# SOCIO-ECOLOGICAL RESILIENCE OF PEOPLE EVICTED FOR ESTABLISHMENT OF ULUGURU NATURE RESERVE IN MOROGORO REGION, TANZANIA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN THE MANEGEMENT OF NATURAL RESOURCES FOR SUSTAINABLE AGRICULTURE OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.



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## ABSTRACT

Utilization of natural resources has been steadily increasing due to population growth as demand exceeds ecosystem capacity to supply them. In response to this, sometimes the government tends to evict people already established their livelihood for conservation of natural resources. This causes disturbance on livelihood of the people who need to be socio-ecological resilient after eviction. The study aimed to assess the socio-ecological resilience of people evicted for establishment of Uluguru Nature Reserve. Specifically, to analyze the institutions governed the eviction and its implications on socio-ecological resilience of people evicted, to assess the eviction process during the establishment of UNR and its implication on socio-ecological resilience of the people evicted, to examine components of socio-ecological resilience for people evicted from UNR and to assess socio-economic factors underlined socio-ecological resilience of people evicted from UNR. Content analysis was employed for institutions governed the eviction. Frequencies and percentages were calculated for eviction process and coping strategies. General Linear Model (GLM) Univariate was used to determine factors influenced components of socio-ecological resilience. Binary regression was used to examine statistical significance of socio-economic factors influencing adoption of coping strategies after eviction. The study realized that institution governed eviction stipulate clearly the rights of evicted people. The study revealed also that people with high income were resilient than with low income, people with many economic activities were socio-ecological resilient than those performing only one activity, males were more socio-ecological resilient than females. The study concludes that eviction process lead to low socio-ecological resilience of the evicted people. The study recommends that strategies for increasing socio-ecological resilient of the evicted people including

participation of local community in eviction process, support from government and Non Governmental Organization( NGOs) on creating awareness to people about the whole process of eviction is required.

## DECLARATION

I, OLIVA MARCUS NYENZA, do hereby declare to the Senate of Sokoine University of Agriculture, that this dissertation is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted for degree award in any other institution.

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## DEDICATION

This work is dedicated to my husband Humphrey Mwasimbi, my children Faraja and Frank, and my mother Anna Chafu. Without forgetting my late father Marcus Nyenza and my young sister Remija Nyenza. May the Almighty God rest their souls in external Peace Amen.

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## LIST OF ABBREAVIATIONS AND SYMBOLS

| | |
|---|---|
| BTC | Belgium Technical Cooperation |
| FAO | Food and Agriculture Organization of the United Nations |
| FR | Forest Reserve |
| GLM | General Linear Model |
| IBT | Island Biogeography Theory |
| NEMC | National Environmental Management Council |
| NGO | Non Governmental Organisation |
| PAs | Protected Areas |
| PCA | Principal Component Analysis |
| RPF | Resettlement Policy Framework |
| SUA | Sokoine University of Agriculture |
| UNR | Uluguru Nature Reserve |
| URT | United Republic of Tanzania |
| VEOs | Village Executive Officers |
| WEOs | Ward Executive Officers |
| WCST | Wildlife Conservation Society of Tanzania |

# CHAPTER ONE

## 1.0 INTRODUCTION

This chapter is divided into five sections; section one, describe the background information of the study, section two presents statement of the problem and justification of the study, followed by objectives of the study including main objective and specific objectives in section three while in section four research questions are presented. in section five is the conceptual framework that guided the study.

## 1.1 Background Information

Utilization of ecosystem goods and services has been steadily increasing due to population growth as demand exceeds ecosystem capacity to supply them. It has created much pressure on ecosystem and hence threats on their sustainability (NEMC, 2006). The demand of natural resources and the impacts of growing world population on the environment have lead to establishment of policies that regulate the use of natural resources (Marshall and Marshall, 2007). Invariably, the restrictions required in sustaining the supply of ecosystem goods and services result in the impacts on resource users (Machlil and Force 1988; Stedmin, 1999). Policies that are implemented without due consideration of socio-ecological consequences often generate conflict and leads to poor compliance (Sutuinen, 1998; Hiedampaa, 2005). This in turn undermines the effectiveness of the policies in achieving the original goal of resource sustainability (Maiolo *et al.*, 1992). Understanding the responses of resource users to planned changes in resource policy is central to effective management of natural resources (Mukul *et al.*, 2012).

Socio-ecological resilience is the ability of socio-ecological systems to cope with and adapt to change (Folke *et al.*, 2002). Resilient systems are adaptable, flexible, and prepared for change and uncertainty. Nonresilient systems, in contrast, are prone to irreversible or catastrophic change and are at risk of shifting into another, often undesirable state governed by different rules and processes (Jain, 2012; Morton, 2007). Knowledge of the resilience of a system enables managers to foresee the likely consequences thus choose policy options that balance social and economic costs with resource sustainability goals. A driving factor in the response of resource users is their socio-ecological resilience to policy changes. The ability of resource users to cope with and adapt to changes in the rules that govern their access to natural resources will determine their willingness and capacity to comply and will determine, as well, the social and economic impacts of their response. Natural resource policies that take into account the socio-ecological resilience of resource users are likely to be much more effective at achieving resource sustainability while also minimizing the impacts of these changes. However because of difficulties inherent in predicting and measuring the responses of these complex socio-ecological systems resource policies are frequently developed and applied without good understanding of their likely consequences (Adgar, 2000).

The Uluguru Nature Reserve (UNR) is part of the Eastern Arc Mountains chain which stretch 900km from Makambako in south Tanzania to Taita Hills in south coastal Kenya (Frontier, 2005; Batulaine, 2007). The Uluguru Nature Reserve in Tanzania supports a wealth of endemic species, found no where else on the planet. Notable endemic species includes 135 different plants and more than 50 animals. In addition to wildlife

protection, also important to protecting the local Watershed (William, 2010). Safeguarding this forest from harvest also helps reduce the amount of carbon dioxide in the atmosphere (Batulaine, 2007).

Bunduki gap was a corridor area of 661 ha separating Uluguru North and Uluguru South Forest reserves (William, 2010). It was assumed that the existence of this gap causes fragmentation of Uluguru North and Uluguru South Forest Reserves with consequences on biodiversity loss of the forest reserve and the Uluguru Mountain landscape as a whole. Island biogeography theory explains the effects of fragmentation of previously continuous habitat, which may lead to species decline and lastly disappearance in the fragmented habitat because of lower migration rates and high extinction rate (Arthur and Wilson, 1967 cited by Batulaine, 2007). Forest fragmentation is thought to be the cause of long-term viability of many endemic plants and animal species in the eastern arc (Newmark 1991, 1993, 2002). Burgess (2004) noted that most of the forest endemic mammals, birds, amphibian, reptiles and invertebrates of the Eastern Arc do not venture outside the forest, even cross small gap. With this regard, the government of Tanzania in 2008 combined the former Uluguru North and South territorial forest reserve and formed Uluguru Nature Reserve (UNR) (William, 2010). In the process of unifying the north and south Uluguru Forest Reserves the government was evicted peasants who used the land of Bunduki gap for agricultural activities to sustain their life.

The successfully application of natural resource policy has an ultimate goal in the resilience of the evicted people. In so doing the existence of sound institutions and well

positioned to respond to evictions by providing the sound procedural that enables the evicted people to better become socio-ecological resilient is required. With this in mind, the institutions should reflect anticipated change when eviction process occurs. This goes along way with the institutional arrangement that is providing adaptation procedure in an effective and efficient way. This study therefore, entails to asses socio-ecological resilience of people evicted for establishment of Uluguru Nature Reserve in Morogoro, Tanzania.

## 1.2 Problem Statement and Justification

The eviction of people from their land for nature conservation has been common in East Africa (Brockington, 1999). Land loss then is a pressing issue for most rural people in Tanzania, and not just for farmers, for example in 1998 the government evicted 200 people in Kazimzumbwi forest reserve, the study by Ngailo (2011) in Mbarali district also revealed that Livestock keepers were evicted for nature conservation. In Tanzania, there are various policies for example land policy, environmental policy, wildlife policy, forest policy that recognize the importance of conserving the nature reserve and that the improvement of livelihood should be major goals in all action for the development of forest sector so as to contribute to poverty reduction (Mungenyi *et al.*, 2005) However little is known on the socio-ecological resilience of the evicted people particularly in the study area, despite these policies that should have helped them to adapt to new environment. Therefore, there was a need to assess socio-ecological resilience of people evicted for establishment of Uluguru Nature Reserve. Generating such information is imperative, since it adds the overall knowledge base on how policies and institutions are positioned to ensure socio-ecological resilience of the evicted people. Further more the

study results are beneficial to, policy makers, conservation research institution in designing mechanism for effective and efficiency socio-ecological resilience of the evicted people to attain the desired goal of sustainable natural resources management.

## 1.3 Objectives

### 1.3.1 Overall objective

The overall objective was to assess socio-ecological resilience of people evicted for establishment of Uluguru Nature Reserve, Morogoro Tanzania.

### 1.3.2 Specific objectives

(i) To analyse the institutions that governed the eviction and their implications for the socio-ecological resilience of the evicted people

(ii) To asses the eviction process during the establishment of UNR and its effects on socio-ecological resilience of the evicted people

(iii) To examine components of socio-ecological resilience for people evicted from UNR in terms of perception and coping strategies

(iv) To assess socio-economic factors underlined socio-ecological resilience of the evicted people

## 1.4 Research Questions

(i) What are the policy/guideline/act/ by-laws which govern eviction process?

(ii) How was the eviction process for establishment of UNR conducted?

(iii) Was the rules and guideline followed during establishment of UNR?

(iv) What are the economic activities done by the evicted people from UNR?

(v) What are the components of socio-ecological resilience of the evicted people?

(vi) What are the socio-economic factors underlined socio-ecological resilience of the evicted people?

## 1.5 Conceptual model

Conceptual model provides the variables to be investigated and its likely relationships (Fig. 1). For this study, institutions have direct influence on the socio-ecological resilience of evicted people and the eviction process. But, socio-ecological resilience is subject to the underlined of various socio-economic factors.

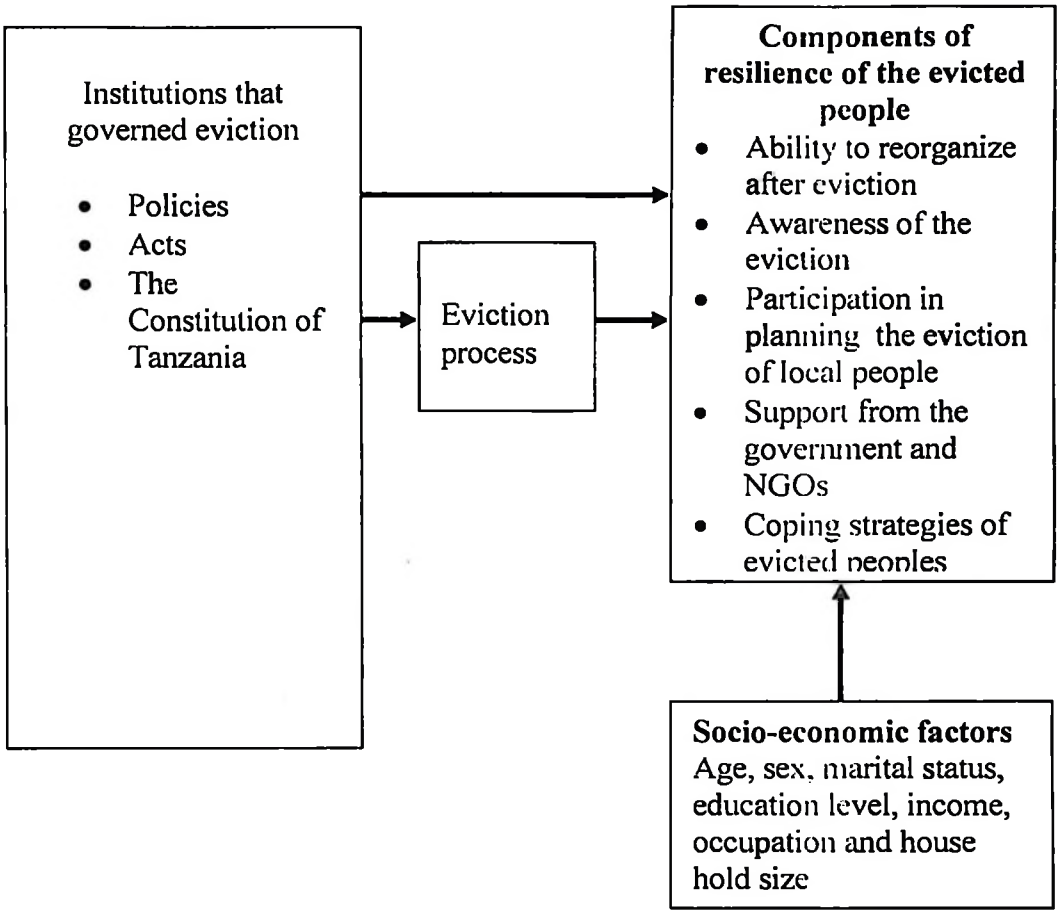


**Figure 1:** **Conceptual model of the study of socio-ecological resilience of people evicted for establishment of Uluguru Nature Reserve, Morogoro, Tanzania**

# CHAPTER TWO

## 2.0 LITERATURE REVIEW

This chapter presents general review of literature related to the study including role of institutions in socio-ecological resilience of the evicted people, eviction, the concepts of resilience, components of socio-ecological resilience in terms of perception and coping strategies and socio-economic factors underlined socio-ecological resilience of the evicted people.

### 2.1 Role of Institutions in Resilience of Evicted People

The concept of institution has been defined and classified differently depending on the conceptual choice of the authors. Institutional economists see institutions as a set of rules of the game in a society that define and shape human interactions (North, 1990; FAO, 1990 and Ostrom, 1999). According to North (1990), institutions are rules of the game in a society or, more formally the humanly devised constraints that shape human interaction. Ostrom (1992) define institutions as a working rules or rule-in-use, set by individuals to organize repetitive activities that produce outcomes affecting those individuals and potential affecting others. The working rules are those actually used, monitored, and enforced when individual make choices about actions they will take in operational settings or when they make collective choices (Ostrom and Crawford, 2005 cited by Msuya, 2010). These rules and enforcement mechanisms together with formal and informal sanctions indicate what individuals must or must not do what they may do without interference from other individuals, what they can with the aid of collective power, and what they cannot (Ostrom and Crawford, 2005 cited by Msuya, 2010).

Other institutional economists definitions confine institutions to a system of rules, decision-making procedures, and programs that govern social practices, assign roles to participants in such practices and guide interactions among occupants of relevant roles (Young, 2003 cited by Msuya, 2010). Institutions are also seen as regulatory arrangements such as rules, norms, customs, values and enduring practices operating at multiple scales in enabling and constraining societal behavior and actions, accepted by members of a particular area in a given society (Mbwambo, 2000; Msuya, 2010). In policy and legal frameworks perspectives, institutions are laws, rules and regulations, organizations, by-laws and core values and operational plans and procedures, incentives, accountability and conflict resolution mechanisms; knowledge systems; and norms, traditions, practices and customs (Bandaragoda, 2000 cited by Cleaver, 2002).

According to Cleaver (2002), institutions are defined in term of "bureaucratic" and "socially embeddedness". Bureaucratic institutions refer to formalized arrangement based on explicit organizational structures, contracts and legal rights, often introduced by government and development agencies; while socially embedded institutions are those based on culture, informal social organizations and daily practices. Institutions are differentiated from organizations in that; organizations are structures of organized and accepted roles (Ostrom, 1999). North (1990) defines an organization as group of individuals or teams with definite roles, bound together by some common purpose, and working within the framework of the rules and procedures to achieve specific objectives and provide structure of human interactions. An organization operates within rules and constraints provided by institutions, but not all institutions have organizational structures (Young, 2003 cited by Msuya, 2010). Institutions can be formal or informal.

According to the new institutional economics scholars reveal that formal institutions, exemplified by constitutions, statutes, laws, by-laws, regulations, associations, contracts and conventions, have a foundation in and backed by laws and are readily observable through written document (Ostrom, 1999). But informal institutions are exemplified by taboos, customs, traditions, routines, cultural values and beliefs, folklores, and social norms, are not enforced through formal (legal) means (Msuya, 2010).

Informal institutions have roots in the local communities and are upheld by mutual agreements, or relations of power and authority and rules, and enforced endogenously (Appia-Opoku and Hyma, 1999). Institutional framework refers to the linkages of institutions and organizations in order to attain desired purposes, and it is related to institutional arrangements in the sense that the former defines the mandates and responsibilities of various institutions while the latter provides governance structure that shapes actions and interactions in a given community (Saleth and Dinar, 2004 cited by Msuya, 2010).

Socio-ecological resilience of the evicted people should be guided by the institutions. In Tanzania, the institutions that have or would have an impact to socio-ecological resilience include among others, wildlife policy, forest policy, guidelines and by laws issued by Ministries and Departments concerned with the management of forests. These organs include Local Governments in the Prime Minister's office; the Ministry of Natural Resources and Tourism; the Ministry of Lands, Housing and Human Settlements Development and the Ministry of Health and Social Welfare. The ministries

provide policy orientation and technical support while the district departments and village governments implement the policies and enforce the laws, rules and regulations. Most of the policies underscore the socio-ecological resilience of the evicted people as to increase their ability with their livelihood in the well defined manner (URT 2008). The policy provides that the improvement of livelihood should be major goals in all action for the development of forest sector so as to contribute to poverty reduction (Mungenyi *et al.*, 2005).

Furthermore the policy put humanitarian aspect in perspective before people may be evicted from the forest reserve. Mungenyi *et al.* (2005) narrates that the guidelines cal! for opening of forest boundaries should ensure clarity. Guidelines for compensation and resettlement should be developed as means to minimize suffering and protect right of the evicted people. A list of victims should be prepared by name and activities they engage in. Victims are then required to be aware of the consequences of their actions and need for restoration of the forest reserve and persuade to leave (URT, 2008).

## 2.2 Eviction

Eviction for conservation, like other forms of eviction comprises two processes: physical removal of people from their homes and economic displacement in the form of the exclusion of people from particular areas in their pursuit of livelihood through such things as losing farming land, grazing land or reduced access to forest resources (Brockington and Igoe 2006; Cernea, 2006). For example, people dwelling on the edge of a newly formed park would be unable to gather firewood or wild foods, hunt, or fish, or walk to through the park after the formation of the park. Therefore exclusion of

economic activity which does not lead to moving homes but displaces livelihood activity to elsewhere also is eviction (Cernea, 2006). In this study the concept of eviction is used in the sense of the latter aspect of economic displacement of activity as evidenced in the study area rather than physical movement of residences. Even though the literature on eviction is not so massive, it is possible to recognize certain patterns in the eviction literature, both geographically and historically (Brockington and Igoe, 2006). Studies of eviction have shown that establishment of protected areas in many African and Asian countries have depended on such population evictions (Brockington and Igoe 2006; Vangen, 2009). Most protected areas, from which evictions have been reported, were established before 1980 (Brockington and Igoe, 2006; Vangen, 2009). However, the research and reports were not conducted until after 1990. This is a sign of a lower academic interest in studies of evictions before 1990 (Brockington and Igoe, 2006).

## 2.3 The Concept of Socio-ecological resilience

Since the introduction of the concept of resilience in 1973 by the ecologist Holling, the concept also emerged in literature on psychology, economics and sociology (Gardner *et al.*, 2007). This concept is based on the idea that ecological, economic and social systems become increasingly entangled, and interactions between these systems are increasing in intensity and scale. Ecosystem provides essential goods and services that are vital for the survival and civilization of human beings , which includes food, water, soil formation and prevention of erosion, carbon sequestration, nutrient cycling, recreation and education (Folke *et al.*, 2002; Folke, 2007). However, since Mankind is a core part of the socio-ecological system, these makes delineation between them as

well as treating them separately a difficult task (Folke, 2007). Resilience is the ability to absorb disturbances while maintaining structure, functions, and feedbacks. Socio-ecological resilience is the ability of socio-ecological systems to cope with and adapt to change. Walker *et al.* (2006) define a resilient socio-ecological system, as a system with a greater capacity to avoid unwelcome surprises in the face of external disturbances. Socio-ecological resilience is a property that reflects the capacity of a system to cope with disturbance and reorganize while undergoing change to maintain structure and functioning. In this case evicting farmers from their area which they used for agriculture activities to sustain their life is a disturbance, since they would be unable to live as they were before (Abidi-Habib and Lawrence, 2007). In a complex resource management contexts it is often the nature of the interactions between the social and the resource system that determines the system's capacity to adapt to changes.

Although there is a growing body of literature examining resilience in socio-ecological systems, many of these studies use different terminologies to describe similar processes. The terms resilience, adaptation, adaptive capacity, and vulnerability are often used interchangeably, since a universally-accepted framework for defining these terms and their relationships to one another does not exist (Gallopin, 2006 in Jain, 2012). Resilience is mostly used to describe the capacity for adaptation despite adversity (Tompkins and Adger, 2004).While adaptation is defined as an adjustment in social or economic systems in response to observed or expected changes in order to alleviate adverse impacts of change or take advantage of new opportunities (Adger *et al.*, 2005). Further they narrates that adaptation can involve both building adaptive capacity thereby increasing the ability of individuals, groups, or organizations to

adapt to changes, and implementing adaptation decisions, i.e. transforming that capacity into action. Folke *et al.* (2003) highlight four categories of factors for building socio-ecological resilience: learning to live with change and uncertainty; nurturing diversity for reorganization and renewal; combining different kinds of knowledge, and creating opportunity for self organization. "*For example an agricultural system in which precipitation, vary from year to year. Precipitation impacts human livelihoods, since agricultural production is tied to the amount of water available in a system. If a farmer is entirely dependent on rainfall for his crop production, he may have high income and yields during ideal precipitation years but low income and yields when the precipitation is too high (i.e. floods) or too low (i.e. droughts). This farmer is said to be vulnerable to changes in climate, since his livelihood is very dependent on the variability in climate. However, a farmer could become less vulnerable to climate by adapting his livelihood strategies; he could adapt by switching to less climate-dependent livelihoods such as salaried professions, gaining access to irrigation, or altering cropping strategies to suit current climate patterns. Adaptation ensures that the farmer maximizes his income despite the variability in climate. This farmer, whose income is not as heavily dependent on climate, is said to be resilient to climate change. Certain farmers are better able to adapt to climate change than others. For instance, a wealthy farmer who can afford irrigation is better able to adapt to climate change than a poor rain-fed farmer. This wealthy farmer who has an increased ability to adapt is defined as having increased adaptive capacity*" (Nelson *et al.*, 2007 cited by Jain, 2012).

Hence, adaptive capacity is seen as one of the primary factors that promote socio-ecological resilience of a system. Adaptive capacity has been defined as the ability to

plan, prepare for, facilitate and implement adaptation options (Walker *et al.,* 2006). The system with higher adaptive capacity will be more socio-ecological resilient to disturbances (Brooks *et al.,* 2007). On the other hand, systems are considered to be vulnerable if they have low socio-ecological resilience and are greatly impacted by changes (Jain, 2012). Tompkins and Adger (2004) define vulnerability as the degree to which people are impacted by hazards (natural or man made). Reduced socio-ecological resilience increases vulnerability, and thus, susceptibility to the impact of hazards).

## 2.4 Components of Socio- ecological resilience

Various studies have identified different components of socio-ecological resilience, for example the study by Marshall (2007) in Australia identified perception of risk associated with change; perception of the ability to plan, learn, and reorganize; Perception of the ability to cope; and level of interest in change were the components of resilience in the study area. Another study by Fabricus *et al.* (2007) came up with Leadership and vision, knowledge network, institutions that are nested across scales, linking culture with management and enabling policies as the components of socio-ecological resilience in the study area. In this study, the ability to reorganize, awareness on the eviction, participation of the local community in planning eviction, and support from government and NGOs were identified as the components of socio-ecological resilience of the evicted people as stipulated by guideline that governed eviction (URT, 2008).

### 2.4.1 Ability to reorganize

The term reorganization has been defined differently by different people. According to Berkes *et al.* (2003), reorganization is defined as the ability of actors to manage socio-ecological resilience, Edger (2005), define reorganization as the ability to plan. prepare for, facilitate and implement adaptation options. Resilient systems are adaptable. flexible, and prepared for change and uncertainty. Non- resilient systems, in contrast. are prone to irreversible change and are at risk of shifting into another, often undesirable state. Lebel *et al.* (2006) also defined reorganization as a capacity of a system to have a way to maintain and re-create its identity. Study by Marshall (2007) found that the capacity to reorganize in the face of change is dependent on novelty, creativity, experimentation, learning, and planning. Abel *et al.* (2006) outline the factors that can prevent reorganization which included lack of training and expertise and reduced financial and physical capital for new occupants. Howard *et al.* (2006) added that a well reorganized system/community among other factors includes a well developed coping strategies, a flexible set of institutions that organizes people and creates clear rules for the management of resources and social relations, a sufficiently social memory that has accumulated knowledge and experience over a long period, and as well as space for individual creativity and innovation, that can be drawn on to face current crises.

### 2.4.2 Awareness of the eviction

Information given prior to eviction may enhance the ability to cope, as it can make individual/ community to be prepared for changes and became socio-ecological resilience. Mungyenyi (2005) narrates that evicted people should be made aware of the

consequences of their activities and be given a due eviction notes before the actual eviction process takes place. When identifying the process of evictions, not only the statements from the initiating actors are important but also from local peoples as they are the central in the policy, as they are the one who have to carryout the changes and who are often the ones to bear the costs (Vangen, 2009; Emmanuel, 2008). Furthermore they argues that keeping local people uninformed and uninvolved may create resentments that can affect the quality of conservation efforts in the area.

### 2.4.3 Participation of the local community in planning eviction

According to the World Bank (1994), participation refers to the process through which stakeholders influence and share control over development initiatives and the decision and resource which affect them. Furthermore participation is involvement of community through consultation on a particular issue (World Bank, 1994).

Participation of local communities broadens the range of interest and issues that need to be considered. Different stakeholders assign different values to different ecosystem services and risk and that involvement represents democracy (Label *et al.*, 2006). Further they argues that capacity building needs to start at the local level, they added that socio-ecological resilience does not happen in a vacuum, it needs a clear medium through which local communities can be empowered with knowledge about their risks, effectively warned and equipped with the right skills to adapt, cope, re-group and recover in the event of extreme occurrence. The role of institution has therefore comeback to the fore as a vehicle for moving the rhetoric of resilience into reality by providing the right incentives for building socio-ecological resilient communities

(Olsson *et al.*, 2006). Such communities will then be able to cope, adapt to and effectively regenerate as well as recover from extreme events without collapsing. Local people's knowledge and experiences are fundamental in every community to be socio-ecological resilient, the increased vulnerability to changes continues largely because of the undermining local people involvement (Jain, 2012). Walker *et al.* (2006) narrates that the capacity to adapt and to manage socio-ecological resilience requires learning and the ability to make sense of things, especially in arenas of collaborative learning, using a combination of various sources of information and knowledge. Participation allows differences in interests and interactions with other issues to be brought forward for public scrutiny. Deliberation allows the differences in interests, perceptions, and explanations to be explored without forcing consensus. Trust and shared understanding are built up through repeated interactions of stakeholders and enable social learning (Lebel *et al.*, 2006).

### 2.4.4 Support from Government and Non-Governmental Organization (NGOs)

Studies by Anderies *at el.* (2006); Olsson *at el.* (2006) state that, support from government is always critical in preparing the system to become socio-ecological resilient. Government can prepare a group of people or community to be aware with the situation by exploring alternative system configurations and developing strategies for choosing from among possible futures. The key attributes of government support is to enable successful transitions including the ability to reconceptualize issue; generate and integrate a diversity of ideas, viewpoints, and solutions; communicate and engage with key individuals in different sectors; move across levels of governance and politics, i.e., span scales; promote and steward

experimentation at smaller scales; recognize or create windows of opportunity; and promote novelty by combining different networks, experiences, and memories Walker *et al.*,(2006).

### 2.4.5 Coping Strategies of the Evicted People

Eviction of the people from the forest for the purpose of conservation has increased since 1980s to date (Vangen, 2009), and a number of coping strategies have been identified. Coping strategy is defined as an adjustment in social or economic system in response to actual or expected situation in order to reduce vulnerability of a society to changes (Kutua, 2008). Is the ability of a system to absorb stress or impacts and bounce back or recover (Walker *et al.*, 2006). Although local levels coping strategies on disturbance differ among households and communities depending on the resource available and social capacity, coping strategies as outlined by Orindi and Murray (2005) include receiving remittances from migrant household members, collecting wild fruits, offering causal labor, brick making, handicraft, collecting honey, and charcoal burning. These activities provide important source of cash to allow household to purchase and cater for other necessities. Also the study by Brockington (1999) in Mkomazi Game Reserve, Tanzania, identified the following coping strategies of the evicted people, which included migration to other areas, people become marketers and not farmers and just sit down and doing nothing.

## 2.5 Socio-economic Factors Influencing Socio-ecological resilience of the evicted people

Socio-economic factors may include socio-economic variables like Age, marital status, education level, family size, income of a respondent and poverty (Malinza, 2009). Furthermore study by Jain (2012) identified the following factor that influences socio-ecological resilience; strong institutions and networks, social memory and previous exposure to disturbance, access to capital, cognitive factors, such as perceived risk and adaptive capacity, and diversification of livelihoods.

In institution perspective, it is argued that institutions can aid socio-ecological resilience by creating both horizontal and vertical networks (Adger, 2003; Tompkins and Adger. 2004; Folke *et al.*, 2002 and Anderies *et al.*, 2006). Horizontal networks are relationships between people and groups at the same level e.g. between individuals or village governing bodies. While vertical networks form relationships between actors at different political levels e.g. between a village governing body and national political leaders (Jain, 2012). Experience with previous exposure to certain disturbance and subsequent effects may result in increased social memory that allows better communities to adapt to future disturbance. For example, fishing communities in Southeast Asia who had experienced frequent tsunamis in the past were better able to prepare for and survive the large tsunami that hit in 2004. This is because the community had social memory in the form of inherited local knowledge of tsunamis as well as institutional memory allowing for better preparedness (Folke *et al.*, 2005; Anderies *et al.*, 2006). Access to capital gives individuals more options to adapt leading to socio-ecological resilience. Cognitive factors: an individual's risk perception of the

likelihood of a disturbance event has been shown to affect one's decision to adapt to a disturbance. Perceived adaptive capacity has been shown to play a strong role in whether an individual adapts to disturbance. For example, even if someone believes a disturbance may occur (i.e. risk perception), still may not adapt because of the believe that there is nothing to do to reduce the negative impacts of the disturbance (Jain, 2012).

# CHAPTER THREE

## 3.0 RESEARCH METHODOLOGY

This chapter describes the research methods used to collect data. The chapter is divided into six section including location and description of the study area, population, sampling procedure and sample size, research design, type of data collected, method of data collection and finally data analysis.

### 3.1 Location and Description of the Study Area

This study was conducted in Morogoro and Mvomero Districts. Both districts are found in Morogoro Region in Tanzania mainland. The Region lies between latitudes 5°58' and 10°00' South of the Equator, and between longitudes 35°25' and 38°30' East of Greenwich. Mvomero is bordered to the north by the Handeni district, to the east by the Bagamoyo district, to the southeast by the Morogoro District council and to the west by the Kilosa District while Morogoro district is bordered to the east by the Kibaha district, to the South by the Morogoro Urban District and to the west by the Mvomero District.

### 3.2 Population, Sampling procedures and Sample size

#### 3.2.1 Target population and study units

Target population for the study was the evicted families. Since the eviction for the establishment of the UNR involved households, the unit of analysis was evicted households on the sampled village. A household is a unit consisting of one or more persons, related or unrelated who live together in one part or more than one housing and have common catering arrangement (World Bank, 1995). Heads of households were selected for the interview.

### 3.2.2 Sampling procedure and sample size

The study area comprised three villages in two different districts; namely Bunduki and Vinile villages in Mvomero district and Nyachilo village in Morogoro district (Fig 2). The study employed two sampling techniques, namely purposive and random sampling.

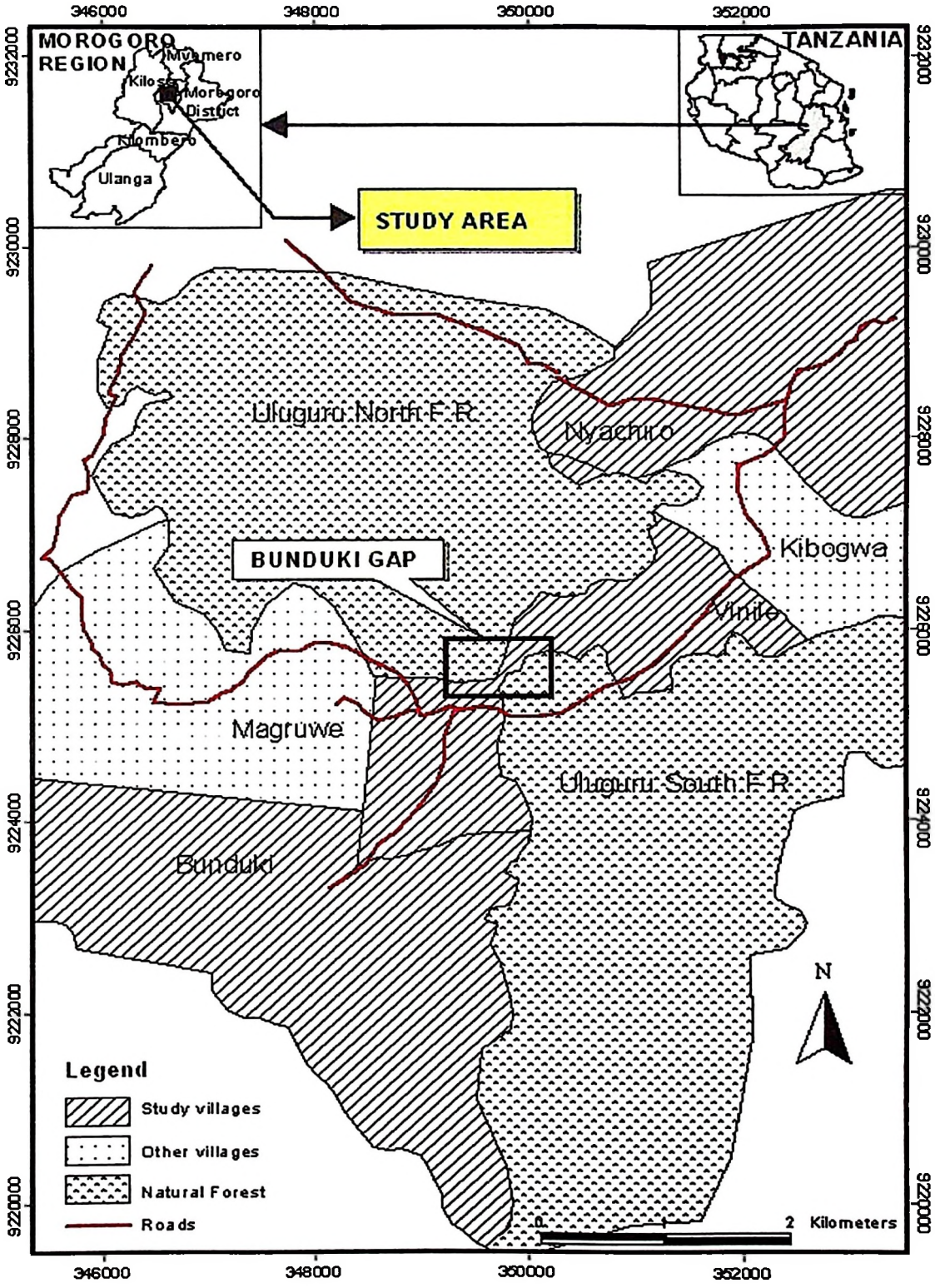


**Figure 2: Map showing the location of study area**

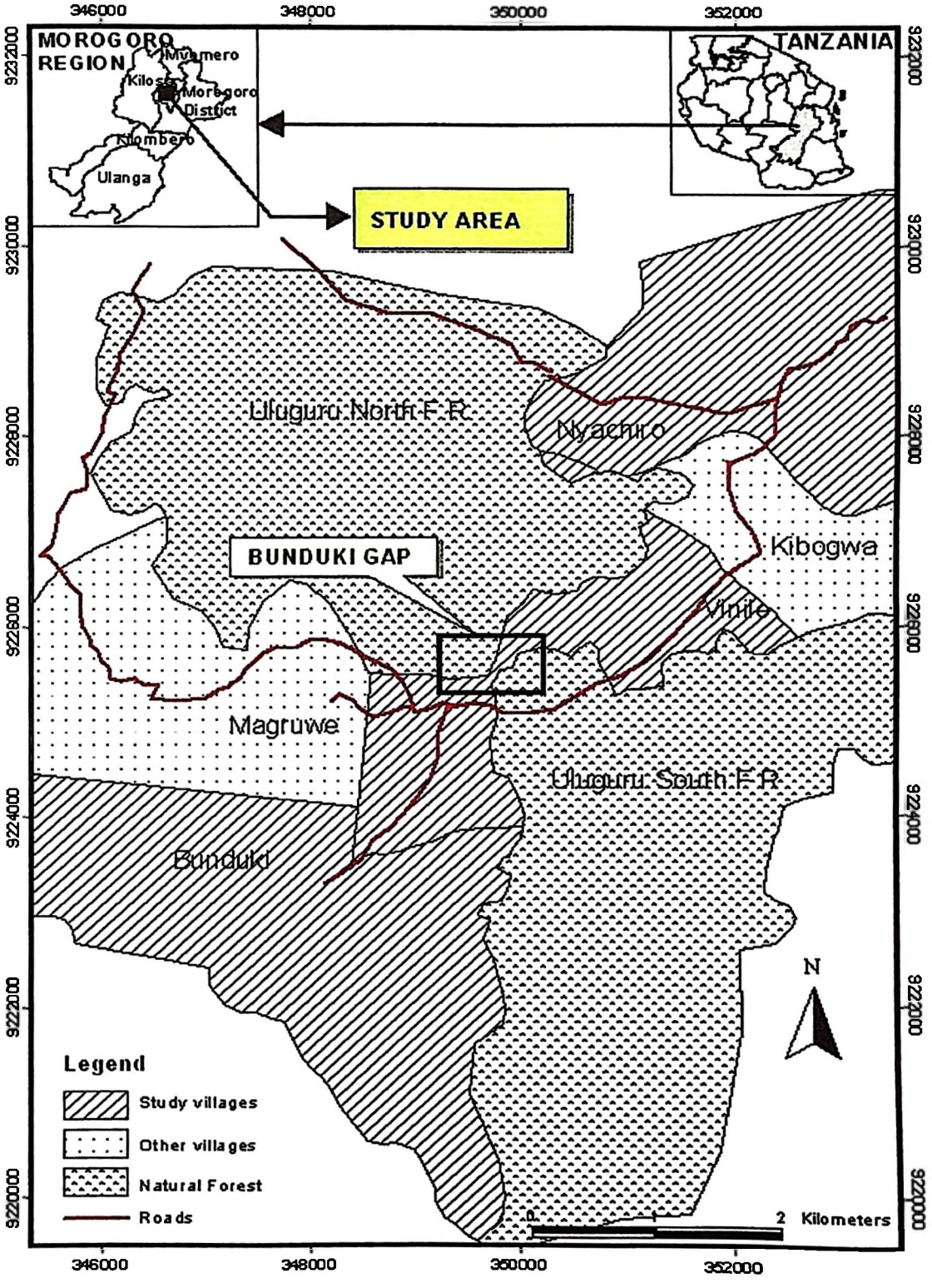


**Figure 2: Map showing the location of study area**

Purposive sampling was used to select three villages that were involved on eviction process for establishment of UNR and the key informants. Random sampling was employed to select 90 households, 30 house hold from Nyachilo, 40 from Bunduki village and 20 household from Vinile village. These selections were based on the number of people that were evicted and the availability during data collection, the numbers of victims were many in Bunduki followed by Nyachilo and few in Vinile. Evicted people from Nyachilo were few because some of them migrated to other places to search for survival.

### 3.3 Research Design

This study adopted a cross-sectional design. The cross sectional design in this study involved collection of data at one point in time. This design was adopted because it enabled the research to collect data at a single point in a time and also it generates in-depth data based on the study objectives (Kothari, 2004).

### 3.4 Type of Data Collected

#### 3.4.1 Secondary data

Creswell (2003) defined secondary data as "the data that have already been collected by and are readily available from other sources. Such data are cheaper and more quickly obtainable than primary data and also may be available when primary data cannot be obtained at all. Secondary data were gathered from various sources including; government websites, government survey reports (e.g. population censuses), and various publications (e.g. books, journal articles, dissertations, theses and CD-ROMs) and other reports.

### 3.4.2 Primary data

Walliman (2006) defined primary data as the data collected by the researcher directly from his own observation and experience. The study involved multiple data collection methods. More than one method was used in order to provide checks and balances as regards any shortfalls in the other data gathering methods. The methods used were questionnaire survey, interviewing key informants and direct observation.

## 3.5 Methods of Data Collection

### (a) Household survey

Interviews were held with heads of the households. Questions were closed and open-ended in order to get some overview and understanding of people's experiences in relation to eviction as well as their opinion about how the eviction process was conducted, coping strategies opted and whether the evicted people are resilience and socio-economic factors influencing resilience of evicted people for establishment of UNR. To measure responses on opinions of farmers on the eviction process as well as resilience, a list of statements about eviction process, resilience were generated on the basis of the literature review. The survey statements attempted to measure the level of well-being of farmers after the eviction as well as their opinions on the eviction process. Respondents were asked to rate their attitude to each of the 24 statements using a five-point Likert scale, by choosing one appropriate answer among the five option and put a tick, that is whether strongly disagree, disagree, neutral, agree and strongly agree, as shown in Appendix 1.

**(b) Key informant interviews**

In order to gain information about how the eviction process was carried out and what is the institutional framework that is policy/guideline/ by-law surrounding these process, some interviews with Village Executive Officers, Ward Executive Officers, Morogoro Regional Catchment Officers and the Uluguru conservator and Project Manager of Conservation Organization i.e. Wildlife Conservation Society of Tanzania (WCST) were done using check list (Appendix 2).

**(c) Direct observation**

One should not undermine the researcher's ability to observe people during an interview and to observe the social setting in which the research is carried through. Observations technique was used to make direct observations of households and local communities daily activities especially coping strategies adapted by the evicted people after establishment of UNR in the study area. As a researcher this provided valuable information, which could support or not support some of the oral statements of the interviewees. Also it is helpful when analyzing the data collected. Mettrick (1993) cited by Rurai (2007) argues it is always good to keep one's eyes open when visiting a study area and check what you are told against what you see. This way is useful tool for crosschecking information obtained from the questionnaire survey.

### 3.6 Data Analysis

To analyses the current institutions in view of providing resilience to evicted people, content analysis was employed. Identified institutions including policies, acts and constitution was depicted in terms of their strength and weakness to address the issue of

socio-ecological resilient for the evicted people. Which included Land policy 1997, Land Act 1999/village Act 1999, Forest Act 2002, Environment Management Act 2004. Resettlement policy framework 2008 and The Constitution of United Republic of Tanzania 1997.

Before performing Principal Components Analysis (PCA), the statements were tested for internal consistency of scale for socio-ecological resilience, as described by reliability analysis (Carmes and Zeller 1979; Zeller and Carmines, 1980 and Spector, 1992). A reliability analysis is based on a calculation of correlation among the statements using Cronbach's α (Chen and Popovich, 2002). A Cronbach's of 0.7 or greater indicates reliable scale (Sutton and Ditton, 2001; George and Mallery, 2003). In this study a Cranach's α obtained was 0.900. Since the greater Cronbach's α the better the internal consistency and values 0.9 and above may be accepted as indicating highest reliability, a cut off point of 0.9 was accepted as indicating reliable scale. Then five statements that had largest Cronbach's α if item deleted were removed from the scale and remain with 19 statements and the Cranach α obtained after deleting the five statements with high Cranach's α was 0.907 indicating highly reliable scale (George and Mallery, 2003).

To identify the underlying variables comprising the response eviction process as well as socio-ecological resilience and to reduce the complexity of factors to a more manageable number, a Principal Components Analysis (PCA) was used. A PCA is a statistical technique used to discover which statements form independent of one another. Statements that are correlated with one another but are largely independent of other

responses are combined into factors (Zeller and Carmines, 1980; Tabachnick and Fidell, 1996). A PCA is based on the assumption that certain underlying factors, which are smaller in number than the original number of statements, are responsible for the co-variation among the responses. In this study, the data were rotated using an orthogonal rotation (varimax rotation), which simplifies the factor structure by maximizing the variance of a column in the pattern matrix (Kim and Mueller, 1978).

General Linear Model (GLM) Univariate analysis and binary logistic regression were used to assess the influence of independent variables on individual dependent variables. The General Linear Model Univariate provides regression analysis and analysis for variance for one dependent variable by one or more factors and/ or variables. By using GLM Univariate procedure you can investigate interactions between factors as well as the effects of individual factor (Moshi, 2010). GLM Univariate procedure was used to determine factors which influence component of socio-ecological resilience which were ability to reorganize after eviction process, awareness of the eviction, participation on planning eviction and, support from government and NGOs. General linear Model Univariate was chosen because the components of socio-ecological resilience are independent from each other. Binary logistic regression is a type of regression analysis used to predict the outcome of categorical dependent variables in which the dependent variable is binary, that is the number of available categories is two, it measures the relationship between categorical dependent variable and one or more independent variables, which are usually/ but not necessary continuous (Gujarati, 1995 cited by Moshi, 2010). Binary logistic regression was used to determine socio-economic factors influence adoption of coping strategies after being evicted. Binary logistic regression

was chased because it is most useful when you want to model the event probability for a categorical response variable with two outcomes. In this case respondents that adopted the respective coping strategies scored 1 and those that did not adopt scored 0. Socio-economic factors included were age, household size income, sex, marital status, level of education and occupation. All statistical analyses were performed using SPSS 16.0.

# CHAPTER FOUR

## 4.0 RESULTS AND DISCUSSION

This chapter presents and discuses major findings of the study, it presents the objectives of the study, which included institutions governed the eviction and their implications for socio-ecological resilience of the evicted people, the eviction process for establishment of UNR and its implications for socio-ecological resilience of the evicted People, Components of socio-ecological resilience of the evicted people in terms of perception and coping strategies and socio-economic factors underlined the evicted people.

### 4.1 Institutions that governed the eviction process and their implications for resilience of the evicted people

Successful implementation of eviction to allow conservation of the natural resources depends much on the existing policies and acts guiding the conservation of natural resources. Hence existence of sound institution framework to respond to eviction by providing the sound procedural that enable the evicted people to better socio-ecological resilience are an important aspect.

This section reviews Land policy 1997, Land Act 1999, Village Act 1999, Forest Act 2002, Environment management Act 2004, Resettlement policy framework 2008 and The Constitution of United Republic Tanzania. Specifically institution arrangements are viewed as to they take adequate reference to resilience of evicted people for establishment of nature reserve. It was found that the key issues addressed on the reviewed policies, act constitution and framework are first, it insist provision of information to people prior to eviction, fair compensation and last it insist that the

procedure should adhere to laws and regulation (Table 1).This is relative to National Forestry Authority(NFA) of Uganda (2011) who came up with creation of awareness among stakeholders, sensitization of the evicted people before the start of eviction, registration of the evicted people with their activities, negotiating the grace period (of between 3-6 months) and ensuring eviction notes. Further it added that, this is done to allow the evicted people to have enough time to prepare themselves with the situation. Eviction that involves sensitization of the victims can make them understand why they must leave, thorough negotiations among all stakeholders to establish parameters for the eviction and plan for future (NFA, 2011). Study by Mungyenyi *et al.* (2005) come with argument that evicted people should be made aware of the consequences of their activities and be given a due eviction notes before the actual eviction process takes place. Further they added that there should be policies established that deals with the issue of compensating people that have been evicted because people have invested human labour, working days, money and keeping it sustainable.

**Table 1: Key issues addressed on the existing Policy, Acts, constitution and Guidelines for provision of socio-ecological resilience to evicted people**

| Key issue | Policy/Act/Guidelines/Constitution |
|---|---|
| Fair compensation | Land policy 1997, Land Act 1999/,Village land Act 1999, Forest Act 2002, Environment management act 2004, Resettlement policy framework 2008, Constitution of United Republic Tanzania 1997 |
| Provision of Information | Land Act 1999/ Village Land Act 1999 and Forest Act 2002 |
| Adherence to laws and regulation | Forest Act 2002, Constitution of United Republic Tanzania 1997 |

### 4.1.1 Land policy 1997/ Land Act 1999

Addressing the challenges on the government to take land for different purpose a comprehensive land policy that brings together all the relevant instrument and build up a synergy between them is required. The main reason as to why this policy was developed is giving holistic view of using land for development process by putting emphasis on authority institution for land management as well as it emphasizes clear delegation of authority and hierarchical system of accountability (section 8.1.1). Carrying out responsibility in partnership, in harmony and in coordinated manner makes the basis of this policy which it is stipulated clearly by its acts of 1999.

Land act aim to provide for the basic law in relation to land other than the village land, the management of land, settlement of disputes and related matters. Act promote all persons exercising powers under, applying or interpreting this to ensure that they use existing rights, ensure that laws are applied, to facilitate an equitable distribution of and access to land by all citizens, to regulate the amount of land that any one person or corporate body may occupy or use, to ensure that land is used productively and that any such use complies with the principles of sustainable development, to pay full, fair and prompt compensation to any person whose right of occupancy or recognized long-standing occupation or customary use of land is revoked or otherwise interfered with to their detriment by the State under this Act or is acquired under the Land acquisition act (URT,1999, 2008).

Land Act 1999 number 4, section 5(1) underscores the socio-ecological resilience of the evicted people for nature conservation; it states that evicted people should be informed.

The Minister shall cause to be published in the Gazette and sent to the village Council notes specifying location of the transfer land, boundaries and extent of transfer, brief statement of the reasons for the proposed transfer and the date of publication of the notes, then a copy to Minister responsible for that land, Local authority, Where there are any person occupying and using that land to those person in manner and form that will enable to understand the information contained in the notes. It also emphasizes full and fare compensation to the evicted people and that compensation will base on the opportunity cost which will include market value of the real property, disturbance allowance, and transport allowance, loss of profit/accommodation, cost of acquiring or getting the subject land and any other cost or capital expenditure for development of subject land (URT, 1999a, b) this are in line with the studies by (Acaye, 2005 cited by Mungyenyi, 2005; Mungyenyi, 2005 and Luzinda, 2008 cited by Vangen) who agued that when identifying the process of evictions, not only the statements from the initiating actors are important but also from local peoples as they are the central in the policy, as they are the one who have to carryout the changes and who are often the ones to bear the costs.

Creating awareness to the victims make them aware with the whole situation and make some plans for future (Fibricus *et al.*, 2007; Label *et al.*, 2006 and NFA, 2011).This imply that the act underscore the resilience as it emphasize provision of information to the people to be evicted. When people are informed they become aware and hence its is possible for them to participate on the eviction process when they have appreciated the reasons of eviction, also when they are aware on the whole process of eviction, including compensation which is among the aspect determining socio-ecological

resilience of the evicted people. Lack of proper information about the eviction process as well as compensation lead to complain from the evicted as they do not know if the compensation they get was appropriate to what they were suppose to get.

### 4.1.2 Village Land Act

Village Land Act 1999, number 5 sections 4 also emphasize giving prior information to the people expected to be evicted explaining the reason and process of eviction. Provision of information that is relevant to users is very strategic in the overall successful of any process. The act states that there should be clear procedures for full, fair and prompt compensation while acquiring land from citizens. These procedures should be adhered to, especially the Land (assessment of the value of compensation) Regulations made under section 179 of Land Act no. 4 of 1999 (URT, 1999).This concurs with other studies else where, who agued that local people are the central in the policy, as they are ones who actually have to carry out the change and who are often the one to carry the costs, therefore creation of awareness to victims prior to eviction is essential (Cernea, 2006; Fabricus *et al.*, 2007; Vangen, 2009 and NFA, 2011). This implies that informed people will be able to know the conduction of the eviction process; procedures for compensation and thus it will reduce complain from the evicted people and also it will enable them to be socio-ecological resilient.

### 4.1.3 Forest Act

Forest Act 2002 number 14 section 22(5), it emphasizes process to be clear to the people to be evicted. It is not different from other acts and policy described in section 4.1.1, 4.1.2, 4.1.3 and 4.1.3 above which emphasize that people should be made aware

of the whole eviction process including calculations for compensation (URT, 2002). This is in line with the study reported by Mungyenyi (2005); Fibricus *et al.*, (2007) who narrates that evicted people should be made aware with the whole process of the eviction as they are ones who actually have to carry out the changes. Mungenyi *et al.* (2005) narrates that the guidelines call for opening of forest boundaries should ensure clarity. Guidelines for compensation and resettlement should be developed as means to minimize suffering and protect right of the evicted people. A list of victims should be prepared by name and activities they engage in. This implies that being transparent with the whole process probably will make the evicted people prepare themselves and hence become socio-ecological resilient.

### 4.1.4 Environment Management Act

Environmental Management Act of 2004 number 20 sections 160(1), emphasize that if the land is to be taken for environmental conservation, compensation should be made accordance to land acquisition act 1967 and land act 1999 which emphasize full and fair compensation to the evicted people. In addition to other acts described in 4.1.1, 4.1.2, 4.1.3, 4.1.4 and 4.1.4; that is Land policy/land act, Village Land Act, and Forest Act, the environmental management act emphasize fairness on compensation. It means that compensation should be reasonable to enable the evicted people to be socio-ecological resilient (URT, 2004; URT, 1999a, b,). These concurs with other pattern reported by other studies who narrates that evicted people have to be compensated regardless to whether it is physical or economic displacement eviction, as they have been invested human labour, money and time on their land (Cernea, 2006; Mungyenyi *et al.*, 2005). The study by Vangen (2009), narrates that failure of compensating people that have

been evicted makes eviction more painful. As the result evicted people may not be socio-ecological resilience.

### 4.1.5 Resettlement Policy Framework

Resettlement policy framework of 2008; section (3)4 states that any kind of land needed for a project can only be withdrawn from existing use if equivalent land can be allocated to the category of a person concerned, the land must have the same productive capacity if not better than the original land. No one has to suffer economically or livelihood and living standard due to eviction. The Resettlement Policy Framework emphasize that the land should have the same productive capacity or better than the existing to enable the evicted people to be socio-ecological resilient. Further it states clearly that displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher (URT, 2008).These are in line with other studies who narrates that evicted people have to be compensated regardless to whether it is physical or economic evictions, as they have been invested human labour, money and time on their land (Brockington and Igoe, 2006; Cernea, 2006 and Mungyenyi, 2005, Luzinda cited by Vangen, 2009).This implies that giving proper compensation to evicted people may enables them to be socio-ecological resilient.

### 4.1.6 Constitution of United Republic Tanzania

Constitution of United Republic of Tanzania of 1997, 24(1) states that every person is entitled to own property and has right to the protection of his property held in

accordance with law from act no 15 of 1984 section 6 of Land ac., although the land owned according to the laws can be taken by the government for different issues as stipulated on the land policy 1997 but the evicted person has the right to the protection of his/her property. Furthermore section 24(2) of the constitution of United Republic of Tanzania states that it shall be unlawful for any person to be deprived of property for the purposes of nationalization or any other purposes without the authority of law which makes provision for fair and adequate compensation (URT, 1997). This is related with the study by Vangen (2009) who agued that failure of compensating people that have been evicted makes eviction more painful. Other study by Berghoefer *et al.* (2010) argued that human component in nature conservation should be core for sustainable natural resources management. This implies that in order to attain the desired goal of sustainable natural resource management human component should be part and parcel in all development initiatives by ensuring fair and adequate compensation in order to be socio-ecological resilient.

## 4.2 The Eviction Process for Establishment of UNR and Its implications for the Socio-ecological resilience of the Evicted People

Most of institutions governed the eviction emphasis is made on provision of information prior to eviction fair compensation and that rules and guideline for eviction should be followed. Table 2 indicates the results with regard to receiving notes, guideline for compensation and preparation of list of people during eviction process. The results shows that majority of the respondents (78.9%) responded that they did not receive the eviction notes. This implies that despite the fact that the policy insists that prior information should be given to the people to be evicted through the Government gazette

as well as through the local village leaders. Local people were not informed well before the eviction process. This is inline with the study conducted by Vangen (2009) in Mount Elgon Uganda who reported that 28% of respondents claimed to have been taken by surprise when eviction was carried out. Mugyenyi (2005) narrates that evicted people should be made aware on the eviction process and be given eviction notice. These indicate that some time when people are evicted for Nature conservation information is not well explained to victims before the start of the process.

**Table 2: Response with regard to receiving notes, guideline for compensation and list of people from Uluguru Nature Reserve**

| Variable | Response | | | |
|---|---|---|---|---|
| | Yes | | No | |
| | N | % | N | % |
| Receiving notes | 19 | 21.1 | 71 | 78.9 |
| Receiving any guideline for compensation | 39 | 43.3 | 51 | 56.7 |
| List a list all people made | 67 | 74.4 | 23 | 25.6 |

Eviction process for the land expected to be taken for conservation are guided by institution framework (Land Act 1999, Village Act 1999 and Land policy 1997, Forest Act 2002, Resettlement policy framework 2008, Constitution of United Republic of Tanzania 1998). The findings in Table 2 revealed that 56.7% of respondents indicated that they didn't receive any guideline that guide eviction process which eventually would help them to know the conduct of whole process. This means that eviction process was conducted while most of the farmers were not aware on the guideline that governs the eviction process. This lead to complain of the farmers with regard to compensation they received. As some of them were complain that they received low

than what they deserved. These complain would be eradicated if the guideline that governs the whole eviction process as well as compensation would be made open to the famers.

### 4.3 Components of socio-ecological resilience of the evicted people

The Principal Components Analysis revealed that the responses to the statements were best described by four factors. These factors represented 71.2% of the variance (Table 3).

**Table 3: Principal Components Analysis Matrix showing response of the evicted people towards the statements describing socio-ecological resilience**

| Survey items | PC1 (41.9%) | PC2 (13.6%) | PC3 (9.6%) | PC4 (6.1%) |
|---|---|---|---|---|
| I have sustained my family wealth | 0.92 | | | |
| I have sustained my household food security | 0.89 | | | |
| I have sustained labour power for my farm | 0.83 | | | |
| I manage sustained my income after eviction | 0.82 | | | |
| I have sustained my social welfare | 0.83 | | | |
| The eviction process little disturbed our life style | 0.67 | | | |
| I was informed by government leaders before eviction | | 0.85 | | |
| Information on eviction process was given in time | | 0.79 | | |
| I received information about the eviction well before the start of the eviction | | 0.77 | | |
| Eviction process maintained solidarity among us | | 0.70 | | |
| The level of local participation in decision making processes was high | | | 0.87 | |
| Community was highly involved in the design of eviction process | | | 0.87 | |
| There was consideration of local people's needs while making management plans for eviction | | | 0.65 | |
| The eviction process followed the rules and regulations | | 0.50 | 0.59 | |
| The eviction process was well conducted | | | 0.56 | |
| I was provided with information on the policy that govern eviction process | | | | 0.76 |
| There was training on familiarizing with the eviction process | | | | 0.77 |

The first Principal component (PC1) represents statement related to ability to reorganize after eviction process; these statements make reference on the condition of the evicted people after being evicted. These factors represented 41.9% of the variance (Table 3). Farmers responses on socio-ecological resilience after eviction involves ability to sustain family wealth, well being, food security, household income, farm labor as well as well being. The mean for all the five statement contained on the first principal component is less than 1 (Table 4), implying that most of them were not socio-ecological resilient.

**Table 4: Descriptive statistics and reliability analysis for the responses evicted people from Uluguru Nature Reserve (UNR)**

| Survey items | Mean | Standard deviation | item-total correlation | α if item deleted |
|---|---|---|---|---|
| Community was highly involved in the design of eviction process | 1.04 | 1.31 | 0.56 | 0.21 |
| The level of local participation in decision making processes was high, | 0.94 | 1.22 | 0.51 | 0.89 |
| There was the consideration of local people's needs while making plans for eviction | 0.51 | 0.84 | 0.58 | 0.89 |
| The eviction process creates more trouble to my family*§ | 0.20 | 0.55 | 0.26 | 0.90 |
| Am proud that local ecological knowledge was recognized during establishment of UNR* | 1.64 | 1.14 | 0.11 | 0.90 |
| I was involved in conservation of mount Uluguru | 1.90 | 1.32 | 0.45 | 0.89 |
| Researchers gathered information from us with regard to conservation of UNR* | 1.07 | 1.26 | 0.35 | 0.90 |
| I was informed by government officials before eviction | 1.46 | 1.54 | 0.57 | 0.89 |
| The eviction process was well conducted | 1.01 | 1.24 | 0.75 | 0.89 |
| The eviction process followed the rules and regulations | 1.04 | 1.18 | 0.79 | 0.89 |
| I received information about the eviction well before the start of the eviction | 1.64 | 1.50 | 0.68 | 0.89 |
| I was given right to get land on other place* | 1.24 | 1.36 | 0.35 | 0.90 |
| I got my compensation on time to enable me establish new life* | 3.11 | 1.29 | 0.04 | 0.91 |
| The compensation I got was appropriate | 0.33 | 0.86 | 0.40 | 0.20 |
| Information on eviction process was given on right time | 1.78 | 1.65 | 0.55 | 0.90 |
| There was training on familiarizing with the eviction process | 0.90 | 1.26 | 0.68 | 0.89 |
| I was provided with information on the policy that govern eviction process | 0.74 | 1.12 | 0.53 | 0.89 |
| I managed to sustain my income after the eviction | 0.39 | 0.92 | 0.60 | 0.91 |
| I have sustained my social welfare | 0.65 | 1.20 | 0.64 | 0.89 |
| I have sustained my household food security | 0.43 | 0.88 | 0.62 | 0.91 |
| I have sustained my family wealth | 0.47 | 0.99 | 0.67 | 0.89 |
| I have sustained labour for my farm | 0.43 | 0.96 | 0.57 | 0.89 |
| The eviction process little disturbed our life style | 0.51 | 1.10 | 0.49 | 0.89 |
| Eviction process maintained solidarity among us | 1.06 | 1.31 | 0.51 | 0.89 |

§The data for negatively worded statements were reversed prior to analysis

*The five statements that were removed from the scale were those with the largest Cronbach's α if item deleted

During interview with the respondents, majority complained that previously before eviction exercises they owned big plots which were fertile and on top of that they were cultivating permanent crops like yams, banana, and coffee, but now days, they don not have enough land just small plots around homes, and some times they hire land which are not fertile and that now they don't have permanent crops only they cultivate seasonal crops like maize, beans which are not paying them. Also they said that areas which now are cultivating is unfertile means that they need fertilizer on which them they don't have ability to get it, that is why they are not resilient. This is in line with the study by Adger *et al.* (2002), who describe resilience as involve the ability of communities to absorb external changes and stresses and reorganize to sustain their livelihoods. Also studies by Holling (2004); Olsson *et al.* (2006) and Trosper (2003), shown that resilience involve the capacity to reorganize and to undergone a social transformation after being evicted.

The second principal component factor represent 13.6% of the total variance, it consisted of statements related to awareness on eviction. The acts for eviction highlight that the farmers should be given the information prior to eviction. This information is about the reason for eviction and the whole process. The mean for all the statement included in this factors is higher than 1 (Table 4). This means that the respondents were given the information about the eviction. In an interview the study revealed that respondents was given the information about the time for eviction, date to list the names of the victim but it was revealed that the respondents were not given the information regarding the issue about the compensation as stipulated by guideline governing eviction (URT, 1997). Which make some complains that what they were given was little. This finding is related with the study by Vangen (2009) in Mount Elgon who

noted that Government often do not recognize or protect peoples rights, which make it easily evict without giving proper compensation. This complains could be solved by making compensation aspect open to all victims.

It was lack of training about the whole process of eviction as well as the policy and acts that govern the eviction process. Training could have helped them to become socio-ecological resilience since through training, the evicted people could even be educated on those compensation that was been provided to use in such away improving their livelihood, even though majority complained that what they get was not enough, but with training it could be some how better, since they could be helped to gain some knowledge to use whatever little they have in sustainable manner. Study by Walker *et al.* (2006) noted that the capacity to adapt and to manage socio-ecological resilience requires learning and the ability to make sense of things, especially in areas of collaborative learning, using a combination of various sources of information and knowledge.

The third component represented statements related to participation of the local community in the plan for eviction process and it represents 9.6% of total variance. However, the mean of the two statements contained in this component is low (less than 4). This means that involvement of the local community on the eviction was low. This implies that they didn't participate in contributing their views on how the process of eviction could be undertaken. This result concurs with the study by Jain (2012) who noted that the increase of vulnerability to changes continues largely because of the undermining of indigenous knowledge through direct government policies/acts.

The fourth and final statement consisted of the statement related to support from the government leaders and NGOs; these statements make reference on provision of knowledge with regard to policy through trainings. The means for these statements also is less than 1, these imply that support from Government and NGOs was not adequate. Study by Anderies et al. (2006); Olsson et al. (2006) states that, leadership, are always critical in preparing the system for socio-ecological resilience. Before the eviction process people need to be informed about the essence of eviction. This can be achieved by using the government agents as well as Non governmental organization.

Another component of socio-ecological resilience of the evicted people in the study area was interns of coping strategy. Various coping strategies were identified in the study area that was adopted by evicted people after establishment of UNR. The results are summarized in Table 5; the findings revealed that coping strategies adopted by evicted people in the study area were provision of casual labour on the farm of other people, hire land, and buy land.

**Table 5: Coping strategies adopted by the evicted people**

| Coping strategies | N | % |
|---|---|---|
| Buy land | 29 | 32.2 |
| Livestock keeping | 7 | 7.8 |
| Provision of casual labour | 39 | 43.3 |
| Hire land | 25 | 27.8 |

Respondents have more than one coping strategies

However, the following agricultural practices were adopted by a few respondents; Livestock keeping (7.8%). The respondents gave reasons for not buying land on other

area and continue with their farming activities as they were doing earlier. Among the mentioned reasons was low compensation received after being evicted. This mean that after being evicted most of the farmer did not continue with agricultural activities. As it was found that most of them engage on provision of casual labour which is seasonal. They are available during the agricultural season this mean that most of the farmers were not socio-ecological resilient. The findings of this study are related to those reported by Vangen (2009) who revealed that evicted people who had no land to cultivate were forced to go into casual labour, so as to find other way to feed their family. Howard *et al.* (2006) and Folke *et al.* (2003) states that in order for social system to become socio-ecological resilience, among the factor which influence is a well developed coping strategies. Therefore a well developed coping strategy is very important so as to make individual/community socio-ecological resilient. This study reveal that most of the people evicted are not socio-ecological resilient simply because the coping strategies adopted are not enabling them obtaining their livelihoods throughout the year. Also the study findings through interviewing people, realized that other reason for less socio-ecological resilient of respondents in the study area was lack of knowledge on performing other economic activities other than agriculture, as most of them seem to engage on provision of casual labour. With knowledge they could even start doing business with the compensation that they were given even though they complained that it was low instead of providing casual labours which are not making them socio-ecological resilience.

## 4.4 Socio-economic factors underlined socio-ecological resilience of the evicted people for establishment of UNR

Various socio-economic factors have significant influence on variables of socio-ecological resilience (Table 6).

**Table 6: General Linear Model (GLM) Univariate analysis for components underlying socio-ecological resilience of evicted people for establishment of Uluguru Nature Reserve (UNR)**

| Component of socio-ecological resilient | Source | Type I Sum of Squares | Df | Mean Square | *F* | *P* |
|---|---|---|---|---|---|---|
| **Ability to reorganize(C1)** | Age | 1.68 | 2 | 0.84 | 1.16 | 0.321 |
| | Sex | 4.15 | 1 | 4.15 | 5.70 | **0.020** |
| | Marital status | 0.21 | 3 | 0.07 | 0.10 | 0.961 |
| | Education | 3.76 | 2 | 1.88 | 2.59 | 0.083 |
| | Household Size | 0.14 | 2 | 0.07 | 0.10 | 0.904 |
| | Occupation | 19.86 | 5 | 3.97 | 5.46 | 0.000 |
| | Income | 7.25 | 3 | 2.41 | 3.32 | **0.025** |
| **Awareness of the evction(C2)** | Age | 4.11 | 2 | 2.06 | 2.30 | 0.107 |
| | Sex | 5.31 | 1 | 5.31 | 5.95 | **0.017** |
| | Marital status | 1.98 | 3 | 0.66 | 0.74 | 0.531 |
| | Education | 0.31 | 2 | 0.16 | 0.17 | 0.841 |
| | Household Size | 0.04 | 2 | 0.02 | 0.02 | 0.980 |
| | Occupation | 11.08 | 5 | 2.22 | 2.48 | **0.040** |
| | Income | 2.72 | 3 | 0.91 | 1.02 | 0.391 |
| Participation on planning eviction(C3) | Age | 0.54 | 2 | 0.27 | 0.27 | 0.768 |
| | Sex | 0.33 | 1 | 0.33 | 0.32 | 0.573 |
| | Marital status | 1.85 | 3 | 0.62 | 0.61 | 0.611 |
| | Education | 0.03 | 2 | 0.02 | 0.02 | 0.985 |
| | Household Size | 1.62 | 2 | 0.81 | 0.81 | 0.453 |
| | Occupation | 1.81 | 5 | 0.36 | 0.36 | 0.877 |
| | Income | 10.86 | 3 | 3.62 | 3.57 | **0.018** |
| **Support from government and NGOS(C4)** | Age | 1.25 | 2 | 0.62 | 0.67 | 0.514 |
| | Sex | 2.54 | 1 | 2.54 | 2.74 | 0.102 |
| | Marital status | 3.77 | 3 | 1.26 | 1.35 | 0.264 |
| | Education | 0.44 | 2 | 0.22 | 0.24 | 0.790 |
| | Household Size | 0.27 | 2 | 0.13 | 0.14 | 0.867 |
| | Occupation | 8.75 | 5 | 1.75 | 1.89 | 0.108 |
| | Income | 6.03 | 3 | 2.01 | 2.17 | 0.100 |

Note: Bold figures are significant at $P \leq 0.05$.

### 4.4.1 Effect of socio-economic factors on ability to reorganise

The variations in ages of respondents may affect their ability to reorganise as different age groups may give different perception, aspirations and feelings towards eviction process. Young and energetic are more active and venturesome able to reorganize. The results show that there is no significant different between age groups in terms of ability to reorganize people (Table 6).

In Africa women have been always involved in agriculture. The results show that there is a significant different in gender category and ability to be reoraganised (Table 6). The mean score for male is higher than that of the female (Table 7). This implies that females are less inclined to reorganize after being evicted than their counterpart. Probably is due to lack of knowledge among women on doing alternative livelihood rather than depending on agricultural activities as their sources of livelihood. The results concur to those reported by Adger *et al.* (2005); Brooks *et al.* (2005) and Folke *et al.* (2005) who revealed that the capacity to cope with nonlinearities or other forms of surprise and uncertainty requires openness to learning, an acceptance of the inevitability of change. Further more study by Berkes (2004) revealed that the capacity to effectively combine or integrate understanding gained from different sources and forms of knowledge, increases the likelihood that the key threshold and components of diversify will be acknowledge. As more than half of the respondents were female 51(56.7%) and male 39(43.3%), but female were less inclined to reorganize after being evicted this implies that majority of the respondents in the study area did not re organize after being evicted.

**Table 7: Summary statistics of the values of principal component associated with a category of socio-economic variable which are statistically significant influence**

| Component of socio-ecological resilient | Socio economic factors | | Mean | Std |
|---|---|---|---|---|
| **Ability to reorganize** | Sex | Male | 0.21 | 1.10 |
| | | Female | -0.16 | 0.88 |
| | Income | Less than 100 000.00 | -0.28 | 0.62 |
| | | 100 000-200 000.00 | 0.10 | 1.02 |
| | | 200 000-300 000.00 | 0.61 | 1.08 |
| | | More than 300 000.00 | 1.73 | 1.98 |
| | Occupation | Farming | -0.18 | 0.64 |
| | | Farming and livestock | -0.60 | 1.23 |
| | | Farming and laborers | 0.39 | 0.58 |
| | | Farming livestock and laborers | 1.21 | 1.62 |
| | | Farming and business | 0.84 | 1.66 |
| | | Laborers | 0.65 | 0.66 |
| **Awareness of the eviction** | Sex | Male | 0.32 | 1.00 |
| | | Female | -0.25 | 0.93 |
| | Occupation | Farming | -0.24 | 0.89 |
| | | Farming and livestock | 0.29 | 0.98 |
| | | Farming and laborers | -0.1.3 | 0.97 |
| | | Farming livestock and laborers | 1.01 | 0.75 |
| | | Farming and business | 0.11 | 1.49 |
| | | Laborers | 0.46 | 1.15 |
| **Participation on planning eviction** | Income | Less than 100 000.00 | -0.15 | 0.87 |
| | | 100 000-200 000.00 | 0.09 | 1.08 |
| | | 200 000-300 000.00 | 0.41 | 1.54 |
| | | More than 300 000.00 | 0.76 | 1.38 |

It is assumed that married couples share experience of different activities that would enable to be reorganized. Though married couples were expected to have high ability tc be reorganise due to shared experience on different income generating activities, however the study results show that as there was no significant different on marital status and the ability to be reorganized after being evicted. This implies that ability to be reorganized is not determined by marital status in the study area.

Better educated farmers are assumed to have information allowing them to make better decision. However, as far as education is concerned, there is no association on levels of education and ability to be reorganized (Table 6).

Large number of household members would be able to provide the labour that might be required by different agricultural activities. Thus household size would be expected to increase the probability of being reorganized. According to results in table 6, there is no significant difference between household size categories and the ability of being reorganised. This implies that in this study ability to be reorganize of the respondents after being evicted not differ with the number of people in a household.

The finding indicates that evicted people engaged on various economic activities which include farming, livestock keeping, and provision of hired labour and small scale business as the main activities of the study respondents. Farmers engaged on a number of more than one economic activities would be more likely to be reorganize. According to results, there is significant difference between occupation of the respondents and the ability of being reorganized. This implies that in this study ability to be reorganized of the respondents after being evicted differ with the kind of occupation of an individual. It was further found that farmers engaged on more than one activity that is farming, livestock business and causal labour have high chance of reorganized compared to those engaged on only one kind of activities. This is related to the study by Jain (2012) which found that community enhances their socio-ecological resilience by diversifying their livelihood strategies for

example by practicing at least two or more livelihoods. Also she added that diversifying livelihood strategies is a way to reduce vulnerability and it leads to increased income.

Household income is an indicator of wealth and perhaps a proxy for social status and influence within a community. Literatures provide evidence that income has positive influences on the ability to reoganise after being evicted (Morton, 2007; Howden *et al.*, 2007). It is expected that farmers with high income have high chance to reorganize after being evicted. The result shows that there was significant difference on income categories and ability to be reorganized (Table 6). Compared to other income categories, famers with more 300 000.00 annual income have high ability to reorganize. However, the study revealed that 56.7% of respondents had received the income of Tanzanian shillings less than 100 000 per annum, 33.3% of respondents received 100 000 to 200 000 Tshs, 4.4% of respondents received 200 000 to 300 000 Tshs (Table 8). According to these data, it is therefore likely for people with less income to be less socio-ecological resilient. In that matter, majorities of respondents in the study area can fall under less socio-ecological resilience. Study by Marshall (2007) in North Australia also showed that respondents who were not in a strong financial position believed that they could not afford the costs of change and thus showed less socio-ecological resilience. This is because with high income it enables one to diversify their livelihood strategies, hence reducing vulnerability, at the same time increasing further income of an individual.

**Table 8: Annual income of farmers evicted for establishment of Uluguru Nature Reserve**

| Annual income | Number | Percentage |
|---|---|---|
| Less than 100 000 | 51 | 56.7 |
| 100 000 - 200 000 | 30 | 33.3 |
| 200 000 - 300 000 | 4 | 4.4 |
| More than 300 000 | 5 | 5.6 |
| Total | 90 | 100.0 |

### 4.4.2 Effect of socio-economic factors on awareness of the eviction

The variations in ages of respondents may affect their ability to get information prior to eviction as different age groups may lead into different preferences on the sources of information. As the studies shows that young people prefer sources like television and radio but also most of young are literate, thus have no difficult with reading newspaper, note board on other hand old people prefer meetings discussion an, radio and television. Thus information channels used to address the people for eviction has an impact on the number of the people who would receive the information. The results show that there is no significant different between age groups in terms of receiving information prior to eviction (Table 6).

Studies show that when sources of information are classified as mass media sources, women prefer interpersonal sources of information (meeting and discussion) over mass media (Emmanuel, 2008). The results show that there is significant difference between gender categories and being informed prior to eviction process (Table 6). The mean score for male is higher than that of the female (Table 7). This implies that females were less informed prior to eviction compared to males. This might be caused by the model

of communication which was used to provide information prior to eviction. It was found that provision information for eviction was mostly involved use of notes board, studies shows that women do not prefer this method (Emmanuel, 2008). As more than half of the respondents were female51 (56.7%), and female were less informed prior to eviction this implies that majority of the respondents in the study area were less informed about the eviction process.

Married couples share different information tone received in daily to daily life. The researcher therefore investigated the influence of marital status with regard to the ability to receive information prior to eviction. It was expected that married to have high ability to be informed due to reason that once one person receive information about the eviction it is easy to pass such an information to the couple, the study results show that as there was no significant different on marital status and being informed prior to eviction (Table 6). This implies that being informed about the eviction process is not determined by marital status in the study area.

Better educated farmers are assumed to have high chance of being informed due to reason that they can utilize information packed in variety sources. The results shows that there is no significant different on levels of education and ability to be informed prior to eviction (Table 6).

Farmers engaged on a number of more than one economic activities would be more likely to be more informed. According to results, there is significant difference between occupation of the respondents and the ability of being informed prior to eviction. This

implies that in this study ability of being informed prior to eviction differ with the kind of occupation of an individual. It was further found that farmers engaged on more than one activity that is farming, livestock business and labour have high chance of reorganized compared to those engaged on only one kind of activities

### 4.4.3 Effect of socio-economic factors on participation in planning the eviction

The variations in ages of respondents may affect their ability of an individual to be involved in the process of eviction. Adult are perceived to have wise with appropriate decision with regard to natural resources management thus their involvement in eviction is expected to be high. The results show that there are no significant differences between age groups in terms of involvement in eviction process (Table 6).

Male dominate the women on participation on decision with regard to natural resources. The results show that there is no significant different gender categories and involvement on eviction process (Table 6). This implies that none of the gender categories have high involvement on the eviction process.

Married couples might have high chance of participating on the eviction process. The researcher therefore investigated the influence of marital status on participation on the eviction process, the study results show that as there was no significant different on marital status and participation on the eviction process (Table 6). This implies that involvement of local community on the eviction process is not determined by marital status in the study area. Educated farmers are assumed to be knowledgeable to make better decision with regard to natural resources management. As far as education is

concerned, there is no significant different on levels of education and participation on eviction process (Table 6). This implies that levels of education are not a determinant of an individual to participate on eviction process.

According to results in table 6, there is no significant difference between household size categories and participation of an individual on planning for eviction process. This implies that in this study involvement on eviction process is not differ with the number of people in a household.

The results show that there no significant difference between occupation of the respondents and participation of an individual on planning for eviction process (Table 6). This implies that in this study involvement of the respondents on eviction process do not differ with the kind of occupation of an individual.

Household income is an indicator of wealth and perhaps a proxy for social status and influence within a community. It is expected that farmers with high income have high chance to be involved in eviction process. The results shows that there was significant different on income categories and involvement of the respondents on the eviction process (Table 6). Compared to other income categories, famers with more 300 000.00 annul income were highly involved in eviction process.

### 4.4.4 Effect of socio-economic factors on getting support from government and NGOs

The variations in age of respondents may vary with ability of an individual to get support from government and NGOs. It was expected that adult and grown up people can be easily supported by government and NGOs and became resilient. The result shows that there are no significant differences between age groups in terms of getting support from government and NGOs with the situation (Table 6). However the results show that there were no significance difference between gender categories and getting support from government and NGOs (Table 6). This implies that none of the gender males or females was highly supported by government and NGOs with the eviction process.

The study results show that as there was no significant difference on marital status and getting support from government and NGOs (Table 6). This implies that being supported by government and NGOs with the eviction process is not determined by marital status in the study area.

Better educated farmers have knowledge and skills to analyze the situation. Thus it was expected that they could easily be supported by the government and NGOs with regard to eviction. However, the results show that there is no significant different on levels of education and getting support from government and NGOs with the eviction process (Table 6).

According to results in Table 6, there is no significant difference between household size categories and being supported by government and NGOs to concur with the eviction process. This implies that in this study getting support from government and NGOs on eviction process do not differ with the number of people in a household.

Farmers engaged on a number of more than one economic activities would be more likely to have an interaction with other colleague to expand their understanding on the situation at hand. However, according to results in Table 6, there is no association between occupation of the respondents and being supported by government leaders and NGOs with the eviction process.

Household income plays an important role in influencing external sources such as government and NGOs official. The results shows that there was no significant different on income categories and being supported by government leaders and NGOs with the eviction process (Table 6).

### 4.4.5 Effect of socio-economic factors on coping strategies adopted by evicted people

Table 8 summarizes the results on socio-economic factors on copping strategies adopted by evicted farmers. These are buying land, livestock keeping, and provision of casual labour and hiring land.

**Table 9: Logistic regression results for coping strategies of the evicted people from Uluguru Nature Reserve**

| Variable | B | S.E. | Wald | Df | *P* | Exp(B) |
|---|---|---|---|---|---|---|
| **Buying land** | | | | | | |
| Age | 0.53 | 0.44 | 1.46 | 3 | 0.227 | 1.69 |
| Sex | -0.09 | 0.59 | 0.02 | 1 | 0.879 | 0.92 |
| Marital status | -0.65 | 0.36 | 3.38 | 3 | 0.066 | 0.52 |
| Education level | 0.13 | 0.52 | 0.06 | 2 | 0.806 | 1.14 |
| Household size | -0.37 | 0.42 | 0.79 | 2 | 0.375 | 0.69 |
| Occupation | -0.30 | 0.20 | 2.11 | 5 | 0.147 | 0.74 |
| Income | 0.82 | 0.37 | 4.93 | 3 | **0.026** | 2.26 |
| Constant | -1.02 | 1.92 | 0.28 | 1 | 0.596 | 0.36 |
| Livestock keeping | | | | | | |
| Age | 1.34 | 0.87 | 2.38 | 3 | 0.123 | 3.85 |
| Sex | -0.44 | 1.12 | 0.15 | 1 | 0.697 | 0.65 |
| Marital status | -0.38 | 0.59 | 0.41 | 3 | 0.521 | 0.69 |
| Education level | 1.15 | 1.03 | 1.23 | 2 | 0.268 | 3.15 |
| Household size | -0.81 | 0.79 | 1.04 | 2 | 0.308 | 0.45 |
| Occupation | 0.23 | 0.29 | 0.64 | 5 | 0.424 | 1.26 |
| Income | 0.66 | 0.47 | 1.92 | 3 | 0.166 | 1.93 |
| Constant | -6.72 | 3.77 | 3.18 | 1 | 0.074 | 0.00 |
| Provision of casual labour | | | | | | |
| Age | -0.92 | 0.50 | 4.19 | 3 | **0.041** | 0.40 |
| Sex | -1.022 | 0.62 | 2.68 | 1 | 0.101 | 0.36 |
| Marital status | 0.12 | 0.28 | 0.18 | 3 | 0.675 | 1.12 |
| Education level | 0.39 | 0.53 | 0.54 | 2 | 0.462 | 1.47 |
| Household size | 0.34 | 0.42 | 0.66 | 2 | 0.417 | 1.41 |
| Occupation | -0.30 | 0.20 | 2.20 | 5 | 0.138 | 0.74 |
| Income | -0.21 | 0.35 | 0.38 | 3 | 0.535 | 0.81 |
| Constant | 2.10 | 1.92 | 1.19 | 1 | 0.275 | 8.16 |
| Hiring land | | | | | | |
| Age | -0.41 | 0.44 | 0.87 | 3 | 0.350 | 0.64 |
| Sex | 0.67 | 0.61 | 1.21 | 1 | 0.271 | 1.96 |
| Marital status | 0.17 | 0.27 | 0.38 | 3 | 0.540 | 1.18 |
| Education level | -0.93 | 0.51 | 3.37 | 2 | 0.066 | 0.39 |
| Household size | 0.04 | 0.42 | 0.01 | 2 | 0.933 | 1.04 |
| Occupation | 0.63 | 0.22 | 7.98 | 5 | **0.005** | 1.87 |
| Income | -1.44 | 0.46 | 9.86 | 3 | **0.002** | 0.24 |
| Constant | 1.49 | 1.97 | 0.57 | 1 | 0.449 | 4.45 |

Note; Bold number are significant at $P \leq 0.05$, -2 log likelihood = 99.017; Cox and Snell $R^2$ = 0.145; Nagelkerke $R^2$ = 0.203 for buying land, -2 log likelihood = 39.951; Cox and Snell $R^2$ = 0.098; Nagelkerke $R^2$ = 0.232 for livestock keeping, -2 log likelihood = 97.968; Cox & Snell $R^2$ = 0.086; Nagelkerke $R^2$ = 0.128 for provision of hired labour and -2 log likelihood = 94.179; Cox and Snell $R^2$ = 0.275; Nagelkerke $R^2$ = 0.369 for hiring land.

#### 4.4.5.1 Effect of socio-economic factors on buying land

Results in Table 8 revealed that, household income of the evicted people was an important factor in buying land as the coping strategies after being evicted. According to results, there is significant difference between income of the respondents and buying land as copping strategy. Similar to the pattern reported by other studies (Brooks *et al.*, 2005; Jain, 2012). Age of respondents, sex, marital, education, household size and occupation were not statistically significant. Therefore, in this case adoption of buying land as the coping strategies was influenced by household's income of the household.

#### 4.4.5.2 Effect of socio-economic factors on livestock keeping

Results in Table 9 revealed that, age of respondents, sex, marital, education, household size, occupation and income were not significant. Therefore, this implies that age of respondents, sex, marital, education, household size, occupation and income were not the socio-economic factors influencing adoption of livestock keeping as coping strategies.

#### 4.4.5.3 Effect of socio-economic factors on Provision of casual labour

Results revealed that, age of respondents was an important factor in provision of causal labour as the coping strategies after being evicted and it was statistically significance (Table 9). Other socio-economic factors was not statistically significant on adoption on provision of casual labour as the coping strategies which included Sex, marital, education, household size, occupation and household income .

#### 4.4.5.4 Effect of socio-economic factors on hiring land

Results revealed that, household income and occupation of the evicted people was an important factor in hiring land as the coping strategies after being evicted. The coefficient of the households income and occupation was statistically significant (Table 9).These results imply that people with high income it was possible to hire land, similar to the pattern reported by other studies (Howden *et al.*, 2007; Morton, 2007). Also people with many occupation were able to hire land probably due to earning of income from different sources which enabled them to hire land. Age of respondents, sex, marital, education and household size were not statistically significant. Therefore, in this case adoption buying land as the coping strategies was influenced by household's income of the household and occupation of respondents.

# CHAPTER FIVE

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

This chapter presents conclusions and recommendations of the study. The chapter is divided into the following sections; section one presents the conclusions of the study while section two presents recommendations.

### 5.1 Conclusions

Based on the results and proceeding discussion, the following conclusion have been reached;

i. The study revealed that institutions governed eviction clearly states the rights for a victims of eviction as it insists on fair compensation, provision of information before the process and that the eviction process should adhere to laws and guidelines and hence socio-ecological resilient of the evicted people.

ii. The study found that most of the respondents were not informed prior to eviction as stipulated on the institutions. Also it was revealed that evicted people didn't receive guidelines for compensation this implies that eviction process was conducted while most of the farmers were not aware on the guideline that governs the eviction process, hence less socio-ecological resilient.

iii. The study revealed that the evicted people have low resilient due to lack of awareness on the eviction, not well reorganized, poor participation on planning the eviction, low government support and NGOs and poor coping strategies adopted

by the evicted people, as we have seen that 43% of the respondents engaged on provision of casual labour on the farm of other people which is seasonal activity and hence not making them socio-ecological resilient.

iv. The results show that sex, occupation and an annual income were the factor which determines ability of an individual to be socio-ecological resilient. The results shows that there was significant different on income categories and ability to be socio-ecological resilient compared to other income categories, famers with more 300 000.00 annual income have high socio-ecological resilience than people with less income, results was further found that farmers engaged with many activities that is farming, livestock business and causal labour have high chance of being socio-ecological resilient compared to those engaged on only one kind of activity. Also the study found that females were less informed prior to eviction as compared to males. As more than half of the respondents were females (56.7%) and female were less informed prior to eviction this implies that majority of the respondents in the study area were less informed about the eviction process. Further more it was revealed that socio- economic factors determine coping strategies were as follows; buying land was determined by household income, provision of casual labour was determined by age of an individual while hiring land were determined by household income and occupation of an individual.

## 5.2 Recommendations

i. The study recommends that local community should be involved in the process of eviction through providing them with information about the whole processes by

giving them a guide for compensation as we have seen that the majority complained that the compensation given was not enough and hence not enabled them to become socio-ecological resilient.

ii. The government and Non-governmental Organization support is required on creating awareness to people about the whole process of eviction.

iii. Evicted people should also be provided with training on how to cope with the situation especially on how to choose the best coping strategies to engage with in order to be socio-ecological resilient. As we have seen that provision of casual labour was the leading activity adopted by the farmer which is less profitable.

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# APPENDICES

## Appendix 1: Questionnaire for household of the evicted people from Uluguru Nature Reserve

### A. General instructions to Enumerator

- Make brief introduction about the study at each start of the interview.
- Please fill in the interview schedule according to the respondent's responses.
- Please ask each question clearly and patiently to enable the respondents understands it.
- Please probe for inadequate answers

Ward.....

Village.....

Date of interview.....

### B. Demographic and Socio-economic characteristics

1. Age of the respondent (.....) years
2. Sex of respondent
    1. Male
    2. Female

3. Marital status
    1. Married
    2. Single
    3. Widowed
    4. Divorced

4. Education level of respondent
    1. Non formal education
    2. Primary education
    3. Secondary education
    4. Post secondary education

5. Household size (people living in single house)

1. 1-3

2. 4-7

3. More than 7 people

6. What is your main occupation?

1. Farmers

2. Livestock production

3. Businessperson

4. Employed

5. Other (please specify).....

7. Main sources of income (more then one answer is possible)

1. Farming activities

2. Livestock production

3. Business

4. Employment

5. Other (please specify).....

8. What is your average annual income in Tshs?

9. Is your income (above) similar to the income before eviction?

1. Yes

2. No

10. If NO, how much it affect you?

1. Less than 10%

2. 10-50%

3. More than 50%

**C. Institutional framework of the eviction and its effects on the socio-ecological resilience of the evicted people**

11. Did you got the information about the plan of the government to conserve the Uluguru Nature Reserve

1. Yes 2. No

12. If yes, did you receive any guidelines/bylaws/policy that stipulate the whole process of eviction

1. Yes 2. No

13. How do you rate role Institutional framework of the eviction and its effects on the socio-ecological resilience of the evicted people?

(States whether you **Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree** on each of the following statements)

**13. Attitude of eviction people towards eviction for conservation of Uluguru Nature Reserve**

| | Statements | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| 1 | Community was highly involved in the design of eviction process | | | | | |
| 2 | The level of local participation in decision making processes was high during establishment of UNR. | | | | | |
| 3 | There is the consideration of local people's needs while making management plans for eviction | | | | | |
| 4 | The eviction process creates more trouble to my household | | | | | |
| 5 | Am proud that local ecological knowledge was recognized during establish of UNR | | | | | |
| 6 | I was involved in conservation of mount Uluguru | | | | | |
| 7 | Researchers gathered information from us with regard to conservation of UNR | | | | | |
| 8 | I was informed by government official before eviction process | | | | | |

**D. Eviction process for establishment of UNR and its effects on the socio-ecological resilience of the evicted people**

14. Did you receive the eviction notes?

1. Yes 2. No

15. Did you receive guidelines for compensation and resettle?

1. Yes 2. No

16. Did a list of all people living on the Uluguru Mountain prepared by name and activities they engage in?

1. Yes 2. No

17. How do you rate process the eviction and its effects on the socio-ecological resilience of the evicted people state whether you strongly agree, agree, neutral, disagree and strongly disagree on each of the following statements

| | Statements | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| 1 | The eviction process was well conducted | | | | | |
| 2 | The eviction process followed the rule and regulation | | | | | |
| 3 | Community receive the information at time to start eviction | | | | | |
| 4 | The right to get land on other place was given | | | | | |
| 5 | Compensation was given on time to enable establish new life | | | | | |
| 6 | The compensation given was appropriate | | | | | |
| 7 | Information on eviction process was given on right time | | | | | |
| 8 | There was a training on the familiarizing with the eviction process | | | | | |
| 9 | I was provided with the information on the policy, guidelines and rules that govern eviction process | | | | | |

**E. Coping strategies of evicted people**

18. Please what is your coping strategy that you adopted after been evicted from Uluguru Mountain (Tick the appropriate one)
    1. Find other source of income(performing off farm like business)
    2. Buy land on other place and continue with agricultural activities
    3. Increase social capital(engage on the social groups)
    4. Real livestock
    5. Form income networks
    6. Seek employment
    7. Other (specify).....

19. How do you rate the following statement with regard to coping ability after being evicted?

| | Statements | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| 1 | I managed sustain my income | | | | | |
| 2 | I have sustained my social welfare | | | | | |
| 3 | I have sustained my household food security | | | | | |
| 4 | I have sustained my family wealth | | | | | |
| 5 | I have sustained my labour power for my farm | | | | | |
| 6 | The eviction process disturbed little in our life style | | | | | |
| 7 | Eviction process maintain solidarity within our selves | | | | | |

**F. Factors affecting socio-ecological resilience of the evicted people**

20. Is there any factors which affect you on copping after being evicted?

1. Yes
2. No

21. If yes, what are the factors affecting you to cope after been evicted?

1_____

2_____

3_____

22. Was there any meeting concerned with eviction process?

1. Yes
2. No

23. If YES, how was it done?

.....

.....

24. Was there any influence of local leaders on eviction process?

1. Yes
2. No

25. If YES, who are they? Mention them

**THANK YOU FOR YOUR COOPERATION**

**Appendix 2: Checklist for key informants**

1. What is the institutional framework of the eviction and its effects on the socio-ecological resilience of the evicted people
2. How eviction process for establishment of UNR to the evicted people was conducted and its effects on the socio-ecological resilience of the evicted people
3. What are the coping strategies for the evicted people for the establishment of UNR
4. What are the socio-economic factors affecting coping ability of the evicted people