

**INTERPLAY OF FORMAL AND INFORMAL GRASSROOTS INSTITUTIONS
FOR LAND MANAGEMENT IN THE ULUGURU MOUNTAINS, MOROGORO,
TANZANIA**

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**A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS
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EXTENDED ABSTRACT

Despite various interventions geared at countering land degradation in the Uluguru Mountains, the problem has persisted. Institutions have an instrumental role in land management. However, the question of compatibility between formal and informal institutions and hence the effectiveness of the institutions in governing land management is yet to be adequately addressed. This study assessed how the interplay of formal and informal grassroots institutions determines their effectiveness in governing land management in the Uluguru Mountains. Data collection involved administering an interview schedule at a single point in time and conducting in-depth interviews as repeatedly as deemed necessary. Qualitative data were analysed using content analysis. Institutional effectiveness was measured on a five-point Likert scale and conditions for institutional effectiveness evaluated using multinomial logistic regression. Inclusively, the formal and informal grassroots land management institutions were effective in that their ultimate effect was more of fostering actors' land management behaviour. The outcome of formal and informal institutional interactions was largely one of inter-institutional conflict which, the study argues, is not necessarily undesirable. The study also uncovered that, besides sanctions against non-compliance and individual benefits, ecological concerns motivated adherence to land management prescriptions. Thus, land management actions are not guided by individual rationality alone; they are also guided by social rationality. Therefore, the influence of institutions on land management in the Uluguru Mountains is not adequately explained by the property rights theory since the theory rejects rationalities for actions other than that of maximizing individual utility. It was evident that actors' propensity to apply a particular practice is institutionally dependent and hence the social constructivist perspective of the theory of human actions supported. Land ownership security, awareness of institutions and market access

were significantly important conditions for institutional effectiveness and hence ought to be policy priorities. The study advocates for individual land property regime and establishment of institution(s) to regulate opportunistic behaviours on farmland water sources. Formulation of land management institutions should be location specific and informed by existing institutions because people's perceptions, preferences, motivations and land resource problems are location specific. It is important to promote land management enhancing informal institutions.

DECLARATION

I, Emmanuel Timothy Malisa, do hereby declare to the Senate of Sokoine University of Agriculture that this thesis is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted in any other institution.

Emmanuel Timothy Malisa
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The above declaration is confirmed

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Date

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
EPINAV	Enhancing Pro-poor Innovation in Natural Resources and Agricultural Value Chains
FGD	Focus Group Discussion
GEF	Global Environmental Facility
HIV	Human Immunodeficiency Virus
IFAD	International Fund for Agricultural Development
MLR	Multinomial Logistic Regression
MVIWATA	<i>Mtandao wa Vikundi vya Wakulima Tanzania</i> (Network of Farmers' Groups in Tanzania)
NGO	Non Governmental Organization
NMBU	<i>Norges Miljø-og Biovitenskapelige Universitet</i> (Norwegian University of Life Sciences)
PRA	Participatory Rural Appraisal
SDGs	Sustainable Development Goals
SPSS	Statistical Package for Social Sciences
SUA	Sokoine University of Agriculture
SWC	Soil and Water Conservation
TANU	Tanganyika African National Union
TFCG	Tanzania Forest Conservation Group
ULUS	Uluguru Land Usage Scheme
UMADEP	Uluguru Mountains Agricultural Development Project
UN	United Nations
UNDP	United Nations Development Program

URT	United Republic of Tanzania
WCST	Wildlife Conservation Society of Tanzania

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Land degradation is an important phenomenon both in developed and developing countries due to its impact on food security and quality of the environment. In East Africa, land degradation problem has been associated with increasing population pressure on land (Ponte, 2003), poverty (URT, 2001), and malfunctioning institutions (Tanguilig and Tanguilig, 2009). These contribute to low adoption of natural resource management practices, which in turn contributes to land degradation. In Tanzania, land degradation is particularly acute in mountainous areas which have experienced rapid population growth resulting into increased food demand hence the need for more farmland. For example, Mowo *et al.* (2011) and Ponte (2003) reported land degradation and deforestation as the major problems in Usambara and Uluguru Mountains respectively.

In areas where farming is the predominant activity, land degradation is likely to continue unless appropriate land management practices are adopted. This is more so for the mountainous areas where farming is implemented on steep land whose proneness to soil erosion is more pronounced. The Uluguru Mountains in Morogoro, Tanzania, is such an area. According to Ponte (2003), in the Uluguru Mountains, farmers have opened forest reserves and steep land for cultivation, resulting in higher land degradation and lower yields.

The history of land management interventions in the Uluguru Mountains dates back to 1909 when the German colonial administration declared an area of 277 km² as forest reserve in order to halt shifting cultivation into the Uluguru Mountains forest (Temple,

1972). Other interventions promoted in the area in an attempt to address land degradation include terracing, contour strip cropping, organic farming, agroforestry and tree planting (Malisa, 2009). Despite the efforts, recent studies (Chamshama, 2009; Mussa *et al.*, 2012; Mattee *et al.*, 2015) show that land degradation is still one of the main threats to food security in the Uluguru Mountains. According to Tanui and Russell (2009), technological developments which include new farming technologies and natural resource management practices have not succeeded much in increasing agricultural productivity, ensuring food security or improving rural incomes. It is, therefore, high time scientists moved beyond technical solutions in addressing environmental problems.

Institutions matter; they structure the relationships between humans as they utilize their common natural resource base (Vatn, 2005). Review of many previous studies (Magayane, 1995; Chamshama *et al.*, 2009; de Leeuw, 2009; Malisa, 2009; Tanui and Russel, 2009; Mowo *et al.*, 2011) reveals one thing in common, that is, institutions are necessary in enhancing households' investment in land management practices. For example, in their study in the Uluguru Mountains, Chamshama *et al.* (2009) found that groups and by-laws have an instrumental role in managing natural resources. At the same time an extensive literature review has shown that little has been done on analysis of existing formal and informal institutions, their interactions and the resultant influence on land management. The study intended to analyse the existing formal and informal grassroots institutions for land management, with a focus on their interplay, functioning, importance and effectiveness in governing land management in the Uluguru Mountains.

Institutions are defined differently by different scholars. North (1990) defines institutions as constraints humans devise to structure or govern their relationships. According to Agrawal and Gibson (1999), institutions are sets of formal and informal rules and norms

that shape interactions of humans with others and nature. Mahonge (2010) defines institutions as rules, norms, conventions, and customs governing and linking the practices and decisions of users and enforcers of natural resource management. These definitions are different but have one common insight, that institutions influence individuals. This study was inspired by the definition of institutions by Helmke and Levitsky (2004), that is, institutions are rules and procedures (both formal and informal) that structure social interaction by constraining and enabling actors' behaviour. In this regard, routine activities that grow up in conjunction with efforts to implement the rules are also institutions (Scott, 1995). It is in line with the insight by Vatn (2005) that institutions influence individuals and their motivations.

Distinguishing institutions from organizations, North (1990) describes institutions as “rules of the game” and organizations as “the players”. In the same vein, Koning (2011) asserts that institutions and organizations are not the same in the sense that organizations are groups of people with a common purpose to achieve objectives, whereas institutions create the framework upon which organizations are based. On the other hand, Uphoff (1986) contends that the two concepts overlap and diverge and that there are organizations that are institutions or vice versa, institutions that are not organizations and organizations that are not institutions. He indicates further that, to the extent that an organization has acquired special status and legitimacy for having satisfied people's needs and for having met their normative expectations over time, one can say that an organization has become “institutionalized”. Therefore, institutions and organizations are not the same, but there are cases of overlap between the two concepts.

Institutions exhibit both a formal nature (constitutions, rules, regulations, laws and rights) and an informal nature (sanctions, customs, mores and traditions) (IFAD, 2008). Formal

institutions are defined as rules and procedures that are created, communicated, and enforced through channels widely accepted as official. By contrast, informal institutions are socially shared rules, usually unwritten, that are created, communicated, and enforced outside officially sanctioned channels (Helmke and Levitsky, 2004). For the purpose of this study, grassroots institutions refer to institutions at community¹ level. The study adopts the definition of institutional interplay propounded by Young (2002), as intended or unintended relationships among institutions either vertically–cross-scale (across different levels of organization) or horizontally–cross-issue (across the same level of social organization). Underscoring the importance of institutional interplay in natural resource management, Mahonge (2010) asserts that collaboration between formal and informal institutions may be important for enforcement of sustainable natural resource management initiatives.

1.2 Problem Statement

In the Uluguru Mountains there exist formal institutions such as village environmental management committees and by-laws, and informal institutions such as traditional land tenure systems and traditional norms and beliefs. The institutions govern land management actions, among others. They do so by influencing land users and decision makers and their choices and motivations. Given this jurisdiction, it can be argued that what is seen today with regard to land management in the Uluguru Mountains is largely a reflection of the performance of existing formal and informal institutions.

Literature points to persistence of land degradation in the Uluguru Mountains despite substantial efforts, including formation of institutions, geared at addressing the problem.

¹Community is seen as a spatial unit, as a social structure, and as a set of shared norms (Agrawal and Gibson, 1999)

According to Chamshama *et al.* (2009), problems of natural resource degradation, biodiversity loss and rural livelihood decline on the Uluguru landscape persist in spite of efforts by various actors to maintain biodiversity and ecosystem services, as well as to ensure sustainable land management in this farming landscape. Examples of unsustainable land management practices in the area include yearly occurrence of wild-land fires which result into loss of biodiversity, erosion of savings and household food insecurity (Mussa *et al.*, 2012), farming activities on land with very steep slope (above 55%) (Ponte, 2003; Malisa, 2009) and cultivation up to the borders of the forest reserve and occasionally within the reserve (Hymas, 2000).

From the literature, it is clear that technical solutions for land degradation are available, and that they include various land management practices, adoption of which could reverse the situation. It is also clear that institutions are instrumental in enhancing land management, and that there is a problem with enforcement of conservation by-laws, which is a manifestation of institutional malfunctioning. For instance, Chamshama *et al.* (2009) established that in the Uluguru Mountains, there is lack of wide participation of stakeholders in the process of formulating by-laws, particularly at community level. Mahonge (2010) observed that poor enforcement of conservation by-laws was a contributing factor to the encroachment of water catchment areas on the steep mountainous areas inclining towards Lake Jipe. The question is whether or not we can attribute the on-going land degradation in the Uluguru Mountains to ineffectiveness of formal and informal institutions for land management. The next question would relate to reasons for institutional ineffectiveness/effectiveness.

It is also clear from the Uluguru Mountains literature that studies have focused much on the formal institutions such as by-laws, giving very little attention to informal institutions

such as traditional norms and beliefs. At the same time, as Vatn and Vedeld (2012) posit, no regime² operates independently of existing institutions. They assert also that it is the sum of institutions that influences human action. This suggests a need to combine both formal and informal institutions when analyzing the influence of institutions on land management. One possible explanation for the observed poor enforcement of by-laws is that there is incongruence/incompatibility in the way formal and informal institutions operate or in the way they interact. It is also notable that previous studies in the Uluguru Mountains did not answer the question "how do formal and informal institutions influence land management?". Therefore, this study examined the interplay of formal and informal grassroots institutions for land management with a focus on their functioning, importance and effectiveness in governing land management.

1.3 Justification of the Research

Previous efforts to address land degradation in the Uluguru Mountains, for example from 1909 to the 1970s, focused mainly on technological development including bench terraces and tree planting, with research (example Savile, 1947 cited in Magayane, 1995; Rapp *et al.*, 1972 cited in Magayane, 1995) focusing on soil erosion and its effects. From the 1980s onwards, the focus was mainly on technology promotion (promotion of high value crops to be cultivated on terraces or along contours, improvement of agronomic practices, improvement of traditional irrigation system and crop marketing). Studies of the time, for example Kisanga (1992), Lulandala *et al.* (1995), Mkoba (2001) and de Leeuw (2009) focused on effectiveness of soil and water conservation technologies in soil erosion control. The fact that land degradation continued despite the availability of appropriate technologies made various scholars (Magayane, 1995; Carswell, 2005; Malisa, 2009) endeavour to establish reasons for poor adoption of soil and water conservation measures.

² Regimes are the institutional structures established to regulate resource use (Vatn, 2005).

One common observation from the above mentioned studies is that institutions have an instrumental role in natural resource management. The study on which this thesis is based built on previous studies by endeavouring to answer the questions how the institutions are instrumental in land management, how effective they are and under what conditions they become effective.

Thus, the study broadens the understanding on functioning of formal and informal institutions in land management. The findings are instrumental in guiding future formulation of institutions for governing management of land and other natural resources as well as in guiding planning and implementation of interventions aimed at addressing the conditions for institutional effectiveness.

Also, the study contributes to the existing body of knowledge, especially on institutional interplay literature, in that it focuses on institutions that operate at grassroots level and demonstrates a two-way direction of influence (from formal to informal institutions and vice versa). The mainstream literature on institutional interplay (for example Young, 2002; Oberthür and Gehring, 2006; Young *et al.*, 2008) focuses on international institutions and emphasizes on a one-way direction of influence, that is, from source institution to target institution.

The study addresses the UN Sustainable Development Goals (SDGs) number 15 (UN, 2015) whose thrust is to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. It also addresses the National Strategy for Growth and Reduction of Poverty II, Cluster I, Goal 4 which is “ensuring food and nutrition

security, environmental sustainability and climate adaptation and mitigation” (URT, 2010).

1.4 Objectives of the Research

1.4.1 Overall objective

To assess how the interplay of formal and informal grassroots institutions determines their effectiveness in land management in the Uluguru Mountains.

1.4.2 Specific objectives

- i) To analyse the role of formal and informal grassroots institutions in land management in the Uluguru Mountains
- ii) To determine the implications of institutional interplay on land management
- iii) To determine the effectiveness of existing grassroots institutions in governing land management

1.5 Research Questions

- i) How do grassroots institutions work for or against land management in the Uluguru Mountains?
 - (a) What institutions related to land use and management exist in the area?
 - (b) How do the institutions function?
 - (c) What is the importance of the institutions in land management?
 - (d) How have the institutional practices evolved over time?
- ii) How do grassroots institutions for land management interact to achieve actors' behavioural change with respect to soil erosion control, farmland fires control and farmland water sources conservation?

- (a) How can we characterize the interactions between formal land laws and traditional land tenure system?
 - (b) What is the resulting arrangement due to the interactions?
 - (c) What effects do the resulting arrangements have on individual institutions?
 - (d) What implications do the resulting arrangements have on land management?
- iii) What influence do grassroots institutions have on actors' behavioural change towards soil erosion control, farmland fires control and conservation of farmland water sources?
- (a) What is the influence of institutions on actors' preferences and actions towards soil erosion control, farmland fires control and conservation of farmland water sources?
 - (b) To what extent has people's land management behaviour changed as a result of the institutions?
 - (c) What are the necessary conditions for the influence of institutions on behavioural change in land management?

1.6 Theoretical Framework

Institutional theories have been intensively applied in the field of natural resource management. A number of schools of thought within which the theories are framed exist. For example, there are schools of thought developing from neoclassical institutionalism to old and then contemporary classical institutionalism. Neoclassical institutionalism is based on individualistic perspective while classical institutionalism is based on social constructivist perspective. Vatn (2005) asserts that the new institutional economics and the positions subsumed under it (example property rights and transaction costs schools) are strongly inspired by the neoclassical model and are based on the idea that institutions are external constraints—the "rules of the game". For contemporary classical institutionalism,

on which this study is based, institutions are not just seen as constraints; they also influence values and preferences an individual holds and what is considered right to do in certain situations (Vatn, 2011).

Therefore, the major contributing theories attempting to link institutions with land management can be conveniently grouped into two philosophical stances, namely those which are consistently based on the individualist perspective whose central concept, according to Vatn (2005), is rational choice as maximizing individual utility and those which are based on social construction which holds that people act on the basis of different kinds of rationalities in different contexts.

On the one hand, this study uses the theory of human action, particularly the social constructivist perspective of the theory, to explain how formal and informal institutions, through their roles in defining the rights and responsibilities of actors, have an impact on land management. On the other hand, the study uses property rights theory to explain the implications of land tenure regimes on land management, thereby assessing the validity of the theory. Each of the two theories used is relevant for the specific objective(s) for which it was adopted.

From a social constructivist perspective, the theory of human action entails that institutions are not just seen as constraints; they influence the individual—the values and preferences an individual holds and what is considered right to do in certain situations (Vatn, 2011). That is, institutions are a human creation and human beings are a product of the same institutions (Vatn, 2005). It contrasts with the individualist position which sees institutions as constraints against which the given individuals act and choose. The individualist perspective treats humans as autonomous, maximizing individual utility.

According to Vatn (2011), those building on individualist position accept that institutions are formed by humans but do not see them as also forming people's actions.

The property rights theory, on the other hand, accepts the rational choice as maximizing individual utility as one of its core theorems (Vatn, 2005) and claims that private property regime is the only efficient regime. The theory is based on a perspective that human action, for example on land, is guided by the zeal to earn highest individual utility as the only rationality. Moreover, as Sjaastad and Bromley (1997) assert, with the property rights theory, tenure security is seen as a prerequisite for investment and prudent land use.

Sjaastad and Bromley (1997) summarize three propositions of the property rights theory as regards problems related to tenure security and investment decisions in indigenous tenure regimes. These are: First, the lack of legal title to land reduces its value as collateral, thus increasing the price of capital and reducing the value of investments. Second, high transaction costs in establishing ownership will reduce the value of investments, or, conversely, any residual uncertainty about ownership will have the same effect since future returns may be lost. Third, the absence of a land market means that farmers cannot convert fixed land assets into other asset forms, thus reducing the value of investments to the farmer and preventing efficiency gains of trade. For the same reason, land becomes less attractive as collateral to the lender, again increasing the price of capital. As Vatn (2005) points out, the property rights theory claims that, with zero transaction costs, all resource allocations can be made via individual bargains and therefore, no public policy is necessary, that is, there is no need for state intervention.

The study sought to determine whether private property regime is truly the only efficient regime with regard to land use and management as claimed by the property rights theory

and whether human action is truly guided by the zeal to earn highest individual utility as the only rationality.

1.7 Conceptual Framework

The conceptual framework for this study is adapted from the framework for studying environmental governance systems developed by Vatn (2011), which is used to support the identification of relevant variables to explore.

In the context of this study, institutional effectiveness is indicated by change in land management behaviour regulated by institutions. It was measured in terms of behavioural change (outcome) towards land management (impact). In this regard, the measurements were done on the basis of the indicator suggested by Miles *et al.* (2002) namely, the relative improvement (comparing the existing situation with the hypothetical situation that would have existed in the absence of the institutions). Land management entails soil erosion control, farmland fires control and farmland water sources conservation.

Land management is influenced by formal and informal institutions through their influence on actors' (land users and policy makers) behaviour (motivations, preferences and actions). Attributes of the land including the slope and scarcity or abundance, are also assumed to influence land management as they influence the actors' perceptions regarding the land and hence their actions. In turn, this influence may prompt the actors to formulate new institutions and/or amend existing ones.

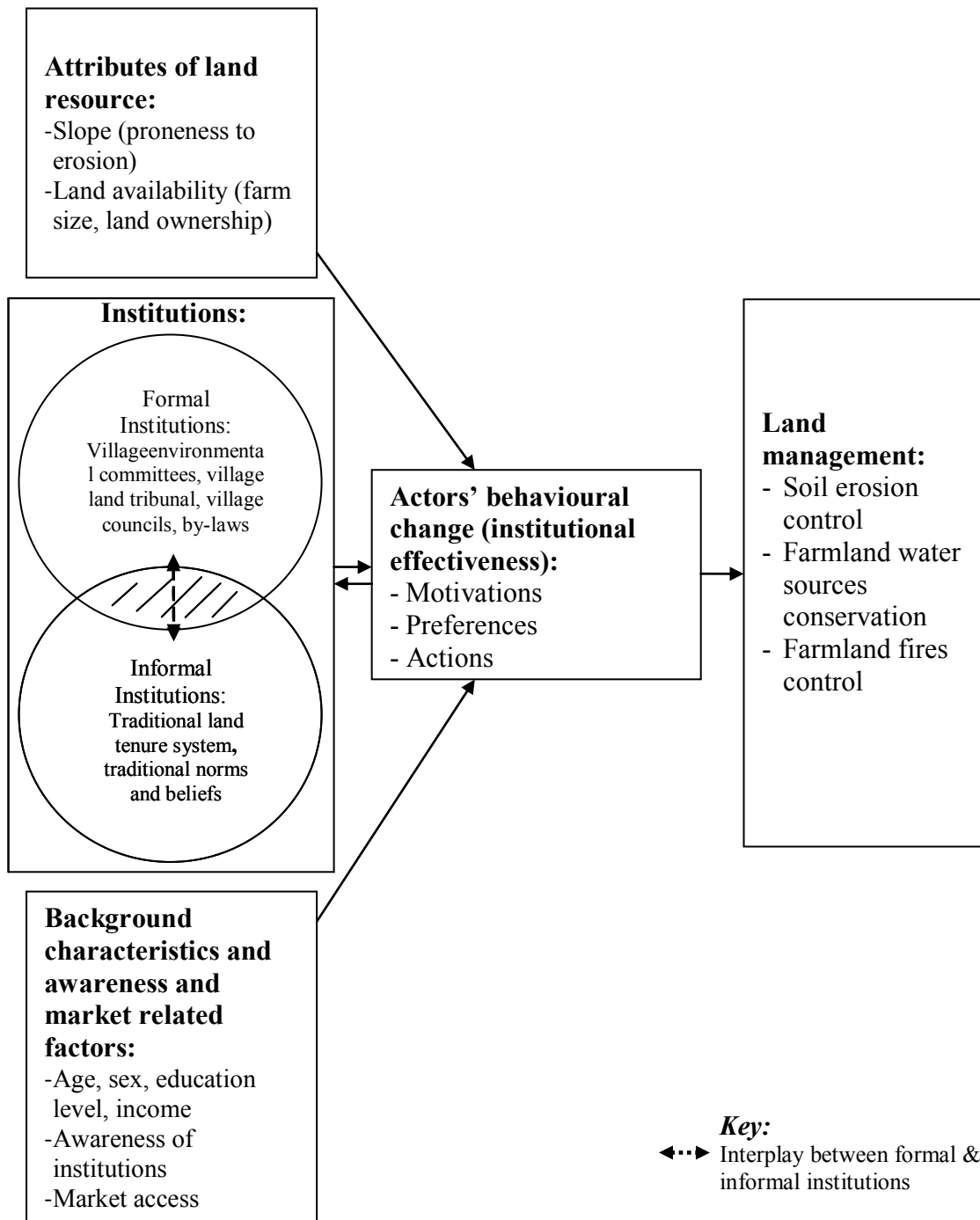


Figure 1.1: A conceptual framework for research on interplay of formal and informal grassroots institutions for governing land management in the Uluguru Mountains

Source: Adapted from Vatn (2011)

In addition to the effect of land attributes, the influence of institutions on human behaviour may be affected by personal characteristics such as age, sex, education level and income; awareness of institutions and market access.

The influence of institutional interplay (relationships between or among institutions) on institutional effectiveness is based on the observation by Schroeder (2005) that the effectiveness of specific institutions often depends not only on their own features but also on their interactions with other institutions (Fig. 1.1). The terms interplay, relationship and interaction are used interchangeably in this study. When an institution is introduced in a community, it interplays with existing institutions conforming to any of the following formal-informal institutional interplay categories propounded by Helmke and Levitsky (2004): Complementary interplay which implies filling the gaps left either by formal or informal institutions; accommodative interplay which occurs when dominant institutions accommodate less dominant ones; substitutive interplay which reflects the situation whereby one type of institution (formal or informal) has replaced another institution and competing (or conflictive) interplay which occurs due to incompatibility between formal and informal institutions.

1.8 Limitations of the Study

Though ultimately the study findings were not affected, the study encountered two important limitations as explained below.

Recall challenges: In some cases, for example when constructing historical timelines, the respondents were required to recall some events which occurred a long time ago. To some it was difficult to recall such events. In the same vein, exploration of the traditional land tenure system required that matrilineal uncles are interviewed as key informants. The

majority were very old rendering it difficult for them to remember or clearly elaborate some events. For example, one such key informant from Tawa village was 92 years at the time of data collection. In extreme cases a child to the uncle assisted clarifying some information provided by his/her father.

Accessibility: Due to lack of all weather passable roads, it was challenging to reach remote villages especially during the rainy season. For example, during the time of data collection, there was no road connecting Nyingwa village to other villages. The problem was addressed by seeking accommodation in one of the villagers' house.

1.9 Organization of the Thesis

The thesis is organized in five chapters. Chapter one covers the background to the study, which is basically about the context in which the problem was found. Problem statement, justification of the study, objectives of the study and the research questions are also presented in chapter one. Chapter one also describes the theoretical framework guiding the study. In this regard, the chapter elaborates the theory of human action and property rights theory as applied in the study. Finally, the chapter presents the conceptual framework for the study, limitations of the study and organization of the thesis.

Chapters two, three and four contain manuscripts emanating from the study. In this regard, manuscript one, which analyses the role of formal and informal grassroots institutions in land management in the Uluguru Mountains, is presented in chapter two. Manuscript two, which explores the implications of institutional interplay on land management, is presented in chapter three while the third manuscript, titled effectiveness of grassroots institutions in governing land management in the Uluguru Mountains, Morogoro, Tanzania, is presented in chapter four. Chapter five summarizes the major findings from

the thesis as well as the overall conclusions, theoretical reflections and recommendations emanating from the thesis. Areas for further research are also presented in this chapter.

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CHAPTER TWO

2.0 The Role of Formal and Informal Grassroots Institutions in Land Management in the Uluguru Mountains, Morogoro, Tanzania

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2.1 Abstract

Land degradation has remained one of the main challenges in the Uluguru Mountains despite the efforts made by various actors to address the problem. Institutions have an instrumental role in land management. How institutions influence land management in the Uluguru Mountains was the question of interest for this paper. The paper analysed formal and informal grassroots institutions for land management with a focus on their functioning and importance in governing land management in the Uluguru Mountains. Data were collected through participatory rural appraisal, focus group discussions, structured and

semi-structured interviews and use of secondary information. Content analysis and descriptive statistics were used to analyse the qualitative and quantitative data respectively. Formal institutions playing an enhancing role in land management were three namely the primary education system, village environmental management committees and extension system. Informal institutions enhancing land management were knowledge transfer from elders to young generation, labour pooling, traditional dances and farmers groups networks. Institutions playing a constraining role included blood sucking belief (*umachinja*), land renting and a tendency to envy a person making some good progress (*katsopata*). Land tenure system, belief in supernatural powers and religious institutions played both enhancing and constraining roles. Most formal institutions, though proven important, were associated with corruption and poor enforcement. The study affirms that institutions influence perceptions, motivations, preferences and action. It contrasts with the rational choice thinking which sees behaviour as only following an individualistic rational calculus independent of institutional setting. Through designed and spontaneous change, some institutions have become more relevant for land management. It is crucial that land management interventions take into consideration the existing institutional landscape. Lastly, coordinated efforts are needed to promote village-level networking of farmers, religious leaders, government bureaucrats, politicians and NGOs with the aim to enhance communication, collaboration and accountability amongst them.

Key words: *formal, informal, grassroots institutions, land management, Uluguru Mountains, role*

2.2 Introduction

Institutions are defined differently by different scholars based on their positions within the institutional theories. Neoclassic institutionalists whose position is based on the

individualist perspective view institutions as external constraints influencing the individual in his/her calculation of what is best to do. For example, North (1990) describes institutions as “rules of the game”. For classical institutionalism which embraces social constructivist position, institutions are not just seen as constraints; they also influence the values and preferences an individual holds and what is considered right to do in certain situations (Vatn, 2011). This study is inspired by the definition of institutions by Helmke and Levitsky (2004), that is, institutions are rules and procedures (both formal and informal) that structure social interaction by constraining and enabling actors’ behaviour. In this regard, routine activities that grow up in conjunction with efforts to implement the rules are also institutions (Scott, 1995).

In Tanzania, widespread poverty in rural areas compels people to over-exploit natural resources in order to survive (URT, 2001a). The situation is particularly acute in mountainous areas which have experienced rapid population growth resulting in increased food demand hence a need for more farmland. The Uluguru Mountains, which are of global importance due to their richness in biodiversity and water resources are no exception. Hymas (2000) asserted that in the Uluguru Mountains cultivation occurs up to the borders of the forest reserve and occasionally within the reserve. According to Chamshama *et al.* (2009), the root causes of anthropogenic threats that the Uluguru forest reserve faces include widespread poverty which is exacerbated by population growth. Increased pressure on the hilly slopes leads to soil erosion and other forms of land degradation since the same farm size is required to support more people.

The history of land management interventions in the Uluguru Mountains dates back to 1909 when the German colonial administration declared an area of 277 km² as forest reserve in order to halt shifting cultivation into the Uluguru Mountains forest (Temple,

1972). Effective agricultural land management entails absence of farmland fires, cultivation only on legally permitted land (not encroaching into water sources or forest reserve) and application of relevant soil and water conservation measures. Other interventions promoted in the area in an attempt to manage the land include terracing, contour strip cropping, organic farming, agro-forestry and tree planting. Despite the efforts to manage the land, recent studies (Chamshama *et al.*, 2009; Mussa *et al.*, 2012; Mattee *et al.*, 2015) show that land degradation is still one of the main threats to food security in the Uluguru Mountains. According to Tanui and Russell (2009), technological developments which include new farming technologies and natural resource management practices have not succeeded much in increasing agricultural productivity, ensuring food security or improving rural incomes. It is therefore high time scientists moved beyond technical solutions in addressing environmental problems. There is a need to empower local communities through their institutions to be actively involved in natural resource governance.

Review of many previous studies (Magayane, 1995; Chamshama *et al.*, 2009; de Leeuw, 2009; Malisa, 2009) reveals one thing in common, that is, institutions are necessary in enhancing households' investment in land management practices. For example, in their study in the Uluguru Mountains, Chamshama *et al.* (2009) found that groups and by-laws have an instrumental role in managing natural resources. However, they did not answer the question "how do formal and informal grassroots institutions influence land management in the Uluguru Mountains?", a question which is important if we are to address the land degradation problem in the area. The study, therefore, intended to analyse grassroots institutions for land management with a focus on their role in governing land management in the Uluguru Mountains. Specifically, this paper identifies existing formal and informal institutions for land management, and describes the institutions in terms of

their functioning and importance in land management. For the purpose of this study, grassroots institutions refer to institutions at community³ level. Formal institutions are defined as rules and procedures that are created, communicated, and enforced through channels widely accepted as official. By contrast, informal institutions are socially shared rules, usually unwritten, that are created, communicated, and enforced outside officially sanctioned channels (Helmke and Levitsky, 2004).

2.3 Theoretical Framework

Institutional theories have been intensively applied in the field of natural resource management. A number of schools of thought within which the theories are framed exist. For example, there are schools of thought developing from neoclassical institutionalism to old and then contemporary classical institutionalism. Neoclassical institutionalism is based on individualistic perspective while classical institutionalism is based on social constructivist perspective. Vatn (2005) asserts that the new institutional economics and the positions subsumed under it (example property rights and transaction costs schools) are strongly inspired by the neoclassical model and are based on the idea that institutions are external constraints; the "rules of the game". For contemporary classical institutionalism, on which this paper is based, institutions are not just seen as constraints; they also influence values and preferences an individual holds and what is considered right to do in certain situations (Vatn, 2011). The classical institutional perspective focuses on how formal and informal institutions, through their roles in defining the rights and responsibilities of actors, have an impact on natural resources management.

³According to Agrawal and Gibson (1999), community is seen as a spatial unit, as a social structure, and as a set of shared norms

The study uses the theory of human action, drawing on the social constructivist perspective, to understand how institutions influence human behaviour and offer meaning to various situations. The theory entails that human perceptions, preferences and motivations are socially influenced. It contrasts with the individualist perspective of the rational choice model that treats humans as autonomous, maximizing individual utility.

2.4 Methodology

2.4.1 Description of the research area

The study was conducted in the Uluguru Mountains, Morogoro Region (Fig. 2.1). The Uluguru Mountains are characterized by a mountainous and hilly terrain consisting of steep and deep valleys of slopes ranging between 10% and 100% (Kilasara and Rutatora, 1993). The landscape is a source of many streams, which join to form rivers. Among the big rivers to which the Uluguru Mountains contribute its tributaries is Ruvu River which is the major source of water to people living along the river within Morogoro and Coast Regions and the city of Dar es Salaam. Due to favourable climate, production of vegetables and fruits goes on all year round, suggesting the need for adoption of sustainable land management practices in order to sustain agricultural activities. However, studies (example Hymas, 2000; Paulo *et al.*, 2007) show that most communities in the landscape outside the forest reserve practise unsustainable agriculture.

2.4.2 Research design, sampling procedure and sample size

The study is primarily qualitative with quantitative approach adopted to achieve complementarity and for triangulation. Except for the in-depth interviews, which were conducted as repeatedly as deemed necessary, a cross-sectional design was adopted and hence data collected at a single point in time.

The sampling process was carried out through multistage sampling procedure. In this regard simple random sampling and purposive sampling methods were used. The geographical locations within the Uluguru Mountains were selected purposively, the criteria being distinct agro-ecological characteristics and land management practices. In this regard, stage one involved selection of two divisions namely Matombo which is on the eastern side of the Uluguru Mountains and Mgeta which is on the western side (Fig. 2.1). On the eastern side, agroforestry is commonly practised, with some farmers practising also contour strip cropping while on the western side terracing and ridging are the common practices (UMADEP, 2001). In order to include a diversity of institutions and practices, purposive sampling was employed during the second stage to select two wards from each division, one from fast growing trade centres and the other one from areas with limited interactions with people from outside the community.

Based on the same criterion, one village was purposively selected from each ward. Stage three involved selecting 45 farmers from each village using simple random sampling, making a sample size of 180 farmers for the whole study area. The 180 respondents sample is big enough, much bigger than the minimum recommended by Bailey (1994).

In order to understand the existing institutions and land management practices and hence explore the relationship between the two, purposive sampling was used to select committees and councils related to land management at village level. At least five institutional actors were selected from each institution using purposive sampling method to ensure inclusion of male and female members for semi-structured interviews. Representation of male and female respondents was important because the views of these categories on institutions' functioning are not necessarily the same.

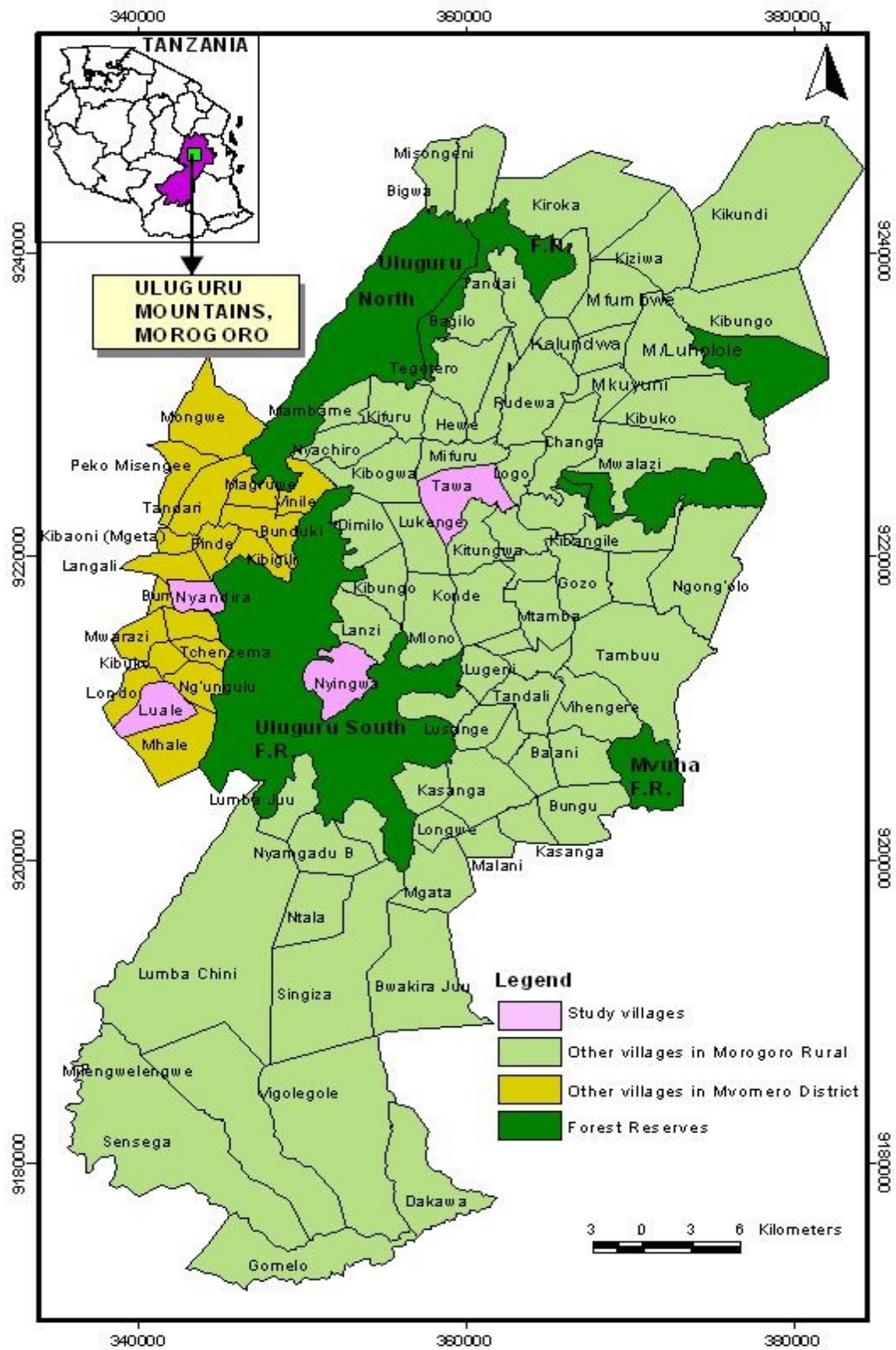


Figure 2.1: Map of Mvomero and Morogoro Districts showing the study area

2.4.3 Data collection

Primary data related to identification and description of institutions and land management practices were collected through PRA, FGD and key informant interviews conducted in each village. In this regard, seven FGDs were conducted, whereby each was composed of at least six participants, including leaders and ordinary members of committees, councils and farmers' groups. Four PRA teams were formed, each with 10-12 participants including committee members, farmers, village leaders and religious leaders, and 10 key informant interviews conducted. The key informants included traditional leaders (uncles), village leaders, government extension officers and elderly and youth farmers. Selection of the participants was based on their positions in the community and/or knowledge on institutions and land issues occurring in the area. In all the groups, the proportion of women participants was around 30%, this being a result of the deliberate efforts to ensure women participation, especially, where random selection would not guarantee their inclusion.

The household survey involved the use of a structured interview schedule to gather data on functionality of various institutions. The structured interview schedule and interview checklists were pre-tested in Londo village, which is located on the western Uluguru Mountains. Secondary data including village by-laws, policies and interventions related to land management in the Uluguru Mountains were collected from Uluguru Mountains Agricultural Development Project (UMADEP) and village offices during the field work and through internet search.

2.4.4 Data analysis

Qualitative data from key informant interviews, PRA and FGDs were analysed using content analysis, specifically the directed approach. As Hsieh and Shanon (2005) assert,

the goal of the directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory. In this regard, the many words of text transcribed from recorded information were compressed into fewer content categories resulting in synthesized meaning based on study objectives. Some data collected through PRA were analysed in the field with the help of the PRA teams. In this regard, the PRA teams drew Venn diagrams indicating the importance of existing institutions, and village resource maps depicting land, forest and water resources. Quantitative data were processed and analysed using the Statistical Package for Social Sciences (SPSS) version 20 and Microsoft Excel computer programmes. Specifically, frequency distributions were employed to quantify the responses given by the respondents on functionality of the institutions.

2.5 Results and Discussion

2.5.1 Identification of institutions for land management

Formal and informal grassroots institutions with direct links with land management in the Uluguru Mountains were identified through institutional analysis conducted with the help of the PRA teams, and the FGD participants. The formal institutions with direct link with land management in the Uluguru Mountains include village councils, village environmental management committees, village land tribunals, the primary education system, the extension system and the religious institutions. The relevant informal institutions are traditional land tenure system, knowledge transfer from elders to young generation, norms and beliefs, labour pooling arrangement (*ubava/ng'ui*⁴) and networks of farmers groups.

2.5.2 Functioning and importance of the institutions for land management

⁴*Ubavaor ng'ui*, as applied in western and eastern Uluguru Mountains respectively, is an institution, in Luguru vernacular, defining traditional labour pooling.

This section describes the formal and informal grassroots institutions for land management with a focus on their functioning and importance in land management. The importance of the institutions on land management was based on perceived influence of the institutions on soil erosion control, farmland fires control and conservation of water sources existing in farmlands. In this regard, through household survey, the institutions were ranked according to their importance, with percents of supporting responses in brackets, as follows: the primary education system (90.6%), norms and beliefs (82.9%), knowledge transfer from elders to young generation (78.5%), labour pooling arrangement known in Luguru vernacular as *ubava* (66.9%), land tenure system (63.1%), village environmental management committees (59.3%), Christian/Moslem religions (54.6%), the extension system (51.8%) and network of farmers groups (34.9%) (Table 2.1). Norms and beliefs with relevance to land management in the study area include *umachinja* (a Luguru term for sucking blood from humans), *katsopata* (a term in Luguru which refers to a tendency to envy a person possessing something or making some good progress) and belief in supernatural powers.

Village councils and village land tribunals were mentioned and in some cases described as institutions that are important in land management. However, many (> 47%) of the respondents described them as unimportant or having no direct link with land management (Table 2.1). In the study area, village environmental management committees operate as the arm of the village councils in matters related to environmental management, making the village council seem less involved in this regard. It was also noted that networks of farmers groups were unknown to 54.4% of the respondents but was important in enhancing land management (Table 2.1).

Table 2.1: Perceptions of respondents on the importance of institutions in land management (n=175)

Institution	Level of importance						Unknown		Ranking by level of importance	
	Unimportant		Important		Very important				Important and Very important combined %	Rank
	n	%	n	%	n	%	n	%		
Formal institutions										
Village environmental committees	47	27.6	51	29.9	51	29.4	23	13.2	59.3	6
Village land tribunals	81	47.1	34	19.7	29	16.6	29	16.6		
Extension system	82	47.1	37	21.1	54	30.7	2	1.1	51.8	8
Primary education system	15	9.3	58	34.9	92	55.7	1	0.6	90.6	1
Village councils	63	49.6	27	20.9	36	27.9	2	1.6		
Christian/Moslem religions	74	44.7	49	29.7	41	24.9	1	0.6	54.6	7
Informal institutions										
Norms and beliefs	26	16.3	93	57.7	41	25.2	1	0.8	82.9	2
Network of farmers' groups	18	10.5	22	13.2	37	21.7	92	54.4	34.9	9
Land tenure system	58	34.3	59	34.7	48	28.4	4	2.6	63.1	5
Labour pooling (<i>Ubava/Ng'ui</i>)	56	32.9	61	35.9	53	31.0	1	0.6	66.9	4
Knowledge transfer from elders	37	21.4	72	41.5	64	37.0	0	0.0	78.5	3

2.5.2.1 Land tenure system

The land tenure system in the Uluguru Mountains is characterised by the traditional system accommodating new arrangements including individual land property. From the household survey, the majority (78.5%) of the plots were owned by individuals. In this regard, 43.8% of the plots were acquired through inheritance while 34.7% were acquired through purchase. The traditional land tenure system involved managing access, use and control of land in accordance with the Luguru traditions namely rituals, taboos and beliefs. Explaining the arrangement, one female key informant from Nyandira village said:

"Traditionally, the head of the clan is an authority over the clan land. He usually allocates land to his nieces".

The majority (63.1%) of the respondents considered the land tenure system to be important in land management (Table 2.1). Regarding the role of land tenure system in land management, the majority (over 69%) of the respondents indicated that the land tenure system, whereby individual land property predominated, was in favour of land management (Table 2.2). On the other hand, the traditional clan-based land tenure regime was associated with negative consequences on land management. On this, one respondent from Nyingwa village commented:

"Land acquisition through the clan does not guarantee a person any ownership. Therefore, I cannot conserve the land for other people. One bench terrace requires up to a week to make. Then is it not absurd to invest that much and then let it go to another person?"

Table 2.2: Farmers' opinions on importance of land tenure system in land management (n=173)

Land management attribute	Disagree		Undecided		Agree	
	n	%	n	%	n	%
Land tenure system enhances adoption of soil and water conservation measures	46	26.6	6	3.5	121	69.9
Land tenure system promotes conservation of farmland water sources	34	19.9	14	8.2	123	71.9
Land tenure system prohibits actions causing farmland fires	36	21.7	10	6.0	120	72.3

The current land tenure system is a result of a process of social construction of the traditional land tenure system in the face of forces of the market and influence of other institutions. People find the traditional land tenure as limiting their security to the land and hence strong orientation to individual land ownership. Arguably, the claims that the current land tenure practice enhances land management are based on its land security enhancing effect, since land security is an important factor for adoption of land management practices, especially those whose benefits are long-term.

2.5.2.2 Land renting

Land renting is an institutional practice common in the study area. It involves periodic payment in the form of cash or a proportion of the harvest made by a tenant to the landowner in return for use of the land. Both short and long-term rents are practised in the area as evidenced in 2.4% and 2.7% of the plots respectively through the household survey. FGD findings indicated that land renting is considered short-term when the tenant is allowed to work the land for one to two cropping seasons while long-term rents involve working the land for not less than one year.

Traditional land tenure system in the Uluguru Mountains promoted land renting in that it resulted in some people having plenty of land with others remaining landless depending on the clan the person originated from. This means the landless had to rely on renting from those with large land holdings. In an FGD in Luale village, the participants ranked their clans by size of land holding in descending order as *Wanyagatwa*, which was the first clan to arrive in Luale and acquired a huge chunk of land, followed by *Walelengwe*, *Wezima* and lastly *Wakalagale*.

Land renting arrangement improves access to land. However, the practice is associated with land degradation because the tenant, not being the owner of the land, is not guaranteed of the benefits accruing from investment in land management practices, especially the long term ones. Therefore, they will mainly concentrate on practices that offer immediate returns even if they degrade the land. Commenting on relationship between land renting and degradation, an informant from Luale village said:

"If at all a person applies a conservation measure on rented land, they would implement annual ridges but not standard terrace".

Thus, though it is an important institution as an opportunity for the landless to access land and as a source of income to land owners, land renting promotes land degradation.

In the study area there are also some cases of land borrowing, an institutional practice which involves use of land on contractual basis but without the land user having to pay the land owner. The arrangement is based on personal ties existing between the land user and the land owner for individually owned land and a set of rules governing land access and use for corporate land. The FGD participants identified the primary and secondary schools and the Roman Catholic church as the institutions involved in lending land to farmers and projects or NGOs in the study area. Contrary to renting which constrains land management, land borrowing enhances land management because it usually involves pre-determination of land management practices as desired by the owner. For example, Nyingwa Primary school requires that whoever works the land manages the available trees as well. Also, the land user feels obliged to the owner based on their personal ties and would therefore endeavour to comply with conventions because the existing relationship is based on trust and not payment as in renting.

Land renting and borrowing cases presented here demonstrate that actions taken by humans on farmland are socially constructed. With renting, actions are motivated by payment attached to the arrangement while for borrowing actions are motivated by a sense of reciprocity and trust.

2.5.2.3 Labour pooling

In the Uluguru Mountains labour pooling, referred to as *ubava* in the Luguru vernacular, has been practised on various occasions with the aim to facilitate timely completion of an activity. *Ubava* as practised in the study area involves helping each other in activities like

land preparation, crop haulage from farm to a market place and house construction. It involves cooperation among community members to implement a certain, usually labour demanding, activity.

This form of social capital⁵ as an institution has evolved over time and hence its impact on land management is also changing with time. In the past, a person seeking assistance would prepare local brew, food or both and invite people mentioning in advance the activity in question. Then people would come from all over the village and in some cases from neighbouring villages too. In this regard, participation in *ubava* is driven by social morality. Participants in *ubava* implement the activity in question as per the socially held ways of doing it. It is likely that activities implemented under this arrangement result in similar outcomes.

Currently, existing *ubava* practice is more inclined to reciprocity in the sense that people attend to one's problems if one also attends to theirs. The traditional practice which involves calling the public for assistance is still operating. However, overall, popularity of the arrangement has declined. There has emerged another form of *ubava* which is practised by organized groups. In this regard, group members work for each other on a rotational basis. Comparing *ubava* practised in the past with today's practice, one key informant from Nyingwa village said:

"With the current practice, one does not necessarily need to prepare local brew not even food. What matters is the fact that I work for you, you also will work for me. Also the number of participants in ubava is smaller nowadays. The other difference is

⁵According to Pretty and Ward (2001), social capital comprises social relations and trust that have been developed through networks to facilitate coordination and cooperation (collective action) for mutual benefits.

that in the past there was no schedule indicating when ubava would take place. But at present there are schedules that are agreed upon by the members".

Labour pooling has been instrumental in enhancing adoption of land management practices such as various types of terraces. Through *ubava*, people pool labour and other resources, learn from one another, exchange views and motivate one another. In the past *ubava* was instrumental in getting the work done but had little contribution to land management because people would mainly implement in one's field the institutionalized practices like *sesa* (a Swahili term for flat cultivation or non-use of any conservation measure), annual ridges and slash and burn. At present when good land management practices have been promoted, and when people have a felt need for the same, *ubava* contributes more positively in land management. Commenting on the importance of *ubava*, one informant from Luale village said:

"Ubava is very important in land management. For example, through ubava, Wangahamwe group, which is involved in horticultural crops production, has managed to have all the group members' plots terraced".

From the household survey, labour pooling was considered to be important in land management by the majority (66.9%) of the respondents, making it rank the fourth in terms of importance in land management (Table 2.1).

The transformation of the form of *ubava* that prevailed in the area in the past has been due to factors like the market economy which puts a price tag on every item, making people more conscious of time and money earned or spent on any undertaking. As such, an informant from Luale said:

"Nowadays people are cost conscious; they compare ubava with use of hired labour and many think it is more expensive preparing local brew to be taken during ubava than paying for hired labour".

NGOs and government organizations, through facilitating formation of farmers' groups, have also contributed to the transformation of the original *ubava* practice leading to "modern *ubava*". In the study area there exist a number of farmers' groups whose formation has been influenced by external interventions. Their importance in land management stems mainly from the fact that they provide an opportunity for labour and skills sharing in land management activities and that they are governed by conventions which pressure members to implement group decisions and rules. This is illustrated by a comment by an informant from Wangahamwe group in Luale village who said:

"Group members have agreed to conserve their land. We excavate terraces collectively, harvest and sell the crop products collectively".

The discussion above indicates an inclination to formalization of *ubava*, for example, by the current popularity of farmers' groups which imitate *ubava*, but in a more structured way. This implies that, in the study area, social construction of human motivations is being highly influenced by the forces of the market economy including the cash economy. Van Donge (1992) asserts that money is a pervasive aspect of social life and individualism is a strong force. However, even with the formalization process, people still act in a reciprocal fashion which is based on the spirit of assisting each other.

2.5.2.4 Informal norms and beliefs

In the Uluguru Mountains, informal norms include traditional ceremonies of which traditional dances appeared to have influence on land management. As for beliefs,

umachinja (a Luguru term for sucking blood from humans), *katsopata* (a term in Luguru which refers to a tendency to envy a person possessing something or making some good progress) and beliefs in supernatural powers were found to have influence on land management.

Traditional dances

Traditional dances performed by the Uluguru Mountains' communities are usually connected with events like girls' initiation and other traditional ceremonies, religious ceremonies, political and public events like environmental day and farmers' day. For example, at Nyandira village, there is a traditional dance group which performs a dance known in Luguru as *mbeta* (a Luguru term which literally means "wait for me"). In an FGD in Luale village, it was reported that when dancing people used to say "wait for me so that I can dance" and hence the name *mbeta*. *Mbeta* has been performed at various events and carries various messages including environmental management and others usually formulated to feature the event in question.

Traditional dances which are embedded in the Luguru culture are very instrumental when it comes to convening and mobilizing members of the community and hence an important awareness creation tool. When used to put across messages related to land management, traditional dances work well as they make it possible for the message to reach large sections and diverse groups of the community within a short time. Similar findings were reported by Mowo *et al.* (2011) who observed that environmental management committees of the village governments in Lushoto make use of institutions like traditional dance groups in creating awareness on management of natural resources including water sources, forests and soil conservation.

Belief in supernatural powers

Belief in supernatural powers such as gods, spirits and ancestors was considered to enhance, and in some cases constrain, land management actions. Talking on the role of supernatural powers in land management, an informant from Luale village said:

"If I am known to have supernatural powers, no one will set fire to my land because even if I do not see him physically, he knows that by doing so he will suffer the consequences".

This is similar to an observation by Msuya (2010) that Chagga people believed that the spirits (*warumu*) punished those who destroyed water sources. Those who subscribed to an opinion that supernatural powers constrained land management associated their claims with magical transfer of yields known in Luguru vernacular as *bukula*. It is a belief that a farmer may plant crops which may grow very well but yet obtain very poor yields, while another farmer who invested very little on the same crop harvests a lot at the expense of the one who invested heavily. Crop yield improvement being a key motive for investment in land management, fear of loss of crops through *bukula* becomes a factor constraining investment in land management.

Katsopata

Katsopata is a term in Luguru vernacular which refers to a tendency to envy a person possessing something or making some good progress. In the Uluguru Mountains *katsopata* is entrenched in the social life. It is associated with hindering progress in land management in that *katsopata* involves a tendency of people, who have land management skills, refraining from passing on the knowledge to others or a tendency of people discouraging those who are involved in implementation of land management practices. On this account, an informant from Luale village claimed that:

"A person can set fire on one's plot for no other reason than being envious of good progress in crop production registered by the owner of the plot".

Katsopata has also been associated with many of the land disputes occurring in the Uluguru Mountains, and this constrains land management since a farmer would hardly invest in land management practices on land which is under dispute. Van Donge (1993) asserted that envy is an important causal factor of the wasteful and unnecessary court cases in Mgeta primary court.

Blood sucking

Defining blood sucking, known in Luguru vernacular as *umachinja*, an informant from Nyingwa village said: *Umachinja means "sucking blood from humans"*. In the same vein, a traditional leader from Tawa village said: *Umachinja means "murdering someone"*.

The belief has persisted in the Uluguru Mountains since the colonial era. It is a belief that there are people, especially foreigners to the area, who suck blood from people. Therefore, whenever there is a dead body found on the road side or in the bush without knowledge as to how the death occurred, people tend to believe that the death resulted from blood sucking.

Though there is no evidence of blood sucking in the area, the belief has endured, and there are a number of events that have been used to perpetuate it. A traditional leader from Tawa village explains the way it started:

"In the 1940s a dead body was found lying on white men's cemetery. The man was from Kibogwa village and just before his death he was seen carrying bananas in a bamboo crate. When he was examined, the doctor said he was suffering from lack of

blood. Then people questioned, how can it be possible for a person with no blood to carry such a heavy luggage from Kibogwa village to Tawa village? And here started the belief".

The informant said also that:

"During the same period a wife and a husband from Kasanga were walking together. When passing at a place called Banteyage, a white man by the name of Bignet murdered the man and later on the woman. Passersby saw the dead bodies and reported to the head of the village (Mndewa). When they inspected the area they saw traces of blood, and people said so blood suckers exist".

The informant's position with regard to the belief is implicit in his comment that: *"Bignet was a very bad person"*, and he seems to be holding the belief to date.

Local people who have been cooperating with outsiders such as NGO staff have also been associated with blood sucking. It is held by some people that meetings organized by these NGOs are meant to train local people on blood sucking. Therefore, instead of learning from those who participate in training on land management, people shy away from them as suspects of blood sucking. One farmer who used to serve as para-professional in Nyingwa village is one of the blood sucking suspects. Explaining the incident which occurred to him he said:

"Recently, I was ambushed by eight people from my village where one of them started by saying is it not you who have been involved with CARE programmes; we have heard a lot about you. Then two of them, one being my neighbour, started beating me. I reported the case at the police station and, when asked, they explained that my colleague and I sucked blood from a villager resulting in his death. They said further

that we started by giving him porridge so that his blood warmed up making it easier to suck, then we sucked blood from him to death".

In a similar occasion, as revealed through key informant interview, Uluguru Mountains Agricultural Development Project (UMADEP), which was running a farmers training centre and has been involved in promoting land management in the area for a long time, has on several occasions been suspected of involvement in blood sucking. On this, UMADEP field officer said:

In 2003 UMADEP staff in Tawa was ambushed by a villager who explained at the police station that he fought him in an attempt to defend himself against blood sucking which he understood the project was involved in. In 2014 a youth from Tawa village visited me and explained to have come to apply for a job in blood sucking. He claimed to have heard from people that UMADEP was involved in trainings on blood sucking.

Belief in blood sucking appeared to be held more strongly on the eastern Uluguru Mountains compared to the western side, in villages where people have more idle time than where people are fully engaged in agricultural activities and in villages with relatively more cases of deaths with no clearly known causes. Commenting on this aspect, one woman from Tawa village said:

"In Tawa village there is more of this belief compared to other villages around because people in Tawa do gossip a lot".

On the same note, a traditional leader from Tawa village said:

“Here at Tawa were witnessed a lot of dead bodies. For example last year, a number of people died abruptly, and if the situation continues like this, people will never stop believing in the presence of blood suckers in the area”.

Explaining on impact of blood sucking on land management, an informant from Tawa village said:

“Development partners coming to support land management in the area may decide to quit because people are harassing them. For example, in 1909 when terraces were introduced in the Uluguru Mountains, my uncle who was working with white men in promoting the practice was killed, and this resulted in termination of the project”.

In the same vein, an informant from Tawa village said:

“Often you see the same people turning up for seminars; you try to call new people for training, but they hardly come and if they do, they come hesitantly”.

Therefore, the widely held belief of blood sucking is impeding people’s engagement in land management programmes because it lowers participation in training; it hinders adoption of land management practices; and it creates unfriendly environment for development partners interested in promoting land management in the Uluguru Mountains.

The material presented here concerning informal norms and beliefs shed light on influence of informal institutions on human behaviour and hence actions. *Katsopata*, beliefs in supernatural powers and *umachinja* are social constructions in the sense that they are built up from perceptions and actions of social actors. They have become institutionalized and are influencing people's behaviour. The community members' shared interpretation of

social behaviour in turn makes the beliefs linger on. The beliefs and behaviours have persisted despite prevalence of forces such as Christianity and the primary education system which are working against them. While there are strong forces working against the beliefs and behaviour presented here, there are equally strong social forces perpetuating them. Van Donge (1993) asserted that socio-economic life in Mgeta is better understood as socially constructed by local actors rather than as shaped by outside forces. The discussion shows further that people's actions, for example the way they work the land, are informed by the shared interpretation of social behaviour. Shepsle and Bonchek (1997) claim that, each institution has a structural effect on human activities.

2.5.2.5 Primary education system

Primary education is intended to equip children with literacy, numeracy and basic life skills and values to enable them function productively in the socio-economic setting of Tanzania (URT, 2001b). The primary education system as an institution instilling morals to pupils, who are actually the future generation, is important in determining their future preferences and actions. Through primary education it is possible to instil environmental stewardship among children, to inculcate alternative land management practices where existing ones are suboptimal and to discourage undesirable beliefs. Explaining the role of primary education system in land management, the Head teacher for Nyingwa Primary School in Nyingwa village said:

"As you saw us working on the school farm, pupils were firstly taught in classroom as part of their life skills subject and then allowed to practise under teachers' supervision. The practices covered include tree planting and heaping grasses and straws from previous seasons across the slope so as to counter soil erosion. Conventionally, such grasses would be burnt but we have completely banned burning in the farmland".

With regard to undesirable beliefs, the Head teacher explained the following blood sucking incident:

"In 2006 two white men who were on research came to the school. Since I had a plan to glue some papers on the wall, I left the guests in staff room and moved to the Head teacher's office where I collected glue which was in a red container. Astonishingly, I saw standard one to three pupils running away from the school after they had seen me. One woman came anxiously to know what had transpired. When asked, one pupil said they were running saying there are blood suckers in the staffroom. Then that woman said I guess those white men are the blood suckers in question. In about 20 minutes a man came with a bush knife saying I will chop your heads if you do not explain as to where my other child is because one managed to make it home after seeing the Head teacher holding some blood in a container heading to the room where the white men were seated sucking blood. His son, who was in the crowd, heard him and identified himself. Then they brought the glue container for the man to see that it was not associated with blood in any way".

The remarks by the passerby and the parent show that the belief in prevalence of blood sucking is very strong. It is therefore more likely that the children who, for most of their time, had lived with their parents would have been raised to believe that blood sucking existed in the village. The fact that the pupils who ran away were the younger ones, standard one to three, indicates a possibility that socialization that takes place as a result of primary education system was yet to change their original mindset as they had less than three years in school. This discussion demonstrates how pupils' behaviour is institutionally influenced. It also demonstrates the tension between formal institutions, in this case the primary education system, and informal norms and beliefs.

From the household survey, the majority (90.6%) of the respondents were of the opinion that primary education system has been playing an important role in enhancing land management (Table 2.1). The reasons provided in this regard include the following: in primary schools, pupils are encouraged and involved in establishing tree nurseries and planting trees that conserve water sources and the soil; environmental conservation events are organized and are instrumental in community sensitization; teachers and other professionals train pupils who practise both at school and at home, providing avenue for the wider community to see and learn from the land management practices implemented by pupils.

Therefore, the primary education system provides a good opportunity to groom future environmental stewards. Through primary education, children are prompted to examine conventional land use practices, and norms and beliefs related to land use and come up with practices and behaviour that enhance land management.

2.5.2.6 Village environmental management committees

Responsibilities of village committees on the environment as stipulated in the National Environmental Policy (URT, 1997) include promoting environmental awareness and generation, assembly and dissemination of information on the environment relating to the village.

Based on FGD, the village environmental management committees existing in the Uluguru Mountains were formed between 2006 and 2010 and have been formed in collaborative efforts between the Uluguru Nature Reserve office, Tanzania Forest Services formerly known as the Uluguru Catchment Office, the Wildlife Conservation Society of Tanzania (WCST), Tanzania Forest Conservation Group (TFCG) and CARE. The

committees are responsible for controlling indiscriminate fires, protecting forest reserve against illegal activities, and sensitizing the community on conservation of land and water sources. Execution of the committees' functions ought to be guided by village by-laws on environmental management. However, in practice, operations of the committees are based on convenience, with by-laws that are hardly practical being amended or ignored. For example, Nyingwa village chairperson elaborated that:

"In spite of the government prohibiting farming within 60 metres from water sources, in our village we have adopted 10 metres because given the nature of our farms adoption of 60 metres will mean literally no farmland".

Awareness creation is done through elaborating environmental by-laws to people in gatherings such as the village assembly, or individuals including those who are caught performing illegal practices in the forest. The committees' operation procedures involve, among others, reporting non-compliance cases to the village councils for action. In execution of their functions, the committees face some challenges including scanty avenues for meeting with community members. Functioning of the committees was also found to be hampered by the weaknesses the committees were experiencing. These include poor enforcement of environmental management by-laws and corruption exercised by village councils when handling non-compliance cases reported by the committees. Commenting on Nyandira village environmental management committee performance, the secretary to the committee said:

"The problem is that the village council does not have environmental management agenda during village assembly or it is so lowly prioritized that it is hardly addressed before the meeting time is over. Also often we report culprits at the village council, but there is no sanction imposed on them".

Providing his experience on by-laws enforcement, one informant from Tawa village commented:

"Almost every year fire is set to my farm and no one has ever been prosecuted on this ground".

Cases of corruption among members of environmental management committees were also evident in the study area. As explained by one informant from Nyingwa village, some committee members, when on patrol and somebody is caught responsible for farmland fires, they accept bribes in exchange for not reporting the culprit. In this regard, the informant said:

"The village environmental management committee eagerly awaits a person to set fire so that they can go and collect a bribe".

Community views over the importance of environmental management committees on land management were largely positive. Some cases of negative opinions were also evident. From the household survey, 59.3% of the respondents considered village environmental management committees as important in land management while 27.6% said it was not important. About thirteen per cent was not aware of the institution (Table 2.1). Out of 20 respondents who provided reasons for considering the institution not important, 10 (50%) mentioned poor enforcement, 6 (30%) corruption and 4 (20%) other reasons. One of the respondents from Nyandira village who considered the committees to be important in land management justified his position by saying:

"The village environmental management committee is formed and operates in accordance with the law. Once sanction is imposed on a person it serves as a lesson to the rest of the community members".

From the findings, the importance of the village environmental management committees is associated with the institutions being backed by the law; that is having an authoritative legitimacy and hence legally binding. According to Scott (2001), the authoritative legitimacy of regulative institutions derives from conformity to the legal requirements. Cases of indiscriminate fires and land use-related conflicts are usually reported to the village councils either by the affected individuals or by village environmental management committees for action. Though seemingly lacking moral legitimacy⁶, the village councils are an authority in this regard. They are gradually replacing the customary land disputes handling institutions. Mbeyale (2009) asserts that the decline of authority and influence of local elders and ritual leaders have resulted into a shift of power from the community to government bureaucrats. The powers bestowed upon the village councils do not reflect acceptance by the people but legality. In the study area the village councils were highly associated with lack of personal integrity of the office holders, corruption and poor enforcement. Alluding to this, an informant from Luale village said:

"Nowadays when you have broken the law, say you have set fire on someone's land, you just take with you a chicken under your armpit and hand it to the Village Executive Officer and that is it, no sanction".

Non-compliance with by-laws related to land management in the Uluguru Mountains can be explained as resistance to external forces that work against the shared code of conduct in the community. Adoption of farming within 10 metres from water sources contrary to 60 metres required by the law is based on the quest to preserve the behaviour of farming adjacent to water sources. Resistance is also demonstrated in burning in farmlands, which is an institutionalized practice in the area but restricted by the law. Burning is done by

⁶Moral legitimacy derives from adherence to social norms, and as Scott (2001) asserts, it stresses a deeper morality that is based on both external and internal ideas.

people during land preparation in an attempt to eradicate bushy vegetation, or when chasing rodents for consumption, or out of *katsopata* when wishing to block someone's progress.

Corruption as an institution is being perpetuated by community members who are against the formal laws and hence would wish to maintain their practices. Therefore, the process of social construction of reality in the Uluguru Mountains has created institutions to sustain shared behaviour in the face of counteracting formal institutions. As a result, formal institutions like village environmental management committees, which have been formed to regulate unwarranted behaviours are working but with difficulties. Van Donge (1993) asserts that social life can create situations which simply do not fit a legal normative system.

2.5.2.7 Knowledge transfer from elders to young generation

In the Uluguru Mountains knowledge transfer from elders to the young generation is one of the major ways through which people acquire know-how on farming and management of the land. This is supported by the household survey findings which showed that 77.9% of the respondents had acquired skills and knowledge on soil and water conservation practices implemented in their farms through learning from their elders (Table 2.3). The findings show further that land management knowledge related to ridging⁷ was acquired by 48.7% of the respondents, and that the greatest proportion (42.2%) of the respondents acquired this knowledge through the elders. This can be explained by ridging being the conventional way of farming and hence already an institutionalized practice. Katani (2010) observed that knowledge and practices of integrated natural resources management

⁷ Ridging in this regard involves establishment of earth embankments across the slope, done when digging the land. Crops are planted on the soil heaps. Ridging is not a sufficient measure against soil erosion (Leeuw, 2009).

were embedded in local norms, rules, taboos and cultural beliefs, which are transferred from one generation to another through oral history. From the household survey, knowledge transfer from elders to young generation was considered by the majority (78.5%) of the respondents as important in land management, ranking third (Table 2.1).

Table 2.3: Distribution of respondents by source of land management knowledge (n=154)

Land management practice	Source of knowledge									
	Elder		Fellow farmer		NGO/Government organization		Other		Total	
	n	%	n	%	n	%	n	%	n	%
Bench terraces	11	7.1	3	1.9	3	1.9	0	0.0	17	11.0
Annual ridges	65	42.2	7	4.5	2	1.3	1	0.6	75	48.7
<i>Fanyajuu</i> terraces	0	0.0	0	0.0	2	1.3	0	0.0	2	1.3
Contour strip cropping	0	0.0	0	0.0	4	2.6	0	0.0	4	2.6
Agroforestry	18	11.7	1	0.6	3	1.9	1	0.6	23	14.9
Grass strips/trash lines	26	16.9	4	2.6	2	1.3	1	0.6	33	21.4
Total	120	77.9	15	9.7	16	10.4	3	1.9	154	100

Upland rice production is another example of practices perpetuated through elders-young generation knowledge transfer. From the FGDs, upland rice production was mentioned to be an important activity for women on the eastern Uluguru Mountains. The FGDs and direct observation indicate that the practice involves land clearance, accomplished through slashing of the vegetation usually coupled with burning and ploughing to ensure total eradication of the vegetation so that the land remains "clean". Usually no soil conservation measure is applied and the land is left bare for a long time, making it prone to soil erosion and other forms of land degradation. Given the social value attached to it, the practice has continued to be implemented by the Luguru women for years despite its land degradation effect. In the area, particularly on the eastern Uluguru Mountains, a woman gains respect when she harvests own produced rice.

Certainly, much of the knowledge of land management in the study area has been acquired through transmission from elders to young generation. This is a social construction process in that the young generation derives the logic of their actions on land based on routine activities implemented and talked about in the area by their elders. Whether the knowledge transferred is technically appropriate or not is a different question. For example, ridging is widespread in the area and this is largely due to it being a traditional practice. However, given the current situation where people have shifted from subsistence farming to production for the market and hence the need for practices like irrigation and continuous cultivation of the same land, ridging does not seem to be appropriate. One key informant from Luale village said:

"People have been adopting annual ridges which are not effective in soil erosion control".

Terraces are a necessary practice in this regard but are hardly (as indicated by only 9.7% of the respondents) being transferred through elders-young generation channel, probably because they are yet to be institutionalized. While not contradicting the assertion by Kauzeni and Madulu (2001) that village communities and their local knowledge are very effective in solving local problems in resource use and management among themselves, this study acknowledges the importance of external knowledge in addition to local knowledge, especially where newly emerging challenges can hardly be solved with existing knowledge.

2.5.2.8 Networks of farmers groups

In the study area there are a number of farmers groups. These are basically groupings of persons united voluntarily to pursue a common social, economic and cultural interest.

With the influence and support of projects and NGOs namely UMADEP, MVIWATA⁸ and CARE International in Tanzania, the farmers groups have formed networks. A farmers'groups network is not an apex of farmers groups (Gilla and Nombo, 1994); it is a means of horizontal communication and collaboration that provides an avenue for information and experience exchange among farmers and between farmers and change agents. The network acts as the groups' advisor and guardian (Lassalle *et al.*, 2003).

The importance of farmers'groups networks in land management stems from the fact that they bring together diverse groups including those with interest in land management and others, and change agents, thus providing an opportunity for cross learning. Also the governing rules of the networks are socially binding in the sense that they regulate members' compliance with an agreed upon course of action, which usually takes into consideration environmental soundness.

Procedurally, in addition to making a presentation on group performance during the month in question, in any one meeting, group representatives are required to describe how the groups worked on advice provided during the previous meeting. Members find it prestigious to report success stories and find it a disappointment when they are blamed for failure to register any good progress. The institution derives its legitimacy from being managed by farmers themselves with change agents playing only an advisory role, centred on issues of interest to the community, and the fact that the rules governing the networking process are set by members themselves. The institution is, therefore, instrumental in influencing members' behaviour and hence actions because individuals are prompted to subscribe to a commonly agreed course of action, which basically is seen as

⁸MVIWATA is a Swahili acronym for "Network of Farmers' Groups in Tanzania"

normatively appropriate. According to Lassalle *et al.* (2003), the farmers of the Mgeta community are able to take decisions and action, and communicate amongst themselves through regular group meetings within their area. Commenting on the importance of farmers' groups network in land management, a member of Wangahamwe farmers group in Luale village said:

"The network exposes us to opportunities such as meeting with various officials. It has motivated us to improve agriculture, and others have learned from us".

On the same note, one respondent from Tawa village said:

"Many have changed their way of looking at things through the network. However, the network reaches few people".

2.5.2.9 Religious institutions

The Christian and Moslem religions are involved primarily in preaching the word of God as per the Holy Bible and the Quran respectively. They are also involved in promoting environmental management through enlightening people on expected behaviours. One relevant Bible quote in this regard is Numbers 35:34 which says: "Defile not therefore the land which ye shall inhabit, wherein I dwell". In the study area the Christian denominations include Roman Catholic, Lutheran, Assemblies of God, Apostolic Church, Baptist and Seventh Day Adventists. Islam is present in the eastern side of the Uluguru Mountains.

Though in the opinion of many (54.6%) of the respondents religious institutions are important in land management, there was disagreement on the opinion by 44.7% of the respondents who considered the Christian and Moslem religions not playing any role in

enhancing land management (Table 2.1). They claimed that the religions weakened some rituals which were important in land management. For example a respondent from Nyandira village said:

"The Christian religion has killed our traditions. For example, it is preached that no one can make or stop the rain but God alone. It sees rituals as believing in other gods".

On the same note, respondent from Tawa village said:

"There were good things done by our elders, but have been undermined by religions. For example, there were sacred areas where entry was restricted and hence well managed".

Defending his opinion that religious institutions are important in land management, one informant from Luale village said:

"Announcements related to irrigation canal rehabilitation and other developmental issues are made in the church and hence reaching many people at once".

On the same note, an informant from Nyandira village said:

"When the missionaries came, one of the main activities they implemented was tree planting. As a result, many people were sensitized and engaged in tree planting".

Arguably, when followers go to church and see conserved land on church premises, or when they hear about land management in the church, it is likely for them to consider it a good practice and adopt it because they link it with the preaching on expected behaviour and actions.

Religious institutions in the Uluguru Mountains have persisted over time and have created some shared expectations about others' behaviour and hence played a major role in influencing people's behaviour. For example, one of the hadiths of Prophet Mohammed goes: "Whoever plants trees, God will give him reward to the extent of their fruit" (Musnad, v, 415). This suggests that followers of Islam are taught to believe that involvement in tree planting is a morally appropriate behaviour.

Similar to the observation by some institutional scholars, for example Msuya (2010) and Katani (2010), it is clear in this study that Christian and Moslem religions have weakened people's beliefs and taboos related to natural resource management. Though the study provides evidence of both enhancing and constraining roles of the religious institutions in land management, overall, the enhancing role is more evident and hence affirmable that religious institutions play an enhancing role in land management. This is because some of the traditional beliefs that the religious institutions are blamed to have weakened, such as the belief in blood sucking, have not been in favour of land management.

2.5.2.10 Extension system

Extension system in Tanzania involves agricultural extension service delivery by the public sector through extension officers, non-governmental organizations (NGOs) and farmers' organizations. The extension system entails a set of regulations including deploying approaches and methods that will involve regular visits to contact farmers and groups, regular training of extension staff, frequent interaction with researchers and use of other methods and approaches appropriate to the target community or commodity (URT, 1997). The extension system is crucial in land management because it governs the introduction and dissemination of new agricultural knowledge and practices in the villages.

Traditionally, people in the Uluguru Mountains had been practising shifting cultivation, a practice which involved slash and burn as land preparation method. In Nyingwa village, FGD participants were in consensus that vegetation clearance and burning are traditional land preparation practices in the area. According to Temple (1972), the first conservation measure was introduced in the area in 1909 by the German colonial administration. Literature (Temple, 1972; Malisa, 2009) shows that since 1909 to date, land management practices introduced in the Uluguru Mountains include tree planting, bench terraces, contour strip cropping, *fanya juu* terraces, live grass barriers, ridging, trash lines, storm draining, agroforestry and enforcement of regulations against burning. The introduction of these practices has been guided by the extension system.

During the period 1909 - 1950s the extension system of the colonial administration prevailed. The system involved forcing community members to adopt land management practices. Talking about land management efforts during the colonial times, one informant from Luale village said:

"A person who did not comply with technical recommendations was subjected to caning. For example, anyone who was involved in causing indiscriminate fires was caned by the use of a special cane called nomondo".

The extension approach of the time resulted in failure of many land management interventions. According to Rutatora *et al.* (1996), people in the Uluguru Mountains have been subjected to coercive measures and top-down manipulative approaches which required them to adopt a given conservation measure.

After independence the extension system defined by the Government of Tanzania prevailed. This is characterized by provision of extension services by public and private

sectors. Rutatora and Mattee (2001) assert that several NGOs and farmer-led initiatives have, over time, supplemented extension service delivery of the public extension services. At present, delivery of extension services in the study area follows various approaches namely trials and demonstrations, participatory rural appraisal, farmer field schools, farmers groups, training, farm visits and farmer to farmer exchange visits. UMADEP is one of the organizations which have been promoting many of these extension approaches. The approach of UMADEP and of some other organizations involves working with government extension officers. Hence, the operating extension system in the area has combined elements of approaches originating both from the public and the existing NGOs and projects.

From the household survey, new agricultural knowledge, for example knowledge related to two newly introduced land management practices namely *fanya juu* terraces and contour strip cropping, was reported to have been acquired solely through NGOs and government organizations (Table 2.3). Commending the contribution of the extension system in land management, one informant from Tawa village said:

"We have a group of people living with HIV/AIDS in Tawa village, and we have adopted conservation agriculture, thanks to regular on-farm visits and advice by the extension officer".

Therefore, the extension system, as also acknowledged by 51.8% of the respondents (Table 2.1), is important in enhancing land management.

Compared to the other institutions, extension system was ranked relatively low (the eighth out of nine) in terms of importance in land management. In this regard, 47.1% of the respondents described the extension system as unimportant in land management.

Expressing his disapproval of the extension system, one respondent from Tawa village said:

"Sometimes the services provided by extension officers do not help the farmer to reach his objectives. For example, the technical recommendations on contour strip cropping have resulted in pineapples bearing very small fruits to the extent that I resorted to uprooting all pineapples and replant in my own way. Many people thought the extension officers were using us to conduct their experiments".

On another occasion, one informant from Nyandira village said:

"Some extension staff advise us to burn weeds and crop residues right on the land so as to kill pathogens while others argue that burning would kill soil organisms that are important for decomposition and others that are needed for biological control of soil pathogens".

Another informant from Nyingwa village said:

"Some people came here and asked us to plant tree species called Cedrella odorata. Later on came others and told us to get rid of that specie because it is an invasive species which suppresses other species and it has water drying effect".

Knowledge and preferences of extension staff are influenced by the institutional environment surrounding them. An extension staff with strong orientation in environmental sustainability would campaign against burning of weeds and crop residues. Similarly, for the Nyingwa case above, an extension staff with orientation in biodiversity conservation would discourage planting high water-consuming and/or invasive tree species. Arguably, effective extension system would regulate the introduction and dissemination of new knowledge in an area by influencing any player, be it public or

private, to operate in line with the rules it sets forth. This would minimize contradictions of this kind. Therefore, though the extension system, through the regulatory role it plays, has proven instrumental in the introduction and dissemination of new agricultural knowledge, the study provides evidence of prevalence of poor coordination among extension staff.

2.6 Conclusions and Recommendations

The formal and informal grassroots institutions with importance in land management include those which play an enhancing role namely the primary education system, knowledge transfer from elders to young generation, labour pooling, village environmental management committees, traditional dances, the extension system and network of farmers groups. Institutions playing constraining roles are blood sucking belief (*umachinja*), land renting arrangements, and *katsopatawhile* institutions playing both enhancing and constraining roles are land tenure system, belief in supernatural powers and religious institutions.

Except for the primary education system, the other formal institutions namely village environmental management committees, village councils and extension system were ranked lower compared to informal institutions in terms of importance in enhancing land management. This is due to some formal institutions namely village councils and village by-laws lacking moral legitimacy. Village councils were also associated with lack of personal integrity of office holders and corruption. Poor enforcement of environmental management by-laws was also evident. However, due to being legally binding, the formal institutions are important, especially in the face of declining popularity of informal sanctioning arrangements.

The importance of formal and informal institutions in land management is particularly seen in their role in defining the logic of action. The study affirms that institutions influence perceptions, preferences, motivations and action. It therefore contrasts with the rational choice thinking which sees behaviour as only following an individualistic rational calculus independent of institutional setting. It is argued by this study that it is through social construction process that some actions have continued to be implemented on the land while others have been rendered irrelevant and hence rejected regardless of the amount of effort put into promoting the same.

Through designed and spontaneous change, some institutions have become more relevant for addressing land management challenges. For example land tenure system, which is experiencing gradual changes from being dominated by clan-based tenure to being dominated by individual land property, is more favourable to land management now than it was in the past because it offers land security to the owner, and hence a motivation for investment in land management. Likewise, labour pooling and traditional dances have changed in favour of land management.

The study recommends future land management interventions to consider the existing institutional landscape so as to increase chances of success in institutionalization of desired practices. Moreover, careful formation of new institutions, with thorough knowledge of existing institutions and practices, is advocated in order to avoid failure of the institutions in motivating land management behaviour.

In order to bridge the formal institutions' moral legitimacy gap, the study recommends that development efforts support village-level networking of farmers, elders, religious leaders,

government bureaucrats, politicians and NGOs with the aim to enhance communication and collaboration amongst them and as an avenue for enhancing accountability.

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CHAPTER THREE

3.0 Implications of Institutional Interplay on Land Management: A Case of Traditional Land Tenure and Formal Laws in the Uluguru Mountains, Tanzania.

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3.1 Abstract

Despite various interventions which have been implemented since colonial times geared at countering land degradation in the Uluguru Mountains, the problem has persisted. At the same time, it is generally acknowledged that land tenure regime is an important institution in shaping land management behaviour. Therefore, how institutional interplay influences land management was the question of interest for this paper. The paper examines formal land laws and the traditional land tenure system to demonstrate the implications of formal and informal institutional interplay on land management in the Uluguru Mountains. Data

were collected through participatory rural appraisal, focus group discussions, structured and semi-structured interviews and document review. Content analysis and descriptive statistical analysis were used to analyse the qualitative and quantitative data respectively. The predominant form of land tenure regime in the Uluguru Mountains is individual land property. This is different from the pre-colonial, colonial and the immediate post-independence eras where clan-based land tenure was predominant. The outcome of interplay between formal land laws and the traditional land tenure system has been characterised by inter-institutional conflict, with inter-institutional synergy becoming evident only during the market economy era. During this era, forces working for individual land property are seen to be stronger than those working for the clan-based tenure, indicating prospects for enhanced land management because individual ownership improves land security which motivates investment in land. However, for farmland water sources, there is a need for an institution to regulate their use. It is argued that the implications of land tenure regimes on land management is not adequately explained by the property rights theory since the theory rejects rationalities for actions other than that of maximizing individual utility, which is contrary to the findings of this study. Formulation of laws and policies related to land use and management should be thoroughly informed by existing institutions and practices. For the Uluguru Mountains, focus should be on promoting conservation of farmland water sources and control of soil erosion and farmland fires while respecting individual land property regime. Interventions targeting an institutionalized practice ought to be long-term and consistent.

Key words: *land tenure regime, traditional land tenure system, formal land laws, institutional interplay, land management, Uluguru Mountains*

3.2 Introduction

Agriculture is the predominant activity in the Uluguru Mountains and in rural Tanzania in general. It provides about 66.9% of employment in Tanzania (URT, 2016). In the Uluguru Mountains, crop production is implemented on steep slopes, a practice which has been associated with soil erosion and other forms of land degradation. Chamshama *et al.* (2009) observed that among other root causes of the threats the Uluguru forest reserve faces are extensive and inefficient land use practices. In the same vein, Paulo *et al.* (2007) claimed that most communities in the landscape and outside the Uluguru forest reserve practise unsustainable agriculture. Due to its proneness to soil erosion, the Uluguru Mountains landscape is likely to continue experiencing land degradation unless appropriate land management practices are adopted.

Explaining land degradation in Tanzania, Dondeyne *et al.* (2003) identified lack of secure land rights. Similarly, Katani (2010) mentioned lack of some form of private land ownership as an important factor in that land declared as public property is more liable to degradation. Other studies have attributed land degradation to the failure of existing institutions for natural resource management to govern land management. For example, Mahonge (2010) linked land degradation, in the North Pare Mountains, with poor enforcement of conservation by-laws. On the same note, Chamshama *et al.* (2009) reported that, in the Uluguru Mountains, there is lack of a wide stakeholder participation in the process of formulating by-laws, particularly at community level. One possible explanation is that there is incongruence/incompatibility in the way formal and informal institutions operate or in the way they interact. The question, therefore, is whether or not this institutional failure is due to problems arising from the interplay between existing formal and informal institutions.

Literature points to a clear link between land security, which is largely determined by prevailing land tenure regime, and land management. For instance, Dondeyne *et al.* (2003) contend that secure access to land, particularly secure land rights, are of prime importance for sustainable land management. Land tenure regime, defined in this paper as a set of rules (formal and informal) that govern land access, use, ownership and control in a society, influences human motivation and action towards land management. Katani (2010) contends that land tenure regulates behaviour on land use and management. The land tenure regime prevailing in the Uluguru Mountains is a result of the interplay between traditional land tenure system which is an informal institution and formal land laws which represent formal institutions⁹. Individual institution's influence often depends not only on its features but also on its interactions with other institutions (Young *et al.*, 1999 cited in Oberthür and Gehring, 2006).

Impacts of land tenure regime on land management can be positive or negative. In the Uluguru Mountains, interventions by the colonial regime, such as the Uluguru Land Usage Scheme (ULUS), have been reported (Young and Fosbrooke, 1960 cited in Temple, 1972) as a failure, one of the reasons being that the interventions had threatened the traditional, social and cultural systems of the Luguru people particularly over the authority to allocate the land. During the post-independence period, van Donge (1993), besides claiming that land in the Uluguru Mountains is extremely fragmented, reported that the corporate forms of land tenure in Mgeta (western Uluguru Mountains) did not necessarily adapt harmoniously to social change.

⁹Formal institutions are defined as rules and procedures that are created, communicated, and enforced through channels widely accepted as official. By contrast, informal institutions are socially shared rules, usually unwritten, that are created, communicated, and enforced outside officially sanctioned channels (Helmke and Levitsky, 2004)

Exploration of the way formal land laws and traditional land tenure system interplay shapes land tenure regime and the ensuing implications for land management is important in the effort to generate options to enhance inter-institutional synergy and mitigate unnecessary inter-institutional conflict. The study, therefore, uses formal land laws and traditional land tenure system as cases to examine the implications of formal and informal institutional interplay on land management in the Uluguru Mountains. Specifically, this paper describes existing forms of land tenure regimes; examines the interactions between formal land laws and traditional land tenure system, and the influence the interactions have on one another, as well as the implications they have on land management.

The study adopts the definition of institutional interplay by Young (2002), as the intended or unintended relationships among institutions either vertically – cross-scale (across different levels of organization) or horizontally – cross-issue (across the same level of social organization). It is also inspired by Helmke and Levitsky's (2004) categorization of the interplay between formal and informal institutions, namely complementary, accommodating, substitutive and competing. Complementary interplay implies filling the gaps left either by formal or informal institutions whereas accommodative interplay occurs when dominant institutions, whether formal or informal, accommodate less dominant ones. Substitutive interplay reflects the situation whereby one type of institution (formal or informal) has replaced another institution, while competing (or conflictive) interplay occurs due to incompatibility between formal and informal institutions. The terms interplay, relationship and interaction are used interchangeably in this paper.

3.3 Theoretical and Conceptual Framework

3.3.1 Theoretical framework

Major contributing theories attempting to link institutions with land management can be conveniently grouped into two philosophical stances, namely those which are consistently based on the individualist perspective whose central concept, according to Vatn (2005), is that of rational choice as maximizing individual utility and those which are based on social construction which holds that people act on the basis of different kinds of rationalities in different contexts. Elaborating the concept of plural rationality, Vatn (personal communication, 2013) commented that an actor taking over different roles, for example, as a farmer and member of village council, is confronted with two distinct contexts supporting individual interests and community interests respectively.

One influential theory inspired by individualist perspective is the property rights theory. Sjaastad and Bromley (1997) summarize three propositions of the property rights theory, as regards problems related to tenure security and investment decisions in indigenous tenure regimes. These are: First, the lack of legal title to land reduces its value as collateral, thus increasing the price of capital and reducing the value of investments. Second, high transaction costs in establishing ownership will reduce the value of investments, or, conversely, any residual uncertainty about ownership will have the same effect since future returns may be lost. Third, the absence of a land market means that farmers cannot convert fixed land assets into other asset forms, thus reducing the value of investments to the farmer and preventing efficiency gains of trade. For the same reason, land becomes less attractive as collateral to the lender, again increasing the price of capital.

The property rights school rejects rationalities or reasons for action other than that of maximizing individual utility. Also, as Vatn (2005) points out, the property rights theory claims that, with zero transaction costs, all resource allocations can be made via individual bargains, and therefore no public policy is necessary, that is, there is no need for state intervention.

3.3.2 Conceptual framework

Institutions influence human motivation, preference and action. Different institutional structures may support different types of motivation. However, as asserted by Vatn and Vedeld (2012), it is the sum of institutions that influences human action and hence it is the relative position of the signals sent from various institutional structures – as perceived by actors – that shapes the final impacts. The paper is based on an understanding that the influence caused by individual institutions often depends not only on their features but also on their interactions with other institutions.

When an institution is introduced in a community, it influences the existing institutions. The outcome conforms to one of the four categories of institutional interplay namely: complementary, accommodating, substitutive and competing (or conflictive) interplay. The definition of these interplay categories as suggested by Helmke and Levitsky (2004) presupposes that informal institutions emerge in response to performance of existing formal institutions.

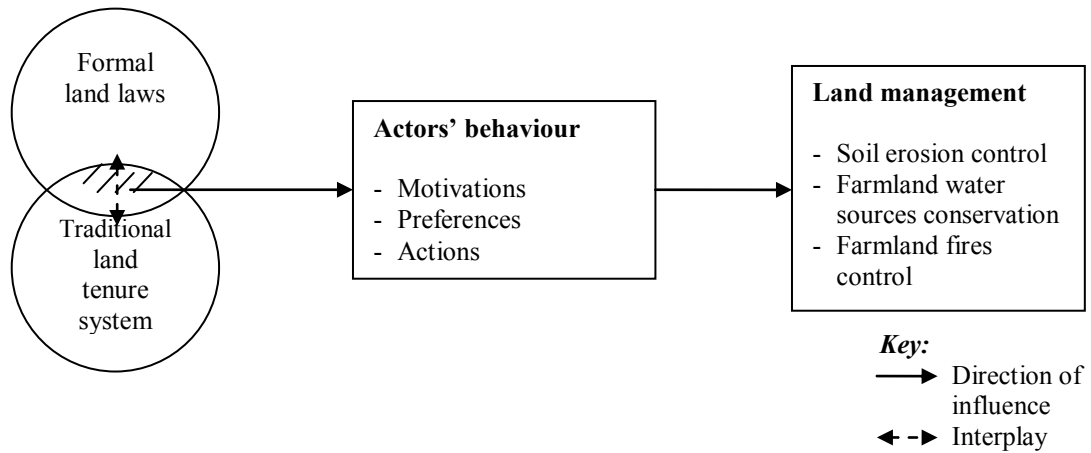


Figure 3.1: A conceptual framework for research on interplay of formal and informal institutions for land management

This study broadens the view to include cases where formal institutions' emergence is influenced by existing informal institutions. Therefore, the way the institutions interact has an influence on the ability of respective institutions to govern land management. This occurs through the influence the institutions exert on actors' behaviour and the subsequent action towards land management following the effect of interplay (Fig. 3.1).

3.4 Methodology

3.4.1 Description of the research area

The Uluguru Mountains landscape (Fig. 2.1) is characterized by a mountainous and hilly terrain consisting of steep and deep valleys of slopes ranging between 10 and 100% (Kilasara and Rutatora, 1993). The landscape is the source of many streams, which join to form rivers. Among the big rivers to which the Uluguru Mountains contribute its tributaries is Ruvu River which is the major source of water to people living along the river within Morogoro and Coast Regions and the city of Dar es Salaam. Due to favourable climate, production of vegetables and fruits goes on all year round, suggesting the need for adoption of appropriate land management practices in order to sustain

agricultural activities. However, studies (example Hymas, 2000; Paulo *et al.*, 2007) show that most communities in the landscape outside the forest reserve practise unsustainable agriculture.

3.4.2 Research design, sampling procedure and sample size

Considering that the interest of the study to understand, in Luguru people's social context, actions and meanings assigned to land management, a QUAL → quan design was used, which means that the approach adopted for this paper was primarily qualitative with quantitative approach included to achieve complementarity and for triangulation. While the interview schedule was administered at a single point in time, the in-depth interviews were repeated whenever there was a need for clarification and/or information validation.

The sampling process was carried out through multistage sampling procedure. The geographical locations within the Uluguru Mountains were selected purposively to represent distinct agro-ecological and socio-economic characteristics, land management practices and the changes occurring to the same over time. In this regard, stage one involved selection of two divisions namely Matombo which is on the eastern side of the Uluguru Mountains and Mgeta which is on the western side. In order to capture the influence of pressure from outside the community on land tenure, during the second stage, purposive sampling was used to select two wards from each division, one representing fast growing trade centres and the other one representing areas with limited interactions with people from outside the community. Based on the same criterion, one village was purposively selected from each ward. The villages are Nyandira and Tawa (fast growing trade centres) and Luale and Nyingwa (areas with limited interactions) (Fig. 2.1). Stage three involved selecting from each village 45 farmers using simple random sampling, making a sample size of 180 for the whole study area for interviews. The 180 respondents

sample is big enough, much bigger than the Bailey's (1994) minimum recommended sample size of 30 cases for a research in which statistical data analysis is to be done.

In order to understand the existing land management practices, their relationships with land tenure regime, and interactions occurring between formal and informal institutions, actors of councils and committees governing land management at village level were considered for semi-structured interviews. At least five institutional actors were selected from each institution using purposive sampling method to ensure inclusion of male and female members for semi-structured interviews. Representation of male and female members was important because the views of these categories are not necessarily the same. In addition to organizing focus group discussions for each institution, in each village at least two key informants who were knowledgeable of land tenure issues were also interviewed. These included matrilineal uncles, village leaders, and village and ward agricultural extension officers.

3.4.3 Data collection

Primary data on land tenure related institutional changes and land management practices adopted in different eras were collected through PRA, focus group discussions (FGDs) and key informant interviews which were conducted in each village. In this regard, four PRA teams were formed, each with 10-12 participants including committee members, ordinary farmers, village leaders and religious leaders; 10 key informant interviews and seven FGDs were conducted, whereby each was composed of at least six participants, including leaders and ordinary members of committees, councils and representatives of farmers' groups. The key informants included traditional leaders (uncles), village leaders, government extension officers and elderly and youth farmers. Selection of participants was based on their positions in the community and/or knowledge on land management,

land tenure and changes occurring on the same over time. In all the groups, the proportion of women participants was around 30%, this being a result of the deliberate efforts to ensure women participation, especially, where random selection would not guarantee their inclusion.

The household survey used a structured interview schedule to collect primary data on the forms of land tenure regimes and corresponding land management practices. Interview checklists and the structured interview schedule were pre-tested in Londo village, which is located on the western Uluguru Mountains. Secondary data including village by-laws, policies and interventions on land management in the Uluguru Mountains were collected from Uluguru Mountains Agricultural Development Project (UMADEP) and village offices during the field work and through internet search.

3.4.4 Data analysis

Qualitative data from key informant interviews, PRA and FGDs were analysed using content analysis, specifically the directed approach. As Hsieh and Shanon (2005) assert, the goal of the directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory. In this regard, the many words of text transcribed from recorded information were compressed into fewer content categories resulting in synthesized meaning based on study objectives. Some data collected through PRA, for example those on institutional relationships, were analysed with the aid of Venn diagrams. Quantitative data were processed and analysed using SPSS version 20 and Microsoft Excel computer programmes. In this regard, frequency distributions were employed to quantify responses on the form of land tenure regimes and land management practices applicable for each farm plot, and year of implementation.

3.5 Results and Discussion

3.5.1 Land tenure regimes in the Uluguru Mountains

Through the household survey, the study identified six forms of land tenure regimes in the Uluguru Mountains. Arranged from the most prevalent to the least prevalent, with percentages of respective plots in brackets, the land tenure regimes include: individual land property through inheritance from parents (43.8%), individual land property through purchase (34.7%), clan-based land tenure (14.1%), long-term rent (2.7%), family land property (2.4%) and short-term rent (2.4%) (Table 3.1).

Table 3.1: Number of respondents' farm plots by land tenure regime

Village	Land tenure regime											
	Individual property (bought)		Individual property (inherited from parents)		Clan		Family		Short-term rent		Long-term rent	
	n	%	n	%	n	%	n	%	n	%	n	%
Tawa	27	24.8	64	58.7	7	6.4	0	0.0	6	5.5	5	4.6
Nyingwa	52	43.3	17	14.2	34	28.3	9	7.5	5	4.2	3	2.5
Nyandira	82	50.0	54	32.9	23	14.0	1	0.6	0	0.0	4	2.4
Luale	29	18.7	105	67.7	13	8.4	3	1.9	2	1.3	3	1.9
Total	190	34.7	240	43.8	77	14.1	13	2.4	13	2.4	15	2.7

The findings provide evidence of the existing land tenure regimes being characterized by predominance of individual land property (bought and inherited from parents) as indicated by 78.5% of the plots. In addition to the six forms of land tenure regimes, the FGD participants mentioned two other forms of land tenure regimes. These are land ownership by organizations such as schools, religious organizations and village government, and land access and use through borrowing. The forms of land tenure regimes are described below.

3.5.1.1 Individual land property

Individual land property¹⁰ is the predominant form (78.5%) of land tenure regime in the Uluguru Mountains (Table 3.1). There are three ways by which land can be owned individually. These are: inheritance from parents, purchase and allocation by the village council. Involvement of village authorities in land allocation was evident only in Nyingwa and Tawa villages. It occurred in Nyingwa in the 1970s during the villagization programme and did not last beyond the mid-1980s (Section 3.5.2.4). Explaining the arrangement, one key informant from Nyingwa village said:

"I inherited this land, where I am living, from my parents who secured it from the village council in 1974 during the villagization programme".

Based on Tawa FGD, the arrangement involves the village land committee identifying landless youths in the village and negotiating with clan leaders for transfer of some of their land, which is then allocated to the youths. Such land becomes individual property.

3.5.1.2 Clan-based land tenure regime

Land access, use and control through the clan is the traditional land tenure arrangement in the Uluguru Mountains. Under this regime, lineages hold property rights over portions of the territories, and access, use and control of land is managed in accordance with the Luguru traditions namely rituals, taboos and other beliefs. According to the regime, land is acquired through matrilineal inheritance which involves passing on the land to female children by the head of the clan (uncle). In this regard, one key informant from Nyandira village said:

¹⁰ Individual property referred to here is not in absolute terms; it is actually land use rights since as the Land Policy (URT, 1995) states, all land in Tanzania is considered public land vested in the President as a trustee on behalf of all citizens

"Traditionally, the head of the clan is an authority over the clan land. He usually allocates land to his nieces".

The arrangement also allows the mother to transfer land to her son, and her grandchildren inheriting land from their father on the premise that the grandchildren will not pass on the land but when they stop working it, the land reverts to the clan where it belongs.

At present, the clan-based land tenure regime is rarely practised in the Uluguru Mountains. Only 14.1% of the plots were still in the custody of the clan during the time of the study (Table 3.1). Many (43.8%) of the plots which, a long time ago, were inherited through the clan have been passed on from parents to children and declared individual property.

3.5.1.3 Family land property

Family land property occurs in families whose parents did not allocate their land to any of the children, making it remain a joint property. Explaining the way family land property works, one key informant from Tawa village said:

"We operate land which was left to us by our mother. On this land, whoever plants a coconut should expect that it becomes a joint property. We will continue using the land jointly throughout".

In Luale village, the FGD participants indicated that, for family land, if the members decide to sell it, priority is given to family members and that selling the land outside the family is taken as an act of the last resort. However, cases of family land property are very few in the study area as evidenced by only 2.4% of the plots (Table 3.1).

3.5.1.4 Land renting

Land renting regime involves periodic payment in the form of cash or a proportion of the harvest made by a tenant to the landowner in return for use of the land. Both short-term and long-term rents are practiced in the study area, as indicated by 2.4% and 2.7% of the respondents respectively (Table 3.1). FGDs findings indicated that land renting is considered short-term when the tenant is allowed to work the land for one to two cropping seasons while long-term rents involve working the land for more than two seasons. Clan-based land tenure regime resulted in some people having plenty of land with others remaining landless depending on the clan a person originates from. This means the landless have to rely on renting from those with large land holdings. Thus, land renting offers an opportunity for the landless to access and use land. However, the practice is associated with land degradation because the tenant, not being the owner of the land, is not guaranteed of the benefits accruing from any investment he/she makes on land management practices, especially the long-term ones (Malisa, 2009).

3.5.1.5 Land ownership by organizations

Land ownership by organizations is a form of private property regime. In the Uluguru Mountains, organizations owning land include the Roman Catholic Church, primary and secondary schools and village governments. As explained by the FGD participants, access and use arrangements for such land include renting the land to individuals, projects and NGOs usually for agricultural and/or environmental management activities; using the land for agricultural projects by the respective organizations or reserving the land for woodlots or forestry.

3.5.1.6 Land borrowing

Land borrowing regime involves use of land on contractual basis, but without the land borrower having to pay anything to the land owner. The regime is based on personal ties existing between the borrower and the land owner for individually owned land and a set of rules governing land access and use for land belonging to an organisation. Land borrowing follows an arrangement that the owner allows individuals or organizations to use the land on agreement that the land borrower will follow the pre-determined land management practices, usually agreed by discussing with the land borrower.

The findings provide evidence of the land tenure system in the Uluguru Mountains being characterized by predominance of individual land property regime. This contrasts with the past (before the 1990s) when clan-based land tenure system dominated. While in the 1990s the majority (90%) of the plots in Mgeta were under clan ownership (van Donge, 1993), at present the proportion of plots under clan-based tenure regime in Mgeta (Nyandira and Luale villages) stands at 11.2% on average (Table 3.1). The shift from clan-based land tenure to individual land property is a result of the changing people's preferences as informed by the institutions in place.

Being social constructs, the forms of land tenure regimes are being continuously constructed with time. This means that, in the face of changing institutional landscape resulting from interplay of formal and informal institutions, the meaning, logic and hence preference that the Luguru people continue to assign to the various land tenure regimes is also changing. As a result, some land tenure regimes have been breaking down with others gaining popularity. Declining popularity of the traditional clan-based land tenure and increasing popularity of individual land property are cases in point. The breakdown of the traditional land tenure system is a result of prevalence of forces working against it, which

include the market economy forces. As indicated in subsequent discussion, the changes have an implication on land management because the various forms of land tenure regimes influence land management differently.

3.5.2 Interplay of Traditional Land Tenure System and Formal Land Laws and the Implications on Land Management

Land tenure regimes prevailing in the Uluguru Mountains ensue primarily from interplay of traditional land tenure system and formal land laws occurring over four main periods namely pre-colonial, colonial, post-independence and the liberalised market economy. Through key informant interviews, FGDs, household survey and review of secondary data, the study established the major changes related to land tenure occurring since pre-colonial era to date, which had an influence on land management in the Uluguru Mountains as presented in Table 3.2, and as discussed in subsequent sections. The study was keen to elucidate the consequences of the interactions between formal land laws and traditional land tenure system on individual institutions and on land management.

3.5.2.1 Pre-colonial era

Before colonial rule (before 1884), in the Uluguru Mountains the lineage head was the source of authority on land issues. Lineages held property rights over portions of the territories. Access, use and control of land were managed in accordance with the Luguru traditions namely rituals, taboos and other beliefs. To the Luguru people, land was an inalienable possession of the lineage and was acquired through matrilineal inheritance. In this regard, as van Donge (1993) asserted, land was held by a corporate entity namely the matrilineal clan. It was passed on to female children by the head of the clan (uncle).

Matrilineality is not only about inheritance of land; it also implies that kinship and decision making are defined through the female line. Accordingly, power of decision making is bestowed upon the uncles. The arrangement allows the mother to transfer land to her son, and her grandchildren inheriting land from their father on the premise that the grandchildren will not pass on the land but when they stop working it, the land is surrendered to the clan where it belongs. However, there are claims that where male children are considered for land acquisition, they are usually given marginal land, because after all this is considered as a favour.

"The practice is such that male children are given land on temporary basis, or are given unproductive land, usually on a steep slope". - A key informant from Luale village.

The Luguru people are also traditionally matrilocal (or uxorilocal) in the sense that upon marriage, the husband moves to live with his wife and his in-laws on land owned by the wife's clan. The institution strengthens women's position in the households while weakening that of men. Explaining this one key informant from Nyandira village said:

"In the past, power was with the mother's line. The father had barely any power because even if his child experienced a problem, the uncle to the child would be asked to address it leaving the father with no say or role to play".

Land inheritance through the female line is motivated by the fact that the arrangement ensures that the land remains in the custody of the clan in question since the clan is perpetuated through the female line. A Luguru couple giving birth to a baby girl would be very much praised by the clan members because it perpetuates the clan.

In principle, before the colonial period, land was not commoditized. However, there were few cases of land acquisition through barter system. Cases of sale of land also occurred but very rarely. Elaborating this arrangement, one key informant from Tawa village said:

"There are old people, who in the ancient times, acquired land and gave it to people in exchange for a goat, salt or garment, and in some cases money as it occurred when there was a problem, for example on the side of their nieces or when they needed a certain item. For example, there is a man here in the village who obtained a big chunk of land through barter system and has in the recent past been selling some portions of his land".

The land tenure regime adopted in the Uluguru Mountains during the pre-colonial era was not in favour of land management. Reasons for this are threefold. Firstly, the regime involves distribution of available farm plots among clan members leading to fragmentation, which exacerbates land degradation. Van Donge (1993) observed that, in Mgeta division people see fragmentation as a problem but they feel powerless in the face of the social forces causing this fragmentation. Secondly, the regime resulted in lack of land ownership security to male descendants discouraging efforts to conserve the land because they knew they would lose access to it anytime. Logically, one would hardly invest in land management practices for the land he/she does not have assurance of the conservation benefits, which are usually long-term. Thirdly, the land tenure regime was such that one owning land does not necessarily own trees planted on the land. Trees belong to the one who planted them while the land is clan's property. As a result, some clan leaders prohibited people from planting trees or perennial crops on the land as this was a potential cause of disputes when the land user was required to return the land. According to Lundgren (1978), in the Uluguru Mountains, a land user was not allowed to

plant trees without permission, as tree planting invalidates lineage control of land. On this, a key informant from Tawa village said:

"I operate a plot belonging to my wife's family and I have been prohibited to plant banana, orange trees, coconut or other trees like cedrella. Therefore, for the past 20 years that I have been working the land I have not planted any permanent crop, I am growing rice".

3.5.2.2 Colonial era

The colonial rule (1884-1961) introduced formal institutions for land management. One such institution was a law enacted by the German colonial administration in 1909, declaring an area of 277 km² as forest reserve in order to halt shifting cultivation into the Uluguru Mountains forest. Land Tenure Ordinance Cap 113 is another formal institution enacted by British colonial legislative assembly in 1923 to guide and regulate land use and ownership. The law stated that all the land in Tanganyika and the use rights are under the control of the British governor and that any use must be subject to the will and permission of the governor. The British administration also enacted the Native Authority Orders (1929-1951) which, among others, stated that except when breaking or preparing new land, burning of grass and bush in hilly land was forbidden at all times and was permitted on flat land only to destroy weeds. Also, during the same period the British colonial government formed a committee on rehabilitation of eroded areas, and implemented the Uluguru Land Usage Scheme (ULUS) from 1945 to 1955. The ULUS emphasized terracing; re-enforcement of regulations against burning of grass, weeds and trash in the hilly areas and stressed the planting of trees outside the forest limits for the provision of fuel wood and poles for construction purposes. It also emphasized the adoption of contour tie-ridging on a large scale in order to control soil erosion (Temple, 1972).

The formal laws enacted during the colonial period recognized the customary laws and thus there was a co-existence of formal laws and traditional land tenure system. As a result, land inheritance remained largely in the hands of the lineage heads with the formal laws focusing more on land management. From a technical point of view, the formal laws were necessary for enhancing land management. This connotes a complementary institutional interplay in that the formal laws attempted to introduce land management aspect which was seemingly missing in the traditional land tenure system. However, the introduction of new practices, like bench terraces and laws like prohibition of burning which essentially interrupted the traditional land use practices, including slash and burn, was not well received by the Luguru people. For example, Temple (1972) asserted that, except in the Mgeta area where the ladder terrace system largely obviated the burning of trash, the people complained bitterly over prohibition of fires. Therefore, the institutional relationship turned into a competing one resulting in inter-institutional conflict and the consequent weakening of individual institutions involved. According to Rosendal (2001), interaction will create conflict if the specific rules of the institutions involved are incompatible.

In terms of effect on land management, the colonial government efforts have been seen as a failure (Young and Fosbrooke, 1960 cited in Temple, 1972; Duff, 1961 cited in Rutatora *et al.*, 1996; Temple, 1972). For example, Duff (1961) cited in Rutatora *et al.* (1996) contended that the objectives of the ULUS were never realized and the scheme was abandoned in 1955. Reasons provided for the failure of the interventions of the colonial times, for example the ULUS, include the fact that the scheme had threatened the traditional social and cultural system of Luguru particularly over the authority to allocate the land (Young and Fosbrooke, 1960 cited in Temple, 1972); the interventions involved coercive measures and top-down manipulative approaches, requiring people to adopt a

given conservation measure (Rutatora *et al.*, 1996); the primary focus was on physical measures (Rutatora, 1993 cited in Rutatora *et al.*, 1996).

This study, therefore, postulates that the failure of the colonial government efforts was due to the fact that the interventions were introduced amidst informal institutions which were strongly embedded in the social and cultural setting of the Luguru people. The logic of action has been governed largely by the institutional framework that existed before the coming of the colonialists. A newly introduced practice is more likely to be accepted if it is compatible with existing practices or if demonstrably improves the existing situation without compromising embedded local interests. However, the traditional land tenure system being a social construct, the "interruptions" (Table 3.2), which were caused by the colonial interventions, gradually continued to influence the regime. That is, the traditional land tenure system in the Uluguru Mountains has little by little continued to accommodate some new elements brought by the formal laws, and as discussed in the following sections, this accommodating interplay process has had some long-term impacts on the land tenure regime and land management.

3.5.2.3 Immediate post-independence

After independence (1962 to early 1980s), the colonial land policies were maintained. However, the customary law that was recognized during the colonial time was abolished. It was maintained that all the land in Tanzania is public but vested in the President as a trustee on behalf of all the citizens. In this regard, the only change to the law was replacement of "governor" with "president". The major event that had an impact on land management was the villagization programme (operation *vijiji*¹¹) which was implemented

¹¹ *Vijiji* is a Swahili term for villages

in the early 1970s. During the villagization programme, land ownership by clan held under customary law was abolished and little attention paid to natural resource conservation, strong emphasis being on economic growth. Land was nationalized and people who were scattered in various places in the Uluguru Mountains relocated to a common place to form *ujamaa*¹² villages where collective farming was promoted.

The Village Land Act no. 5 (URT, 1999) provides that any allocation of land granted under operation *vijiji* programme (1970-1977), is considered a valid allocation of land, and that all prior rights to the land are extinguished. Providing his experience on the operation *vijiji*, one key informant from Nyingwa village said:

"In 1974 seventy paces were measured to make sure that one's house is surrounded by one acre. This plan was implemented by the government and did not consider existing land tenure regime which essentially entailed land inheritance by clan".

In 1982 village councils were established. They are responsible for administering and managing village land, and granting certificate of customary right of occupancy (Katani, 2010). The formal law which required land allocation to be done by the village council substituted the arrangement established under traditional land tenure system whereby land allocation was done by clan uncle, and hence substitutive interplay. Msuya (2010) contends that substitutive institutional interplay reflects the situation whereby one type of institution (formal or informal) has replaced another institution. The institutional interaction depicted here is associated with inter-institutional conflict in that the formal law and traditional land tenure system rule regarding land allocation were incompatible resulting in the former substituting the latter institution.

¹²*Ujamaa* is a Swahili term for socialism

Thus the immediate post-independence period saw undermining of the role of informal institutions on land management because it was the village council that was authorized to allocate land. As Mahonge (2010) assert, the top-down interactions between the government and the local people in natural resource management during the *ujamaa* era were unsuccessful in improving either economic growth or conservation of natural resources. On gender perspective, the villagization programme, through abolishment of the customary land ownership which basically was characterized by matrilineality, weakened the position of women in the villages. On this, one key informant from Nyingwa village said:

"Land allocation under the operation vijiji did not discriminate people along gender lines as the customary practice did".

The immediate post-independence period interventions had a remarkable impact on traditional land tenure system (clan-based land tenure regime) as they resulted in alteration of its core provision. In the short-run the institutional changes promoted under the villagization programme did not receive wide community acceptance because many felt obliged to protect their identity (clan-based land tenure). The reaction was also due to the fact that those who were favoured by the traditional land tenure regime saw the new interventions as putting their interests at stake because its fate was not known. More importantly, the interventions did not enhance land management because in addition to land management not being one of the interventions' priorities, people were in the dilemma of having to comply with the new law while they had strong sense of loyalty to their traditional land tenure regime. It was these uncertainties which deterred people from investing in land management.

Table 3.2: Major institutional changes related to land tenure since pre-colonial era to liberalised market economy era and their implications for land management

Time	Major institutional change	Implications for land management
Pre-colonial era (before 1884)	Traditional land tenure arrangements prevailed, with no formal national policies to control and coordinate land management. Land was distributed among clan members, along the female line	Land fragmentation. Male involvement in land management discouraged. Prohibition of tree planting by some clan leaders
Colonial era (1884-1961)	State-led management regimes started. Customary law was also continued, but with some interruptions to the clan-based land allocation	Implementation of new practices and laws, example, terracing and prohibition of burning of grass or bush on land, but with scepticism
1905	Missionaries constructed a church at Bumu village, Mgeta. The education they offered weakened traditional leaders' powers but also created environmental stewardship	
1923	Land Tenure Ordinance Cap 113 enacted by British to regulate land use and ownership. It stated that all the land in Tanganyika and the use rights were under the control of the British governor. The ordinance recognized the customary laws. However, customary land ownership was interrupted	
1929-1951	Native Authority Orders enacted: Consisted mainly of regulations against burning of grass or bush on land	
1945-1955	Uluguru Land Usage Scheme (ULUS): It emphasized terracing, tree planting and re-enforcement of regulations against burning of grass, weeds and trash in hilly areas	
Immediate post-independence era (1962 to early 1980s)	<ul style="list-style-type: none"> - Colonial land policies maintained: All the land in Tanzania is public but vested in the president as a trustee. - Village councils established: They manage village land and grant certificate of customary right of occupancy. - Authority of traditional leaders that was recognized under the colonial administration was eroded. 	Investment in land management interfered with on land ownership uncertainties. Little attention was paid to natural resource conservation. Thus, no significant changes seen on land management.
1963	Chieftainship abolished by TANU (Tanganyika African National Union), weakening clan-based land management	
1970-1977	Villagization programme. The policy interfered with clan-based land tenure in that land allocation was implemented by the village authority	
1970s onwards	Land allocation along the female line criticized for not allowing land entitlement to male children	
Market economy era (from 1980s)	Liberalised market economy policies adopted. The period saw institutional shift from clan-based and socialized land tenure arrangements to individual arrangements	Land management practices, example, terracing and contour strip cropping implemented more on plots under individual land property, which is the predominant land tenure regime in the current era
1995, 1999	Enactment of the National Land Policy of 1995 and the land acts of 1999. They recognize customary land ownership. The acts provide equal land rights to men and women.	
1990s onwards	Alternative land tenure forms, other than clan-based arrangements gained popularity	
2004 onwards	Amendments to Land Act no. 4 of 1999 and establishment of land bank to facilitate land marketing (sale of bare land, softening conditions for foreigners to invest on land)	

Source: Primary data, Temple (1972), URT (1999), Sheridan (2004), Myenzi (2005), Katani (2010), Mahonge (2010)

It is worth noting that though the immediate post-independence laws on land tenure were generally disliked by the Luguru people, to some, especially those who were not favoured by the clan-based land tenure regime, the new laws were welcome. Formal laws that started to be introduced since the colonial times have continued to influence the traditional land tenure system. Therefore, people's preferences, behaviour and action towards land management seen during the immediate post-independence era were a result of the land tenure regime that ensued from the interplay of traditional land tenure system and formal land laws. For example, it was during the immediate post-independence period when land allocation through matrilineal inheritance ideology started receiving criticisms from the Luguru people themselves for not allowing land entitlement to male descendants.

3.5.2.4 Liberalised market economy era

In the mid-1980s when Tanzania adopted liberalised market economy policies, the customary law that allowed land ownership by clan was reinstated. The Village Land Act no. 5 (URT, 1999) recognizes the validity of customary rights of occupancy without the need to issue and register a formal certificate. The liberalised market economy era is characterized by commercialization of smallholder farming whereby land and other factors of production are commoditized. The era is also characterized by traditional methods of allocation and inheritance of land giving way to new arrangements, wherein land is sold or leased to individual farmers even outside the clan (Mahonge, 2010). Despite recognition of customary land laws, as stipulated in the Land Acts of 1999, the liberalised market economy era saw emphasis on equal land rights between men and women. Moreover, selling of land was permitted by the law. In the Uluguru Mountains, the market-based policies have been fuelling the evolution of land tenure regime from the traditional clan-based to individual property regime, and this has impacted on access, use and management of land resources.

Despite the reinstatement of the customary rights of occupancy, people who secured land through the villagization programme resisted going back to clan-based land tenure regime. For example one respondent from Nyingwa village said:

"I inherited this land where I am living from my parents who secured it from the village government during the villagization programme. My uncle came to me a few days ago telling me to pay him if I wanted to continue using the land claiming that the land belonged to his uncle who died long ago and thus at present he is the owner. I refused and told him to report me to the village government if he thought I had charges to answer".

The prevailing land tenure regime represents a case of competing institutional interplay which, as Helmke and Levitsky (2004) assert, involves co-existence of informal and formal institutions. For example, the Village Land Act no. 5 of 1999 states: *"Any rule of customary law and any decision taken in respect of land held under customary tenure, whether in respect of land held individually or communally, shall have regard to the customs, traditions, and practices of the community concerned"*. This law restored the core feature of the traditional land tenure system, which was already put at stake during the immediate post-independence period. However, as Myenzi (2005) reports, in 2004 amendments were made to the Land Act no. 4 of 1999 authorizing sale of land. This formal law contradicts with the traditional land tenure system which prohibited commoditization of land. The relationship demonstrated in this account amounts to inter-institutional conflict, whereby the traditional land tenure system which proscribes land sales is weakened by the formal law prescribing selling of land.

Due to these competing institutional relationships, the land tenure regime seen in the Uluguru Mountains at present is characterized by a combination of rules from the

traditional land tenure system and the formal laws. For instance, while land is generally still inherited in the female line, exceptions are allowed. Commenting on the mixed land tenure regime, one key informant from Nyandira village said:

"Nowadays my property is the property of my children. But if I have a plot provided to me by my mother, it will go back to the clan".

During the liberalised market economy era, cases of complementary institutional interplay were also evident. Explaining one of the issues around traditional land tenure system, a key informant from Luale village said:

"Somebody from Wanyagatwa clan dispossessed my in-law of the land she was using claiming that she did not belong to the clan while, in fact, she was a member of Wanyagatwa clan. He was reported to the village chairperson and the case was resolved by the village land tribunal".

The act of reporting cases associated with the customary laws at village council for action indicates a complementary interplay. In this regard, the traditional land tenure system fails to sanction non-compliance cases, a discrepancy which is addressed by the village council through the village land tribunal. Similarly, Mahonge (2010) observed that, for land that is managed under the customary system, decision-making is mainly based on customary institutions, though formal land institutions enforce compliance with customary institutions when the need arises. This complementary relationship corresponds to inter-institutional synergy. It results in strengthening of involved institutions because the relationships involve filling gaps left by one of the institutions.

The liberalised market economy policies have also resulted in many areas in the Uluguru Mountains becoming cosmopolitan. Nyandira and Tawa villages are cases in point. In such

areas people, especially the younger generation, have succumbed to external pressures resulting in abandonment of some of their traditions. For instance, in addition to selling land, a male child may inherit land from his father, which the father inherited from his mother, and may pass it on to his descendants. Thus land is becoming individualized and acquiring an exchange value. Patrilineality is also penetrating the area. Explaining the mixed tradition scenario, one key informant from Nyandira village said:

"My mother-in-law was given a piece of land by her uncle then she gave it to my wife. Now, my wife and I are allocating the land to our sons and daughters, and they will continue owning the land even if they marry and relocate to their spouses".

Similar findings were reported by Dondeyne *et al.* (2003) who observed that in south-eastern Tanzania the matrilineal system is clearly changing: clan membership is still determined by matrilineal descent, but inheritance happens according to a bilineal pattern while marriages are now mostly patrilocal. Bilineality in this regard means that both matrilineal and patrilineal forms of kinship inform the inheritance procedure.

On gender and power relations, the liberalised market economy era saw weakening of the women's position in the Uluguru Mountains. From an FGD in Luale village, the participants proclaimed that in the village there now exists *mfumo dume* (male dominance) in the sense that even though traditionally it is the wife who owns the land, currently it is the husband who has the decision-making power. Liberalised market economy policies also weakened the power bestowed upon the uncles. Van Donge (1993) asserted that the breakdown of older social structures and the dispersal of males through migration have reduced the authority of the uncle.

The discussion above demonstrates multi-faceted institutional interactions whereby the formal land laws and traditional land tenure system have been influencing one another

since the colonial era through the liberalised market economy era. The ensuing outcome has been more of inter-institutional conflict. Inter-institutional synergy became evident during the liberalised market economy era when the traditional land tenure system failed to sanction non-compliance cases, necessitating involvement of the village councils. It is therefore argued that the human preferences, motivations and hence action seen today with regard to land management are a result of the influence of the land tenure regime which is an outcome of interplay of traditional land tenure system and the formal land laws over time. That is, as for human action, it is the sum of signals from the interplaying institutions that matters and not the effect of individual institutions when treated in isolation. That is why it is important to consider the existing institutional landscape when introducing any new institution in an area.

As for implications on land management, some literature associates the new land laws with negative implications on land management. For example, Myenzi (2005) asserts that the definition of general land¹³ provided by the Village Land Act no. 5 of 1999 implies that the village land which is not occupied or used by villagers will be earmarked as potential land for investment to be acquired and allocated to needy investors and land purchasers, jeopardizing security of tenure of the majority of small scale producers. Other interventions seen as threatening smallholders' rights to access, own and control land as noted by Myenzi (2005) include amendments to the Land Act no. 4 of 1999 and establishment of land bank which are aimed at facilitating land marketing and mortgaging, allowing sale of bare land and softening conditions for foreigners to acquire land.

¹³ According to the Village Land Act no. 5 of 1999, general land means all public land which is not reserved land or village land

The Village Land Act no. 5 of 1999 has also been criticized by Katani (2010) who claimed that the use of a minimum of five years to judge whether the land is unused may discourage people from leaving their land to undergo natural regeneration and hence leading to land degradation due to continuous use. While the current study does not contradict these findings, it contends that in the Uluguru Mountains land is very scarce leaving virtually no unoccupied or unused land nor does it provide room for fallowing and hence the mentioned laws' weaknesses are not felt in the area.

The land tenure regime, as it stands at present in the Uluguru Mountains where the interplay of formal land laws and traditional land tenure system has favoured preference to individual land property, plays an enhancing role on land management. The claim is based on the fact that individual land property enhances land security which is an important factor for adoption of land management practices, especially those whose benefits are long-term. Elaborating the role of land tenure system on land management, one key informant from Luale village said:

"Traditional land tenure system as it stood in the past was an obstacle to land management since men were not motivated to engage in long-term land management practices like bench terraces or tree planting because they knew they would sooner or later be dispossessed of the land. Now that an individual can have ownership of the land, it is more likely that they will invest in the land as it is their property".

A historical timeline (Table 3.3) indicates that most (85.6%) of the land management practises seen in the farm plots in the Uluguru Mountains were implemented during the liberalised market economy era. Considering the colonial, immediate post-independence and liberalised market economy eras, the data depict an increasing trend in terms of implementation of the selected land management practices. Most of the practices were

introduced during the colonial period and are long-term. However, over time, people have continued to negotiate between traditional practices and the newly introduced ones. The higher rate of adoption of land management practices during the liberalised market economy era is attributable to people's preferences as influenced by the existing institutional framework, of which land tenure regimes play a key role.

Table 3.3: Number of responses by period of implementation of land management practices

Land management practice	Implementation period					
	Colonial era (1890-1961)		Immediate post- independence era (1962-1985)		Liberalised market economy era (1986-2014)	
	n	%	n	%	n	%
Bench terraces	3	2.7	3	2.7	62	55.9
<i>Fanya juu</i> terraces	0	0.0	0	0.0	6	5.4
Contour strip cropping	0	0.0	0	0.0	5	4.5
Agroforestry	0	0.0	3	2.7	13	11.7
Grass strips/Trash lines	2	1.8	5	4.5	9	8.1
Total	5	4.5	11	9.9	95	85.6

The household survey findings provide evidence of the existing land tenure regimes being predominated by individual land property (Table 3.1), and hence motivating investment in land management (Fig.3.2). For instance, bench terracing which is a land management practice whose benefits are long-term was implemented more on individually owned plots than on clan owned plots.

Statistically, terraced plots were 20.1% of the bought (individual) plots compared with 14.5% of the plots under clan-based land tenure regime. The trend was the same for *fanya juu* terraces and contour strip cropping. In this regard, while for the bought plots *fanya juu* terraces and contour strip cropping accounted for 1.8% and 3% of the plots respectively, none of the clan owned plots had any of the two land management practices (Fig. 3.2).

Ridging, which is a traditional farming practice, was mostly implemented on inherited plots, that is, by 64% and 53.6% for plots inherited from parents and plots inherited from the clan respectively. High prevalence of annual ridges on inherited plots was expected.

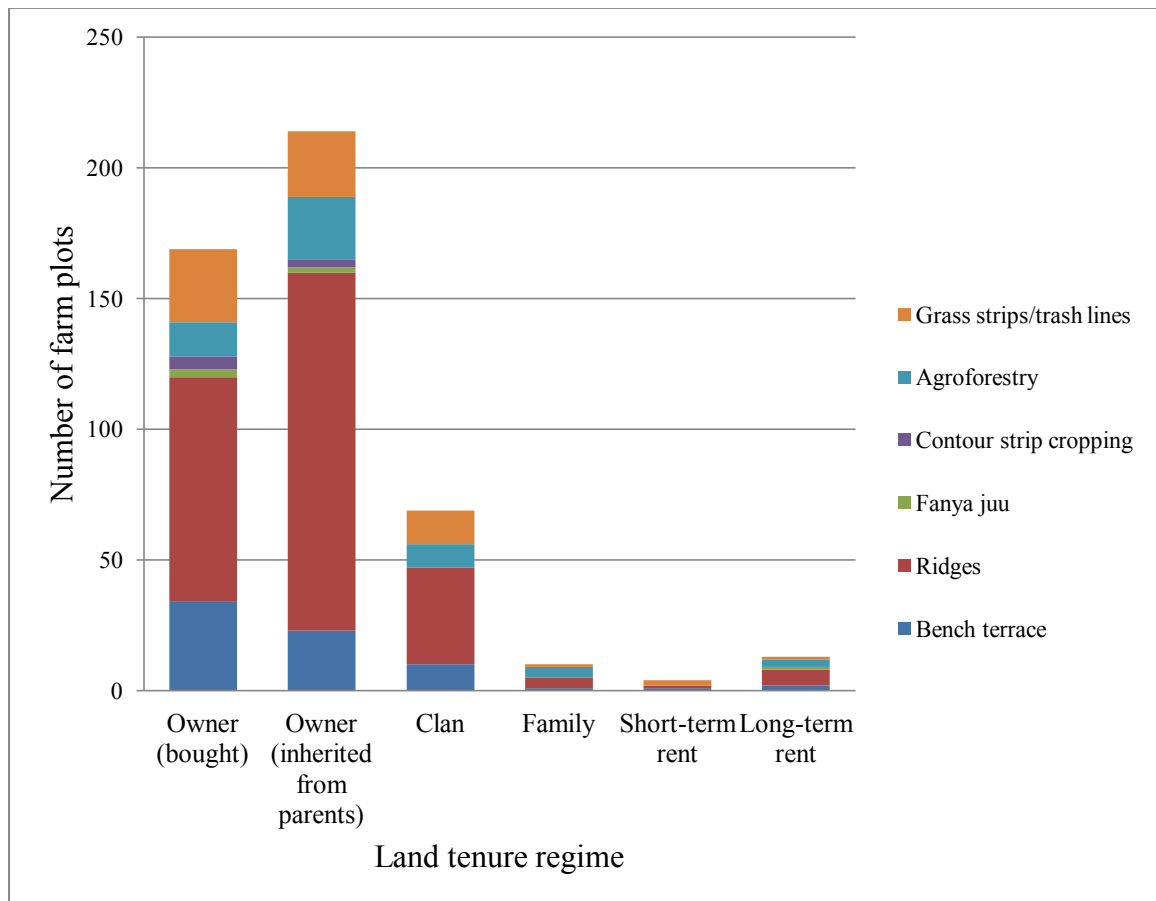


Figure 3.2: Distribution of farm plots in the study area by form of land tenure regime and land management practice (n=479)

Possible explanation is that the inheritance pattern occurring in the Uluguru Mountains perpetuates the institutionalized land management practices regardless of their technical appropriateness. This means that other traditional practices like farming around farmland water sources¹⁴, upland rice production, slash and burn, and *sesa* (a Swahili term for flat

¹⁴Farming around farmland water sources, in this case, involves crop production within 60 metres from a water source a practice which is both unlawful and technically inappropriate

cultivation or non-use of any conservation measure) are also likely to be perpetuated along with land inheritance.

Overall, the findings associate individual land property with enhanced land management. Nonetheless, the findings provide evidence of the regime being associated with promoting degradation of farmland water sources. Farming around farmland water sources is common in the Uluguru Mountains. It has been passed on from elders to the young generation and hence seen by the majority of the Luguru people as an acceptable practice. With the growing water scarcity in the area, people are increasingly becoming concerned with farmland water sources as an important source of water for domestic use as well as for irrigation. However, as implied in the comment below, people feel to be lacking control when it happens that a water source being degraded is located on individually owned land. A farmer from Luale village said:

"The farm plot you see here, currently with eucalyptus trees, was acquired from my grandmother by one of my relatives. She worked the land for sometimes and then sold it to the current owner who planted eucalyptus trees resulting in drying of the water source".

By-laws like prohibition of farming within 60 metres from water sources are hardly enforceable in the Uluguru Mountains because, as indicated in one of the FGDs, the nature of the land in the area is such that quite a number of farm plots would have to be forfeited if the by-law was to be adhered to. Others, for example prescriptions on tree planting around water sources, have been ill-communicated, resulting in confusion among the community members. For instance, in the 1980s eucalyptus and *Cedrella odorata* were promoted in the area. These tree species were proscribed in the 1990s when they were proven to be high-water consuming and invasive respectively. This calls for further

intervention on water sources management in the face of the individual land property regime.

3.6 Theoretical Reflections

The property rights theory accepts the rational choice as maximizing individual utility as one of its core theorems (Vatn, 2005) and claims that private property regime is the only efficient regime. The theory is based on a perspective that human action, for example on land, is guided by the zeal to earn highest individual utility as the only rationality. Moreover, as Sjaastad and Bromley (1997) assert, with the property rights theory, tenure security is seen as a prerequisite for investment and prudent land use. This paper assessed the validity of the above mentioned provisions based on the actual practices around land tenure regime and land management in the Uluguru Mountains.

Based on the study, land user's propensity to invest in land management is influenced by land tenure security and a socially determined logic inherent in investment in land management. That is, to the Luguru people, investment in land management practices such as control of soil erosion and farmland fires is seen as socially optimal as it sustains agricultural activities. To them, land tenure security is conceived of as likelihood to continue owning the land and enjoying the benefit streams resulting from one's investment in land management at present and in the long run. Thus, land tenure regime that ascertains land ownership to land user would encourage investment in land management.

People's enthusiasm about agricultural sustainability is motivated by social rationality – that is, doing what is appropriate or expected by a given community (the logic of appropriateness) while the desire for ownership of benefits accruing from investment in land is based on individual rationality (the logic of consequentialism). Therefore, in the

Uluguru Mountains, decision to invest in land management is triggered by plural rationalities. With the logic of consequentialism, decision making is based on cost-benefit calculations. According to the logic of appropriateness, human agencies follow rules, not because it is rationally the best strategy but because institutions define appropriate behaviour in a given community, irrespective of implied costs and benefits (Babili *et al.*, 2015).

As for institutional interactions, land tenure-related institutions have continued to be adopted, rejected or modified on the basis of the extent to which they foster sustained ownership of land and the streams of benefits accruing from the land. Thus, when an institution or intervention is introduced in the Uluguru Mountains, people judge it based on its influence on their imbedded interests in land, that is, the impact of the institution or intervention on chances of an individual and his/her lineage to continue owning the land and do farming on the land now and in the future. This means that, with an institutional landscape that guarantees land ownership to individual land users, interventions intended to sustain agricultural activities would most likely be adopted.

As for land management, people in the Uluguru Mountains are not free from undesirable practices. For example, there are number of cases involving expansion of crop production activities around farmland water sources. Though it supplies the owner of the land with food, the action deprives the rest of the community members of the possibility to benefit from the water resource since such activities do degrade water sources. Hence, the practice is technically undesirable. However, crop production around water sources is an institutionalized practice, being passed on through elders-young generation knowledge transfer, and hence seen by the majority of farmers as normatively acceptable.

Also there are some cases involving planting high water-consuming tree species around farmland water sources – the practice which is normatively unwarranted. However, the FGD findings indicate that tree planting around water sources was done following promotion of eucalyptus tree planting in the 1980s. Therefore, it was done out of ignorance as regards the resultant externalities. It is argued from this study that rather than being driven by individual utility maximization rationality *per se*, the actions are by and large triggered by the zeal to meet family needs, which is a social obligation for any household head in the study area. Thus, as Hall and Taylor (1996) assert, what is seen by an individual as rational action is itself socially constituted. A key informant in Luale village said:

"I have a plot which used to be wet and hence suitable for yam production, but now it is completely dry, and I cannot plant yams anymore. I attribute the problem to eucalyptus trees planted on a plot bordering that of mine".

On the one hand, the informant appears to put all the blames on his neighbour, but not considering his action of yam production around water sources as part of the problem. On the other hand, the informant appears to be powerless to stop the actions of his neighbour since he is operating an individually owned plot.

As the land tenure system tends towards individual land property, there is a general take that actions on the land by the land owner should not be interfered with. This is illustrated by the case above whereby the owner of the plot neighbouring the one planting eucalyptus trees felt powerless to intervene. This is threatening the sustainability of farmland water sources due to likelihood that in the face of dwindling water resource, the zeal to protect one's status (ability to meet the family needs) in the community triggers opportunistic behaviour of individual agents leading to overexploitation of farmland water sources. In one of the FGDs, the participants indicated that some farmers would clear trees and shrubs

surrounding water sources located on their farms so that they expand crop production area. Existence of such externalities, associated with opportunistic actions of individuals on the land, calls for some form of a third party intervention.

3.7 Conclusions and Recommendations

Since the colonial era to date, the Uluguru Mountains have been experiencing an institutional shift from clan-based and socialized land tenure regimes to individual regimes. The shift was felt more during the liberalised market economy era whereby commodification of land became a common phenomenon. At present the predominant form of land tenure regime in the area is individual land property.

The study brings to light multi-faceted institutional interactions demonstrated by interplay between formal land laws and the traditional land tenure system, with each type of institutions influencing the other from the colonial era to the current liberalised market economy era. The ensuing outcome has been more of inter-institutional conflict. It is argued from the findings that, compatibility of institutions is an important attribute for institutional strengthening. When compatible, the involved institutions are strengthened. However, this is true when the intended outcomes for involved institutions are convergent, that is, effectiveness means the same thing to them.

Since institutional interplay is associated with either synergy or conflict among involved institutions, it is important to consider existing institutional landscape when introducing any new institution in an area. While the mainstream literature emphasizes on enhancing inter-institutional synergy and mitigating inter-institutional conflict, the study demonstrates that interventions resulting in inter-institutional conflict, which weakens some of the involved institutions, are not necessarily undesirable. At times it becomes a necessary

undertaking, especially when deemed necessary to change existing institutional practice. For instance the bitterly protested laws, which proscribed farmland fires and those which prescribed terracing and gender equality in land allocation, caused inter-institutional conflicts but were necessary and are no longer seen as a taboo in the Uluguru Mountains.

As for the implications on land management, the clan-based land tenure regime which was predominant in the Uluguru Mountains during the pre-colonial and colonial eras was not in favour of land management. It involves distribution of available plots among clan members leading to land fragmentation which exacerbates land degradation; it is associated with lack of land security and discourages tree planting. The immediate post-independence era was a transition period during which people were in the dilemma of having to comply with the new land laws while they still had a strong sense of loyalty to their traditional land tenure system. The liberalised market economy era is seen to be dominated by individual land property regime. Due to its land security enhancing effect, individual land property is associated with enhancing adoption of soil and water conservation while deterring farmland fires.

However, in the face of growing water scarcity and declining productivity of the land, individual land property is likely to encourage farmland water source degradation actions. Expansion of crop production activities and planting of high water-consuming tree species around water sources located on individually owned plots, with people feeling powerless to intervene are cases in point. Thus, though tenure security motivates investment in land, it is not necessarily a prerequisite for prudent land use.

The study associates human preferences, motivations and hence action seen today with regard to land management in the Uluguru Mountains with the influence of the prevailing

land tenure regimes which are basically an outcome of interplay between traditional land tenure system and the formal land laws over time.

Overall, the findings of this paper demonstrate that, rather than being driven by the logic of utility maximization alone, people act on the basis of different kinds of rationalities in different contexts. Contradicting further with the property rights theory, the findings indicate that while tenure security motivates investment, it is not necessarily a prerequisite for prudent land use. Moreover, the property rights theory would reject the need for a third party intervention on grounds that resource allocations can simply be made via individual bargains. Land allocations in the study area are liable to externalities justifying third party intervention. Therefore, the property rights theory does not adequately explain the implications of land tenure regimes on land management in the Uluguru Mountains.

Formulation of laws and policies related to land use and management should not be generalized, and should as much as possible be informed by existing institutions and traditional land use and management practices. It is also recommended that interventions targeting an institutionalized practice have to be long-term and consistent. Haphazard changes in the intervention, as exemplified by abolition of customary land tenure during the immediate post-independence era and reinstatement of the same during the liberalised market economy era, creates dilemma, a sense of insecurity and free ride behaviours among the people.

For the Uluguru Mountains, the policy focus should be on promoting conservation of farmland water sources and control of soil erosion and farmland fires while respecting individual land property regime. NGOs and government organizations are urged to facilitate formation of an institution to regulate farmland water source management. The

institution would sanction unwarranted opportunistic behaviours over the resource. To be effective, the institution should be backed up by village by-laws and should have enforcers composed of representatives of village-level community members including male and female farmers, elders, traditional leaders and religious leaders, village council and civil society organizations.

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CHAPTER FOUR

4.0 Effectiveness of Grassroots Institutions in Governing Land Management in the Uluguru Mountains, Morogoro, Tanzania

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4.1 Abstract

Unsustainable land management practices such as farming on steep slopes without soil conservation measures have been reported in the Uluguru Mountains. Literature points to a clear association between land management and institutions, reveals a problem in terms of effectiveness of conservation by-laws and indicates lack of focus on informal institutions. This paper assessed the effectiveness of formal and informal grassroots institutions in governing land management. Data were collected through household survey, participatory rural appraisal, focus group discussions and key informant interviews. Institutional

effectiveness, indicated by behavioural change, was measured on a five-point Likert scale, and multinomial logistic regression was used to analyse the influence of nine independent variables on institutional effectiveness. Content analysis was used to analyse qualitative data. The results showed that institutions are effective in governing land management in the Uluguru Mountains. Formal institutions were seen to be legally binding. Informal institutions on the other hand, though they influenced land management behaviour, were associated with a declining trend in terms of credibility accorded to them by the Luguru people. Land ownership security, awareness of institutions and market access were significantly important conditions for institutional effectiveness and hence ought to be policy priorities. They provide knowledge on, and incentives for adherence to, rules, norms and conventions related to land management. The study also uncovered that ecological concerns motivated compliance to prescriptions on land management. Thus, actions on land management are not guided by individual rationality (the logic of costs and benefits) alone; they are also guided by the social rationality, that is, doing what is appropriate or expected by a given community. It is important to ensure community awareness on prescriptions and proscriptions related to land management. Also, while it is important to invest in formulation and/or amendment of formal rules for land management as deemed necessary, it is equally important to promote the good aspects of informal institutions.

Key words: *land management, Uluguru Mountains, effectiveness, behaviour, institutions, formal, informal*

4.2 Introduction

In Tanzania, particularly in mountainous areas, land degradation is a serious problem. For instance in Lushoto, Mowo *et al.* (2011) reported degradation, deforestation and land fragmentation as major problems while in the Uluguru Mountains van Donge (1993)

claimed that the land shortage and land degradation made it impossible for people to be self-sufficient in food. A number of cases of unsustainable land management practices have been reported in the Uluguru Mountains, notwithstanding the fact that the mountains are of global importance due to their richness in biodiversity and water resources. They include yearly occurrence of wild-land fires which result into loss of biodiversity, erosion of savings and household food insecurity (Mussa *et al.*, 2012), farming on steep slopes, usually above 55% gradient (Malisa, 2009), and cultivation up to the borders of the forest reserve and occasionally within the reserve (Hymas, 2000).

Various causes have been given to explain land degradation occurring in Tanzania. They include widespread poverty which is exacerbated by population growth (Chamshama *et al.*, 2009), inappropriate agricultural activities and encroachment of cultivation on fragile areas such as river tributaries, poor enforcement of conservation by-laws (Mahonge, 2010), and lack of some form of individual ownership as land considered as public property is liable to degradation (Katani, 2010). A study conducted in the Uluguru Mountains by Chamshama *et al.* (2009) indicated that groups and by-laws have an instrumental role in managing natural resources, and that there is lack of wide participation of stakeholders in the process of formulating by-laws, particularly at community level.

Suggesting a possible approach to ensuring land management, Dondeyne *et al.* (2003) contended that secure access to land, particularly secure land rights, are of prime importance for sustainable land management. The link between land rights and land management is well explained by Katani (2010) who asserts that land tenure regulates behaviour on land use and management. Along the same line, literature indicates that there is an association between land management and institutions, and that there is a problem with enforcement and hence effectiveness of conservation by-laws. It is also clear that

much focus has been placed on formal rules and that even when informal institutions are studied, the two (formal and informal institutions) were studied in isolation from one another. This called for the need to investigate informal institutions along with the formal institutions with respect to their effectiveness and the conditions influencing their effectiveness.

As Vatn and Vedeld (2012) posit, no regime¹⁵ operates independently of existing institutions. They assert also that it is the sum of institutions that influences human action. It is from this context this study sought to assess the effectiveness of formal and informal grassroots institutions in governing land management. The main questions were: first, has there been notable behavioural change among the community members as a result of the institutions, and secondly, what are the conditions for institutional effectiveness? The two questions warranted an empirical study to address them and ultimately contribute to the existing body of knowledge.

In the context of this study, the definition of institutions by Helmke and Levitsky (2004) is operational. That is, institutions are rules and procedures (both formal and informal) that structure social interaction by constraining and enabling actors' behaviour. Formal institutions are rules and procedures that are created, communicated, and enforced through channels widely accepted as official. By contrast, informal institutions are socially shared rules, usually unwritten, that are created, communicated and enforced outside of officially sanctioned channels.

¹⁵Regimes are institutional structures established to regulate resource use (Vatn, 2005)

4.3 Conceptual Framework

The conceptual framework for this study is adapted from a framework for studying environmental governance systems developed by Vatn (2011), which is used to support the identification of relevant variables to explore. The study is based on assumptions of the theory of human action. Specifically, it embraces the social constructivist position in attempting to understand how institutions influence human behaviour and offer meaning to various situations.

From a social constructivist perspective, the theory entails that institutions are not just seen as constraints; they are also seen to influence the individual - the values and preferences an individual holds and what is considered right to do in certain situations (Vatn, 2011). That is, institutions are a human creation and human being is a product of the same institutions (Vatn, 2005). According to the theory, people act on the basis of different kinds of rationalities in different contexts. It contrasts with the individualist position which sees institutions only as constraints within which the given individuals act and choose. According to Vatn (2011), those building on individualist position accept that institutions are formed by humans but do not see them as also forming people. The individualist perspective sees maximization of individual utility as the only rationality.

In the context of this study, institutional effectiveness is indicated by change in land management behaviour regulated by institutions. Land management entails soil erosion control, farmland fires control and farmland water sources conservation. Land management is influenced by formal and informal institutions through their influence on actors' behaviour (motivations, preferences and actions).

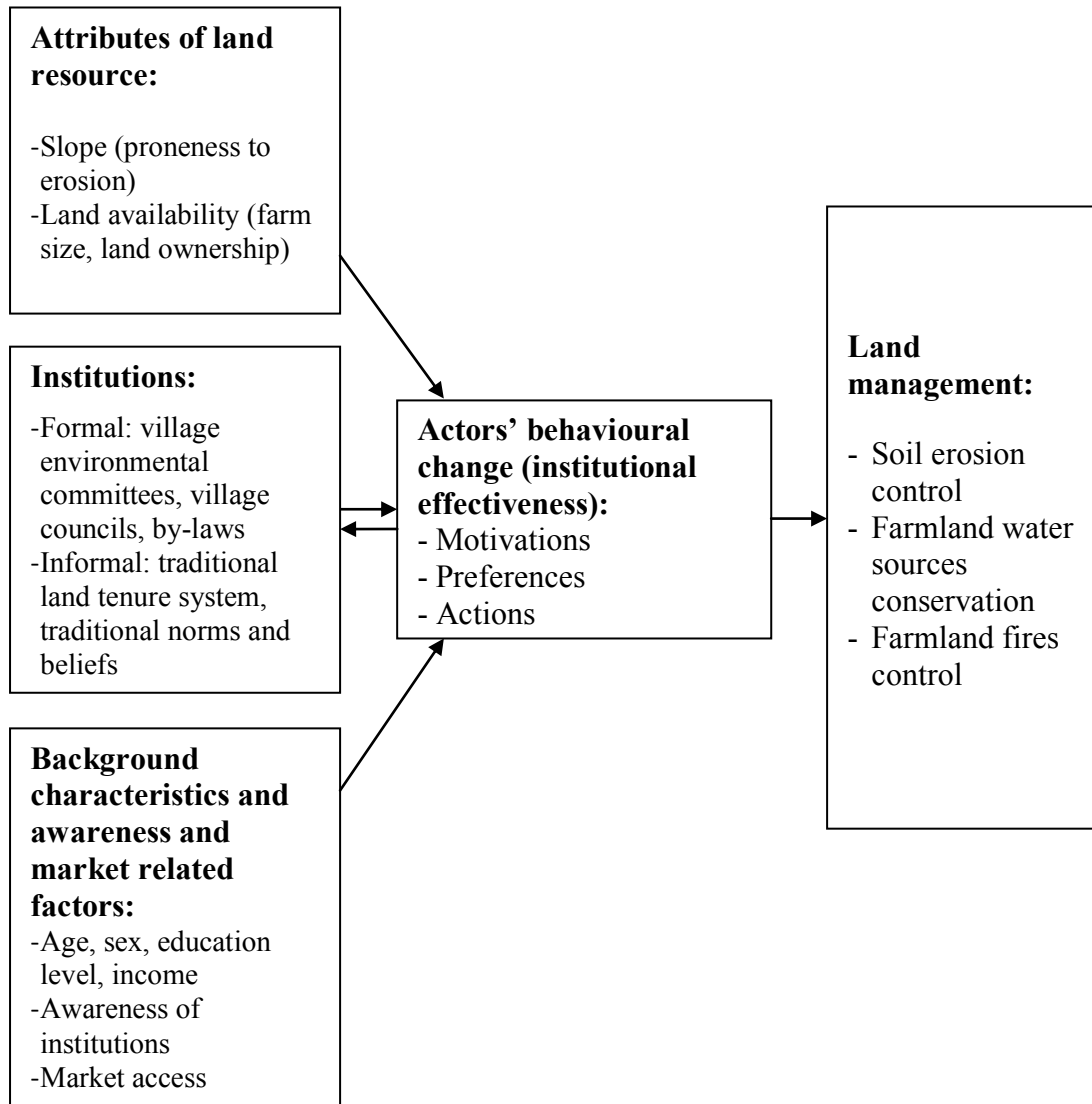


Figure 4.1: A conceptual framework for research on effectiveness of grassroots institutions for governing land management in the Uluguru Mountains

Source: Adapted from Vatn (2011)

Attributes of the land including the slope and scarcity or abundance, are also assumed to influence land management as they influence the actors' perceptions regarding the land. For example, with small land parcel the land owner, who in this case has limited access to land, may feel the need to employ land management practices so that the land can continue to be productive. Actors can as well formulate new institutions and/or amend existing ones depending on attributes of the land. In addition to the effect of land attributes, the influence

of institutions on human behaviour may be affected by personal characteristics such as age, sex, education level and income; awareness of institutions and market access (Fig. 4.1).

4.4 Methodology

4.4.1 Description of the research area

The study was conducted in the Uluguru Mountains, Morogoro Region (Fig. 2.1). The area is characterized by a mountainous and hilly landscape consisting of steep and deep valleys of slopes ranging between 10% and 100% (Kilasara and Rutatora, 1993). The landscape is the source of many streams, which join to form rivers. Among the big rivers to which the Uluguru Mountains contribute its tributaries is Ruvu River, which is the major source of water to people living along the river within Morogoro and Coast Regions and the city of Dar es Salaam. Due to favourable climate, cultivation of vegetables and fruits goes on all year round suggesting the need for adoption of appropriate land management practices in order to sustain agricultural activities. Despite presence of various formal and informal institutions governing land management in the area, studies (example Hymas, 2000; Paulo *et al.*, 2007) show that most communities in the landscape outside the forest reserve practise unsustainable agriculture.

4.4.2 Research design, sampling procedure and sample size

The study used a cross-sectional design, and hence collection of data was done at a single point in time. The sampling process was carried out through multistage sampling procedure. In order to ensure geographical representativeness, stage one involved purposive selection of two divisions namely Matombo which is on the eastern side of the Uluguru Mountains and Mgeta which is on the western side. The two divisions have distinct agro-ecological characteristics and land management practices. According to UMADEP (2001), on the eastern side, the climate varies from tropical-humid to sub-

tropical allowing cultivation of bananas, citrus and spices. Agroforestry is commonly practised, with some farmers practising contour strip cropping as well. Except for Kikeo and Luale wards, which are semi-arid, the western side is mainly characterized by sub-tropical climate supporting production of temperate fruits and vegetables. Terracing and ridging are commonly practised in this area.

During the second stage, purposive sampling was used to select two wards from each division. In order to capture the diversity of institutions and conditions that are likely to influence institutional effectiveness, one ward was selected from fast growing trade centres and the other one from areas with limited interactions with people from outside the community. Based on the same criterion, one village was purposively selected from each ward. Stage three involved random selection of 45 farmers from each village, making a sample size of 180 for the whole study area for interviews. The decision to use this sample size was based on homogeneity of the study villages in terms of existing institutions and attributes of the land resource namely slope, availability and land tenure arrangements. Thus, a sample of 45 respondents per village is big enough, and actually much bigger than the minimum recommended by Bailey (1994), that is, 30 cases for a research in which statistical data analysis is to be done.

4.4.3 Data collection

The study is primarily quantitative with qualitative approach included to achieve complementarity and for triangulation. Primary data were collected through a household survey, participatory rural appraisal (PRA), focus group discussions (FGDs) and key informant interviews. In each village the number of key informants was at least two. These were selected based on their positions in the community and/or knowledge on institutions and land management practices in the area. The key informants included matrilineal uncles,

village leaders, government extension officers and farmers. In order to capture land management practices and their relationships with existing institutions, the FGDs and PRAs were composed of representatives of the village councils, village environmental management committees and farmers' groups. Religious leaders were also involved in the PRAs. In all cases, male and female members were represented since the views of these categories are not necessarily the same. Moreover, institutional enforcement may affect the two categories differently. Therefore, four PRA teams were formed, each with 10-12 participants including committee members, ordinary farmers, village leaders and religious leaders; 10 key informant interviews conducted and seven FGDs conducted, whereby each was composed of at least six participants, including leaders and ordinary members of committees, councils and representatives of farmers' groups. In all the groups, the proportion of women participants was around 30%, this being a result of the deliberate efforts to ensure women participation, especially, where random selection would not guarantee their inclusion.

The household survey used a structured interview schedule. Interview checklists and structured interview schedule were pre-tested in Londo village, which is located on the western Uluguru Mountains. Secondary data including village by-laws, policies and interventions on land management in the Uluguru Mountains were collected from Uluguru Mountains Agricultural Development Project (UMADEP) and village offices during the field work and through internet search.

4.4.4 Measurements and data analysis

4.4.4.1 Measurements

Institutional effectiveness, indicated by behavioural change, was measured using a five-point Likert scale against three indicators of land management namely soil erosion control,

farmland fire control and conservation of farmland water sources. Institutional effectiveness was conceived of as relative improvement caused by institutions when compared to the hypothetical situation that would have occurred in their absence. Eighteen Likert statements, nine with negative connotation and nine with positive connotation (Table 4.1), were formulated based on the indicators above and given scores ranging from one to five. The scores reflected strongly agree, agree, neutral, disagree and strongly disagree for 5, 4, 3, 2 and 1 points in that order. The minimum of 18 points would be scored by one who would choose strongly disagree for all the 18 items, and the maximum of 90 would be obtained by someone who would choose strongly agree for all the 18 items.

4.4.4.2 Data analysis

Qualitative data from key informant interviews, PRA and FGDs were analysed using content analysis, specifically the directed approach. As Hsieh and Shanon (2005) assert, the goal of the directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory. In this regard, the many words of text transcribed from recorded information were compressed into fewer content categories resulting in synthesized meaning based on study objectives.

In the analysis, the opinion on institutional effectiveness was judged unfavourable when the overall mean was below the average (18-53), neutral when the mean was equal to average (54) and favourable when the mean was above the average (55-90). The analysis was done using the Statistical Package for Social Sciences (SPSS) version 20 and Microsoft Excel. Descriptive analysis was done by computing frequencies, means and minimum and maximum values of individual variables.

In order to determine the patterns of association that exist between institutional effectiveness and a set of variables assumed to affect the effectiveness of institutions, inferential statistical analysis was performed. In this regard, a multinomial logistic regression (MLR) model was developed and used to test the influence of nine independent variables, indicated in the model below, on institutional effectiveness. As Field (2009) asserts, MLR is used when the outcome (dependent) variable is categorical and consists of more than two categories (which cannot be ordered in any meaningful way) and the predictor (independent) variables are continuous and/or categorical. MLR is suitable for this research because the dependent variable (institutional effectiveness) has three categories (unfavourable opinion, neutral opinion and favourable opinion), while the independent variables are a mixture of nominal, ordinal and ratio variables. The MLR model used was specified as follows:

$$P(y) = \frac{e^{\alpha + \beta_1 x_1 + \beta_2 x_2 \dots \beta_k x_k}}{1 + e^{\alpha + \beta_1 x_1 + \beta_2 x_2 \dots \beta_k x_k}} \text{ (Agresti and Finlay, 2009), where:}$$

$P(y)$ = the probability of the success alternative occurring

e = the natural log

α = the intercept of the equation

β_1 to β_k = coefficients of the predictor variables

x_1 to x_k = predictor variables entered in the regression model

In this research:

$P(y) = 1$ = the probability of institutions being effective

x_1 = age of respondent

x_2 = total income

x_3 = market access

x_4 = farm size

x_5 = sex

x_6 = education level

x_7 = slope of the farm plot

x_8 = land ownership security

x_9 = awareness of institutions

The analysis involved determining beta weights, Wald statistics, levels of significance (p-values), and odds ratios as shown in Table 4.4.

4.5 Results and Discussion

4.5.1 Effectiveness of institutions for land management

The proportions of the respondents who disagreed, those who were neutral and those who agreed with the 18 statements of the Likert scale are presented in Table 4.1. The results show that, of the 9 statements with positive connotation, the respondents had the highest favourable opinions towards by-laws. In this regard, by-laws were seen to be effective in prohibiting degradation of farmland water sources (98.9%), in prohibiting farmland fires (98.3%) and in promoting soil and water conservation behaviour (97.2%). The other levels of favourable opinions with respect to the statements that had positive connotations are as shown in Table 4.1.

Identifying by-laws operational in the study area, prohibition of farmland and wild-land fires was the most (36%) mentioned by the respondents. The other by-laws include prohibition of tree felling in the forest reserve (23.7%) and prohibition of degradation of water sources (20.0%). Additionally, the FGD participants mentioned farming within 60 metres from a water source as banned by the law.

Less favourable opinions were more pronounced for informal norms and beliefs. The most (39.7%) unfavourable opinions were with the notation that some norms promote degradation of farmland water sources, followed by the notation that there are norms that promote farmland fires (29.1%). The least (6.1%) unfavourable opinions were accorded to the statement indicating that there are by-laws which account for increasing cases of farmland fires. The opinions for other statements are as shown in Table 4.1.

Based on the FGD findings, the norms and beliefs referred to here include *umachinja* (a Luguru term for sucking blood from humans), *katsopata* (a term in Luguru which refers to a tendency to envy a person possessing something or making some good progress) and belief in supernatural powers. Malisa *et al.* (2016) asserted that the supernatural powers with relevance to land management in the Uluguru Mountains include the magical transfer of yields known in Luguru vernacular as *bukula*. It is a belief that a farmer may plant crops which may grow very well but yet obtains very poor yields, while a neighbouring farmer who invests very little on the same crop but harvests a lot at the expense of the one who invests heavily.

Crop yield improvement being a key motive for investment in land management, fear of loss of crops through *bukula* becomes a factor constraining investment in land management. This explains why the respondents accorded the most unfavourable opinions to the informal norms and beliefs.

Table 4.1: Proportions of the respondents with respect to opinions towards statements on institutional effectiveness (n=180)

Statement	Disagree (%)	Undecided (%)	Agree (%)
1. By-laws are instrumental in moving people towards adoption of soil and water conservation (SWC) measures	1.1	1.7	97.2
2. Traditional land tenure system enhances adoption of SWC measures	27.4	3.4	69.3
3. It is normatively incorrect to operate a plot on a steep slope without application of appropriate SWC measures	5.0	1.1	93.9
4. By-laws are instrumental in prohibiting people from degrading farmland water sources	0.6	0.6	98.9
5. Traditional land tenure system promotes conservation of farmland water sources	21.2	7.8	70.9
6. It is normatively incorrect to degrade farmland water sources	7.8	3.4	88.8
7. By-laws are instrumental in prohibiting setting fires on farm plot	0.6	1.1	98.3
8. Traditional land tenure prohibits actions causing farmland fires	24.6	6.7	68.7
9. It is normatively incorrect to set farmland fires	6.7	0.6	92.7
10. There are by-laws which induce reluctance to implementation of SWC measures	83.2	7.3	9.5
11. Traditional land tenure system has negative consequences on adoption of SWC measures	72.1	6.1	21.8
12. Some norms in our area promote rejection of SWC measures	70.9	5.6	23.5
13. There are by-laws which induce reluctance to conservation of farmland water sources	85.5	4.5	10.1
14. Traditional land tenure system encourages actions leading to degradation of farmland water sources	80.4	6.1	13.4
15. Some norms in our area promote degradation of farmland water sources	58.1	2.2	39.7
16. There are by-laws which account for increasing cases of farmland fires occurrence	89.4	4.5	6.1
17. Traditional land tenure system encourages setting fire on farm plots	74.9	8.9	16.2
18. There are norms in our area promoting farmland fires	67.0	3.9	29.1

The proportions of respondents with unfavourable (18-53), neutral (54) and favourable (55-90) opinions towards institutional effectiveness were 33.3%, 15.0% and 51.1% respectively. Therefore, overall, the respondents had favourable opinions towards

effectiveness of institutions in governing land management. The overall score on the Likert scale was 56.3, which is more than 54 that denoted neutral attitude.

From the discussion above, it is clear that institutions are generally seen to be effective in governing land management in the Uluguru Mountains. Superiority of the formal institutions when compared with informal institutions is attributable to their being legally binding. The study provides evidence of presence of informal institutions which discourage land management behaviour. For example, traditional land tenure system has been associated with weakening land ownership security which in turn demotivates land users from investing in land management. Also, there is a declining trend in terms of credibility accorded by the Luguru people to their informal institutions. The growing interaction of the Uluguru Mountains community with the outside world, coupled with the lack of deliberate efforts to promote informal institutions, is a strong force towards the declining adherence to informal institutions.

From the key informant interviews, a traditional leader from Luale village said:

"Our traditions are fading away; people do not respect them. For example, during our times a 'mentally fit person' wouldn't degrade a water source. But now look at my neighbour here; he has planted eucalyptus trees around a water source located on his farm. In the past, rarely did such a thing happen, and if it did the responsible person would be required to explain himself to the elders. Today you hear them saying leave me alone, those traditions are outdated".

Contextually, usage of the term *mentally fit* in the above quotation implies that a person not adhering to expected behaviour was equated with a mentally unfit one.

The formal institutions are legally binding. For informal institutions, their socially determined sanction mechanisms have been losing ground with time. This explains further as to why formal institutions have been accorded with more favourable opinions when compared with informal institutions. However, it is worth noting that the ultimate behaviour and hence land management actions is a result of the combined effect of the various institutions at play.

4.5.2 Conditions for institutional effectiveness

In order to determine the association that exists between institutional effectiveness and a set of variables assumed to affect the effectiveness of institutions, inferential statistical analysis was performed. In this regard, a multinomial logistic regression (MLR) model was developed and used to test the influence of nine independent variables on institutional effectiveness. The MLR model analysis findings are presented and discussed below.

One of the outputs of the MLR model was the model fitting information. Based on the results, the probability of the model chi-square (55.811) was 0.000, less than the level of significance of 0.05. This means that, the model statistically significantly predicts the dependent variable better than the intercept-only model alone. Also, it means that there is adequate fit of the data to the model and that at least one of the predictors is significantly related to the response variable (Garson, 2008).

Another output was the Pseudo R-square. From the results (Table 4.2), Nagelkerke R^2 was 0.378 implying that the independent variables entered in the model explained 37.8% of the variance in the dependent variable. According to Garson (2008), Nagelkerke R^2 value, which is the modified form of Cox and Snell R^2 , is always higher than Cox and Snell R^2 and is the most reported of the pseudo R^2 estimates.

Table 4.2: Pseudo R-Square

Pseudo R-square	
Cox and Snell	0.326
Nagelkerke	0.378
McFadden	0.199

Other outputs of importance were the likelihood ratio test and the Wald statistics. The likelihood ratio test evaluates the overall relationship between an independent variable and the dependent variable. The Wald statistics evaluates whether or not the independent variable is statistically significant in differentiating between the two groups in each of the embedded binary logistic comparisons (Bayaga, 2010). According to Garson (2008), the Wald statistic is commonly used to test the significance of individual logistic regression coefficients for each independent variable.

Table 4.3: Relationship between independent variables and the dependent variable (institutional effectiveness)

Effect	Model Fitting	Likelihood Ratio Tests		
	Criteria	Chi-Square	df	Sig.
	-2 Log Likelihood of Reduced Model			
Intercept	299.967	0.000	0	
Age	300.629	0.662	2	0.718
Income	300.834	0.867	2	0.648
Market access	312.998	13.031***	2	0.001
Farm size	301.335	1.368	2	0.505
Sex	300.892	0.924	2	0.630
Education level	307.026	7.059	6	0.315
Slope	302.416	2.448	4	0.654
Land ownership security	311.250	11.283***	2	0.004
Awareness of institutions	313.746	13.779***	2	0.001

***denote significance at 1%level

The results showed that there was a statistically significant relationship between three independent variables namely land ownership security ($p = 0.004$), awareness of institutions ($p = 0.001$) and market access ($p = 0.001$) and the dependent variable (institutional effectiveness) (Table 4.3). The other variables namely age, sex, income and education level of the respondent; farm size and slope did not have statistically significant relationship with the dependent variable.

According to Bayaga (2010), if an independent variable has an overall relationship to the dependent variable, it does not necessarily suggest statistical significance. In fact, it might or might not be statistically significant in differentiating between pairs of groups defined by the dependent variable. Therefore, parameter estimates output has been included and is described and discussed as follows, based on the findings in Table 4.4.

As indicated in Table 4.4, market access was statistically significant in distinguishing category 1 of the dependent variable (unfavourable opinion), from category 3 of the dependent variable (favourable opinion). Based on the $\text{Exp}(B)$ value (the odds ratio) for market access, the implication is that the survey respondents who spent longer time to reach a market place were 1.0% (1.007-1.0) more likely to be in the group of survey respondents who thought that the institutions were not effective (dependent variable category 1), rather than being in the group of survey respondents who thought that institutions were effective (dependent variable category 3, the reference). This means that, each additional minute to the total time from farm to the market increases (because B is positive) the odds that a respondent subscribes to the opinion that institutions are not effective by a factor of about 0.007.

The results imply that proximity to a market place, which has to do with the possibility of a farmer selling and earning returns from his/her agricultural produce, is an important condition for institutional effectiveness. It is more plausible for a farmer who has access to a market place to comply with a by-law or prescription related to land management and hence improved agricultural production than a farmer with limited access to a market place. In this case, returns on investment in land management serves as an incentive for compliance. Kessler (2006) asserts that for farmers to be interested in soil and water conservation, it is important to enhance the profitability of agriculture.

Land ownership security and awareness of institutions were statistically significant in distinguishing category 2 of the dependent variable (neutral opinion) from category 3 of the dependent variable. The Exp(B) values for land ownership security indicate that the survey respondents who had strong land ownership security were 78.8% (0.212-1.0) less likely to be in the group of survey respondents who had neutral opinion regarding institutional effectiveness, rather than being in the group of survey respondents who thought that institutions were effective (favourable opinion).

Secure land ownership guarantees a farmer of both short and long-term benefits accruing from his/her investment in land management. Chonde (2015) reported that land ownership security influenced men in Malawi to invest in land. Therefore, institutions such as by-laws and prescriptions related to land management, are more likely to influence the behaviour and hence actions of land users with strong, than those with weak, land ownership security. Similar findings were reported by Yami *et al.* (2012) that the growing number of landless youths in rural villages constrained the effectiveness of village by-laws.

Table 4.4: Parameter estimates for individual predictors on institutional effectiveness

Opinions on institutional effectiveness ^a		B	Std. Error	Wald	df	Sig.	Exp(B)	95% C.I. for Exp(B)	
								Lower Bound	Upper Bound
Unfavourable opinion	Intercept	-1.562	1.273	1.506	1	0.220			
	Age	-0.008	0.013	0.351	1	0.554	0.992	0.967	1.018
	TotIncome	0.000	0.000	0.523	1	0.470	1.000	1.000	1.000
	MrktAccess	0.007	0.002	11.741	1	0.001	1.007	1.003	1.011
	FSize	-0.089	0.080	1.226	1	0.268	0.915	0.782	1.071
	[Sex=1.00]	0.352	0.378	0.867	1	0.352	1.422	0.678	2.982
	[Sex=2.00]	0 ^b			0				
	[EdLevel=1.00]	2.117	1.093	3.753	1	0.053	8.303	0.975	70.671
	[EdLevel=2.00]	0.867	1.222	0.504	1	0.478	2.381	0.217	26.095
	[EdLevel=3.00]	0.367	0.862	0.181	1	0.670	1.443	0.267	7.811
	[EdLevel=4.00]	0 ^b			0				
	[Slope=1.00]	0.137	0.721	0.036	1	0.849	1.147	0.279	4.708
	[Slope=2.00]	0.562	0.450	1.562	1	0.211	1.754	0.727	4.234
	[Slope=3.00]	0 ^b			0				
	[LandOwnSec=1.00]	0.300	0.469	0.410	1	0.522	1.350	0.539	3.383
	[LandOwnSec=2.00]	0 ^b			0				
	[Awareness=1.00]	-0.775	0.394	3.866	1	0.049	0.461	0.213	0.998
	[Awareness=2.00]	0 ^b			0				
Neutral opinion	Intercept	-0.996	1.750	0.324	1	0.569			
	Age	0.005	0.017	0.085	1	0.770	1.005	0.972	1.040
	TotIncome	0.000	0.000	0.093	1	0.760	1.000	1.000	1.000
	MrktAccess	0.002	0.003	0.684	1	0.408	1.002	0.997	1.007
	FSize	-0.012	0.106	0.013	1	0.908	0.988	0.803	1.215
	[Sex=1.00]	0.056	0.521	0.012	1	0.914	1.058	0.381	2.935
	[Sex=2.00]	0 ^b			0				
	[EdLevel=1.00]	1.965	1.614	1.482	1	0.224	7.134	0.302	168.798
	[EdLevel=2.00]	-	0.000		1		3.33E-08	3.33E-08	3.33E-08
		17.217							
	[EdLevel=3.00]	0.536	1.240	0.187	1	0.666	1.709	0.150	19.438
	[EdLevel=4.00]	0 ^b			0				
	[Slope=1.00]	0.634	1.011	0.394	1	0.530	1.886	0.260	13.667
	[Slope=2.00]	0.787	0.740	1.134	1	0.287	2.198	0.516	9.366
	[Slope=3.00]	0 ^b			0				
	[LandOwnSec=1.00]	-1.553	0.572	7.367	1	0.007	0.212	0.069	0.649
	[LandOwnSec=2.00]	0 ^b			0				
	[Awareness=1.00]	-1.823	0.530	11.834	1	0.001	0.162	0.057	0.457
	[Awareness=2.00]	0 ^b			0				

a. The reference category is: 3 Favourable opinion.

b. This parameter is set to zero because it is redundant.

Similarly, for awareness of institutions, the odds ratio was such that the survey respondents who were aware of existence of institutions for land management were 83.8% (0.162-1.0) less likely to be in the group of respondents who had neutral opinion, rather than the group of survey respondents who thought institutions were effective. Awareness of institutions was also statistically significant in distinguishing category 1 of the dependent variable from category 3 of the dependent variable. The Exp(B) was such that the survey respondents who were aware of existence of institutions for land management were 53.9% (0.461-1.0) less likely to be in the group of respondents who had unfavourable opinions, rather than being in the group of survey respondents who thought institutions were effective.

Awareness of the rules (formal or informal) and procedures is an important aspect of the process of creating rule/procedure adherence practice. For example, knowledge transfer from elders to young generation has proven to be effective in passing on conventional land management practices like ridging¹⁶ in the Uluguru Mountains. Farming being the predominant activity in the area, and ridging a conventional practice, children and youths have high exposure to the practice as they learn from the elders and see it in the fields. One way to increase awareness about a particular institution is through involvement of the people in its formulation and enforcement. Yami *et al.* (2012) observed that the active involvement of all users in decision making enhanced the effectiveness of the village by-laws.

In addition to the inferential statistical analysis, descriptive analysis was performed with the aim to provide additional information regarding the motivations for adherence to prescriptions on land management. In this regard, 82.3% of the responses were such that adherence to prescriptions on land management was motivated by concern about the effects

¹⁶ Ridging involves establishment of earth embankments across the slope, done when digging the land.

of fire, soil erosion and degradation of water sources on the land and the environment at large. In this case, the FGD participants identified UMADEP/SUA, CARE International, Uluguru Nature Reserve and Tanzania Forest Services as the main sources of awareness. On the same theme, 7.2% of the responses suggested that compliance was driven by worry of being punished by the law. This means that, the respondents were ecologically responsible and not just individually rational.

The above findings and discussion imply that imposition of sanctions against non-compliance and ascertaining individual benefits from land are important but not sufficient conditions for adherence to prescriptions on land management. This corroborates the observation by Vatn and Vedeld (2012) that people act according to plural motivations. That is, actions on land management are not guided by individual rationality (the logic of costs and benefits) alone; they are also guided by the logic of appropriateness or social rationality. Elaborating on the logic of appropriateness, Babili *et al.* (2015) contend that human agencies follow rules, not because it is rationally the best strategy but because institutions define appropriate behaviour in a given community, irrespective of implied costs and benefits.

4.6 Conclusions and Recommendations

Combined, the formal and informal grassroots land management institutions in the Uluguru Mountains are effective in that their ultimate effect is more of fostering actors' land management behaviour. That is, they favourably regulate motivations, preferences and actions related to soil erosion and farmland fires control and farmland water sources conservation. While the formal institutions are considered to be legally binding, the socially determined sanction mechanisms of the informal institutions have been losing ground with time. However, the ultimate behaviour and hence land management action is a

result of the combined effect of both formal and informal institutions. Thus, presence of institutions which discourage land management behaviour counterbalances the effect of the institutions which motivate land management behaviour. This explains the presence of anthropogenic threats to the land resource in the Uluguru Mountains despite presence of effective land management institutions. Land ownership security, awareness of institutions and market access are significantly important conditions for institutional effectiveness. They provide knowledge on, and incentives for, adherence to, rules, norms and conventions.

The study posits that imposition of sanctions against non-compliance and ascertaining individual benefits from investment in land management are important but not sufficient conditions for adherence to rules, norms and conventions on land management. For example, in the Uluguru Mountains, rule-adherence motivated by ecological concerns was evident. That is, deterrence from farmland fires, soil erosion and degradation of water sources motivated by awareness of their effect on the land and the environment at large. Thus, people act according to plural motivations. That is, actions on land management are not guided by individual rationality (the logic of costs and benefits) alone; they are also guided by the social rationality, that is, doing what is appropriate or expected by a given community. The study confirms that institutions do influence the individual – the values and preferences an individual holds and what is considered right to do in certain situations.

The policy implication from the study is that enhancement of land ownership security and access to agricultural crop markets ought to be the policy priorities as these are necessary conditions for successful land management interventions. Involvement of local leaders and the ordinary community members in formulation of land management by-laws would enhance awareness and hence the likelihood of adherence to the by-laws.

In the efforts to ensure grassroots institutional effectiveness, it should be underscored that, while it is important to invest in formulation and/or amendment of formal rules for land management as deemed necessary, it is equally important to promote the good aspects of informal institutions (practices, norms and beliefs). This is important because much as one institution could be enhancing land management behaviour, this effect could be counterbalanced by presence of another institution that discourages land management behaviour. Moreover, when formulating and/or amending grassroots institutions for land management, it is crucial to consider the characteristics of the actors and the attributes of the land resource. This is based on the observation that these have an effect on institutional effectiveness.

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CHAPTER FIVE

5.0 SUMMARY OF THE MAJOR FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents a summary of the major findings of the study, the overall conclusions, theoretical reflections and recommendations. In doing so, a reflection has been made on the study objectives, research questions, theoretical underpinnings and the literature used in the study. Finally, the chapter highlights the areas for further research.

5.1 Summary of the Major Findings and Conclusions

This study assessed the interplay of formal and informal grassroots institutions with a focus on their effectiveness in governing land management in the Uluguru Mountains, Morogoro, Tanzania. The thrust was to contribute to addressing land degradation in the Uluguru Mountains, the problem which has persisted despite efforts by various actors to maintain biodiversity and ecosystem services and ensure sustainable land management in this farming landscape. In doing so, the study attempted to answer three main research questions: First, how do formal and informal grassroots institutions influence land management, second, what are the implications of formal and informal institutional interplay on land management, and third, to what extent has actors' land management behaviour changed as a result of institutional influence. It was also the interest of the study to determine the influence of land attributes and other factors on human behavioural change towards land management. Three manuscripts have emanated from the study whereby, each manuscript corresponds to one objective.

5.1.1 The role of formal and informal grassroots institutions in land management in the Uluguru Mountains

The first objective was to describe the functioning and importance of the existing institutions for land management. In this regard, the existing formal and informal institutions for land management were identified and described in terms of their functioning and importance in land management. It was found that institutions playing an enhancing role in land management included four formal institutions namely the primary education system, village environmental management committees, village councils and the extension system; and four informal institutions namely knowledge transfer from elders to young generation, labour pooling, traditional dances and network of farmers groups. On the other hand, blood sucking belief (*umachinja*), land renting arrangements, and *katsopata* (envying a person possessing something or making some good progress) played constraining roles. Land tenure system, belief in supernatural powers and religious institutions played both enhancing and constraining roles.

The importance of formal and informal institutions in land management was particularly seen in their role in defining the logic of action. Though found to be important, some formal institutions namely the village councils and village by-laws were considered to be lacking moral legitimacy. Moreover, the village councils were associated with lack of personal integrity of the enforcers and corruption. Poor enforcement of environmental management by-laws was also evident.

The major conclusion from the study is that institutions influence human perceptions, preferences and actions. It is through social construction process that some actions are being implemented on the land while some proposed actions have been rendered irrelevant and hence rejected regardless of the amount of effort put into promoting the same. The

findings contrast with the rational choice thinking which sees behaviour as only following an individualistic rational calculus independent of institutional setting.

5.1.2 Implications of institutional interplay on land management

In its second objective, the study used the formal land laws and traditional land tenure system as cases to examine the institutional interactions and the implications of the interactions on land management. The study brought to light multi-faceted institutional interactions with each of the interacting institutions influencing the other from the colonial era to the liberalised market economy era. The ensuing outcome has been more of inter-institutional conflict. It is affirmed that compatibility between institutions is an important attribute for institutional strengthening. When compatible, the involved institutions are strengthened. However, this is true when the intended outcomes for involved institutions are convergent, that is, when effectiveness means the same thing to them.

Also, the study found that, the clan-based land tenure regime which was predominant in the Uluguru Mountains during the pre-colonial and colonial eras was not in favour of land management. It involves distribution of available plots among clan members leading to land fragmentation which, in the context of the prevailing institutional landscape, exacerbates land degradation; it is associated with weak land ownership security and discourages tree planting. The immediate post-independence era was a transition period when people were in the dilemma of having to comply with the new land laws while they still had a strong sense of loyalty to their traditional land tenure system. The liberalised market economy era is seen to be dominated by individual land property regime. Due to its land ownership security enhancing effect, individual land property is associated with enhancing adoption of soil erosion control measures as well as with deterring farmland fires. However, in the face of growing water scarcity, individual land property is likely to

encourage farmland water source degradation actions. Thus, though land tenure security motivates investment in land management, it is not necessarily a prerequisite for prudent land use.

It is also clear from the findings that when an institution or intervention is introduced in the Uluguru Mountains, people judge it based on its influence on their imbedded interests in land, that is, its impact on chances of an individual and his/her lineage to continue owning the land and farm it now and in the future. Therefore, besides land tenure security, there is a socially determined logic inherent in investment in land management which has an influence on land user's propensity to invest in land management.

Another key conclusion is that, while the mainstream literature emphasizes on enhancing inter-institutional synergy and mitigating inter-institutional conflict, it is argued from this study that interventions resulting in inter-institutional conflict, which weakens some of the involved institutions, are not necessarily undesirable. At times it becomes a necessary undertaking, especially when deemed necessary to change existing institutional practice. For instance, the bitterly protested laws, which proscribed farmland fires and those which proscribed terracing and gender equality in land allocation, caused inter-institutional conflicts but were necessary and are no longer seen as a taboo in the Uluguru Mountains.

5.1.3 Effectiveness of existing grassroots institutions in governing land management

The third objective was to assess the effectiveness of existing grassroots institutions in governing land management. In this regard, the study examined land management behaviour attributable to the influence of institutions as well as analysing the conditions for institutional effectiveness.

The findings revealed that institutions were generally seen to be effective in governing land management in the Uluguru Mountains in that they regulate land management behaviour. Compared to informal institutions, formal institutions were found to be superior in terms of effectiveness, and this was attributable to the formal institutions being legally binding. For informal institutions, their sanction mechanisms were seen to be losing ground with time.

The study affirms that the ultimate behaviour and hence land management actions is a result of the combined effect of the various institutions at play, that is, the effect of institutional interplay. Thus, presence of institutions which discourage land management behaviour counterbalances the effect of the institutions which motivate land management behaviour. This accounts for the continued presence of anthropogenic threats to the land resource in the Uluguru Mountains despite presence of effective land management institutions.

Land ownership security, awareness of institutions and market access are significantly important conditions for institutional effectiveness. They provide knowledge on, and incentives for, adherence to rules, norms and conventions.

Therefore, in sum, grassroots institutions for land management are effective in regulating land management in the Uluguru Mountains. Effectiveness in this regard is defined as change in land management behaviour regulated by institutions. Compatibility between institutions is an important attribute for institutional effectiveness, particularly when effectiveness means the same thing to the involved institutions. That is, higher institutional effectiveness is more likely when institutions are compatible than when they are incompatible. When compatible there is mutual strengthening of operating institutions.

The study posits that imposition of sanctions against non-compliance with rules and regulations, and ascertaining individual benefits from investment in land management are important but not sufficient conditions for adherence to rules, norms and conventions on land management. For example, in the Uluguru Mountains rule-adherence motivated by ecological concerns was evident. Thus, people act according to plural rationalities. That is, actions on land management are not guided by individual rationality alone; they are also guided by the social rationality, that is, doing what is appropriate or expected by a given community.

5.2 Theoretical Reflections

In this study, the theory of human action was used to explain how formal and informal institutions, through their roles in defining the rights and responsibilities of actors, have an impact on land management. The study also used the property rights theory to explain the implications of land tenure regimes on land management.

From a social constructivist perspective, the theory of human action entails that institutions are not just seen as constraints; they influence the individual—the values and preferences an individual holds and what is considered right to do in certain situations (Vatn, 2011). That is, institutions are a human creation and human being is a product of the same institutions (Vatn, 2005). It contrasts with the individualist perspective which sees institutions as constraints within which individuals act and choose. The individualist perspective treats humans as autonomous, maximizing individual utility.

The property rights theory, on the other hand, accepts the rational choice as maximizing individual utility as one of its core theorems (Vatn, 2005) and claims that private property regime is the only efficient regime. The theory is based on a perspective that human action,

for example on land, is guided by the zeal to earn highest individual utility as the only rationality. Moreover, as Sjaastad and Bromley (1997) assert, with the property rights theory, tenure security is seen as a prerequisite for investment and prudent land use.

The study demonstrates that individuals are not autonomous as purported by the individualist school. They are influenced by institutions in that it is the institutions which define the logic of action. For instance, being socially appealing, upland rice production and ridging have continued to be implemented in the Uluguru Mountains despite their being technically inappropriate. Thus, farmers' propensity to apply a particular land management practice is institutionally dependent.

Further, the study demonstrates actions motivated by social rationality – that is, doing what is appropriate or expected by a given community and actions motivated by individual rationality – that is, the logic of costs and benefits. The act of expanding crop production area around farmland water sources to meet family food requirements is an example of an action motivated by individual rationality. However, the action is also socially influenced as, behind it, there is a struggle to protect certain values. Therefore, the study portrays a social player as a complex dynamic entity that trades off individual and social rationalities at the same or different temporal and spatial scales based on contextual realities.

The study affirms that strong tenure security motivates investment in land; however, tenure security is not necessarily a prerequisite for prudent land use as purported by the property rights theory. Moreover, the property rights theory rejects the need for a third party intervention on grounds that resource allocations can simply be made via individual bargains. However, land allocations and use in the study area are liable to externalities justifying third party intervention. A case in point is the expansion of crop production

around farmland water sources, which deprives the rest of the community members of the possibility to continue benefiting from the water resource.

Therefore, the property rights theory does not adequately explain the implications of land tenure regimes on land management in the Uluguru Mountains. Contrary to the actual practice as demonstrated by this study, the theory does not see human action as being guided by plural rationality. On the other hand, the social constructivist perspective of the theory of human action is relevant for explaining the influence of formal and informal institutions on land management.

5.3 Recommendations

The study recommends future land management interventions, including formation of new institutions, to take into consideration the existing institutional landscape so as to increase chances of success in institutionalization of desired practices. It is imperative to uncover the logic attached to people's actions before setting to introduce an intervention or improve/modify the existing one. This responds to the observation that people judge an intervention based on its perceived impact on their imbedded interests in land, and these interests are socially constructed. Establishment of village-level networking of farmers, elders, religious leaders, government bureaucrats, politicians and NGOs would enhance communication and collaboration amongst them and serve as an avenue for enhancing accountability. It would, therefore, bridge the formal institutions' moral legitimacy gap.

Formulation of institutions related to land use and management should not be generalized, and should as much as possible be informed by existing institutions and traditional land use and management practices. This is because people's perceptions, preferences, motivations and land resource problems are location specific. The one-size fits all approach is not

appropriate when it comes to formulation of land management institutions. Also, interventions aimed at changing or eradicating an institutionalized practice ought to be long-term and consistent. Haphazard changes in an intervention create dilemma, a sense of insecurity and free ride behaviours among the people. Furthermore, while it is important to invest in formulation and/or amendment of formal rules for land management as deemed necessary, it is equally important to promote the good aspects of informal institutions (practices, norms and beliefs).

For the Uluguru Mountains, the policy focus should be on promoting conservation of farmland water sources and control of soil erosion and farmland fires. NGOs and government organizations are urged to facilitate formation of an institution to regulate farmland water source management. The institution would sanction unwarranted opportunistic behaviours over the resource. To be effective, the institution should be backed up by village by-laws and should have enforcers composed of representatives of village-level community members including male and female farmers, elders, traditional leaders and religious leaders, village council and civil society organizations

Enhancement of land ownership security would motivate land management actions. In this regard, the study advocates for individual land property regime. However, if unregulated, the regime may encourage opportunistic behaviours such as expansion of farms and planting high water-consuming tree species around farmland water sources. Improvement of crop market access is also recommended as it incentivises land users to adopt land management practices. Likewise, involvement of local leaders and the ordinary community members in formulation of land management by-laws would enhance awareness and subsequently increase the likelihood of adherence to the by-laws.

5.4 Areas for Further Research

The study provides findings which are relevant for areas with similar institutional characteristics. Since informal institutions are usually entrenched in peoples' culture, then they are likely to be distinct among different cultures. Correspondingly, the outcomes of formal and informal institutional interactions are likely to be different, especially among areas whose dominant ethnic groups are different. Effectiveness of institutions in governing land management is therefore less likely to be of the same pattern in such areas. Thus, similar research is recommended for areas whose culture is different from that of the Uluguru Mountains.

Based on the current study, effectiveness has been measured in terms of the relative improvement in land management behaviour as a result of the institutions, that is, the existing situation compared with the hypothetical situation that would have existed in the absence of the institutions. This accomplishment raises a question "what then is the actual improvement compared to the potential". Exploration of the extent to which the optimal land management behaviour has been attained in the Uluguru Mountains under the current institutional arrangements merits attention of future research. Assessment of the role of poverty and population increase on land degradation in the Uluguru Mountains is another area that warrants an empirical study.

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APPENDICES

Appendix 1: A copy of the interview schedule used in the research

A structured interview schedule for research on interplay of formal and informal grassroots institutions for land management in the Uluguru Mountains, Morogoro, Tanzania

Enumerator's name:.....

Date of interview:.....

A. Background characteristics and socio-economic information

1. Name of the village:..... 2. Ward:.....
3. Division:..... 4. District:.....
5. Name of the respondent:
6. Sex of the respondent (land user):
 1. Male ()
 2. Female ()
7. Head of the household?
 1. Yes ()
 2. No ()
8. Age of the respondent in years.....
9. Marital status of the respondent
 1. Single ()
 2. Married ()
 3. Divorced ()
 4. Widow ()
 5. Separated ()
10. Education level of the respondent
 1. No formal education ()
 2. Adult education ()
 3. Primary education ()
 4. Secondary education ()
 5. Other (specify) ().....
11. Tribe
 1. Luguru ()
 2. Other (specify) ()
12. Religion
 1. Christian ()
 2. Muslim ()
 3. Other (specify) ()
13. Occupation of the respondent
 1. Farming ()
 2. Officially employed () Mention:.....
 3. Casual labourer ()
 4. Business (specify) ()
 5. Other (specify) ()

14. Household composition (*make sure to include the person you are interviewing*)

Age	Residing in the household		Residing outside the household	
	a) Male	b) Female	c) Male	d) Female
i) Under 18 years				
ii) 18 – 65 years				
iii) Above 65 years				

15. Please let me know the amount of income you obtained during last farming season/year for each of the following income generating activities

Item	a) Quantity harvested (Unit*)	b) Quantity sold (Unit)	c) Price per unit (Tshs)
i) Beans			
ii) Irish potato			
iii) Peas			
iv) Tomato			
v) Cabbage			
vi) Squash (Zucchini)			
vii) Sweet pepper			
viii) Leeks			
ix) Onions			
x) Pigeon peas			
xi) Peaches			
xii) Plums			
xiii) Banana			
xiv) Pineapple			
xv) Spices (mention...)			
xvi) Maize			
xvii) Chicken			
xviii) Pig			
xix) Goat			
xx) Goat's milk			
xxi) Manure			
xxii) Any other crop (mention...)			

* Please be sure of the quantity contained in mentioned unit (kg,...)

16. Income received from the following items last year (2013)

Item	Tshs
i) Casual labouring	
ii) Remittances	
iii) Local brew selling	
iv) Operating a shop	
v) Any other activity (mention).....	

17. What position do you have in the community?

1. None ()
2. Traditional healer ()
3. Traditional leader () Mention the title:.....
4. Social organization leader () Mention the organization:.....
5. Village government council member () Mention the title:.....
6. Other position (mention....) () Mention the title:.....

18. Are you a member to any group/committee/village council?

1. Yes ()
2. No ()

19. If yes in question 17 above, mention the name of institution(s) to which you are a member and their main activity

A) Name of institution	B) Type of institution/organization: 1. Group 2. Network 3. Association 4. Cooperative 5. Committee (Specify)... 6. Other (specify)...	C) Main activity of institution/organization
1.		
2.		
3.		
4.		
5.		

20. Have the existing institutions influenced your implementation of land management activities??

1. Yes ()
2. No ()

Explain:.....

B. Land unit information

21. How many plots do you have?.....

I would like to ask you a few questions about each plot

Plot No.	1	2	3	4	5	6	7
22. In which area (<i>hamlet</i>) is it located							
23. How far is it from your house (minutes)							
24. How far is it from the market (minutes)							
25. How big is it (acres)							
26. Ownership 1. Owner (bought) 2. Owner (inherited from parents) 3. Clan 4. Family 5. Short rent 6. Long rent 7. Other (specify)...							
27. Slope 1. Gentle 2. Moderate 3. Steep 4. Very steep							
28. Conservation measure 1. Bench terrace 2. Ridges 3. <i>Fanya juu</i> terrace 4. Contour strips 5. Agroforestry 6. Other (specify).....							
29. Main reason(s) for implementing the particular SWC (in no. 28) measure							
30. How did you learn about SWC measure(s) you are implementing? 1. Elder () Member of which group?... 2. Fellow farmer () 3. Group/committee (mention) 4. NGO/Gvt org (mention)... 5. Other (specify)...							
31. Year in which the SWC measure was implemented							
32. Land clearance method: 1. Burning 2. Incorporation of vegetation in the soil 3. Other (specify)...							
33. If burning in 31 above, give reasons.....							
34. Water source type existing close to your plot? 1. River (not canal/furrow) 2. Canal intake 3. Stream 4. Reservoir (dam) 5. Other (specify)...							
35. How far is the plot from the mentioned water source (m)?... 1. Closer than 60 m 2. Further than 60 m							
36. If (1) in 34 above, what do you do to conserve the farmland water source?							

37. Is farming closer than 60 m permitted by the law? 1. Yes () 2. No ()							
38. Is farming closer than 60 m normatively acceptable? 1. Yes () 2. No ()							
39. Which plot do you consider most important for your agricultural activities? Explain.....							
40. Which of the plots has access to irrigation?							
41. Crops planted in each plot in 2013							

42. What do you think are the reasons for some people setting fire on farmland?

.....

43. What factors do you think deter a person from setting fire on farmland?

.....

44. What do you think are the reasons for some people degrading farmland water sources?

.....

45. What factors do you think deter a person from degrading farmland water sources?

.....

46. What would you consider the motivating factors for a farmer to implement soil erosion control measures?

.....

C. Performance of formal and informal institutions

47. Are you aware of by-laws, norms or regulations governing land use and management in this village? Explain.....

48. Do community members abide by the rules? Explain.....

49. For each institution, I would like to have your opinion regarding extent to which it is important in soil erosion control, farmland fires control and conservation of farmland water sources. Please use the scale No (1), A little (2), Much (3).

[illegible]

50. Institutions result in relative improvement in land management through the behavioural change they induce. Please consider the following statements carefully, and tick in the appropriate cells to reflect your opinion: whether you agree a lot with the statement (5), agree a little (4), are neutral (3), disagree a little (2), or disagree a lot (1) with each statement

Statement	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)
A) Soil erosion control:					
1. By-laws are instrumental in moving people towards adoption of soil and water conservation (SWC) measures					
2. There are by-laws which induce reluctance to implementation of SWC measures					
3. Traditional land tenure system enhances adoption of SWC measures					
4. Traditional land tenure system has negative consequences on adoption of SWC measures					
5. Some norms in our area promote rejection of SWC measures					
6. It is normatively incorrect to operate a plot on a steep slope without application of appropriate SWC measures					
B) Conservation of farmland water sources:					
7. By-laws are instrumental in prohibiting people from degrading farmland water sources					
8. There are by-laws which induce reluctance to conservation of farmland water sources					
9. It is normatively incorrect to degrade farmland water source					
10. Some norms in our area promote degradation of farmland water sources					
11. Traditional land tenure promotes conservation of farmland water sources					
12. Traditional land tenure system encourages actions leading to degradation of farmland water sources					
C) Farmland fires control:					
13. By-laws are instrumental in prohibiting setting fires on farms					
14. There are by-laws which account for increasing cases of farmland fires occurrence					
15. It is normatively incorrect to set farmland fires					
16. There are norms in our area promoting farmland fires					
17. Traditional land tenure prohibits actions causing farmland fires					
18. Traditional land tenure system encourages setting fire on farms					

51. Please consider the following statements carefully, and tick in the appropriate cells to reflect your opinion. Please use the scale No (1), A little (2), Much (3).

Statement	No (1)	A little (2)	Much (3)
1. Steep slope motivates adoption of soil erosion control measure			
2. The fact that in the absence of SWC measures floods may carry soil from one's plot and destroy neighbours' plots is one of the reasons for adoption of SWC measures			
3. The fact that our children will inherit the land and have to also benefit from it is an important factor for SWC adoption			
4. This being a catchment area (hence water needs to be conserved for downstream users too) is one of the factors moving people to adoption of SWC measures			
5. Land scarcity contributes to willingness of land users to adopt SWC measures			
6. The severer the land scarcity the less the adoption of SWC measures			
7. The fact that future generations will also need to benefit from the water resource is one of the motives for people's willingness to conserve farmland water sources			
8. Consideration of downstream water users do influence decision to conserve farmland water sources			
9. Declining water resource has become an important factor moving people to farmland water source conservation			
10. Declining water resource encourages farmland water source degrading actions			
11. Burning being unsustainable land use practice forms an important reason for people to avoid it			
12. The fact that future generations will also need to benefit from the land, water and forest resources is one of the reasons making people to avoid setting fire on farms			

Thank you for your cooperation

Appendix 2: A copy of the interview guide for focus group discussion

A. General information

1. Name of the institution
2. Names of participants: (name, sex, position)
3. Year established
4. Number of members (male, female)
5. Area of operation

B. Institutional interplay

6. How have the norms been influenced by any other institution?
7. Explain the existing interaction with other groups/committees or any other institutional arrangement at village or ward level (What influence, source of the influence, target institution...)
8. How were the interactions initiated? (Functional or political linkage?)
9. Elaborate the interactions whether synergetic or conflictive. What are the benefits and what are the disadvantages resulting from the interaction? How would you weigh the benefits compared to the disadvantages?
10. For groups' network: How is networking organized? How often do you meet, how do you interact? (What influence, source of the influence, target institution...)

C. Institutional effectiveness

11. How was the institution formed?
12. How often do you as institutional actors conduct meetings?
13. Participation of members in institution's meetings?
14. What are your guiding rules?
15. How are the rules enforced?
16. Specifically what does the committee do:
 - i) to control soil erosion?
 - ii) to control wild-land fires?
 - iii) to ensure conservation of water sources?
17. Participation of members in activities enforcement of the rules?
18. How does the institution operate: how do the by-laws influence actors with respect to their actions on land (soil erosion and farmland fires control and farmland water sources conservation)
19. What are the enabling factors for the institution?
20. What the constraining factors?

Thank you for your participation in the discussion

Appendix 3: A copy of the interview guide for participatory rural appraisal(PRA)

1. List all institutions/organizations existing in the village (groups, cooperatives, religious institutions, networks, committees, social practices...)
2. Identify those related to land use and management
3. Categorize them into formal and informal
4. Present them on a flip chart using unique symbol for each, distinguishing the importance of each by varying their proximity to the community (represented by a cycle)
5. Indicate the level of influence of each institution with regard to: soil erosion control, farmland fire control and conservation of farmland water sources
6. Indicate interactions existing among and between institutions
7. Describe each institution
8. For the existing interactions:
 - Characterize the interaction
 - Describe the resulting arrangement (consequences of the interactions)
 - Indicate the effect of the resulting arrangement to individual institutions involved
9. Explain changes which have occurred over time (historical timelines) in:
 - Land use (crops, forest cover, irrigation, houses etc.)
 - Land tenure
 - Land degradation (soil erosion, farmland fires, degradation of farmland water sources)
 - Land management (soil erosion control, farmland fires control, farmland water sources conservation)
 - Food security
 - Labour sharing arrangement
 - Major traditional ceremonies and practices (girl's initiation rites, traditional dances etc)
 - Major political events
10. What is the influence of the noted changes in the rest of the events on land degradation (soil erosion, farmland fires and degradation of farmland water sources)?
11. What cause the changes?
12. What is being done to ameliorate any undesirable changes?
13. How do you foresee the practices to be like in the future?
14. Draw a resource map delineating among others private land, common land, village/public land, open access land, forest and water resources; and their estimated sizes with respect to each other
15. How do you describe the land characteristics: abundance/scarcity (estimated size per person, access to additional piece of land, land conflicts and causes), slope...
16. What effect do these characteristics have on state of the land (productivity, erosion...)?
17. How do you respond to the situation (land characteristics, also state of the land): preferences, choices, practices, institutions...

Thank you for your participation

Appendix 4: A copy of the checklist of themes used for in-depth interviews with key informants

1. Describe the functioning of the major institutional arrangements [land tenure, labour sharing (*ubava*), traditional ceremonies (girl's initiation...), norms related to resource use, traditional land conflict resolution, farmland water sources management, farmland fire control, traditional measures against soil erosion] and formal institutions like environmental by-laws
2. How does each of the institutional practices influence land degradation and management? Consider the influence on agents (actors) which then affects their interaction with the land (soil erosion, farmland fire and farmland water sources)
3. How do soil erosion, farmland fires and farmland water sources degradation change with time?
4. How do you describe the physical attributes of the land (slope, abundance or scarcity...)?
5. What effect do these characteristics have on state of the land (productivity, erosion, proximity to water sources and forest reserve...)?
6. How do people respond to the situation (land characteristics, also state of the land): preferences, choices, practices, institutions...
7. How has each of the institutional arrangements evolved over time?
8. How are the institutions related with each other? Do you see that as synergetic or conflictive?

Thank you for your cooperation