Kitulo NP. The results from FGD indicated that in an area, there is plenty land but the people need

to practice shifting cultivation in the area owned by Kitulo NP. This implies that the Kitulo NP should be sustainable because the adjacent communities have enough land for conducting various activities for their livelihoods.

4.3.3 Types of crops grown and livestock kept

The types of crops grown and number of cattle kept before and after establishment of Kitulo conservation are shown in Table 9 and 10. Maize, potatoes, wheat and pyrethrum were the main crops grown in the area. It shows that the same types of crops were grown before and after establishment of Kitulo NP. Conversely, the quantities of the crops harvested before and after establishment of Kitulo NP decreased after the intervention meaning that the livelihoods of the communities was affected.

Table 9: Crops harvested (sacks) before and after the establishment of Kitulo NP

| Crops | Period | | |
|--------------|-------------------------|------------------------|----------------------------|
| | Before Frequency (%) | After Frequency (%) | Total (%) Frequency (%) |
| Maize | 20 (16) | 38 (30) | 58 (24) |
| Potatoes | 24 (20) | 15 (13) | 39 (16) |
| Peas | 3 (3) | 3 (3) | 6 (3) |
| Wheat | 35 (29) | 30 (25) | 65 (27) |
| Pyrethrum | 36 (30) | 32 (27) | 68 (28) |
| Beans | 2 (2) | 2 (2) | 4 (2) |
| Total | 120(100) | 120(100) | 240(100) |

*Chi-square = 0.14

Likewise personal observation and FGD revealed that crops like pyrethrum and potatoes were mostly grown inside the area of Kitulo Dairy Farm. After the establishment of Kitulo NP it was prohibited to use the area and hence the total area available for those crop cultivation decreased. Additionally, Chi-square statistical test ($\chi^2_{0.05} = 0.14$) indicates that there were no difference on crops grown before and after the establishment of Kitulo NP. Similarly, it showed that there was a variation in the number of cattle kept before and after

establishment of Kitulo NP (Table 10). Also, because of livestock grazing the community had to limit grazing area to be done within the village area so as to accommodate cultivation for crops.

Table 10: Number of cattle kept before and after the establishment of Kitulo NP

| Number Groups) | Periods | | Total (%) |
|------------------|------------------|------------------|------------------|
| | Before | After | |
| 1 - 5 | 33 (27) | 70 (58) | 103 (43) |
| 6 - 10 | 33 (28) | 29 (24) | 62 (26) |
| 11 - 20 | 30 (25) | 18 (15) | 48 (20) |
| Above 20 | 24 (20) | 3 (3) | 27 (11) |
| Total (%) | 120 (100) | 120 (100) | 240 (100) |

*Chi square = 0.001

The results showed that 45% of the respondents kept over 10 animals before the establishment while 84% of the respondents kept between one to 10 animals after the establishment of Kitulo NP. These mean that the community around the area lost their livestock after the establishment of Kitulo NP. Personal observation and focus group discussions made indicated that the decline in number of cattle was probably due to abrupt changes in the climatic condition. Animals were removed from the highlands of Kitulo plateau where it is cool and suitable for grazing to low land of Wanji and Magoma division which were relatively hotter. In addition, some animals died due to exhaustion caused by long trekking from the park headquarters in Matamba division where they were seized to villages like Misiwa and Makwaranga. However, the actual causes of death of cattle could not be established in this study. In addition, due to shortage of grazing land, livestock keepers were obliged to reduce the number of cattle heads, and hence, the low number of animals recorded after the establishment of the park.

It was also revealed that when Kitulo NP seized the cattle grazing within the NP, owners of the livestock were fined up to about 450 000.00 TAS to deter them from trespassing in the park. Those who did not have the money to pay for the fines had to sell their cattle at a cheaper price (as low as 50 000.00 TAS per head). The fines executed contributed to the reduction in the number of animals owned by the community. Chi-square statistical test indicates a significant relationship ($\chi^2_{0.05} = 0.001$) between number of cattle owned before and after the establishment of Kitulo NP.

4.3.5 Income of the respondents before and after the establishment of Kitulo NP

Table 11 shows that before establishment of Kitulo NP the maximum income was 2600 000.00 TAS and after the establishment of Kitulo NP, the maximum income was 1800 000.00 TAS. Also the minimum income also decreased after the establishment of Kitulo NP from 100 000.00 to 50 000.00 TAS.

Table 11: Income of respondents before and after the establishment of Kitulo NP. Annual income (TAS) N=120

| Village | Mean | | Minimum | | Maximum | | Std Deviation | |
|--------------|---------------|---------------|---------------|--------------|----------------|----------------|---------------|---------------|
| | Before | After | Before | After | Before | After | Before | After |
| Kinyika | 400455 | 198182 | 250000 | 100000 | 1000000 | 500000 | 153483 | 77006 |
| Ikungula | 626875 | 359167 | 220000 | 100000 | 2600000 | 1800000 | 543399 | 386814 |
| Mpangala | 467500 | 275000 | 200000 | 90000 | 1800000 | 1200000 | 331088 | 224112 |
| Makwaranga | 318913 | 178435 | 200000 | 50000 | 560000 | 300000 | 76306 | 58949 |
| Misiwa | 370435 | 180000 | 100000 | 50000 | 1500000 | 500000 | 274035 | 114535 |
| Total | 439052 | 239862 | 100000 | 50000 | 2600000 | 1800000 | 335271 | 221944 |

Furthermore the results from the study area indicated that income of respondents declined after the establishment of Kitulo NP. In addition to that the average income was 439 052.00 TAS before and 239 862.00 TAS after the establishment of Kitulo NP. Therefore, the observation indicated that the income of respondents declined because there was disruption of economic activities (such as grazing, cultivation of crops like round potatoes and pyrethrum) in the area taken by the Kitulo NP after re-settlement of the local communities.

4.3.6 Income of respondents from non-farm activities

Table 12 showed that only 47.5% (57 respondents) of the respondents were involved in non-farm income generating activities in the area. The local communities adjacent to Kitulo NP were involved in non-farm activities in order to improve their livelihoods. The local communities diversify their livelihoods activities to cope with and recover from stresses and shocks to maintain its capabilities and assets while not undermining the natural resources base. Table 12 shows that the local community participated in non-farm activities such as petty business for sustaining their livelihoods. However the observation from the study area revealed that the promotion of non-farm activities such as trading activities, lumbering, fishing and salaried employment had helped people to improve their livelihood without depending on the resources from Kitulo NP. The phenomenon could facilitate the sustainability of Kitulo NP.

Other important livelihoods like assets and services were also considered in this study. The number of meals taken by the household per day was also considered (Table 13). At the time of the study 82% of the respondents were taken 3 meals per day while 16% were taking 2 meals per day before the establishment of Kitulo NP. The study further shows that after the establishment of Kitulo NP 77% of respondents were taking 3 meals per day while 22% were taking 2 meals per day. The study again indicated that there was availability of food in the study area. Those findings indicated the establishment of Kitulo NP had a minor toll to the availability of food at household level.

Table 12: Income from non-farm activities

| Village | Frequency | Mean | Minimum | Maximum | Std deviation |
|----------------|------------------|-------------|----------------|----------------|----------------------|
| Kinyika | 11 | 153 636 | 70 000 | 300 000 | 62 972 |
| Ikungula | 12 | 155 917 | 50 000 | 500 000 | 143603 |

| | | | | | |
|--------------|-----------|----------------|---------------|------------------|----------------|
| Mpangala | 10 | 274 500 | 70 000 | 1 000 000 | 271 932 |
| Makwaranga | 14 | 144 643 | 80 000 | 200 000 | 38 852 |
| Misiwa | 10 | 210 000 | 80 000 | 600 000 | 146 135 |
| Total | 57 | 183 000 | 50 000 | 1 000 000 | 150 816 |

Also it was observation that the local communities in an area producing more food crops rather than commercial crops like pyrethrum. Therefore the establishment of Kitulo NP has not affected much on food consumptions in the adjacent communities surrounding the NP.

Table 13: Number of meals taken by household per day

| Number of meals | Periods | | Total |
|-----------------|---------------|---------------|---------------|
| | Before | After | |
| | Frequency (%) | Frequency (%) | Frequency (%) |
| Two | 19 (16) | 26 (22) | 45 (19) |
| Three | 101 (84) | 94 (78) | 195 (81) |
| Total | 120 (100) | 120 (100) | 240 (100) |

4.3.7 Assets of household before and after the establishment of Kitulo NP

Generally the results indicated that there were no changes in assets ownership before and after the establishment of Kitulo NP (Table 14). Reason behind the scenario/phenomenon was because those communities affected by establishment of the NP were using the area absolutely for agricultural purposes only. In most cases the local communities were residing outside the area annexed to Kitulo NP which was owned and managed by then Kitulo Dairy Farm.

Table 14: Assets of household before and after establishment of Kitulo NP

| Assets | Response | Period | | Total |
|--------------|----------|---------------|---------------|---------------|
| | | Before | After | |
| | | Frequency (%) | Frequency (%) | Frequency (%) |
| Radio | No | 16 (13) | 16 (13) | 32 (13) |
| | Yes | 104 (87) | 104 (87) | 208 (87) |
| Mobile phone | No | 81 (68) | 81 (68) | 162 (68) |
| | Yes | 39 (33) | 39 (33) | 78 (33) |

| | | | | |
|--------------|-----|------------------|------------------|------------------|
| Iron | No | 63 (53) | 63 (53) | 126 (53) |
| | Yes | 57 (48) | 57 (48) | 114 (48) |
| Bicycle | No | 60 (50) | 63 (53) | 123 (51) |
| | Yes | 60 (50) | 57 (48) | 117 (49) |
| Furniture | No | 1 (1) | 2 (2) | 3 (1) |
| | Yes | 119(99) | 118(98) | 237(99) |
| Total | | 120 (100) | 120 (100) | 240 (100) |

Additionally FGD from the study revealed that priorities towards the income generating activities as the means for their livelihoods were the same before and after the establishment of the park. These priorities were arranged whereby farming activities were the first followed by livestock keeping while forestations were the third and last were non farming activities. Moreover the study explores that activities like hunting (animal products) and remittances from their relatives and other sources were not mentioned. This implies that the means of getting their livelihoods are the same even if they had evicted from Kitulo NP areas as the area concerned was absolutely used as a production area.

4.3.8 Community distance to access resources before and after the establishment of Kitulo NP

The ideal distance which the community were required to move to access various resources for their livelihoods were ranged from within 0.5 to 15 km. The findings revealed that there were changes of distances for resources located inside the NP. The resources concerned included water for livestock, grazing land, farming areas, and hunting, charcoal and building poles (Appendix 8).

The Appendix 8 indicated the average mean distance that community access water for human before establishment of Kitulo NP were 1.60 km while the minimum were 0.75 km and maximum distance were 2.75 km. After the establishment of the park the average mean

distance was 1.45 km while the minimum were 0.75 km and maximum distance was 2.25 km. Also the average mean distance that community access water for livestock before the park establishment were 6.10 km meanwhile the minimum were 5.25 km and maximum were 7.75 km. The average mean distance after the establishment of Kitulo NP were 2.89 km while the minimum was 1.75 km and the maximum distance were 3.25 km. Also the average mean distance for grazing land before the establishment of National Park were 5.95 whereby the minimum distance was 2.75 and the maximum were 7.25 km. The average mean distance for grazing land after the establishment of Kitulo NP was about 2.90 km while the minimum distance were 2.25 km and the maximum distance for grazing land were 3.25 km (Appendix 8). Moreover the average mean distance for firewood resources before the park establishment were 2.39 km while the minimum distance was 1.25 km and the maximum distance were 3.00 km. After the NP establishment the average mean distance for firewood were 2.30 while the minimum distance were 0.50 km and the maximum distance were 2.75 km (Appendix 8).

Likewise, the average mean distance sources of charcoal before the establishment of Kitulo NP were 2.39 km while the minimum distance were 1.75 km and the maximum distance were 3.00 km. Due to the park establishment the average mean distance was 2.27 km while the minimum was 0.50 km and the maximum distance was 2.75 km. The average mean distance for building poles was 2.37 km before the establishment of the park. The minimum distance was 1.75 km while the maximum distance was 3.00 km. Also the average mean distance after the establishment of the park was 2.30 km while the minimum distance was 0.50 km and the maximum distance was 2.75 km. The mean average distance for hunting areas was 2.69 km before the NP establishment while the minimum distance was 0.50 km and the maximum distance was 17.25 km. The average mean distance after the establishment of Kitulo NP was 2.37 km while the minimum distance was 1.75 km and

the maximum distance was 3.00 km. The average mean distance of farming location before the establishment of the NP was 6.44 km while the minimum distance was 2.25 km and the maximum distance was 10.25 km. The average mean distance after the establishment of Kitulo NP was 0.28 km while the minimum distance was 0.20 km and the maximum distance was 0.39 km (Appendix 8).

4.3.9 Group working phenomenon

The results revealed that about 95% (Fig. 4) of respondents accepted that the people in the surrounding community were working in groups as the sources of power to conduct various activities for improvement of their livelihoods. The FGD results revealed that these groups were important because it facilitate in increasing production for their livelihoods because they participate together in all economic activities. This implies that those groups existed before and after the establishment of Kitulo NP.

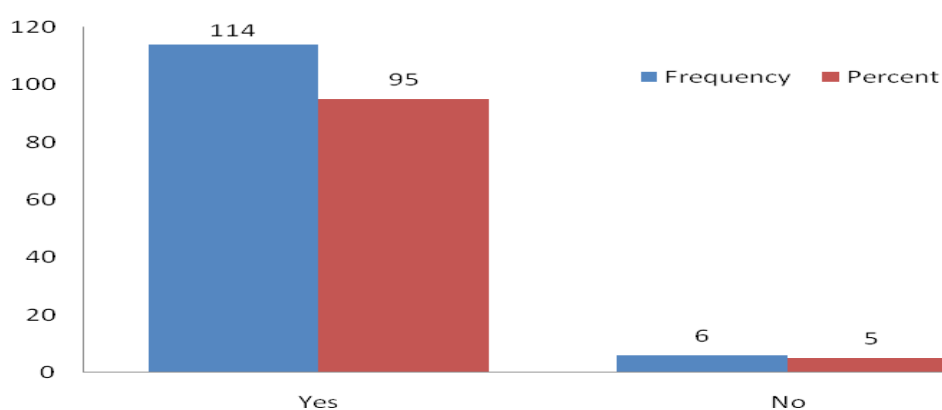


Figure 5: Habit of working in groups

4.3.10 Public institution and non governmental organisations

Fig. 5 indicated that about 53.3% of interviewees accepted that there were various institutions working in various villages in the study area while about 46.7% of respondents said that there were no institutions working in their villages. The results from FGD revealed that there were different institutions in various villages before and

after the establishment of Kitulo NP. Those institutions were dealing with production activities, conservation activities, counselling and development projects construction. Those institutions received assistance from the NP authorities for betterment of their living hence ensures the sustainability of NP.

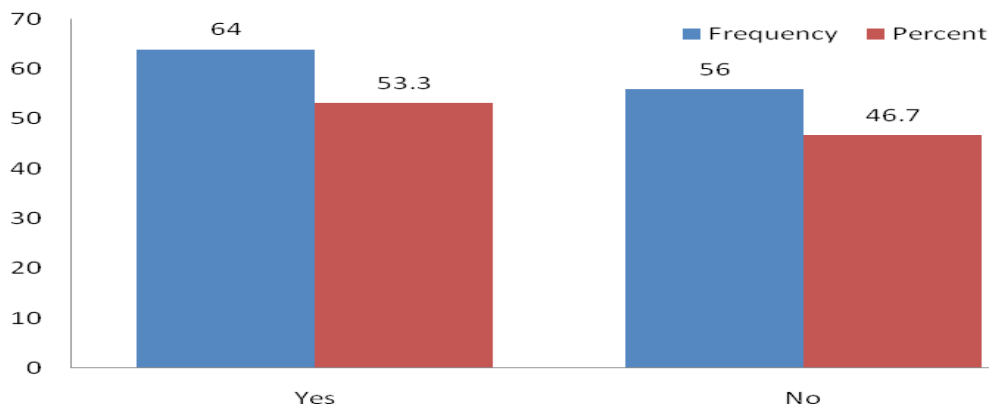


Figure 6: Public institution and non-governmental organisations

4.4 Suitability of new livelihood options after the establishment of Kitulo NP

The result revealed that 81% (Fig. 6) of the respondents acknowledge that the establishment of the NP did not improve their livelihoods. They claimed that establishment of the NP accelerated them in losing their farms, livestock, grazing areas, mistreatment, punishment and blockage of paths from one village to another through the NP. These findings concurred to Adams and Hutton (2007) who reported that establishment of protected area might result into landlessness, economic marginalisation, joblessness and loss of access to common properties and services. However, the study indicated that some benefits emanated as a result of the interventions. These include environmental conservation which resulted into water sources conservation, knowledge provision like solar technology and village development in general. These benefits was also reported by West *et al.* (2006) and Brockington and Igoe (2006).

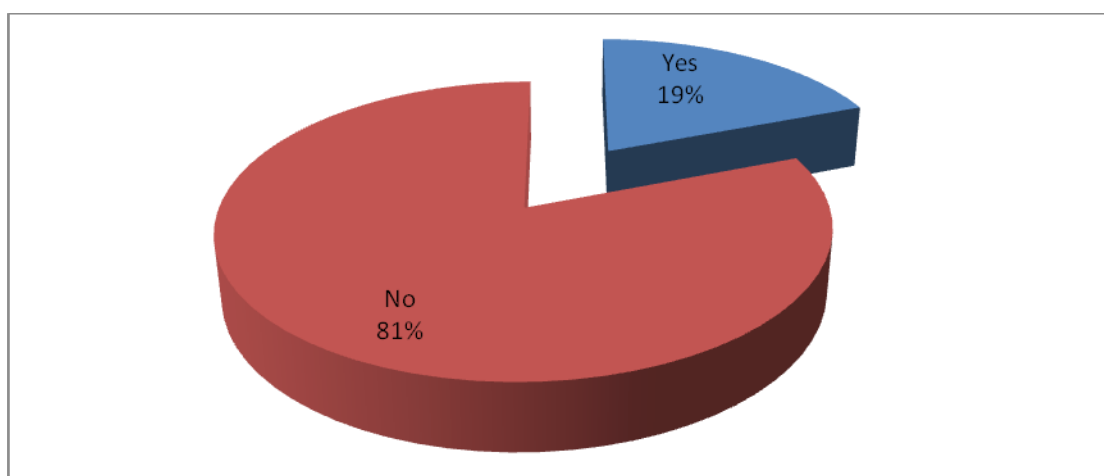


Figure 7: Sustainability of new livelihood options to community wellbeing after the establishment of Kitulo NP

Generally, it was observed that majority of the people preferred to get tangible benefits mainly at an individuals or household level rather than public level. Nevertheless, the observation made indicated that the community benefited after the interventions through public services provided. Various projects such as improvement of social services especially education and health services in the form of buildings construction, establishment of livestock projects and environmental conservation have been implemented.

In addition, the study observation indicated that through the provision of dairy cattle to different groups of local communities it lead to provision of milk. As the milk increasing in the study area it provided nutritious food for the local communities as the results improving the health of individuals in the study area. In this context the results shows that instead of putting more money for health services will be used in other generating income activities. Moreover the provision of livestock, pig's projects and other facilities in the

surrounding communities the study indicated that a local community increases sources of income at household level.

Additionally the provision of new technology like solar energy and fuel wood efficiency stoves for cooking will reduce the dependent on the forests for fuel wood. Also the results indicated that those projects would spread to all communities surrounding the NP. It was revealed that the suitability of new livelihood options could be evident as the communities stabilises gradually and understand their environment because they have enough land but what is required is intensification of land uses among local societies adjoining the NP.

4.5 Impacts of New Livelihood Options on the Sustainability of Kitulo NP

This section evaluates the impacts of the new livelihood options on the establishment of Kitulo NP. The section describes who has lost and who has gained what. The study revealed that payment of compensation and disappearance of properties was the main impacts which emanate in the area whereby needed to be handled carefully.

4.5.1 Compensation for land

The study showed that 98% of the respondents were forced to leave their own land to pave way for Kitulo NP establishment. This situation led to the conflict between the local communities and government. The results concurred with Baldus (1994) and Borrini-Feyerabend *et al.* (2004) who argued that conflicts arise which involve claims in land located in conservation areas.

On the other hand 99% of the respondents were not paid compensation for leaving the land. Discussion with key informants and FGD revealed that the land was owned by Kitulo Dairy Farm whereby farmers were encroached hence have no right for compensation. Other reasons were poor communications which lead to misunderstanding between the local community and TANAPA, unawareness of the community about their rights and fear of government coercive power contributed to the local community loose their rights.

Therefore, Government claimed that continued utilization of land after compensation was like trespassing in the Kitulo Dairy Farm, and they could not be paid compensation twice. Compensation was paid by Kitulo Dairy Farm to the people whose land was taken by the farm. However it appears that due to political interference the people were allowed to continue using the areas even after compensation had been made.

4.5.2 Problems faced by being moved to other places

By losing land which was major sources of income for their livelihood, the people became more impoverished as they were forced to start a new life style in another location. As shown in Fig. 9 only 8% of the people that were evicted managed to start new life successfully while the majority did not move away but they continued to live within their original villages and practiced agriculture in the area belonging to Kitulo Dairy Farm. It was also noted that the 8% were cattle keepers who lived with their livestock within the areas of Kitulo Dairy Farm.

Moreover, it was observed that communities surrounding the Kitulo Dairy Farm knew the boundaries of the dairy farm. Those people argued that they were allowed to utilise land for keeping cattle and cultivating pyrethrum without constructing permanent buildings because this was used as a shield for protecting theft of cattle from Kitulo Dairy Farm.

4.5.3 Loss of Properties

Loss of properties was another impact on new livelihoods options on the sustainability of Kitulo NP. The study showed 40% of the respondents lost their crop, 24% farms, 19% livestock, 8% houses, 4% trees and another 4% wheat barn (Fig. 9). Also it was noted that communities who lost their crops were not ready to leave the areas peacefully. They continued to cultivate the land even after the order of the government to stop any kind of human and economic activities in order to Kitulo NP to implement conservation. The government had give room for giving substantial amount of time for the people to remove their properties out of boundaries in order to avoid loss but a few of them resisted the order. Poor communication among the District administrators, Kitulo NP officials and local communities was a stumbling block. Therefore, the information from focus group discussion revealed that those problems occurred during the establishment of Kitulo NP.

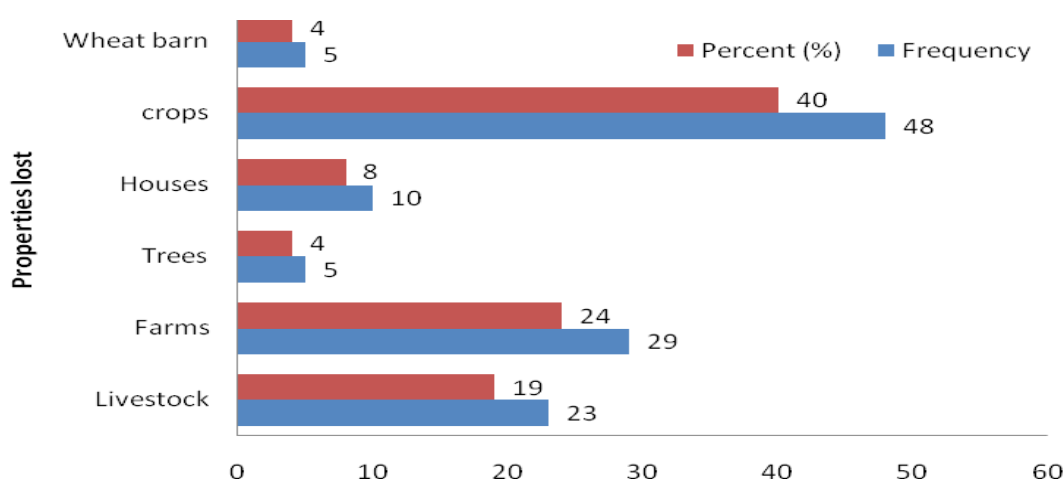


Figure 8: Loss of properties of local communities after establishment of Kitulo NP

In this context the potential impacts of the new livelihoods options after the establishment of Kitulo NP, the study revealed that it would be positive because of the provisional of various development projects at community and at household level. This provisional of alternative sources of income automatically will compensate what were getting from the

park. These results concurred with the argument of Ghai (1994) who emphasised that environmental resources conservation could be improved in areas where social factors influence people interaction with environment, such as access to natural resources, level of decision making and empowerment.

4.6 Community Livelihoods Changes and Its Implication for Sustainable Conservation of Kitulo NP

Among the new livelihood options for the sustainability of Kitulo NP was the total income of respondents and other factors which may be important for the sustainability of Kitulo NP. Moreover this could be described by using statistical analysis as shown in section 3.6.2 of chapter three where regression model was developed. Table 15 contains the definition and explanations of the variables used in regression model.

Table 15: Variable definition

| Variable definition | | | |
|------------------------------|--|-------------|------------|
| Dependent variable | Description | Mean | SD |
| Total Annual income | Total annual revenue of household (Tshs) | 235'043.10 | 223'071.93 |
| Independent variables | | | |
| Non Farm Income (TAS) | Annual revenue from non farm activities | 83'456.90 | 131'121.08 |
| Farm Income (TAS) | Annual revenue from farm activities | 151'586.20 | 188'443.14 |
| Age (years) | Number of years of head of household | 42 | 12.68 |
| Farm size (acres) | Total farm areas in acres | 4.64 | 3.15 |
| Sex | Sex of Respondent | | 1.33 |
| Duration of Residence | Number of years lived in the area | 42 | 12.68 |
| Household size | Total number of household residents related or not | 5.53 | 1.72 |
| Education | Educational level of respondent | 2.42 | 0.92 |

The analysis of total income of respondents was given as the dependent variable (sustainability of Kitulo NP) which was modelled with other independent factors as shown

in Table 15. The relationships between dependent and independent variables were explained through calculations. Table 16 shows the dependent and independent variables and their estimated parameters.

The results of regression analysis for sustainability of Kitulo National Park in Table 16 shows that a significant model was $R^2 = 64$ and significant F value = 0.04. Therefore this explains that the model is significant due the fact that more than 64 percent of independent variables explain the dependent variable. Also the Table 16 shows that the total annual income ($t=8.02$ and $P=0.00$) and education ($t=6.20$, $P=0.03$) of the local community members are the important factors determining the sustainability of Kitulo National Park. These results indicate that contribution in raising income of the local community members and improvement of educational environment are important factors in making Kitulo National Park important to the local community in order to ensure sustainability. Other factors including age, sex, duration of residence, farm size and household size are not important in making the park valuable to the local community and sustainable.

Therefore, the information from PRA shown that the empowerment of the local community through education will help them to be employed in various projects and conducting their activities in a well planned and sustainable manner. This would improve the household income of the surrounding community, as a result will lead to the sustainability of Kitulo NP. This is because the local community will have more time to engage in non-farm activities such as trading, employment and handcrafts. Moreover good policy and guidelines introduced by Kitulo NP would allow the local communities to accept the park and know as their own.

Table 16: Multiple regression models to explain factors for sustainability of Kitulo NP

| Independent Variables | Coefficients | Std Error | Beta | t | p > [t] | 95% CI |
|--------------------------------------|---------------------|------------------|-------------|----------|-------------------|----------------|
| (Constant) Non Farm Income | 0.15 | 0.33 | | 0.51 | 0.38 | 1.01 - 1.31 |
| (TAS) Farm Income | 0.14 | 0.34 | 0.66 | 8.02 | 0.00* | 1.33 - 2.414 |
| (TAS) Age (years) | 0.78 | 0.10 | 0.10 | 7.65 | 0.02* | 0.001 - 0.008 |
| Farm size (acres) | 0.00 | 0.00 | 0.02 | 0.95 | 0.35 | 0.002 - 0.009 |
| Sex | -0.01 | 0.07 | -0.02 | -0.79 | 0.43 | -0.033 - 0.02 |
| Duration of Residence | 0.05 | 0.04 | 0.12 | -0.02 | 0.84 | -0.055 - 0.065 |
| Household size | 0.01 | 0.02 | 0.06 | 0.77 | 0.45 | -0.007 - 0.009 |
| Education | -0.01 | 0.01 | -0.08 | -0.29 | 0.78 | -0.043 - 0.05 |
| | -0.01 | 0.02 | -0.02 | 6.20 | 0.03* | -0.118 - 0.076 |

***=Significant at 0.05, F=0.04, R²=0.64**

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

This chapter provides the major conclusions drawn out of the findings and analysis on this study: Community livelihood changes and their implications on sustainable conservations of Kitulo NP. Conclusions were drawn based on the specific objectives of this study.

5.2 Conclusion

- (i) The establishment of Kitulo National Park had positive impacts on local communities' livelihoods. In general, the community attitude was relatively negative towards the establishment of Kitulo NP. Several reasons contributed to this situation including, inadequate participation of local people, inadequate awareness on the value of conservation and justification for people's relocation, absence of compensation as people were living illegally in the protected area and forcefully eviction which led to loss of properties.
- (ii) However, the activities that were been conducted before and after establishment of Kitulo NP remained the same, though with little diversification and intensification after establishment. For instance, after establishment of the NP, farms and grazing areas were reduced, livestock number especially cattle were reduced which led to significant reduction in productivity. New livelihood options have evolved such as petty business and productivity has been stimulated through increased extension services and introduction of development projects (e.g. building of schools and

dispensaries, introduction of improved varieties of cattle and pigs and infrastructure development) spearheaded by Kitulo NP.

- (iii) The study has documented that various benefits emanated from the establishment of Kitulo NP such as improved social services, infrastructure, income generating activities, introduction of improved varieties of cattle and pigs, considerable environmental conservation which ensured provision of environmental services such as water, and improved energy technologies such as introduction of solar power accessories. However, at household level these seemed to be not well recognised as people prefer individual rather than community level benefits.

- (iv) Initial impact of the establishment of Kitulo NP was overshadowed by loss of properties and time taken for people to stabilize after eviction. However, as time goes the increased support from Kitulo NP became the driving force in improvement of livelihood status of the communities. Currently, the community has much more sources of income and other livelihood options which exceed those previously experienced in the area. All these have contributed to the improvement in environmental conservation activities, which has markedly enhanced natural biodiversity and conservation of water catchment areas.

5.4 Recommendations

Basing on the findings of this study the following recommendations are made.

- (i) From the fact that 19% of the local community had not attended formal school education while only 12% had primary school education up to standard four.

67% had attended only up to primary school level, and only 2% had secondary school education it implies that there was a low literacy level in the study community. Education is very important in providing skills, preparing the youth for the economic function in an increasingly complex technological society including empowering them to fit into new kinds of economic organizations. The study revealed the necessity of increasing access to education to the communities in the study area and to conduct seminars and workshops on various aspects of environmental conservation and other cross-cutting issues like HIV/AIDS, political and cultural issues. Also education on how land is administered and managed in rural areas is important because most of the rural community members think that land belongs to them and often resist when land is acquired for public interest. Education will help to create awareness of an appropriate land laws and policies.

- (ii) The study further shows that the local community surrounding Kitulo NP was not involved in the processes towards establishment of the park. A prior sensitization programme would have helped the people to understand the purpose of the project and its benefits, what is currently taking place and also the future benefits to the local community and nation. Also the sensitization programme would have assisted the local community understand what role they were expected to play and role of Kitulo National Park. Therefore, there is a need to have participatory strategies in establishment of conservation activities or new inputs in a certain area because local communities are part and parcel of the new inputs.
- (iii) From the fact that the local community was not involved in the process of establishing the park, there is a need to consider reviewing the boundaries between the villages surrounding Kitulo NP and the park in order to minimize

conflicts between Kitulo NP and members of the local community. The government should show exactly the borders of the park so as the adjacent communities know the boundaries of their villages.

- (iv) In view of the fact that communities that were evicted lost their property like livestock and crops, there is a need of identifying and supporting the most affected people especially students who left studies, especially at Kikondo primary school and assist them to settle smoothly. This will make them value, and participate in, conservation activities. Therefore it is important for the government to establish social services such as schools, hospitals, places to worship, infrastructure as well as clean water in resettlement areas before the people are moved from their original settlements. Pupils from Kikondo primary school were not continuing with studies because there was no school at Mwalusa, which is a sub village of Ipelele.
- (v) Promotion of conservation education among the local communities should be carried out in the form of encouraging park visits amongst people from surrounding communities, students and pupils. Also the establishment of conservation clubs in schools may be useful in nurturing future generations of conservationists and park staff. Therefore, there is a need for the park to establish a good relationship with their neighbours for the betterment of both the park and the local communities.
- (vi) Sensitization and full participation of the surrounding villagers in land use planning is very important in order to make the community members aware of any new changes in land policies. The National Land Policy of 1999 of Tanzania requires villagers to be involved in planning land use because if they are not involved they may not effectively participate in proper land management. The involvement of community should be from the phase of

planning to implementation and monitoring of the new land use. Interests of the local community must be mainstreamed in the management process. Therefore, the evaluation of economic structure and capability of surrounding community is important in order to determine their livelihoods before acquiring land and resettling the displaced ones.

- (vii) A successful management and conservation of environment should recognize the rights to access and use of the natural resources without affecting livelihoods of local communities and the national park. This would result into sustainable conservation of the environment.

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APPENDICES

Appendix 1: Questionnaire for heads of household

Interview Schedule on Community Livelihood Changes and their Implications for Sustainable Conservation

A: Introduction and Consent

My name is Sebastian William Sanga from Sokoine University of Agriculture. We are conducting a survey on community livelihood changes and its implications for sustainable conservation of Kitulo Ecosystem. The main objective of the study is to learn about community livelihood changes in this area due to conservation and its relationship with the sustainability of Kitulo National Park.

I want to share with you experience you have in all matters concerning community livelihood changes and its implications for sustainable conservation. Everyone is free to express anything concerning the matter; there is no right or wrong answer. You have the right to ask questions or stop the interviewer at any time when you need more clarification. I assure you that the outcome of this discussion is confidential. Therefore, all the information you provide will be useful in decision making for the betterment of the community livelihood and the public. You are kindly requested to respond truthfully and faithfully in filling this questionnaire and or your acceptance to be interviewed. Thank you.

Let me begin the discussion.

1: HOUSEHOLD INFORMATION

1.1 Basic respondent's information

If is immigrant, show years of residence

| DATE OF INTERVIEW | VILLAGE/SUB-VILLAGE NAMES | DIVISION |
|--------------------------|----------------------------|---------------------------------|
| Household code | Name | Ethnicity |
| Respondent's age (years) | Respondent's sex | |
| | [1] = Male [2] = Female | |
| AGE OF HHH (YEARS) | SEX OF HHH | ORIGIN OF HHH |
| | [1] = Male [2] = Female | [1] = Native [2] = Immigrant |

1.2
M

Members of household currently resident

| Name | Age (yrs) | Sex | Relationship | Education | Occupation |
|----------------------------------|-----------|-----------|--------------------|---------------|---------------------|
| 1 | | 1: Male | 1: Head | 1: None | 1: Child |
| 2 | | 2: Female | 2: Wife | 2: Std IV | 2: Student |
| 3 | | | 3: Husband | 3: Std VII | 3: Farmer |
| 4 | | | 4: Child | 4: Secondary | 4: C/servant |
| 5 | | | 5: Other relatives | 5: Higher Ed. | 5: non-farm |
| 6 | | | 6: None relatives | | 6: Livestock keeper |
| 7 | | | | | |
| Total Resident HH members | | | | | |

1.3 Main occupation of the household head

- 1 = Farming
 2 = Farming and off farm
 3 = Off-farm only
 4 = Livestock
 5 = Livestock and farming
 6 = others (specify).....

1.4 Members of household permanently or mostly away

| ID | Name | Age (Yrs) | Sex | | Education level | | If sends money home | | Estimated Amount last season | |
|---|------|-----------|------|--|-----------------|--|---------------------|----|------------------------------|--|
| | | | Code | | Code | | Yes | No | Amount | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| Total family members permanently or mostly away | | | | | | | | | | |
| Total Remittances in the past year [] period from.....to..... | | | | | | | | | | |

SECTION B

2: How many croplands owned and operated by the household (acres)

.....

3. How did you obtain your land?

- 1: Inherited 2: Purchased 3: Village government
 4: Borrowed 5: Accessed free land

4. Total land owned by the household before establishment of Kitulo NP

| Field | Area | Ownership | Rent In Land | Rent Out Land | Major crops | Production domain |
|---|------------------------------------|--|-------------------|------------------------|-----------------------------|---------------------------------|
| | Area of each field or plot (acres) | 1: owned (idle) 2: owned (used) 3: owned (rented out) 4: Rent in 5: Borrowed | Amount paid (Tsh) | Amount received (Tshs) | Crops | 1: Dry season 2: Rain season |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| Total number of plots (Sum codes 1-3 under ownership) | | | Total area owned | | Total area used for farming | |

5. Total land owned by the household after the establishment of Kitulo NP

| Field | Area | Ownership | Rent In Land | Rent Out | Major crops | Production domain |
|-------|------|-----------|--------------|----------|-------------|-------------------|
|-------|------|-----------|--------------|----------|-------------|-------------------|

| S/N | Livestock | Number | Uses |
|-----|------------------|--------|------|
| 1 | Cattle | | |
| 2 | Goats | | |
| 3 | Sheep | | |
| 4 | Horses | | |
| 5 | Chickens | | |
| 6 | Dogs | | |
| 7 | Donkeys | | |
| 8 | Pigs | | |
| 9 | Others (specify) | | |

8. If you keep livestock before the establishment of Kitulo NP give the total number of livestock your in the table below.

9. If you keep livestock after the establishment of Kitulo NP give the total number of livestock you're in the table below.

| S/N | Livestock | Number | Uses |
|-----|------------------|--------|------|
| 1 | Cattle | | |
| 2 | Goats | | |
| 3 | Sheep | | |
| 4 | Horses | | |
| 5 | Chickens | | |
| 6 | Dogs | | |
| 7 | Donkeys | | |
| 8 | Pigs | | |
| 9 | Others (specify) | | |

10.

Outputs and income from non-farm activities

| S/n | Type of work | Amount earned last month (Tsh)* | Amount Earned Past Year (Tsh)** | Place of work | Remarks |
|--|--------------------------|---------------------------------|---------------------------------|--|---------|
| | | | | 1: Nearby 2: District 3: Town (name) 4: City (name) | |
| 1 | Wages – Seasonal | | | | |
| 2 | Wages – Regular | | | | |
| 3 | Salary–govt sector | | | | |
| 5 | Business Income | | | | |
| 6 | Pension Payment | | | | |
| 7 | Other Non Farm (specify) | | | | |
| YEAR TOTAL (Tshs) | | | | | |
| Number HH members earning from non – Farm Incomes | | | | | |
| Total Non – Farm Income earned by household members (sum of years total for all non-farm earns in the household (Tshs) | | | | | |

- 11) What is the average income of the household before establishment of Kitulo NP.....
NP.....
- 12) What is the average income of the household after establishment of Kitulo NP?
.....
- 13) Your income increased or decreased due to establishment of Kitulo NP?
(a) Yes [] (b) No []
- 14) If the answer is yes increased in the above give reasons
.....
- 15) If the answer is No (decreased) in the question 30 above give reasons
.....
- 16) How do you mostly spend the income gained from various sources?
a) Basic needs (clothes, food, shelter) and health services
b) Invest into off-farm activities
c) Hired labour and purchase of farm inputs
d) Others (specify).....
- 17) Do you think the income obtained is satisfactory to most of your family requirements?
a) Yes, very satisfactory
b) Yes to some extent
c) No not satisfactory
- 18). What size of land owned (acres) before the establishment of Kitulo NP
.....
- 19). How many acres of land do you own after the establishment of Kitulo NP
.....
20. What are the major uses of your land
- 21) Among plots you own, how many are not in use.....
- 22) Have you ever been displaced from your original land due to conservation activities?
(a) Yes () (b) No ()
- 23) If yes, were you compensated?
(a) Yes () (b) No ()
- 24). If yes how much was the compensation? Or what was the form of compensation?
.....
- 25). If No why
- 26) Do people in this village work in groups?
a) Yes () (b) No ()
- 27) Did this group exist before the establishment of Kitulo NP?
(a) Yes () (b) No ()
- 28) If the answer is yes what were the activities done by the groups before the establishment of Kitulo NP?
a).....
b).....
- 29). What are the activities conducted by this groups after establishment of Kitulo NP
.....
- 30). Do community based organizations (CBOs) exist in this village?
a) Yes () b) No ()
- 31) If the answer is 'Yes' in question 13 what are the main activities undertaken by the CBOs
a).....
b).....
- 32). How Kitulo NP assists those groups to perform their activities?
.....

SECTION C.

- 33). Did community sensitization in establishment of Kitulo NP take place after or before its introduction
- 34). In which of the following did you attended?
- a) Meeting.....
for what.....
- b) Seminar.....
for what.....
- c) Training.....
for what.....
- d) Course.....
for what
- 35) Do you participate in conservation activities undertaken by the park?
a) Yes () b) No ()
- 36) If yes, what are the types of activities are you involved in the conservations?
a).....
b).....
- 37) What are the reasons for your participation.....?
- 38). What properties did you losses as a result of establishment of Kitulo NP..
.....
- 39). What are the problems experienced due to displacement from your former residence as the result of establishment of Kitulo NP?

Section B 2: Livelihood suitability information

- 40) Do you think Kitulo NP will improve your well-being?
(a)Yes () (b) No ()
- 41) If yes, give reasons
- 42) If No, give reasons
- 43) Do you consider Kitulo NP conservation initiatives have successfully enabled you to reduce poverty in your household?
a). Yes () b). No () c). I do not know ()
- 44) If yes in which ways has it enable poverty reduction?
- 45) If No give reasons

LIVELIHOOD ASSETS

46) Does your household own the following assets before and after establishment of Kitulo NP?

| s/n | Assets | Before | After |
|-----|--------------------------|--------|-------|
| 1 | Radio1 | | |
| 2 | Telephone (mobile).....2 | | |
| 3 | Iron3 | | |
| 4 | Wheelbarrow.....4 | | |
| 5 | Plough5 | | |
| 6 | Vehicle.....6 | | |
| 7 | Bicycle.....7 | | |
| 8 | Furniture.....8 | | |
| 9 | Oxcart9 | | |
| 10 | Television10 | | |
| 11 | Other (specify).....11 | | |

47) What is the main source of energy for cooking?

| | | Before | After |
|---|-----------------------|---------------|--------------|
| 1 | Electricity1 | | |
| 2 | Solar2 | | |
| 3 | Gas (Biogas).....3 | | |
| 4 | Kerosene.....4 | | |
| 5 | Charcoal.....5 | | |
| 6 | Fire wood.....6 | | |
| 7 | Livestock dung.....7 | | |
| 8 | Other (specify).....8 | | |

48) What is the main source of drinking water?

| | | Before | After |
|---|---------------------------------------|---------------|--------------|
| 1 | Piped water.....1 | | |
| 2 | Protected well.....2 | | |
| 3 | Spring..... 3 | | |
| 4 | Surface water (river or stream).....4 | | |
| 5 | Unprotected well.....5 | | |
| 6 | Others (specify).....6 | | |

49) What type of toilets does your household use?

| | | Before | After |
|---|-------------------------|---------------|--------------|
| a | No toilets (bush).....1 | | |
| b | Pit Latrine.....2 | | |
| c | Flush toilets.....3 | | |
| d | Other (specify).....4 | | |

50) What number of meals the household normally has per day

| | |
|-----------------------------------|--|
| Before establishment of Kitulo NP | |
| After establishment of Kitulo NP | |

51) Why?.....

| | | Before | After |
|---|-------|---------------|--------------|
| a | | | |
| b | | | |
| c | | | |
| d | | | |

52) What is the main building materials used in construction of your house?

53) Which type of services is available in your locality?

| | | Before | After |
|---|---------------------------|---------------|--------------|
| a | Primary school.....1 | | |
| b | Secondary school.....2 | | |
| c | Health dispensary.....3 | | |
| d | Veterinary clinics4 | | |
| e | Extension centre.....5 | | |
| f | Feeder Roads.....6 | | |
| g | All weather Roads.....7 | | |
| h | Tarmac Road8 | | |
| i | Market.....9 | | |

54. Rank the following livelihood activities as sources of income of the household in order of their importance.

| | | Before | After |
|---|-----------------------|---------------|--------------|
| a | Farming activities | | |
| b | Livestock keeping | | |
| c | Off farm keeping | | |
| d | Remittances | | |
| e | Hunting activities | | |
| f | Tree/forest resources | | |

55) What is the ideal distance does the community access to the following resources.

| | Resources | Before | After |
|---|-------------------------------|---------------|--------------|
| a | Water for humans | | |
| b | Water for livestock | | |
| c | Communal grazing | | |
| d | Communal fire wood | | |
| e | Wood for charcoal | | |
| f | Building poles | | |
| g | Hunting (animal products) | | |
| h | Communal land for cultivation | | |

SECTION D**56) Community attitude towards establishment of Kitulo NP:**

Strongly agree = 5; Agree = 4; Undecided = 3; Disagree = 2;

Strongly disagree = 1.

| S/n | Questions | Ranking | | | | |
|-----|--|---------|---|---|---|---|
| | | 5 | 4 | 3 | 2 | 1 |
| 1 | The establishment of Kitulo NP was done in accordance to community agreement. | | | | | |
| 2 | The establishment of Kitulo NP perceived positively by local community | | | | | |
| 3 | Sensitization and awareness rising sufficiently provided before establishment of Kitulo NP? | | | | | |
| 4 | Kitulo NP supports various development projects for surrounding community. | | | | | |
| 5 | Kitulo NP support people displaced by the establishment of the park to improve their livelihoods | | | | | |
| 6 | The community surrounding Kitulo NP improved their livelihoods after the establishment of the park | | | | | |
| 7 | After the establishment of the park the infrastructures have not improved within the areas | | | | | |
| 8 | Kitulo NP provides capital for various CBOs involved in conservation and other production activities | | | | | |
| 9 | After the establishment of the park, many people within the area have not been employed by the park | | | | | |
| 10 | The improvement of community livelihoods surrounding the park has enhanced the sustainability of Kitulo NP | | | | | |

57). For your opinion, how the process of establishment of the park could it be enhanced?

Appendix 2: Check List for Key Informants District Officials (DED, DC)

1. What are the attitudes/ perception of the community towards the establishment of Kitulo NP conservation?
2. How much money is paid yearly by Kitulo NP to support the local government for community development projects?
3. In which ways does, Kitulo NP contributes to the national income.
4. Did displaced households in paving way for Kitulo NP conservation was compensated?
(a) Yes (b) No
5. If no why.....
6. What are the notable socio-economic problems associated with the establishment of Kitulo NP
7. What are the notable environmental problems associated with the establishment of Kitulo NP
8. What are your comments on how to enhance the contribution of Kitulo NP to the neighbouring local communities?
9. What is the social relationship between NP and the surrounding communities?
10. What are your views regarding the improvement and accessibility of social services supported by Kitulo NP with respect to education water supply, health and roads?
11. How could it be the process of establishment of Kitulo NP is enhanced?
12. What are the approaches and policies taken to strengthen community livelihoods surrounding the Kitulo NP?
13. What are the newly emerging forms of livelihoods surrounding the Kitulo NP conservation?.....
14. What can be done in order to enhance the conservation activities of Kitulo NP?
15. What are the effects of establishment of Kitulo NP to the surrounding communities?.....

Appendix 3: Kitulo NP Officials

1. How do you contribute to the national income?
2. How do you facilitate the development of surrounding communities to the NP?
3. What did you do with the displaced household in paving way for establishment of Kitulo NP?
4. If the answer is no why...
5. Did the surrounding community accept the Kitulo NP establishment?
6. If yes why
7. If no why
8. What are the changes of livelihood of local communities after the establishment of Kitulo NP?
9. What are the benefits gained by community due to establishment of Kitulo NP?
10. What are the major problems experienced by the community due to establishment of Kitulo NP

Appendix 4: Village Leaders/Authorities

1. Were the community involved in early stages of establishment of Kitulo NP?
2. If yes how
.....
3. If no why.....
4. Did you accept the establishment of Kitulo NP?
5. If yes give reasons
.....
6. If no give reasons.....
7. How do community participate in conservation activities of Kitulo NP?
8. What are the incentives that motivate people’s participation in conservation of Kitulo NP?
9. What makes people lack motivation to participate in conservation of Kitulo NP?
10. How about your relationship with the Kitulo NP authorities.
11. What are the major benefits gained by community due to establishment of Kitulo NP
12. What are the major problems experienced by the community due to establishment of Kitulo NP
13. How could it be the process of establishment of Kitulo NP is enhanced?

Appendix 5: Guideline for focus group discussion (FGDs)

1. What are the attitudes/ perception of the community towards the establishment of Kitulo NP conservation? (High, Medium, Low)
2. In which ways does, Kitulo NP contributes to the development projects?
3. Did displaced households in paving way for Kitulo NP conservation was compensated?
4. What are the notable socio-economic problems associated with the establishment of Kitulo NP
5. What are the notable environmental problems associated with the establishment of Kitulo NP
6. What are your comments on how to enhance the contribution of Kitulo NP to the livelihoods of local communities?
7. What is the social relationship between Kitulo NP and your village?
8. What are your views regarding the improvement and accessibility of social services supported by Kitulo NP with respect to education water supply, health and roads?
9. How could it be the process of establishment of Kitulo NP enhanced?
10. What are the newly emerging forms of livelihoods surrounding the Kitulo NP Conservation?.....
11. What can be done in order to enhance the conservation activities of Kitulo NP?
12. What are the effects of establishment of Kitulo NP to the surrounding communities?.....

Appendix 6: Focus group discussion (FGDs) for each Village**Mssiwa Village**

| S/No | Age | Sex | Position |
|------|-----|--------|--|
| 1 | 51 | Male | Chairperson of the village |
| 2 | 48 | Male | Village Executive Officer (VEO) |
| 3 | 75 | Male | Farmer and Livestock Keepers |
| 4 | 29 | Female | Crop cultivation |
| 5 | 40 | Female | Member of Village Council |
| 6 | 38 | Female | Farming and Livestock keepers |
| 7 | 30 | Male | Member of Village Council |
| 8 | 36 | Female | Farming, livestock keepers and petty traders |
| 9 | 62 | Male | Member of Village Council |
| 10 | 42 | Male | Member of Social affairs and Counseling |

Mpangala Village

| S/No | Age | Sex | Position |
|------|-----|--------|--------------------------------------|
| 1 | 50 | Male | Chairperson of the Village |
| 2 | 49 | Male | Village Executive Officer |
| 3 | 30 | Female | Farming activities |
| 4 | 58 | Male | Chairperson of Maghano group |
| 5 | 74 | Male | Member of Maghano group |
| 6 | 27 | Male | Farming activities and petty traders |
| 7 | 38 | Female | Member of Maghano group |
| 8 | 56 | Female | Member of Village Council |
| 9 | 29 | Male | Member of Village Council |
| 10 | 32 | Female | Member of Village Council |
| 11 | 48 | Female | Farming and Livestock keepers |
| 12 | 45 | Male | Member of Maghano group |

Ikungula Village

| S/No | Age | Sex | Position |
|------|-----|--------|--------------------------------------|
| 1 | 45 | Male | Chairperson of the Village |
| 2 | 40 | Male | Village Executive Officer |
| 3 | 50 | Male | Member of Village Council Kitongoji |
| 4 | 35 | Male | Farming activities and petty traders |
| 5 | 55 | Male | Member of Ilima group |
| 6 | 42 | Female | Member of Village council |
| 7 | 38 | Female | Member of Ilima group |
| 8 | 25 | Female | Farming activities |
| 9 | 40 | Female | Member of Ilima Group |

Kinyika Village

| S/No | Age | Sex | Position |
|-------------|------------|------------|---------------------------------------|
| 1 | 48 | Female | Chairperson of the Village |
| 2 | 43 | Male | Village Executive Officer |
| 3 | 45 | Female | Member of Village Council Kitongoji |
| 4 | 38 | Female | Member of Village Council |
| 5 | 40 | Male | Member of Kilindima group |
| 6 | 30 | Female | Member of Council and Kilindima group |
| 7 | 73 | Male | Farmer and Livestock keepers |
| 8 | 64 | Male | Member of Village council |
| 9 | 68 | Male | Farmer and Livestock keepers |
| 10 | 30 | Male | Member of Kilindima group |
| 11 | 28 | Male | Farmer and Livestock keepers |
| 12 | 32 | Female | Member of Kilindima group |

Makwaranga Village

| S/No | Age | Sex | Position |
|-------------|------------|------------|--|
| 1 | 54 | Male | Chairperson of the Village |
| 2 | 50 | Male | Village Executive Officer |
| 3 | 38 | Male | Member of Village Council |
| 4 | 68 | Male | Farmer and Livestock keepers |
| 5 | 28 | Male | Farmer and petty traders |
| 6 | 52 | Female | Member of socials affairs and counseling group |
| 7 | 30 | Female | Farmer and Livestock keepers |
| 8 | 40 | Female | Member of Village council |

Appendix 7: Definition of operational variables

| Variable | Operation definition |
|------------------------------|--|
| Age | Number of years at birth |
| Sex | Being a male or female |
| Marital status | Being married, single, divorced or widow |
| Education | Highest level of education attained/ years of education |
| Income | Average annual money or asset earned |
| Religion | Perception or belief of a person to a certain dominion. |
| Attitude | Perception of a community towards establishment of Kitulo National Park |
| Household size | Number of residents in the household |
| Household labour | Number of people in a household capable of working |
| Economic status | Income level of parent or guardian |
| Occupation | Kind of work or duties that one performs daily |
| Migration | Movement of people in and out |
| Seasonal farming | Engagement in cultivation of agricultural products periodically by individuals |
| Livelihood | Activities, assets and access that jointly determine the living |
| Empowerment | Enhancement of the community capacity to participate in decision making process pertaining to their livelihood and development |
| Training | Formal and informal acquisition of knowledge |
| Land owned | Size of the farm or plot owned in acres |
| Community | Local and rural community/ group of people having common understanding or interest on the resource around the National Park) |
| National Park | Large area, which contain representative samples of major natural regions, features, or scenery where plant and animals species, geomorphological sites and habitats of special scientific, educational and recreational interest. |
| Remittances | Offerings or assistance from well wishers |
| Sustainability | A characteristic of a process or a state that can be maintained at a certain level indefinitely |
| Diversification | Numerous and various activities/ issues dealt with |
| Land use | Activity performed on land at certain locations |
| Community based organization | Social groups involved in development issues |
| Rules | Laws, regulations and guidelines applied in conservation and management of the resource |

| | | | | | | | | | |
|--|----------------|------|------|------|------|------|------|------|------|
| | Mean | 1.60 | 1.45 | 6.10 | 2.89 | 5.95 | 2.90 | 2.39 | 2.30 |
| | Maximum | 2.75 | 2.25 | 7.75 | 3.25 | 7.25 | 3.25 | 3.00 | 2.75 |
| | Minimum | 0.75 | 0.75 | 5.25 | 1.75 | 2.75 | 2.25 | 1.25 | 0.50 |
| | Std. Deviation | 0.69 | 0.51 | 0.52 | 0.40 | 0.84 | 0.37 | 0.42 | 0.48 |

| Village | Statistics | Distance to charcoal source before | Distance to charcoal source after | Distance to building poles source before | Distance to building poles source after | Distance to hunting area before | Distance to hunting area after | Distance to farming location before | Distance to farming location after |
|-----------|----------------|------------------------------------|-----------------------------------|--|---|---------------------------------|--------------------------------|-------------------------------------|------------------------------------|
| Kanyika | Frequency | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| | Mean | 2.62 | 2.51 | 2.55 | 2.51 | 2.55 | 2.51 | 6.51 | 0.30 |
| | Maximum | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 10.25 | 0.39 |
| | Minimum | 2.25 | 2.25 | 2.25 | 2.25 | 2.25 | 2.25 | 5.25 | 0.25 |
| | Std. Deviation | 0.22 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 1.05 | 0.03 |
| Ikungula | Frequency | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 |
| | Mean | 2.56 | 2.49 | 2.56 | 2.49 | 2.56 | 2.49 | 7.18 | 0.30 |
| | Maximum | 3.00 | 2.75 | 3.00 | 2.75 | 3.00 | 2.75 | 8.25 | 0.30 |
| | Minimum | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 6.50 | 0.30 |
| | Std. Deviation | 0.39 | 0.37 | 0.39 | 0.37 | 0.39 | 0.37 | 0.58 | 0.00 |
| Mpangala | Frequency | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| | Mean | 2.05 | 1.95 | 2.05 | 1.95 | 2.05 | 1.95 | 6.25 | 0.26 |
| | Maximum | 2.25 | 2.25 | 2.25 | 2.25 | 2.25 | 2.25 | 7.50 | 0.30 |
| | Minimum | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 5.25 | 0.20 |
| | Std. Deviation | 0.20 | 0.25 | 0.20 | 0.25 | 0.20 | 0.25 | 0.77 | 0.05 |
| Mkwaranga | Frequency | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| | Mean | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 5.41 | 0.23 |
| | Maximum | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 6.75 | 0.25 |
| | Minimum | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 2.25 | 0.20 |
| | Std. Deviation | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 1.40 | 0.03 |
| Misiwa | Frequency | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| | Mean | 2.30 | 1.96 | 2.30 | 2.11 | 2.30 | 4.44 | 6.90 | 0.29 |
| | Maximum | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 17.25 | 8.25 | 0.30 |

| | | | | | | | | | |
|-------|----------------|------|------|------|------|------|-------|-------|------|
| | Minimum | 1.75 | 0.50 | 1.75 | 0.50 | 1.75 | 0.50 | 6.25 | 0.25 |
| | Std. Deviation | 0.51 | 0.79 | 0.51 | 0.83 | 0.51 | 5.58 | 0.78 | 0.02 |
| Total | Frequency | 120 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| | Mean | 2.39 | 2.27 | 2.37 | 2.30 | 2.37 | 2.69 | 6.44 | 0.28 |
| | Maximum | 3.00 | 2.75 | 3.00 | 2.75 | 3.00 | 17.25 | 10.25 | 0.39 |
| | Minimum | 1.75 | 0.50 | 1.75 | 0.50 | 1.75 | 0.50 | 2.25 | 0.20 |
| | Std. Deviation | 0.39 | 0.48 | 0.38 | 0.48 | 0.38 | 2.39 | 1.12 | 0.04 |

Appendix 9: Priority set before and after establishment of Kitulo NP

| Priority | | Period | | Total | | |
|---------------|------------------|-----------|-----------|-------|-----|-----|
| | | Before | After | | | |
| Farming | 1 | Frequency | 120 | 120 | 240 | |
| | | Percent | 100 | 100 | 100 | |
| Non farming | 2 | Frequency | 19 | 24 | 43 | |
| | | Percent | 16 | 20 | 18 | |
| | 3 | Frequency | 33 | 28 | 61 | |
| | | Percent | 28 | 23 | 25 | |
| | 4 | Frequency | 6 | 6 | 12 | |
| | | Percent | 5 | 5 | 5 | |
| | 5 | Frequency | 62 | 62 | 124 | |
| | | Percent | 52 | 52 | 52 | |
| | Animal husbandry | 2 | Frequency | 99 | 94 | 193 |
| | | | Percent | 83 | 78 | 80 |
| 3 | | Frequency | 19 | 24 | 43 | |
| | | Percent | 16 | 20 | 18 | |
| 4 | | Frequency | 1 | 1 | 2 | |
| | | Percent | 1 | 1 | 1 | |
| 5 | | Frequency | 1 | 1 | 2 | |
| | | Percent | 1 | 1 | 1 | |
| Afforestation | | 2 | Frequency | 2 | 2 | 4 |
| | | | Percent | 2 | 2 | 2 |
| | 3 | Frequency | 65 | 65 | 130 | |
| | | Percent | 54 | 54 | 54 | |
| | 4 | Frequency | 44 | 44 | 88 | |
| | | Percent | 37 | 37 | 37 | |
| | 5 | Frequency | 9 | 9 | 18 | |
| | | Percent | 8 | 8 | 8 | |
| | Total | Frequency | 120 | 120 | 240 | |
| | | Percent | 100 | 100 | 100 | |