THE ROLE OF LOCAL INSTITUTIONS IN REGULATING RESOURCE USE AND CONFLICT MANAGEMENT: THE CASE OF USANGU PLAINS, MBALALI DISTRICT, TANZANIA.

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ABSTRACT

Recent development in sustainable natural resource management advocates decentralization of power and responsibilities to local level institutions. Sustainable resource management in Tanzania is basically dependent on the peasants at the local level. Given this reality therefore, the role of local institutions and their effectiveness in resource use and conflict management are decisive in bringing about sustainable natural resources management. This study examined the role of local institutions in regulating resource use and conflict management in Usangu. Specifically the study investigated land use practices in the study villages; land use conflicts and their underlying courses; and the role of local institutions in regulating resource use and conflict management. The study was conducted in two phases. Phase one involved Participatory Rural Appraisal. The second phase involved a structured questionnaire survey as a major tool for data collection. Participatory observation and secondary sources were used to gather supplementary information. Data collected through PRA in phase one were analyzed with the help of the participants. The Statistical Package for Social Sciences was used to analyze quantitative data generated by questionnaires. The study revealed the existence of land use conflicts in the area. These conflicts centered on competition for resources such as water and land between crop cultivation and livestock. The study also revealed the presence of two traditional local institutions namely: council of village elders and traditional guards and four externally sponsored local institutions namely; village council, irrigation committee, livestock association and the police. With respect to conflict resolution, the study showed that both formal and informal mechanisms played an important role in

conflict resolutions. Although village governments ranked high among the institutions encountered in the study villages with regard to conflict resolution, observations showed that village governments were not answerable to the people who elected them into offices. Most of the decisions at the village level were made outside the recognized "loci" for decision-making and some of these decisions were made contrary to the wishes of the villagers. The study concludes that, changes in land use are a function of both biophysical as well as changes in the socio-economic factors and that most of the existing local institutions are not well organized in terms of operation and management of local resources as evidenced by the prevalence of land use conflicts and unsustainable use of resources in the area. Furthermore lack of popular participation in resource use decision-making has hindered the establishment of democratic and efficient institutional arrangement at the local level to control imprudent resource use. The presence of traditional institutions such as the traditional guards and the council of village elders show that there exists institutional potential at the local-level from which new institutions could be built upon to carry out desired resource management functions. The study recommends that communities should be mobilized and be empowered to manage natural resources through education programs that emphasize the significance of human relationships with natural resources and the society based legal rights over resources. The study also recommends that new roles and functions of existing local institutions be developed and that there is great need to evaluate the performance of state rice farms and Usangu game reserve projects whether or not they are economically and socially viable. If not, the government should consider giving these areas to the local people, as a way of easening the conflicts between different land use.

DECLARATION

I AGREY JOB THOMAS MBWILO do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work and has not been submitted for any degree award in any other university.

Signature: .....

Date: 21.3.2002.

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DEDICATION

This work is dedicated to my beloved parents, Job Mbwilo and Atuvalesyaghe Ngwavi who laid the foundation for my education.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS

CPRS	-	Common Pool Resources
CRDB	-	Cooperative and Rural Development Bank
FAO	-	Food and Agricultural Organization of the United Nations
NAEP	-	National Agricultural Extension Project
NAFCO	-	National Agriculture and Food Cooperation
PRA	-	Participatory Rural Appraisal
SAP	-	Structural Adjustment Program
SMUWC	-	Sustainable Management of Usangu Wetlands and its Catchment
SPSS	-	Statistical Package for Social Sciences
SUA	-	Sokoine University of Agriculture
TFAP	-	Tanzanian Forestry Action Plan
TLUS	-	Tropical Livestock Units
Tshs	-	Tanzanian Shillings
USAMBECO	-	Usangu Mbeya Cooperative Union
WCED	-	World Commission on Environment and Development

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Discussions on rural land policy in the developing countries such as Tanzania are frequently based on what Bromley (1992) terms the "myth of management". There is a mistaken notion that decisions made at policy level and translated into rules and procedures at the organizational level necessarily have the desired or intended effects at the operational level, where farm households, villages, large scale farming etc make actual land use decisions (Cramb *et al.*, 1990). In reality, the formal institutional environment created by the state may be incongruent with the often informal institutions (rules and customs) which define and guide the behavior of operating units or even if congruent, they may be imperfectly applied or enforced. The effect is often to induce behavioral responses, which increase the social cost of land management and impede the process of rural development (Cramb *et al.*, 1990). Bromley (1992) refers to this "layering" of incongruent institutional structures as "institutional dissonance". Such dissonance may arise because of differences between operating units and the state and its agencies concerning the goals of land use, or because of different perceptions of the appropriate institutional means for achieving land use goals, or some combination of the two (Bromley and Chapagain, 1984).

Divergent goals may arise for quite legitimate reasons, such as the need to balance the interests of competing groups in society or to modify individual land-use decisions which have damaging external effects. Goals may diverge because the state

has a hidden agenda involving the redistribution of benefits to a favoured elite (Dove, 1986). Such intentional redistributive policies, however, are invariably rationalized in terms of promoting the public interest. For example, the state may encourage large scale agriculture for export because this gives it excess needed to satisfy the consumption requirements of an urban elite (Dos Santos, 1970) yet the case will be urged in terms of promoting development for the nation as a whole a goal which, in itself, few will criticize.

Even with a genuine agreement on the goals of land use, still, institutional dissonance may arise because of different notions of the appropriate means of administering land use. Limited understanding of the nature and function of traditional, local-level rules and conventions may simply be due to cultural biases at the policy level. In particular, widespread attempts during the colonial period to transplant western economic institutions (especially western system of land tenure) have been notoriously disruptive of traditional social organization (Cramb and Wills, 1990). Western institutional models often continue to dominate the thinking of policy makers in developing countries such as Tanzania.

Ironically, the very institutions imported from the west and imposed on local populations were themselves in many cases derived in an evolutionary way out of the unwritten customs and conventions of western farmers, villagers, guildsmen, and others (Commons, 1924 in Cramb and Wills,1990). Noting these origins of institutions in Anglo-American tradition, Parsons (1962) in Cramb and Wills (1990)

has argued that in the developing countries, ways must be found to build onto and modernize traditional practices and not merely attempt to replace these practices by imported ones. More recently, Bromley and Cernea (1988) have also argued that local-level perceptions should be given greater prominence in planing technical and institutional change.

In Tanzania, land belongs to the state. It is divided into three tenure categories for administrative purposes: Village land, reserved land and general land. Since all land belongs to the state, it is the responsibility of the government to direct land development efforts. It is also its responsibility to protect the land resources on behalf of the land users by formulating appropriate policies to guide both land resource utilization and conservation. Before the recent changes under Land Act of 1999, came into force in Tanzania, discrepancies between tenure categories have existed and widened. On a number of occasions development efforts had inconvenienced the rural population in the general lands. One shortcoming of these land tenure policies and legislation had been the virtual exclusion of pastoralists' and agropastoralists' rights to grazing lands and water rights.

This exclusion has contributed towards the current land use conflicts between pastoralists and agriculturists.

Usangu valley is one of the areas where pastoralists from traditional livestock keeping areas have been moving into since 1950s. The human population in Usangu plains has grown from 31,000 in 1948 to its present figure of approximately 210,000 (SMUWC, 2000). Along with this increase there have been a change in ethnic

composition. The population now is multi-ethnic and multi-cultural, in which the indigenous Sangu are a small minority. The period from 1970 to late 1980 is said to have been the main period of growth in pastoral population. The general perception is that, livestock keeping presents a problem in Usangu, resulting in environmental degradation and increasing conflicts with settled population. The issue of conflict arises from the multiple use of resources (water, land etc) for subsistence and commercial production in the context of rapid economic change. The valley is important nationally for its water, which feeds into the Mtera reservoir for generation of hydropower, and also the Ruaha National Park derives its water from Usangu plains. Locally, its natural resources are the main source of livelihood for subsistence cultivators and agropastoralists from diverse ethnic groups.

Tanzania, like other developing countries is faced with problems of increasing human population and hence conflicting demands for the natural resources which have led to major resource degradation (Luoga *et,al.*, 2000). Historical and current land use changes coupled with existing complex socio-economic interactions among cultures, traditions, economies, and ecologies have had significant effects on rural communities. Conflicts over resource access and use profoundly affect local livelihood systems (Mvena *et al.*, In press). These conflicts provide a lens for understanding social institutions at the local level. They also facilitate the exploration of fundamental cleavages in the social fabric within local communities as well as between such communities and the outside world (Slayter, 1992).

1.2. Problem Statement and Justification

1.2.1 Problem Statement

It is generally recognized that local institutions in Tanzania have been instrumental in natural resource management and rural development at large. Most of these institutions were sustainable over periods of hundreds to thousands of years (Pretty, 1990). Local groups established detailed management measures for sustainable use of natural resources; they provided support and mutual help through sharing arrangements; and they took communal decisions against individuals who attempted to over consume or under-invest in Common Pool Resources (CPRs). Local regulations or by-laws, covered a wide range of activities and potential resource users, and provided for controlled and sustainable use of resources (Pretty, 1990).

Without realizing this reality, both colonial and independent state governments in Tanzania have routinely "suffocated local institutions" in the pretext of modernization. Local management strategies have been substituted for by the state, leading to increased dependency of local people on formal state institutions. Resources have undergone a management change from autonomously devised local resource management system to custodial management by the state in a uniform, centralized and bureaucratic system (Sarin, 1993).

In Tanzania, post-independence local structures such as Ujamaa villages were designed to represent a bottom-up approach to development, but were in essence conduits for channeling propaganda and development ideas from the state to the

local- level. "Ujamaa villages", largely failed in most parts of the country as a result of lack of local legitimacy and institutional overlap with the persisting traditional structures (Kajembe and Kessy, 2000)

The imposition of non-indigenous structures, which grouped (often socially unrelated) villages according to administrative convenience, also devalued and weakened local institutions. State control over resource management powers eroded the legitimacy and traditions of collective decision-making. These changes in institutions have caused a progressive alienation of local people from the land, and weakened the traditional community resource management systems (Sarin, 1993; Katerere *et al.*, 1999). This has led to increased resource degradation and decreased capacity of local people to cope with environmental and economic change and hence increasing resource use conflicts.

1.2.2 Justification

Sustainable resource management in Tanzania is basically dependent on the peasants at the local level. Given these circumstances, therefore, the role of local institutions and their effectiveness in natural resource management and conflict resolution are decisive in bringing about sustainable resource management. It is the contention of this study that, although there are potential institutions at the local level, little has been done to exploit this vast institutional potential. Through historical analysis of institutional change in Usangu, and the examination of existing land use practices, land use conflicts and the role of local institutions in the management of resources

and emerging conflicts, it is hoped to obtain a clear understanding of the situation at the local level and consequently be able to suggest some policy reforms

1.3 Objectives

1.3.1 Overall objective

The overall objective of this study was to examine the role of local institutions in regulating natural resource use and conflict management.

1.3.2 Specific objectives

Specifically this study intended to:

i) Analyze institutional changes that have taken place in the area.

ii) Examine the nature and type of existing land use practices

iii) Identify main land use conflicts and their underlying causes.

iv) Identify major local institutions existing in the area and their role in regulating resource use and conflict management.

1.4 Conceptual framework

The conceptual framework in Figure 1 shows that physical and institutional (including cultural) environments define the choice of possible strategies from which stakeholders can decide in the quest to sustain socio-economic welfare. Stakeholders make decisions and devise livelihood strategies that are based on their perceptions of the environments as exogenous variables-that are fixed over a short run. A number of autonomous and independent groups with fundamentally different values,

perceptions and objectives demand a role in decision making about the natural resources management outcomes.

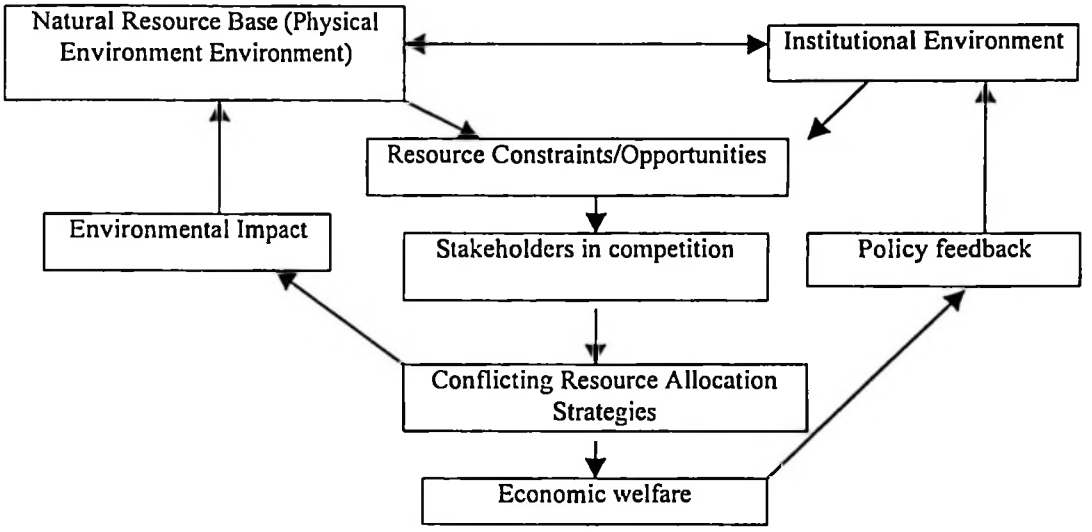

Figure 1: Conceptual framework

When the boundaries of a resource are ill defined they become a source of conflict, which in turn spreads to disagreements over who are the relevant stakeholders. In this case the institutions that deal with these resources need to evolve towards more flexible, resilient and adaptive ways of responding to situations in which definitions of stakeholders, boundaries, and the problems need to be agreed upon.

The growing demand for finite or renewable natural resources to satisfy the needs of different stakeholders is a common source of conflicts. As resources become scarce, different interests cannot be fully met. Faced with such a situation, stakeholders tend to make choices about how best to pursue their individual interests (conflicting resource allocation strategies). This will in turn exert pressure on natural resource

(physical environment) and also will affect the economic welfare of the stakeholders. Such a situation will force stakeholders to form alliances, both as bargaining tools and as means of striking new institutional arrangements.

1.5 Research questions:

Based on the specific objectives the following questions guided the research

i) What are the basic land use types in the study area?

ii) What are the main causes of land use conflicts in the study area in respect to agriculture and livestock production?

iii) What are the existing institutions for regulating resource use and conflict management?

iv) What are the institutional constraints to sustainable resource management in the study area?

1.6 Research hypotheses.

In order to determine the relationship between land use conflicts, institutions controlling resource use and general land use, the following hypotheses were tested:

i) Socio-economic factors influence land ownership and hence contribute towards land use conflicts.

ii) Although local institutions are in place in the study area, their roles and functions in respect to local resource management are not clear.

iii) Crop- livestock integration is lacking in the area

1.7 Study limitations

Most herders did not like to reveal the number of animals they own, for reasons well known to themselves. Therefore the numbers indicated in this study are near approximation of reality. They are of interest for the purpose of comparison. Also there were some difficulties on part of the respondents in estimating the size of their farm holdings. However, with the help of the accompanied extension staff it was possible to make more reasonable estimates for the purpose of comparison.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Land use problems

2.1.1 Global perspective of land problems

According to WCED (1987), human activities have radically reshaped the land natural cover in many places. Vast areas of forests have become pasture and croplands, rangelands have been change to croplands or to deserts, and natural wetlands have been drained and filled in order to feed and house expanding populations. These human activities have drastically changed the balance of land availability and consequently land use itself.

Globally, the apparent trend of accelerating environmental degradation has primarily been driven by land use changes as a consequence of frontier expansion and population growth (Richards, 1990). One important land use change is that the world's forests, grasslands and woodlands have declined. The cropped-land area has expanded in the same magnitude. Increased productivity of labour in exploiting land through the application of capital and technologies has been the major driving force for these land use changes. The agricultural revolution and the opening of frontier land in particular, may explain the conversion of land from natural to agricultural use. Global human population has increased more than seven-fold from 0.6 billions in 1700 to 4.43 billion in 1980, causing much pressure on resources (Adger and Brown 1994). Generally land use change is a continuous process, evolving process,

and is the single most important manifestation of human interaction with the biosphere. The scale and rate of change of land use is greater now than at any time in history due to rapid technological change and population growth.

History shows that people have always been more or less concerned with the adequacy of their food supplies. Experience with the pangs of involuntary hunger has always made them food conscious, a condition well expressed by the first request in the lords prayer; "Give us this day our daily bread". This concern over food adequacy has been tempered somewhat in the Western World during modern times. But still remains a chronic problem in many parts of the third world including Tanzania (Mwagile, 2001).

Land use is a necessary first step for securing most of the products we reap from land resources. Our basic motivation for resource use stems from the human urge for survival and from our desire to secure something more out of life than food and shelter needed for subsistence. As asserted by Barlowe (1986) we use resources because we must and because the products of development can add substantially to the utilities and satisfactions we secure from life (Barlowe, 1986).

Until the twentieth century, traditional land use was and by large in harmony with the environment. That was because over the centuries, societies had developed their own social customs and regulations, which ensured sustainable use of land-based natural resources from one generation to the next. Individual land use practices were governed by those customs and regulations in such a manner that they were considered socially acceptable (Kowero, 1990).

The rapid population growth and development in technology have weakened the traditional land based natural resource management systems. This resulted into a disparity between consumptive and optional use of land-based natural resources. Traditional practices are no longer adequate to support today's high population density. Moreover traditional systems have a rather too limited capacity to absorb new technologies due to poverty and at times low level of literacy (Kaoneka, 1993).

2.1.2 A review of land use studies in Tanzania

Mnzava and Riibinen (1989) observed that, the major land use in Tanzania is agriculture. Thus the authors hypothesize that agriculture is the main cause of ecological degradation. In particular, agricultural activities contribute towards environmental degradation through irrational and inefficient use of natural resources. Further it was observed that one way of readdressing the problem of ecological degradation caused by agricultural practices is to develop "appropriate and organized agricultural systems". However such measures are likely to be constrained by several problems including: inconsistent and incomprehensive political decisions; improper legislation and related organizational and institutional set up; deficiencies in pricing mechanism (which removes economic incentive for efficient land management practices); and lack of responsibility due to the absence of land ownership and property rights especially on the general lands (Mnzava and Riihinen 1989). The net effect of these factors is the continuation of land degradation due to abuse and/or misuse of natural resources.

Jerve (1990) based on Rukwa and Shinyanga cases contend that, the agriculture sector in Tanzania has not played a leading role in development to its fullest capacity. There is an increasing pressure on the exploitation of natural resources caused by population growth and inefficient land husbandry. Furthermore, policies and programs initiated by the government and donor agencies have accelerated rather than contain or minimize land degradation. The deficiencies are due to coercive, blue print and centralized agricultural policy (Jerve, 1990). In this regard the author argues that it could be appropriate to readdress the problem by adopting participative processes as opposed to coercive and blueprint administrative approaches

Kowero (1990) observed that existing land ownership pattern viz. customary and institutionalized law causes land use problems in Tanzania. A deficiency common to both systems is the absence of ownership of land by individuals, hence absence of "private property". Whilst such public system of land ownership facilitated the creation of government forests reserves and plantations it deprived individuals of the incentive to manage agricultural lands on a sustainable basis to the extent that there was no provision or guarantee for long-term ownership.

Mwalyosi (1990) in a study in the lake Manyara basin hypothesized that proper utilization of the resources and environmental conservation depends largely on the people's perceptions of keeping a sound ecosystem. In turn the correct perception lead to proper land use practices. The study attempted to analyze the historical trends in land use. Findings from the study showed that there was a high rate of

deforestation caused mainly by direct utilization of fuelwood and building materials and the expansion of cultivated land area. The study showed that over the years livestock per household had decreased forcing pastoral societies to cultivate crops thereby contributing to further expansion of cropland at the expense of grazing lands. The strategy proposed by the author include control of population growth, improving the existing land tenure regislation and the provision of techno-economic services that are sensitive to existing local ecological capabilities, and raising the carrying capacity of the affected areas.

Mitlzlaff (1991) based on a study in Mbulu district, attributes land use problems to lack of responsibility on the part of villagers and absence of enthusiasm on conservation of natural forest reserves. This negative attitude is cultivated by the perceived danger to villagers' crops and livestock from wild animals. Furthermore, villagers feel that conservation of forest reserves deprive them of property rights to the extent that they are owned by the government. This resentment and mistrust of the government renders villagers irresponsible of the management of forest reserves. The author concludes that forest utilization, forest conservation and agricultural land must be treated as complementary entities in order to stimulate the participation of villagers.

The studies reviewed above indicate the existence of considerable land use problems in the country. The dimensions of the problems vary by geographical location especially due to the vastness of the country. Thus measures to redress the problems

related to land use may vary from one place to another. Furthermore land use is influenced by a number of factors such as, family size, age, education, and cultural background. In the following section a review of these factors is presented.

2.1.2.1 Factors influencing land use

Our overall demand for land resources finds its roots in the needs and aspirations of the many individuals who make up society. People have different wants and desires. Up to a point, every one is concerned with the physical needs to secure sufficient food and other materials to sustain household needs. Beyond that, demand for land resources is influenced by people's knowledge of how resources can be used, their cultural and educational background, individual tests and personal goals, and by changing attitudes that come with advancing age. Each of these factors helps to condition the overall resources demand picture.

2.1.2.1.1 Household size

Some of our basic actions and attitudes concerning the natural resources and their use reflect our conditioning by household. Households involve social systems of privileges, joys and responsibilities. They have an extremely important impact on the economic behaviour, because in most cases it is households rather than single individuals that operate as a planning and resource using units (Barlowe, 1986). Individual operators take the responsibility for making decisions, but the decisions they make are tempered by their concern for support, comfort, well being and future welfare of their household members. Household goals provide incentives for the development and use of land resources.

2.1.2.1.2 Education levels.

Our actions and attitudes concerning the use of natural resources reflect our conditioning by education systems. Education is an appropriate means for preparing our children and us for participation in and enjoyment of modern life (Barlowe, 1986). People go to school to enhance their income producing abilities and to develop understanding and appreciation of how the physical world and human societies operate. Education teaches us how to make a living by preparing us to function as skilled workers. It teaches us how to live and appreciate life. It has affected resource use by raising individual aspirations, facilitating the development of technology, and pointing the way for better resource management. Maro (1995) contends that education on the other hand, plays an important role in socio-economic development of a particular society. As a tool of transfer of knowledge and experience, education system is reported to foster human creativity, and has hence been reported to influence farmers readiness to integrate innovations into traditional systems of land use and management (Maro, 1995).

2.1.2.1.3 Cultural background

Cultural background affects the use of land resources in many ways. Most pastoralists; Maasai for example, have a customary preference for varied diets that are rich in animal products. As a result, large areas of pastureland are used to graze their livestock. Culture can have a direct as well as indirect effect on the ownership and use of land resources. Farmers may cling to customary (cultural) practices, even when improved practices are brought to their attention. For example, Kikula *et al*

(1991) noted that the Sukuma own large numbers of cattle and they are notoriously reluctant to reduce herd size in favour of agricultural expansion. According to the same author cattle are a bulwark of both the economic and social structure of the tribe and explain much of the difficulty associated with improvement of livestock management in Sukumaland. Rigid adherence to custom can lead to inefficiencies in production and loss of potential income for the users of land resources (Barlowe, 1986).

Land resource inheritance, rental and ownership arrangement is also affected by culture. Our emphasis on equal division of land among heirs of equal relationship for example is based on culture. Maro (1990) contends that, among the Sukuma, men are entitled to land and cattle ownership, while women are deprived of decision making in the household. Odgaard and Maganga (1995) noted that among the Sangu, Hehe, and Bena customs. a man must provide his wife or wives with a piece of land whereas no provisions are made for children and unmarried women. Similarly, the high regard with which we view home ownership owe much of its basis on traditional habits of thought (Barlowe, 1986).

Many possible practices are discouraged in tribal societies because they are regarded as taboo. Some of these taboos, such as those against eating certain kinds of food or working on certain days of the week, have indirect effects on land resource use (Barlowe, 1986). Another type of taboo is accepted in India, where the Hindu belief in transmigration of souls has resulted in the toleration of large local populations of

cattle and monkeys. The refusal of local people to keep the numbers of these animals in check has at times contributed to losses in agricultural productivity. In ancient times particular sites were often regarded as holy places. Burial grounds also have been maintained for cultural reasons; and significant areas of potentially productive land in many countries are retained in this use. Most early civilization had agrarian diets. Sacrifices were offered and special rituals held to celebrate harvests, and feast days were held throughout the year. This picture has changed in most countries. But cultural festivals still punctuate the lives of many people (Barlowe, 1986).

Many of the cultural beliefs that have influenced our use of land resources in the past have been discarded. Yet beliefs such as the golden rule, respect for authority, and faith in the future still have strong impact on human behaviour.

2.1.2.1.4 Land tenure

"Tenure" can be defined as either the full and exclusive ownership of resource or the right to use without owning it (usufruct), or something between the two. Some limitations and controls rest on custom and conventions and are based on group protection, others rest on legislation and aim at realizing certain individual or community needs. Tenure rules being a result of existing social relations are always in a state of dynamic change. As social relations change, so do the interpretations or existing tenure rules, and new rules are created (Riddel, 1988 in Kajembe, 1994). In Tanzania all the land is officially held by state and a persons rights to land are dependent on the use they make of it. As land is not a commercial commodity,

theoretically, no private sales can be transacted. In practice, however, land is inherited, exchanged, purchased, sold and leased (Kajembe, 1994).

What characterizes land tenure in Tanzania is the existence of two parallel tenure systems namely customary (use) rights and statutory (ownership) rights. The official laws apply mainly to the communal fields, while the traditional tenure rights are still valid for most individually held land. In pre-colonial times there was no formal authority in charge of land allocation because land was plenty. Tenure rights were based on the principle of occupancy and membership in a community. During the colonial period, persons holding the administrative posts of chiefs and sub-chiefs became responsible for allocating land to those who asked for their assistance. It appears that land allocation to indigenous small holders was not a big issue in practice and did not fall within the routine work of the chiefs. The chiefs, however, were called upon to mediate and settle disputes concerning land tenure conflicts, which could be quite common in some areas (Kajembe, 1994).

The village and Ujamaa Village Act of 1975 is the major policy document formulating the official policy towards land tenure. People were moved into village centers and allocated new land within the village as a territorial unit. It is important to note that the allocation of land made at the inception of villagization and afterwards was based upon witnessed verbal agreements. A couple of years ago a number of villages experienced a surge of people reclaiming their former lands on the basis of customary rights or pre-operation tenure. To stop things from getting out

of hand the government passed an act (Act No. 88 of 1987), giving legal precedence to statutory law as implemented during the villagization period and later by village councils. The overall trend in the country seems to be towards a "progressive extinction of customary land law."

In most traditional systems all lands were claimed either privately or communally. The concept of "vacant" or unclaimed land has been introduced by colonial governments, and applied especially to forest lands, since maps of these areas were often based on surveys done only in one season missing for example the pastoralists who were transhumance (Noronha & Lenthem, 1983 in Kajembe, 1994). Although in the local societies in the tropics, traditionally the land belongs to the tribe or clan, a member's rights to its resources, may be based on continual exercise of those rights. If any area is abandoned then it reverts to the communal property of the social unit and can in principle be used by any other member. Regulated access to and ownership of resources thus exists in the tropics, and is recognized by neighbours, but in the absence of legal titles, it has to be continuously exercised and defended against intruders or usurpers (Kajembe, 1994).

2.1.3 Property rights and sustainable resource management

Different bundles of property rights affect the incentives individuals face, the type of action they take, and the outcomes they achieve. An ideal property right regime gives the owner, incentives for efficient resource allocation in the meaning that, the available input factors are used so that they give the highest possible output. The role

of property rights in resource management and utilization is crucial, because the lack of some basic characteristics of property rights such as proper definition, exclusiveness, security, enforceability, and transferability in local land markets is probably the single most important cause of problems related to natural resources for local consumption such as fuelwood (Sharma, 1992 in Monela, 1995). Property rights problems are also a root cause of environmental problems. Ill-defined property rights provide pervasive disincentives against resource conservation (Bromley and Cernea, 1988). Insecure land tenure reduces incentives and encourages preference for current consumption over future consumption (Feder and Noronha, 1987).

A number of recent attempts to move land tenure from centralized control to more local or private control have demonstrated the efficiency gains that are possible (Spears, 1988; Sharma, 1992; cited in Monela 1995). However, the specific property right regimes that should be implemented are site specific. In small, self-sustaining rural communities, where strong traditions of community or tribal management of resources exist, and where population and other external pressures are mild, community management of resources may be appropriate. Traditional common property has been used successfully throughout history to manage resources on a sustained basis (Ciriacy-wantrup and Bishop 1975; Runge, 1981). Common property institutions continue to be observed, for example, on Swiss grazing lands and elsewhere in Europe (Rhodes and Thompson, 1975).

Lack of some basic characteristics of property rights such as proper definition, exclusiveness, security and enforceability is also a major cause of resource use conflicts prevalent in most parts of the rural areas. In the next section a review of resource use conflicts is presented.

2.2 Resource use conflicts

Conflict over natural resources such as land, water, and forests is ubiquitous (Anderson *et al.*1998; Ayling and Kelly, 1997). People everywhere have competed for the natural resources to enhance their livelihoods. However, the dimensions, level, and intensity of conflict vary greatly. Conflict over natural resources may have class dimensions, pitting those who own the resource against those who own nothing but whose work makes the resource productive. Political dimensions may dominate where the state has a keen interest in public good such as conservation (Fisher *et al*, 1999) or in maintaining the political alliance it needs to remain in power (Suliman, 1999). Difference in gender, age, and ethnicity may influence the use of natural resources, bringing to the fore cultural and social dimensions of conflict (Hirsch *et al*, 1999).

Conflict over natural resources can take place at a variety of levels, from within the household to local, regional, societal and global scale. Conflict occurring mainly in local contexts may extend to national and global levels because of their special legal relevance (Talaue-McManus *et al*, 1999), or as a result of efforts by local actors to influence broader decision-making process (Oveido, 1999).

The intensity of conflict may also vary enormously- from confusion and frustration among members of a community over poorly communicated development policies (Kant and Cooke, 1999) to violent clashes between groups over resource ownership rights and responsibility. With reduced government power in many rural areas, natural resource management decisions are increasingly influenced by the resource users, who include small-scale farmers, pastoralists, large-scale landowners, and private companies such as forestry industry, mining, hydropower, and agribusiness. Resources may be used by some people in ways that undermine the livelihood of others. Power differences between groups can be enormous and the stake a matter of survival. The resulting conflicts often lead to chaotic and wasteful deployment of human capacities and the depletion of the very natural resources on which livelihoods, economies, and societies are based.

De pauw (1995) contends that, resource use conflicts are on the increase in Tanzania. According to the author, the root cause for the increased conflicts over land use is the increase of the human population, which has doubled over the last 25 years. The author further observes that, the main current land use conflicts at a micro-scale is situated between crop production and pastoral livestock systems. For example Lane and Moorhead (1994) documented a land use conflict resulting from alienation by the government of more than 40,000 ha of prime grazing land from the Barabaig pastoralists in Hanang district to develop-large scale parastatal wheat farms. In the process, the Barabaig grazing systems collapsed and severe environmental degradation resulted. Kahurananga, (1995), pointed out increased land acquisition by

large-scale farmers, using the unoccupied nature of pastoral lands as a pretex to set out claims. Similarly, large tracts of land in the center of Tanganyikan maasailand were taken over by settlers and converted into beef ranches, wheat schemes and smallholder farms (Arhem, 1995).

Land use conflicts arise also at the interface between urban and rural areas (De Pauw 1995). This is at present mainly the case in some highly settled areas, such as Kilimanjaro, where the legitimate need for expansion are hampered by very high population density and land shortage in the surrounding rural areas.

Barlowe (1986) pointed out that, competition among individuals and among land uses also has its impacts on land resource supplies. The author urged that in the competition that takes place between individual operators and between uses, resource normally go to those operators and uses that offer the highest prices and enjoy the greatest prospects for their remunerative use. This fact of resources always moving to its highest and best use is generally operative, but it does not operate as smoothly and perfectly as it might (Barlowe, 1986). Many land uses are not compatible, and operators frequently have different combinations of interests and objectives that cause them to assign different weights to the private and social benefits associated with alternative land uses. Conflicts of interest are a frequent result (Barlowe, 1986).

The use of natural resources is susceptible to conflicts for a number of reasons. First, natural resources are embedded in an environment or interconnected space where

actions by one individual or group may generate effect far-site. Second, natural resources are also embedded in a shared social space where complex and unequal relations are established among a wide range of social actors such as agroexport producers, small scale farmers, ethnic minorities, government agencies, etc. As in other fields with political dimensions, those actors with greatest access to power are also able to control and influence natural resource decisions in their favour (Buckles and Rusnak, 1999).

Third, natural resources are subject to increased scarcity due to a rapid environmental change, increasing demand, and their unequal distribution (Homer-Dixon and Blitt 1998). Environmental change may involve land and water degradation, overexploitation of wildlife and aquatic resources, extensive land clearing, drainage or climate change. Increasing demands have multiple social and economic dimensions, including population growth, changing consumption patterns, trade liberalization, rural enterprise development, and changes in technology and land use. Natural resource scarcity may also result from unequal distribution of the resources among individuals and social groups or ambiguities in the definition of rights to common property resources. As noted by Holmer-Dixon and Blitt (1998), the effects of environmental scarcity such as "constrained agricultural output, constrained economic production, migration, and disrupted institutions, can either singly or in combination, produce or exacerbate conflict among groups".

Fourth, natural resources are used by people in ways that are defined symbolically. Land, water and forests are not just material resources people compete over, but are also part of a particular way of life (farmer, fisher, logger, and pastoralists), an ethnic identity, and a set of gender and age roles. These symbolic dimensions of natural resources lend themselves to ideological, social, and political struggles that have enormous practical significance for the management of natural resources and the process of conflict management (Chevalier and Buckles, 1995).

Because of these dimensions of natural resource management, specific natural resource conflicts usually have multiple causes – some proximate, others underlying or contributing. A pluralistic approach that recognize the multiple perspective of the stakeholders and the simultaneous effects of diverse causes in natural resource conflicts is needed to understand the initial situation and identify strategies for promoting change.

2.3 Institutions and their role in natural resource management

2.3.1 Defining institutions

Institutions may mean different things to different people under different situations. They may be formal or informal. North (1990) defines institutions as the rules of the game in a society or, more formally, as the humanly devised constraints that shape human interaction. In consequence they structure incentives in human exchange, whether political, social, or economic.

North (1990) distinguishes between institutions and organizations. Although, according to him, organizations, like institutions, provide a structure for human interaction, this structure consist of human beings, while the other is composed of laws and rules. To him organizations include political bodies such as (political parties, a city council, a regulatory agency), economic bodies (firms, trade unions, family farms, and cooperatives), social bodies (churches, clubs and athletic association), education bodies (schools, universities and vocational training centers).

Ostrom (1992) defines institutions as the set of rules actually used by a set of individuals to organize repetitive activities that produce outcomes affecting those individuals and potentially affecting others. The author distinguishes between institutions and organizations by emphasizing the visibility of organizations. To the author, organizations are visible and measurable (consist of human beings), while rules in use by organizations consist of common knowledge (which people have in their heads) or those that are written down on paper.

Rutan (1989) defines institutions as rules of society or organizations that facilitate coordination among people by helping them form expectations, which each person can reasonably hold in dealing with others. They reflect the conventions that have evolved in different societies regarding the behaviour of individuals and groups relative to their own behaviour and the behaviour of others.

Different authors have used quite different definitions, each emphasizing quite different aspects or characteristics of the more general phenomenon. In any case, in most definitions there appear to be three more or less explicitly stated characteristics, which may be considered basic to the concept of social institutions. The first such characteristic is the rules and constraints nature of institutions. Ostrom (1986) has defined these rules and constraints as prescriptions commonly known and used by a set of participants to order repetitive, interdependent relationships. Prescriptions refer to which actions are required, prohibited or permitted. It is important in terms of institutional analysis to consider the configurations of rules rather than single rules separately. It is as sets or configurations that rules are considered as basic characteristics of institutions.

The second characteristic of institutions is their ability to govern the relations among individuals and groups. Whether they are "voluntarily" accepted through custom or tradition or are enforced and policed through an external authority and a coercive incentive system. To serve an institutional role these rules and constraints have to be applicable in social relations. The third characteristic of institutions is their predictability. The rules and constraints have to be understood, at least in principle, as being applicable in repeated and future situations. Agents should expect these rules and constraints to have some degree of stability; otherwise, they would not have an institutional character (Nabli and Nugent, 1989).

In this study an institution is defined as a set of constraints which govern the behavioural relations among individuals or groups. A formal organization such as an irrigation committee is an institution because it provides sets of rules governing the relationships both among its members and between members and non-members. Cultural rules and codes of conduct are institutions in so far as they, too, can constrain the relationships between different individuals and/ or groups.

2.3.2 The role of institutions in natural resource management

The importance of local institutions in natural resource management has been mentioned frequently. Since 1970s writers like Ciriacy-wantrup and Bishop (1975) have emphasized the importance of considering institutional aspects in resource management. Institutions and their importance in natural resource management have also, been made a subject by Pretty (1995) and an important feature in Ostrom's work (1992, 1996,1986). All these writers make a plea for the importance of understanding the local environment and in particular the relevant institutions for proper design of resource management.

The economies of many countries including Tanzania are undergoing a transition from central planning and control to a free market orientation. These changes are positive in that they present opportunities for development through free entrepreneurship. However, they can also pose a danger for small producers. Structural adjustment programs have often brought hardship to the poorest strata of the population in developing countries (FAO, 1993). From structural adjustment

policies, many structures of the rural world have to define or to redefine their roles. The various structural adjustment programs have drastically reduced the responsibility of central governments to intervene in the rural areas through extension services, cooperatives etc. as was the case before the programs.

With the adoption of liberalization policy in all sectors of the economy, private companies such as, forestry industries, mining, hydropower and agri-business may pursue policies and practices, which will not necessarily be in the interest of the majority of the rural population. The capacity of these people to organize themselves will determine their capacity to defend their land, their share of the markets, their access to input and finally their access to knowledge. Local institutions have always been a central feature of rural development programs. This central importance is derived from the conviction that organization is vital as a mechanism by which rural people can get involved in rural development activities. Institutions have a crucial role in establishing expectations about the rights to use resources in economic activities and about the partitioning of the income streams resulting from economic activity. They provide assurance respecting the actions of others, and give order and stability to expectations in the complex and uncertain world of economic relations (Runge, 1981).

Institutions are critical at all levels of human interaction. This is in part because in the world of limited and uncertain information, individuals must make guesses as to the likelihood of behaviour being sanctioned or rewarded. Those guesses are

complicated by how widely problem and policy areas vary in scale, cost, input, technology and the numbers and preferences of other people involved. Under such uncertainty, political institutions and effective leadership, which help translate problems into policies, are essential (Wunsch, 2000). Institutions are necessary to guide political decision-making along procedures regarded as just and fair, to define certain outcome sets as acceptable and unacceptable, to clarify just who has a right to participate in which decisions, to assure and re-assure people that future decisions will be made predictably and not randomly, and to specify what sort of citizen obligations might and might not be incurred. Institutions are furthermore a mechanism to structure politics along productive lines (avoiding prisoner's dilemma games), and to ground politics in norms (Ostrom, 1986a, 1986b). Pretty (1995) indicated that all good cases of environmental regeneration are invariably those cases where voluntary agencies have set up an effective institution at the village level. The author contend that it is the creation of the village level institutions which brings people together, spurs them into action and ensures the protection and development of natural resource base

The Gal Oya irrigation scheme in SriLanka provides some of the best evidence for the success of local groups and how they can best be established. Over the years, dramatic and lasting changes in the efficiency and equity of water use have been made (Uphoff, 1992,). Despite of many difficulties, including ethnic conflict, budget cutbacks, and bureaucratic interference, farmers associations have maintained themselves and progressed institutionally. Water use efficiency has improved

significantly and yields raised to about 50 percent over a large area. Uphoff (1992) contend that this is because of the particular process of group formation and development itself.

Wunsch (2000) reports on recent research by Ottemoeller (2000) in Uganda and Fass (2000) in Chad, illustrating the potential of local political institutions. Building on local norms of representation, and responding to felt needs for such goods as education, security and conflict management, rural and village dwellers in each country have constructed new local institutions that are effective in raising and delivering collective goods. These local political institutions employ personnel, levy and collect taxes, keep accounts, maintain buildings, manage programs, hear and settle civil cases, and raise local police forces that protect communities. Similarly, Olowu (1993) found great vitality and energy emerging in local governance in its recent reincarnation in Nigeria. The contrasting cases are instructive as to what can be accomplished via local political institutions in Tanzania, and what tends to stand in their way.

Uphoff (1992) lists some of the areas where institutions might play a role in natural resource management as follows:

- Mobilizing resources and regulating their use;
- Generating and interpreting location-specific knowledge;
- Facilitating quicker and less costly monitoring of changes in the status of resources;

- Conditioning peoples behavior through community norms and consensus;
- Conflict resolution: and
- Encouraging people to take a long-term view by creating expectations and a bias for cooperation that goes beyond individual interests.

Institutions are commonly formed to take charge of new activities and/ or manage a new resource, such as water users associations for irrigation, water point committees to manage pumps or farmers of a common micro-catchment to control soil erosion. But such local groups do adopt and change their roles and responsibilities as internal and external conditions change.

2.3.3 Institutional innovation

A shift in the demand for institutional innovation or improvement in institutional performance may arise from a variety of sources. North and Thomas (1973) attempted to explain the economic growth of Western Europe between 900 and 1700 primarily in terms of innovation in institutional rules that governed property rights. A major source of institutional innovation was, in their view, the raising pressure of population against increasingly scarce resource endowment.

Cultural endowment, including religion and ideology, exert at least some influence on the supply of institutional innovation. Cultural endowments make some forms of institutional change less costly to establish and impose severe costs on others (Ruttan, 1989). It has been argued, for example, that the traditional moral obligation

in the Japanese village community to cooperate in communal infrastructure maintenance has made it less costly to implement rural development programs than in societies lacking such traditions (Ishikawa, 1981). Traditional patterns of cooperation have represented an important cultural resource on which to erect modern forms of cooperative marketing and joint farming activities.

Specific demand for institutional change may also arise from a set of existing constraints, institutional and otherwise. These constraints limit the accomplishment of a shared objective. They may include factor endowments, technology and population growth as well as existing barriers. Hirsch *et al,* (1999), point on the intensification of resource use among the many users of resources as the overall situation prompting institutional change.

2.3.4 Factors influencing collective action

Collective action, including establishing rules, can be expected to occur more easily when small groups tie themselves together through face to face relations and use social pressure built upon a strong sense of obligation. Vedeld (1997), comparing two villages Common pool resources (CPRs) in inland Niger found that the larger group/village has more problems in coordinating action in management of CPRs. He suggested that, although size may be one factor, which increases the problems of collective action in a particular village, other factors and relationships, especially those related to leadership, are more important in explanation of differential outcomes. His findings are supported by Ostrom (1990) who also suggest that size is

not a strong design principle for a common property regime. The author urges that 'effective leadership' can make it possible for groups to overcome problems of high group membership. Vedeld (1997) also found that heterogeneity among elite groups enhanced capacity for collective action. When heterogeneity in economic interests between elite groups intensified and coincided with other dimensions of heterogeneity, such as heterogeneity in economic wealth, access to land and common pool resources, and agreement over authority of the leadership, collective action become difficult to achieve. Collective action is also enhanced by political elites and leaders being a bit better endowed and a bit wealthier than the average community members. The coordination power of the leadership related to the management of common pool resources is undermined when leadership has extensive recourse to state officials external to the village community, underscoring the importance of autonomy. Sugden (1984) argued that the more homogeneous a community is, the more likely are optimal outcomes; the more heterogeneous, the more difficult coordination becomes.

2.3.5 Local institutions

The terms "local" or "indigenous" and "traditional" can be differentiated although many writers do not make this distinction. Kajembe (1994) gives the following definitions "Traditional" is based on an order, code of practice accepted from the past. "Local" or "Indigenous" is something originating or developing or produced naturally in a particular place (land), region, or environment. Therefore, something traditional is not necessarily indigenous.

Local institutions for regulating resource use had existed since pre-colonial era in sub-Saharan Africa (Cousins, 1995). Most of these institutions lost their authority and legitimacy during the colonial era. The subordination of customary authorities such as chiefs and headmen to repressive state apparatuses has undermined the legitimacy of these institutions (Chanley,1994). Natural resources were taken from the hands of the local people and became state lands. This act undermined the sense of local responsibility for resource management, a legacy that has proved increasingly problematic (Sarin, 1993).

Prior to colonialism, societies in the then Tanganyika had a system of governance that protected community biological and other natural resources and allocation and utilization was foreseen by tribal rules and regulations. Tribal rules and regulations regulated land uses and enforced cultivation regulations (Chamberlain *et al.*, 1998). Examples of such rules include those, which enhance productivity or protection of trees and shrubs against abusive harvesting and browsing. Kajembe (1994) describes those rules as "fairness ethics" and don't require formal enforcement since they were embodied in the moral cultures of the people. Otieno (2000) argues further that some of these rules were so fundamental, that they appeared to be taken for granted as inviolable and were widely respected by all people. Their violation when it did occur was generally resolved by social controls (Kajembe, 1994).

Kajembe (1994) contend that, informal procedures are part of the social fabric of local societies in the tropics, where kinship system and the rules and obligations set

up by the culture provide the stabilizing force. Although rules and regulations exist in a society, they are rarely explicit, and need to be interpreted to fit each situation. For example, among the Sukuma, there are general rules limiting access to certain pastures (O'kitingati and Kajembe, 1991 in Kajembe, 1994) but there is a constant argument about where and when to apply them. In most cases they use verbal persuasion, involving elaborate rhetorical arguments, in order to influence communal agreement.

Likewise, the means of enforcing rules and regulations vary among different groups. Some have local police force such as the "Sungusungu" or traditional guards in Sukumaland. (O'kitingati and Kajembe, 1991 in Kajembe, 1994). But, most local societies in the tropics rely on observations of each individual member to report transgression and trespass. Some societies impose fees and penalties for transgression of rules (Kajembe, 1994).

Given current concerns about the sustainability of natural resource use, institutional control over the land resource is highly relevant. As pointed out by Brundtland report of 1987, the sustenance of the natural resource base depends on the appropriateness, responsiveness and effectiveness of the institutions that affect land resource allocation, utilization, and management. It is important therefore to recognize and support existing institutions, promoting their re-emergency in a modified form where they have fallen away and facilitating their development in a new context (Cousins, 1995).

Slayter (1992) argues that institutional capacities are essential to manage rural resources. The author notes that, leadership, community institutions, participation and access to and control over external variables are among the most critical components explaining the success in some areas of natural resource management. He suggested that, in order to reverse resource degradation and increase production in rural areas the following conditions must be met:

(1) Strengthened capacities of community institutions to cope with external problems;

(2) Understanding the political context within which these institutions function; and

(3) Both district and regional level administration should be able to help local institutions to gain access to agencies and institutions that have the authority or funds to manage external forces.

Howes (1997), give a number of propositions about good practice. These include understanding existing institutions, utilizing available social capital, pilot testing, avoiding blue prints and modifying donor behaviour. Bromley and Verma (1983) have also argued that local-level perceptions should be given greater prominence in planning technical and institutional change. The development process as it relates to natural resource use should be designed in such a manner that the resource problems as defined by those at the village level carry significant influence vis-a-vis the problem as defined by national or foreign participants. The process must be such that the needs of the local participants are met and it must be consonant with the larger part of the existing technical and institutional structure at the local-level.

Recent Japanese and Korean history seems to suggest that new institutions, which grow out of or integrated with traditional ones, are more likely to be successful. There will, of course, be considerable adaptation and development. Indeed, some may need to be completely new, yet conceived by the local people themselves, borrowing from both local and foreign forms (Mills, 1992). For example, there are no indigenous Swahili financial institutions, which can be the basis for modern Tanzania commercial bank. But although something new is needed, it should reflect in its conception and operational procedures the values of the community, and not be simply a carbon copy of Barclay Bank. In this example, the challenge is to build on the local savings and loan associations that have sprung up in great numbers in recent years in response to modern needs, yet operate on principles which have antecedent in traditional society.

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Description of the Study area

3.1.1 Location

Usangu plains are located in the south-west of Tanzania, between approximately latitudes 7^0 41' and $9^0$25' south, and longitudes $33^0$40' and 35^0 40' east. It covers the whole of Mbalali district, which is situated in the northeastern part of Mbeya region. It borders Makete district in the south, Njombe and Mufindi districts in the southeast and northeast respectively (Figure 1). Mbarali district covers a total area of 619,212 hectares of which 572,089 ha is arable land, 500 ha are game reserve and 46,623 ha are forest reserves. The district covers 30% of the total Mbeya regional land.

3.1.2 Population

According to the 1988 national census Mbarali district had a total population of 152,882 inhabitants of which 75,465 were males and 77,465 were females. The annual population growth rate stood at 3.1%. Household size varied between 3.7 and 6.6. Larger family sizes were found in more rural areas. The population of the district was ethnically diverse, reflecting its immigrant history.

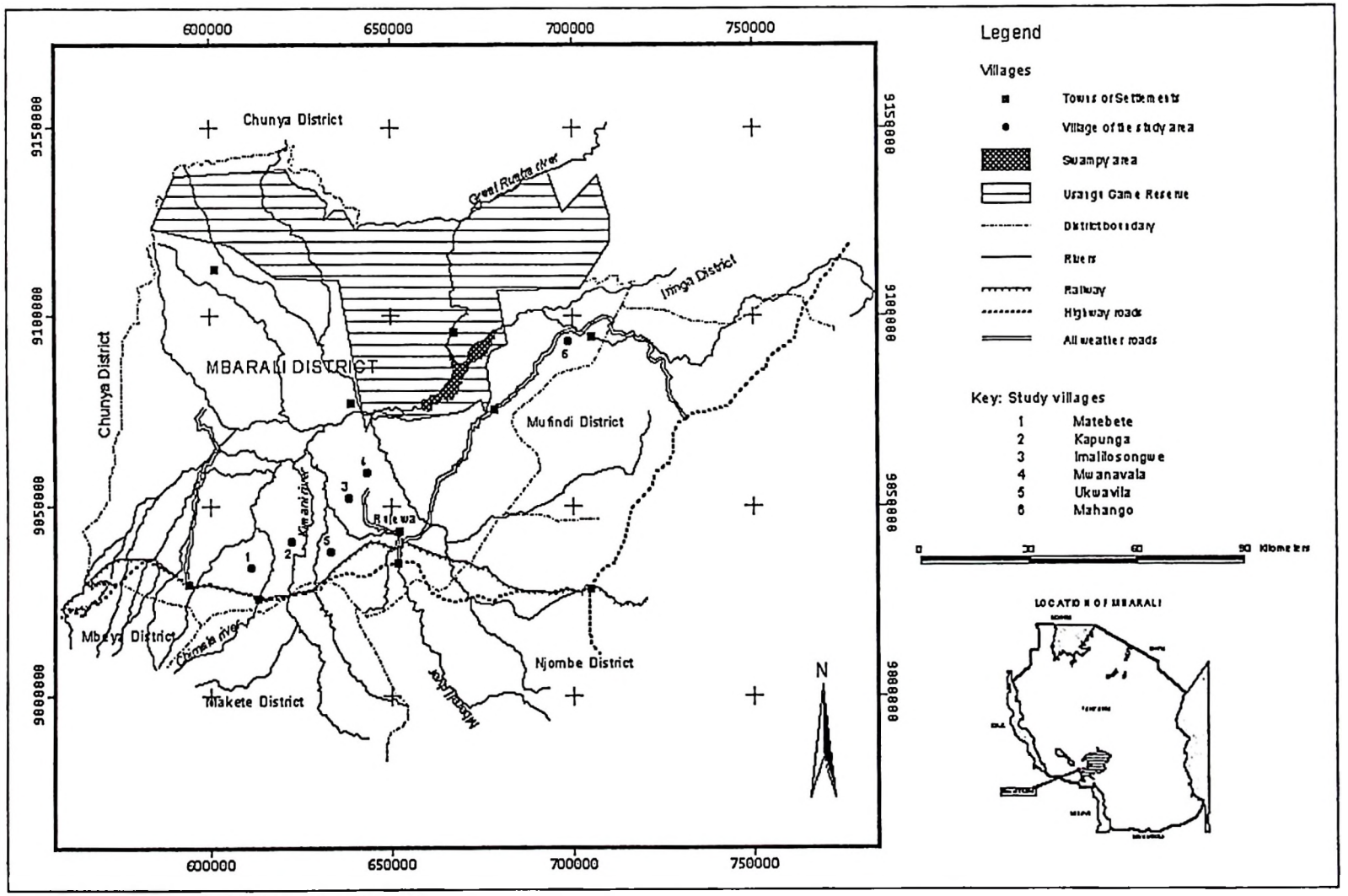

Figure 2. Map of Mabarali district showing study villages
Source : Sustainable Management of Usangu Wet lands and its Catchment project, Mbarali District, 2000.

In the villages the population is ethnically mixed, although a single group may inhabit individual hamlets. The population is organized into eleven wards and 85 villages. The villages are often large, covering up to 16 sq km. Within these large villages, hamlets may be widely dispersed and distant from each other and from the village center. This dispersion is essentially linked to the resource base. The main ethnic groups are the Wasangu, Wabena, Wahehe, Nyakyusa and some migrant Maasai pastoralists and Sukuma agropastoralists (SMUWC, 2000).

3.1.3 Climate

The climate of Usangu plains is generally tropical with marked seasonal temperature and rainfall variations. Temperatures range from 20°-25°C, whereas annual rainfall varies between 650mm to1200mm. The rains normally start in November and go through May. The remaining months are dry. Rain falls in a highly scattered and variable pattern across the plains. Rainfall is generally unreliable, and localized droughts are common. Soils are commonly of moderate fertility, coarse or medium texture and varying from sandy loams, to alluvial.

3.1.4 Vegetation

Although a large area of the valley is cultivated, large tracts of land are still covered by natural vegetation such as "Miombo" (*Brachystegion, Julbernadia*) woodland. Areas with rains between 800-1200mm per annum favour the growth of Miombo woodlands, while areas with less rains especially in the north of the valley support the growth of wooded grassland and bush lands of dense thickets of *Acacia* species including; *Acacia albida, Acacia seyal var. Fistula, Acacia kirkii, Acacia tortilis spirocarpa,* and other thorny trees.

3.1.5 Large mammals

There is a significant population of large mammals in Usangu plains. Aerial surveys undertaken by Sustainable Management of Usangu Wetlands and its Catchment Project (SMUWC) in 1999, show significant animal numbers for topi (*Damaliscus lunatus*), impala (*Aepyceros melampus*), zebra (*Equus burchellii*), reedbuck (*Redunca arundinum*), warthog (*Phacochoenis aethiopicus*), hertebeast (*Alcelaphus lichtensteini*), and giraffe (*Giraffe camelopardalis*). The area is known to have contained extensive and varied herds in the past. The decline can be attributed directly to human activities such as poaching, loss of habitat and interference within the remaining area of suitable habitat.

3.1.6 Birds

The avian fauna is of particular interest in Usangu plains (SMUWC, 2000). The permanent and seasonal wetlands, surrounded by savannah thorn scrub, and backed by escarpments raising 1000m above the plain, provide an area with a range of habitats rarely replicated elsewhere. Some 350-bird species have so far been recorded. The area is on a migratory bird route, although the importance of this is currently unknown. The area has been declared by Bird Life International as one of Tanzania's Important Bird Areas (SMUWC, 2000).

Usangu plain contain a number of birds whose distribution in Tanzania is very limited e.g. the white-throated swallow (*Hirundo albigularis*), yellow-crowned Bishop (*Euplectes afer*), crowned Eagle (*Stephanoaetus coronatus*), wattle crane

(*Grus carunculatus*) and saker Falcon *(Falco cherrug*). Ihefu swamp is an important breeding site for a number of wetland species. Usangu plains also contain some of the highest concentrations of waterfowl in Tanzania.

3.1.7 Economy

The economy of the valley depends mainly on subsistence agriculture. About 80% of the population depend on agriculture, and the rest depend on livestock keeping, fishing, and petty businesses. Paddy is the dominant cereal crop in the plains. Both smallholders and parastatals undertake paddy production. There are two major large-scale farms in the plains. These are: Kapunga and Mbalali state farms. Small-scale rice irrigation schemes are also prominent. These include the Kimani, Madibira, and Igurusi. Besides irrigated paddy, other major crops produced for the market include maize, pulses and vegetables.

Livestock keeping is an important activity in the plains. Both cultivators and pastoralists keep livestock. The livestock populations on the plain amounted just over 366,000 TLUs in 1999. The grazing resources in the plains comprise the fans and wetlands. The carrying capacity in the plains varies with rainfall, between 130,000 TLUs in very dry years to 1,400,000 TLUs in very wet years, with an average capacity of about 526,000 TLUs. Overall capacity is limited by wet season grazing availability (SMUWC, 2000).

3.2 Methodology

The data and information for this study were collected from both primary and secondary sources. Primary data were obtained mainly through PRA and questionnaire surveys where as secondary data were obtained from both published and unpublished documents.

3.2.1 Reconnaissance survey

Reconnaissance survey was done inorder to get the general picture of the study area. The main activities during reconnaissance survey included meeting various stakeholders in natural resource management in the district; The District Commissioner, District Development Director, and Heads of the Departments (Agriculture, Livestock, Natural Resources, and Community Development) and other leaders working in the district e.g. SMUWC- project team leader.

The study villages were selected during the reconnaissance survey with the help of the district staff from Agriculture and Livestock Department. Six villages were selected according to the prominence of resource use conflicts or disputes prevalent in the areas, ethnic composition and multiple use of the natural resources in the villages.

3.2.2 Participatory Rural Appraisal.

Participatory Rural Appraisal approach was used during the first phase of the study. The exercise was carried out in six villages namely Mahango, Ukwavila, Mwanavala, Kapunga, Imalilo and Matebete. A sample of 15 members was selected in each village to participate in the Participatory Rural Appraisal exercises. The group of fifteen members went through various exercises such as resource mapping in relation to village set-up, problem ranking and institutional analysis. Historical change in relation to the immigration of different ethnic groups in the villages and the changes in resources use were also discussed. PRA is essentially a process of learning about rural conditions in an intensive, interactive and expeditious manner (Mc Cracker and Conway, 1988; Devavan, 1992). The emphasis was on tapping the knowledge of local inhabitants.

3.2.3 Formal survey

Besides the PRA exercises, formal survey was also conducted to pursue major issues identified during the PRA exercises. Two structured questionnaires containing both open ended and closed – ended questions were employed in this survey. One was administered to heads of households randomly selected for the survey (Appendix 1) and the other one to village leaders (Appendix 2). As pointed out by Richard (1977), open-ended interviewing serve the purpose of disclosing the system of knowledge and structuring of ideas central to respondent's own view of the world. In closed-ended questions, a number of alternative answers were provided. Questionnaire surveys permitted the collection of information about the same variable from more than one case and ended up with a data matrix (Kajembe and Luoga, 1996).

Six villages out of 85 villages were selected by purposive sampling method based on the prominence of resource use conflicts, ethnic composition and multiple use of the land resources. 165 heads of households were randomly selected from the village registers, i.e 5% of the total number of households in each of the selected villages (Table 1) were obtained by simple random sampling method. The sampling frame was a list of villagers in village registers. The questionnaire was designed to provide answers on aspects such as landholdings, livestock ownership, land use patterns, conflicts and institutional factors affecting resource use.

Table 1: Total number of households in the study area and percent of sampled households.

Village	Total number of households	Number of sampled households	Percent of sampled households
Mahango	938	47	5
Mwanavala	500	24	5
Imalilosongwe	802	40	4
Ukwavila	322	16	5
Matebete	320	17	5.3
Kapunga	520	21	5
Total	3402	165	5

Source: Field data (2000)

The household questionnaire was pre-tested in Mwanavala village before its use in the actual survey. Ten household heads were randomly selected from the village register and were not included in the actual survey. Pre-testing was done to check for clarity, redundancy, meaningfulness and comprehensiveness of the items to ensure that the amount of time required for completing the interview was not excessive and to discover the reaction of respondents with respect to certain items. After pre-testing, the questionnaire was revised and later used for field data collection.

3.2.4 Participant observation

Participant observation was used in this study to assess various situations, activities, and processes in the field such as range conditions, burning of crop residuals in harvested fields, areas subject to conflict between villages, water competition and irrigation furrow damage by livestock, the general social-economic situation of households and the well being of the people. This method allowed the investigator to participate in the social reality experienced by the community under observation (Casley and Kumar, (1988). Participant observation provided the context within which all other methods were applied, and it functioned as the initial medium for learning about social and physical environment interrelationships.

The process of participant observation was primarily used to tie together the more discrete elements of data gathered by other methods. The other methods allowed aspects of life in the study areas to be isolated and studied out of context of community life. Participant observation permitted these elements to be examined within the context of social system (Kajembe, 1994).

3.2.5 Secondary data collection

Data from secondary sources such as publications and reports from local authorities were collected. These gave information on general aspects and specific issues such as records on land disputes, pastoral immigration patterns, livestock carrying capacities, and conflict resolution mechanisms.

3.2.6 Data analysis

Data collected through PRA techniques were analyzed with the help of the local people and the results were communicated back to them. The completed interview schedule was coded and where applicable data from open–ended responses were categorized for further analysis. All quantitative analysis reported in this study was conducted using routine procedures of the Statistical Package for Social Sciences (SPSS). Frequencies, histograms and pie charts were used to summarize the data. Cross tabulations involving chi-square tests were employed in testing association between different variables and the test of hypotheses.Based on inferential statistics, regression equation was developed to show the relationship between land ownership and socio-economic factors. The following general multiple regression model was used:

$Y_i = a+b_1x_1 + b_2x_2 .. b_i x_i + e$

Where

Y_i = the i [th] observed value of the dependent variable

x_1 to x_i = Independent variables

a = Population parameter for Y_i intercept

b_1 to b_i = Coefficients for the independent variables

e = Random disturbance error

i = 1,2, ...n

The general model was applied to find out the relationship between some of the factors, which influence land ownership, as follows

Y_i = Total land owned in (ha)

X_i = Age of respondent in years

X_2 = Education

X_3 =. Household size

X_4 = Ethnicity (cultural background)

X_5 = Price of land

Hypotheses tested are

$\beta = 0$ implying no correlation between dependent and independent variables

$\beta \neq 0$ implying that three is correlation between dependent and independent variable

A two tailed t-test at 5% level of significance, was used to test the relationship between land ownership and socio-economic factors. H_o was rejected where $p<0.05$. Linearity was assumed in this case.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

This chapter presents the results and discussion on historical analysis of institutional change in Usangu, the existing land use practices, resource use conflicts and factors underlying them, major local institutions existing in the area and their role in regulating resource use and in conflict resolution. The first section of this chapter gives a historical analysis of institutional changes in Usangu plains. The second section briefly identifies land use practices in the study area. The third section covers a substantial portion of this chapter. It starts by overviewing resource use conflicts encountered in the study villages and their underlying causes and ends up by identifying local institutions and their role in regulating resource use and emerging conflicts.

4.2 Historical analysis of institutional change in Usangu.

Discussion with respondents who had resided on the Usangu plains at least since the early 1950s and data from secondary sources gave information regarding the changes in natural resource management that had taken place in Usangu since that time (Table 2). Changes in the management of resources in Usangu are both endogenous and exogenous. According to Kajembe and Kessy (2000) endogenous change relate to the way a society is internally organized and linked to natural events such as migration, drought, internal conflicts as well as in internally realized growth related opportunities.

Table 2: Historical changes in natural resource management in Usangu plains

Year(period)	Event (Historical change)
1950s	♦ Cultivator immigrants entered into Usangu plains. Main ethnic groups were the Nyakyusa, Hehe, Bena, Wanji, and Safwa.
1952-53	♦ Maasai pastoralists entered Usangu and were settled in Mwanavala area by Sangu paramount chief Merere ♦ Activities of immigrants regulated by the chief ♦ African chiefs ordinance was passed giving authority to manage the resources to the district councils.
1961-63	♦ Tanzania got it's independence ♦ The offices of the chief, sub-chief, and headmen were abolished and control over resource use and management transferred to the new government structures. ♦ The chief's powers to control immigration and resource use was abolished
1967	♦ Arusha Declaration was proclaimed, major means of production were nationalized. All resources became state property. ♦ Traditional institutions lost their legitimacy
1970-75	♦ Villagezation was introduced in Tanzania, resource management functions were transferred to the village governments. ♦ Unregulated immigration of pastoral and agropastoral groups into Usangu ♦ Transitional period-no well established system of regulating resource use in Usangu plains
1980-1986	♦ Structural adjustment programme was implemented in the country. In Usangu the programme was associated with a marked increase in both small holder and large scale rice irrigation at the expense of grazing lands. ♦ Laxity in the control of resource use and management by village governments. ♦ State policies favoured crop expansion ♦ Intensified resource use conflicts ♦ Land alienation by the state for expansion of paddy cultivation ♦ Gazettment of Usangu game reserve
1993 - 98	♦ Large out flow of pastoralists from usangu
1999-2000	♦ Out migration from Usangu decline

Source: Field data (2001)

Exogenous change relate to those forces that are external to the community and simultaneously affect the functions of those communities and consequently their natural resources. State policies and economic reforms are cases in point.

Prior to colonialism, the Sangu had a system of governance headed by Chief Merere.The chief was assisted by the headsmen, who kept history, claimed and maintained ritual authority over the clan lands and the people living in them. From the allocation and blessing of arable lands, through the rituals of praying for rain, to the purification of land in times of calamity the headsman controlled the production cycle in the Sangu society. Sangu elders asserted that, each year a black cow, a sheep and some local brew were offered as sacrifice to the ancestors. Such ceremony suggests that during the pre-colonial period there existed a ready-made system of land use control that took into consideration the sustainability of the environment.

During the colonial rule, a system of communal property was maintained on the Usangu plains. Access to pastoral and agricultural resources was based on residence in local hamlets or communities. Settlement and residence rights were controlled by local headmen and ultimately chief Merere who had the power to exclude outsiders. Resource use and management was controlled from within these communities.

In 1953 the British passed a Local Government Ordinance No 35. This local government ordinance gave the councils the power to regulate and control all aspects of natural resource use and management within the areas of their jurisdiction, thus

the authority to regulate cultivation, grazing and other land uses practices were transferred from native authority to district councils. The chief became the instrument of the district council, responsible for carrying out the regulations made within his chiefdom. The Local Government Ordinance and the African Chief Ordinance signaled the beginning of loss of the chief's power to control resources access and use in Usangu plains, and the undermining of customary laws regarding resource access and use.

Following the gaining of independence in 1961, things started changing in Usangu. From its inception in 1961, the independent Tanzanian government embraced a philosophy of building a socialistic state. The new leaders viewed the customary power structures of different ethnic groups as being oppressive, and believed that people should gain political office through election rather than inheritance. Following these beliefs, the African Chiefs Act was passed in 1963, repealing the African Chief Ordinance of 1953. This Act abolished the offices of chief, sub-chief and headman. The repeal of this Ordinance, abolished whatever remained of local level political structures that were created by statutory law during most of the British colonial period. In Usangu just like in other parts of the country the chief's power to control immigration into his area of jurisdiction, and the use of natural resources was no longer recognized by statutory law. Local people such as the Sangu might have continued to recognize their chief, as opposed to a village's chairperson or secretary as their primary authority figure. However, other local people belonging to other different ethnic groups were no longer obliged to do so. The new political system

ultimately worked against the interests of the Sangu, but in the interest of immigrants belonging to other ethnic groups.

The villagization era saw the influx of more people into Usangu plains (both pastoralists and agropastoralists) from different parts of the country and the change in the control of resources from the hands of traditional leaders, to structures imposed by the central government (the village government structures). The establishment of Ujamaa villages in the country has been associated with mass immigration of pastoral groups from the northern part of Tanzania into Usangu due to the fact that, pastoralists saw Ujamaa settlements as a threat to their transumant mode of life. Since their livestock depend on natural pastures which its availability is spatially distributed and dependent on rainfall, remaining into Ujamaa settlements would have meant jeopardizing their livestock herds.

Discussion during PRA exercises in the study villages revealed that most of the pastoral groups did move into Usangu plains during villagization as they did not know that the program was being implemented countrywide. (They were running away from the settlement schemes). Respondents in study villages noted that, beginning 1970s there had been a massive immigration of agropastoral groups (Sukuma) from the northern part of the country. The agropastoralist Sukuma are said to have moved in with substantial herds of cattle, which graze widely without regard for existing traditional grazing management systems. For example, they usually graze their herds of cattle ahead of small herds of other ethnic groups disrupting the

traditional collective grazing management systems that had existed in the area before villagization.

Structural Adjustment Program (SAP) era, which started in mid 1980s was characterized by an increase in commercialized agriculture (rice production) in Usangu plains. As Mukamuli *et al.*, (1999) in Kajembe and Kessy (2000) argues, when a trading class develops within a community, a possibility arises that the traders seek out the resources irrespective of its politico- religious roles. The expansion of irrigated agriculture in Usangu has threatened the life of fish and other aquatic lives down stream. It has also inconvenienced pastoral herds with regard to water needs and access to pasturelands and thus resulted into further maginalization of the pastoral groups in Usangu plains. The result of such incoherent state policies has been the loss by the majority of the rural population of virtually all the control over their resources.

Currently, the predominant socio-political structure is the one prescribed by the Village and Ujamaa Village Act of 1975. In reality, however, there is low popular participation in the socio-political life at the village level. Administration and management of village lands is in practice vested in the village councils which feel responsible and accountable to the district authorities and organs of the central government rather than their village assemblies. Village assemblies have virtually lost control over village lands and have no say over their leaders in land matters. This has led to many abuses and malpractice in the allocation, alienation and use of village lands.

Whereas there is overwhelming acceptance of village per se as an appropriate governance structure in the countryside, there is intense dissatisfaction and discontent over land administration of village lands and bitter opposition to the alienation of land to outsiders in the study villages.

4.3 Land use practices

4.3.1 Land acquisition

In traditional land tenure of the Sangu, a household is the basic right-holding unit. The village community, comprising several households and occupying a distinct territory, is the basic unit of land administration. An individual household right to land is gained by virtue of its membership in the village community. Its possession however is not absolute in that it cannot be sold and once a household leaves a village in the absence of any claimant, the land once more becomes a portion of the communal lands of the village (Ordgard and Mganga, 1995).

According to native law and customs, those who can claim rights to land and other natural resources in certain areas are primarily the indigenous members of the ethnic group residing in the area (Ordagard and Maganga, 1995). Thus in Usangu plains it is the Sangu who have indigenous rights in the respective parts of the plains where they reside.The study showed that most people acquired land through allocation by the village government. Among the 165 respondents interviewed during the survey, 162 indicated that they own land (Table 3), whereas the remaining 3 indicated that they did not own any piece of land. Out of this number, 53 percent had acquired land

through allocation by village government, 4.9 percent had acquired land through purchase, 4.3 percent had inherited the land they own, 3.7 percent had rented, where as 32 percent had acquired land through various (more than one) means (Table 3).

Table 3: Method of land acquisition in study villages at Usangu plains.

Method of land acquisition	Mahango (n=47)	Mwanavala (n=24)	Imalilo (n=40)	Ukwavila (n=16)	Matebete (n=14)	Kapunga (n=21)	Total (N=162)
Bought	4.3(7)	-	-	-	-	0.6(1)	4.9 (8)
Rented	-	-	-	1.9 (3)	1.2 (2)	0.6 (1)	3.7 (6)
Inherited	2.5 (4)	1.2 (2)	-	0.6 (1)	-	-	4.3 (7)
Allocated by village govt.	12.3(20)	11.1(18)	10.5(17)	4.3(7)	7.4(12)	9.3(15)	52.9(89)
Various ways	9.9 (16)	2.5(4)	14.2(23)	3.1(5)	-	2.5(4)	32.1(52)
Total	29.0(47)	14.8(24)	24.7(40)	9.9(16)	8.6(14)	13 (19)	99.9(162)

Figures in parenthesis indicate the number of respondents, not in parenthesis denote percent
Source: Field data (2001)

The fact that one can acquire land through more than one means suggests that both customary rights and state land tenure systems are operating in Usangu. Also the fact that some households acquire land by purchasing from other people is a remarkable change from the old traditions where clan land was not supposed to be sold to other people. Nonetheless, discussion with some of the respondents revealed that in the near future this method will be more predominant as shown by increasing sales of landholdings by the indigenous Sangu to the incoming Sukuma agropastoralists. Land purchase was prevalent in Mahango village (Table 3). This might be due to the fact that this village has attracted many people from different places, as a result of the irrigation pontential. Observations made during this study revealed that prices of land varied between Tsh 25,000/= to Tsh 37,500/= per ha of land. Generally the results show that most people acquire land through allocation by the village government and the value of land was higher in areas where irrigation was feasible.

4.3.2 Size of the farm holdings and Land availability.

The study showed that, 41.4 percent of the respondents own between 2.4 and 6 hectares. 38.9 percent owned more than 6 hectares and only 19.7 percent of respondents owned land between 0.4 and 2 hectares (Table 4).

Table 4: Land size categories in study villages

Land size category	Mahango (n=47)	Mwana vala (n=22)	Imalilo (n=38)	Ukwavila (n=16)	Matebete (n=14)	Kapunga (n=19)	Total (N=156)
0.4 to 2 ha	5.1(8)	3.2(5)	2.5 (5)	-	3.8(6)	5.1(6)	19.7(31)
2.4 to 6 ha	16.6(26)	5.4(10)	4.5(7)	5.7(9)	2.5 (4)	5.7(9)	41.4(65)
Above 6 ha	8.3(13)	4.5(7)	16.6(26)	4.5(7)	2.5(4)	2.5.(4)	38.9(60)

Figures in parenthesis indicate number of respondents, not in parenthesis denote percent
Source: Field data (2001)

The results show that people own considerable pieces of farm holdings in the study villages. This might be due to the fact that people in these villages still practice extensive farming and also due to unreliable rainfall people do cultivate plots in different places in order to spread risk of crop failure. Generally the results showed that land cultivation has expanded considerably in the study villages.

Land availability for both arable farming and livestock keeping is still a big problem in most of the villages. Among the 165 respondents interviewed during this study, 45.2% of them indicated that their land holdings were not adequate to meet household needs where as 54.8% had adequate farm holdings (Table 5).

Table 5: Land availability in study villages

Land availability	Mahango (n=47)	Mwanavala (n=24)	Imalilo (n=40)	Ukwavila (n=16)	Matebete (n=14)	Kapunga (n=21)	Total (N=162)
Adequate	8.6(14)	4.9(8)	19.1(3)	3.7(6)	7.4(12)	11.1(18)	54.8(89)
Inadequate	20.4(33)	9.9(16)	5.6(9)	6.2(10)	1.2(2)	1.9(3)	45.2(73)

Figures in parenthesis indicate number of respondents not in parenthesis indicate percent
Source: Field data (2001).

Several reasons were given by the respondents in respect to land scarcity in the study villages. These included: large household size (75%); the need to increase crop production (rice) (17.6%); farm destruction by floods (2.9); land alienation by the smallholder irrigation schemes (1.5%); decline in soil fertility (1.5%); and water deficit (1.5%) (Table 6).

Table 6: Reasons for land shortage in study villages

Reasons village	Large family	Land alienation by small holder irr.scheme	Need to increase production	Formal farm destroyed by floods	Decline in fertility of current plots	Water deficit	Total
Mahango (n=32)	32.4 (22)	1.5(1)	10.3(7)	2.9(2)	-	-	47.1(32
Mwanavala (n=16)	17.6(12)	-	5.9(4)	-	-	-	23.5 (16)
Imalilo (n=9)	13.2(9)	-	-	-	-	-	13.2(9)
Ukwavila (n=8)	10.3(7)	-	-	-	1.5(1)	-	11.8(8)
Kapunga (n=3)	1.5(1)	-	1.5(1)	-	-	1.5(1)	4.4(3)
Total (N=68)	75.0(51)	1.5(10	17.6(12)	2.9(20	1.5(1)	1.5(10	100(68

Figures in parenthesis indicate the number of respondents, not in parenthesis denote percent

Source: Field data (2001)

Sedentarization of pastoralists might also be one of the factors that have affected land availability. It was noted during this study that most Sukuma and Maasai are now settled in the villages permanently and only few members of their families move with livestock herds to distant places in search of pastures. The exclusion of pastoralists from the game reserve which used to provide dry season grazing, might have contributed to concentration of livestock in the village lands preventing further expansion of farmlands by cultivators who have always met their land demands by encroaching in to these lands. As asserted by Dixon and Blit (1998) land scarcity in the study villages might also have resulted from unequal distribution of the resources among individuals and social groups. Generally the results show that land competition between cultivation and herding is very high to the extent that further expansion of farmlands is no longer feasible and thus new options are needed.

Insecurity of tenure is another constraint revealed by some farmers in the study villages (Table 7).

Table 7: Land tenure security in study villages at Usangu plains

Tenure security	Mahango (n=47)	Mwanavala (n=24)	Imalilo (n=40)	Ukwavila (n=16)	Matebete (n=17)	Kapunga (n=21)	Total (N=165)
User right	27.7 (45)	14.3(23)	24.7(40)	8.0(13)	7.4 (12)	12.3(20)	94.4(153)
Title deed	-	0.6(1)	-	-	-	-	0.6(1)
Not secure	1.2(2)	-	-	1.8(3)	1.2(2)	0.6(1)	4.8(8)
Total	28.9(47)	14.9(24)	24.7(40)	9.8(16)	8.6(14)	12.9(21)	100(162)

Figures in parenthesis indicate number of respondents, not in parenthesis denote percent
Source: Field data (2001)

Among the 162 respondents owning land, only one person (0.6%) had a title deed. 94.4 percent of the respondents had no title deeds but had user rights to the landholdings, where as 4.8 percent of the respondents considered their land rights as insecure (Table 7). Most of those who considered their land rights as insecure had rented the holdings they were cultivating at the time of this study. It was claimed during interviews that the owners of land usually rent their holdings seasonally to avoid continuous use by the same renter as they may at times claim ownership to these holdings if allowed to use them continuously. Sometimes an individual may rent out a plot, which is supposed to belong to the clan, once the clan members find out, they refuse to recognize the transaction. From these results it is clear that land tenure security was influenced by the method of land acquisition.

4.3.3 Livestock ownership and grazing land management

Pastoralists rarely use a contiguous set of resources within a comparatively manageable area to make their livelihoods. One of their principal strategies is to move continuously between and within agroecological zones. They rarely posses defined territories and often use resources exploited by other production systems at different times of the year (i.e. crop residues on fields belonging to farmers).

The Maasai and Sukuma pastoralists and agropastoralists respectively own most of the livestock kept in Usangu (Figure 3) although other small livestock (goats, pigs, sheep etc) are kept, cattle is the most important. There are six reasons for keeping cattle as indicated by the respondents in the study villages (Table 8).

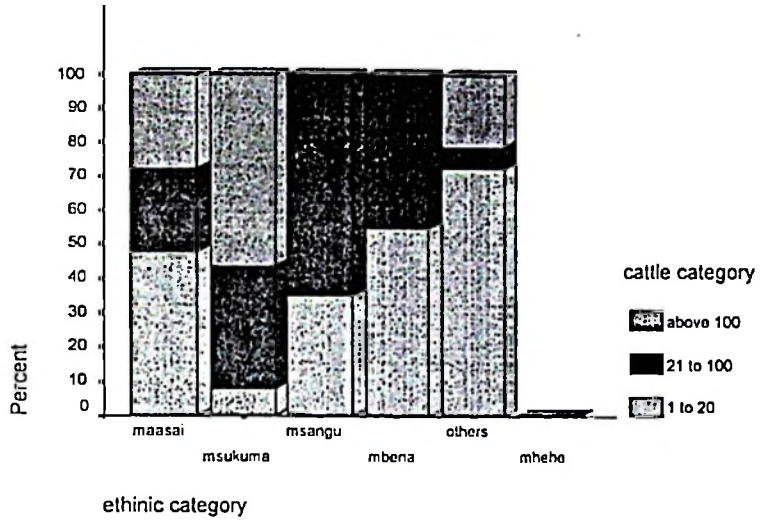

Figure 3: Livestock ownership by different ethnic groups
Source: Field data (2001)

Table 8: Reasons for keeping cattle

Reasons for keeping cattle	Savings account	Draft power	Source of meat/milk	Social fact (bride price)	Guarantee Against crop failure	Source of incom e	Total
Maasai	1.2(1)	-	10.8(9)	2.4(2)	7.2(6)	-	21.7(18)
Sukuma	8.4(7)	4.8(4)	4.8(4)	1.2(1)	7.2(6)	8.4(7)	34.9(29)
Sangu	2.4(2)	4.8(4)	-	-	4.8(4)	4.8(4)	16.9(14)
Bena	1.2(1)	2.4(2)	1.2(1)	-	4.8(4)	-	9.6(8)
Others	-	8.4(7)	4.8(4)	1.2(1)	1.2(1)	1.2(1)	16.9(14
Total	13.2(11)	20.4(17)	21.6(18)	4.8(4)	25.2(21)	14.4(1 2)	100(83)

Figures in parenthesis indicate number of respondents, not in parenthesis denote percent
Source: Field data (2001)

Most people (25.2%) indicated that they keep cattle as a guarantee against crop failure; 21.6% indicated source of meat and milk; while 20.4% indicated as a source of draft power; 14.4% indicated as a source of income; 13.2% indicated as savings account and 4.8% indicated social function as the main purpose of keeping cattle. Generally the results show that most people keep cattle as a guarantee against crop failure.

4.3.3.1 Livestock ownership

Among the 165 respondents interviewed 55.8% own cattle, where as 44.2% do not own cattle. 44.2 percent of those owning cattle kept between 1 and 20 heads of cattle, 43.0% kept between 21 and 100 heads of cattle, where as only 12.9% kept above 100 heads of cattle (Table 9.).

Table 9: Cattle ownership by ethnic groups in study villages at Usangu plains

Cattle category	Maasai	Sukuma	Sangu	Bena	Hehe	Others	Total
1 to 20	14.0(12)	4.7(4)	5.8(5)	5.8(5)	_	14.0(12)	44.2(38)
21 to 100	7.0 (6)	19.8(17)	10.5(9)	4.7(4)	_	1.2(1)	43.0(37)
Above 100	2.3 (2)	9.3(8)	_	-_	-_	1.2(1)	12.8 (11)

Figure in parenthesis indicate the number of respondents, not in parenthesis denote percent

Source: Field data (2001)

The Sukuma agropastoralists had considerable herds than others (Table 9). This may be explained by the fact that the Sukuma keep livestock mainly as a source of wealth, for marriage arrangements and as a status symbol and thus there is generally cultural resistance to marketing their animals. McKenzie (1980) reports similar observations in his study of beef industry in Tanzania. Similarly Kikula *et al* (1991) noted that, the Sukuma own large numbers of cattle and they are notoriously reluctant (quite understandable though) to reduce herd size in favour of agricultural expansion. This reluctance to reduce herd size is explained by the role of livestock (particularly cattle) in social and traditional economy of the Wasukuma. According to Kikula *et al.* (1991), cattle are a bulwark of both the economic and social structure of the tribe

and explains much of the difficulty associated with improvement of livestock management in Sukuma land. In particular the social connotations of stock ownership, with bride price and inheritable obligations to the junior male of the family are far reaching. Also, with the uncertainty of agricultural production and the fact that prices of livestock have an important insurance value (saving on the hoof) as a subsistence crop with a ready barter value in all scarcity situations. Among the reasons for keeping livestock, 8.4% of the Sukuma respondents mentioned savings account, another 8.4% mentioned source of income, whereas 7.2%,4.8%, 4.8% and 1.2% mentioned guarantee against crop failure, draft power, source of meat/ milk and social functions respectively (Table 8).

Another reason as to why the Sukuma have large livestock herds is that being agropastoralists they also grow crops to satisfy home consumption with some households selling the surplus and purchasing additional cattle. This observation is also reported by Kikula *et al* (1991) in their study on land conservation in Sukumaland, they noted that earnings of cotton were largely invested in livestock.

4.3.3.2 Grazing land management.

The grazing land is communal and periodic grazing occurs even on privately owned fields after harvesting crops. Among the 92 respondents owning livestock, 51.6% consider grazing lands as providing enough pastures for their livestock where as 48.4% indicated that grazing lands are not adequate (Table 10).

Table 10: Pasture availability in study villages

Pasture availability	Mahango	Mwanavala	Imalilo	Ukwavila	Matebete	Kapunga	Total
Adequate	10.8(10)	10.8(10)	8.6(8)	6.5(6)	9.7(90)	5.4(5)	51.6(48)
Not adequate	10.8(10)	9.7(9)	14 (13)	3.2(3)	4.3(4)	5.5(6)	48.4(45)
Total	21.5(20)	20.4(19)	22.6(21)	9.7(9)	14.(1.3)	11.8(11)	100(93)

Figures in parenthesis indicate number of respondents, not in parenthesis denote percent. Source: Field data (2001)

In general it was stressed that dry season was the most stressful period in terms of pasture shortage for livestock. Pasture shortage is critical especially in years of little rainfall. Observations by SMUWC (2000) show that the carrying capacity in Usangu plains varies between 140,000 TLUs in dry years and 1,400,000 TLUs in very wet years. Fodder shortage featured highly in Mahango, Imalilo, Mwanavala and Kapunga villages (Table 10), which might be due to the immigration of both cultivators and Sukuma agropastoralists attracted by the rice irrigation schemes and ample grazing lands in these villages. Sukuma agropastoralists also do cultivate large tracts of land (Figure 4). They therefore contribute significantly to their own demise with respect to livestock keeping in these villages.

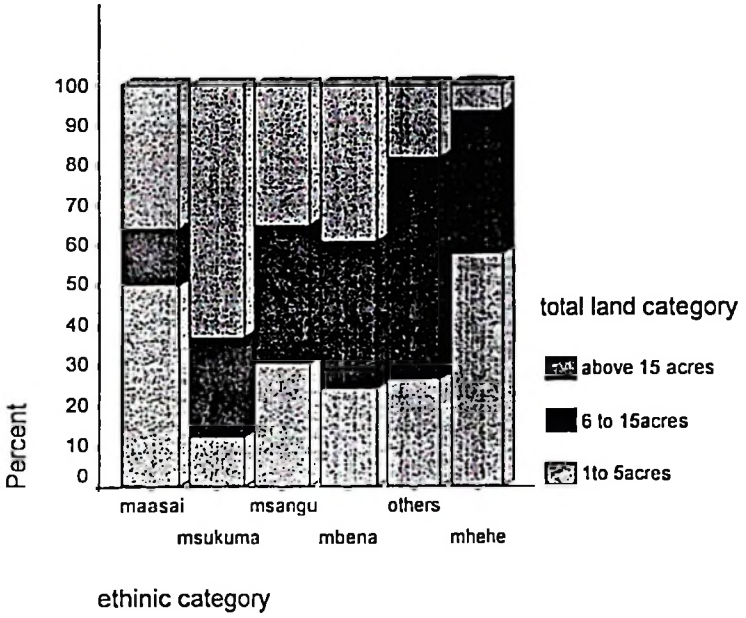

Figure 4 Land ownership by ethnic groups
Source: Field data (2001)

Pastoralists in Usangu plains have developed a number of strategies to mitigate dry season fodder shortage. Table 11 shows some strategies for managing pasture shortage during the dry season.

Table 11: Strategies for managing pasture shortage during the dry season

Rank	Strategy	%	No.
1.	Moving to other areas with ample pastures e.g Usangu game reserve (Ihefu)	53.7	(22)
2.	Grazing on follow land	14.6	(6)
3.	Graze on harvested fields	12.2	(5)
4.	Retain milking and pregnant cows and calves in village lands and move the rest to Ihefu	9.8	(4)
5.	Destocking	9.7	(4)

Source: field data (2001)

53.7% of the respondents who considered pastures as inadequate, indicated that they always move to other areas including the Usangu game reserve as a strategy to cope with pasture shortage. 14.6% graze on fallow lands within the village, 12.2% graze on harvested fields, where as 9.8% indicated that they retain pregnant and milking cows and calves in village grazing lands and move the rest of their livestock to Ihefu swamp and 9.7% said they usually destock during the dry season so as to cope with pasture shortage at this particular period. Studies conducted by Kauzeni (1994) in Hanag and Kikula *et al.* (1991) in Shinyanga reported that similar strategies are being persued by pastoralists and agropastoralists respectively to mitigate dry season fodder shortage. Maro, (1995) in a study on agropastoral systems in Shinyanga, found that, the Wasukuma had developed traditional silvo-pastoral systems many years ago to cope with pasture shortage for their livestock; the Ngitiri system.

Similarly Maenda *et al* (1996) noted that the Pare and Maasai people in the lowland areas of Same district had their own traditional ways of ensuring pasture availability during the dry seasons; the Mlimbiko system.

Both Ngitili and Mlimbiko systems essentially involve reserving pasturelands during the rain season to allow full growth of the pastures and opening them up for grazing during the dry season when other lands are fully grazed. There are traditional rules, which limit accesses to these pasture reserves. Discussion with Maasai pastoralists in Matebete and Mwanavala villages revealed that in the past they used to reserve pasturelands for use during dry periods. This was made possible through enforcement of traditional rules for entry to these reserves. However, due to high population pressure, villagezation, and expansion of agriculture into these grazing lands this practice is no longer feasible as farmers always consider such reserves as being unoccupied and thus suitable for expanding their farm holdings.

It is clear from these results that most livestock keepers in Usangu plains still consider the Usangu game reserve as a potential dry season grazing land for their livestock as confirmed by the 53.7% of the respondents who stated that they still go there during the dry season as a strategy to cope with pasture problems. This situation is calling for re-examination of the decision to exclude pastoralists from the game reserve. Adequate data need to be collected and analyzed to enable understanding of the local resource use in the area as observed by Tyler (1995). Inadequate understanding of local resource use is a common problem in many

developing countries. Central government officials think they understand the situation better than they actually do, but decisions are made in full knowledge that the available data are inadequate. Surprisingly, even in cases where data gaps are recognized, local consultation is seldom attempted as a way to improve understanding before devising or implementing a policy. The gazettement of Usangu game reserve is a case in point. Moves to alienate this area, has come about as a result of the wrong perception that livestock keeping in Usangu is causing environmental degradation and resulting into water shortage in the Mtera reservoir for hydroelectric power supply. The following quote is typical of this line of thinking, "*We have now demarcated 4000 hectares under government control. Nobody is allowed to make a living out of the place. Mind you, we did that in the national interest. The nation cannot miss electricity because of only a few pastoralists who would like to please their cattle*". (Mbarali District Commissioner, as reported in the Daily Newspaper, of 30th December 1998).

Pastoralists and agropastoralists in Usangu plain are regarded as immigrants, whereas cultivators are viewed as original residents. This view masks reality, indeed, many of the pastoralists have been in Usangu for decades, and are longer established than many cultivators. The eviction order by the Mbeya Regional Commissioner as quoted from the press: "*Mramba orders evacuation of valley invaders in Mbarali" and orders the arrest of one Maasai livestock keeper for inciting other livestock keepers to defy the order to vacate*" (Guardian, 12th October, 1998) was quite untenable and most likely based on inadequate data and limited understanding of local resource uses as asserted by Tyler (1995).

4.3.4 Factors influencing land use

Land use is influenced by a number of socio-economic factors thus efforts to enhance sustainable use of resources need to consider factors that directly or indirectly influence resource use. In this view a multiple regression model was developed to show the relationship between these factors and total land owned. Table 12 shows significant positive correlation between total land owned and household size, ethnicity, and price of land, where as education had a negative correlation but significant with the total land owned. Age was positively correlated to total land owned but not significant. The multiple coefficient of determination R^2, obtained was 0.93. This means that the above independent variables accounted for 93.2% of the variation in the dependent variable. The independent variables, which had the greatest positive beta weights, were ethnicity (0.623), followed by price (0.482), family size (0.379), and age (0.181).

Table 12: Results of the regression analysis

X_i	Y_i		R^2= 0.93	
	B	Beta	t	Sign- t
Age	.538	0.181	1.525	0.138 NS
Education	-14.721	-0.552	-4.405	0.000*
Household size	1.782	0.379	3.400	0.002*
Ethnicity	8.847	0.623	4.483	0.000*
Price	7.815E-04	0.482	4.653	0.000*

X_i = Independent variable

Y_i = Total land owned (dependent variable)

R^2 = Coefficient of determination

* = Significant at 0.05 level

ns = non-significance at 0.05 level

4.3.4.1 Household size

The household size ranged between 1 person and 84 persons per household with a mean of 10 persons per household. Of the six sampled villages, Imalilo had the highest average number of people in the household (13) where as Matebete had the lowest (7) (Table 13).

Table 13: Household size in study villages

Household size	Mahango	Mwanavala	Imalilo	Ukwavila	Matebete	Kapunga	Overall
Minimum	3	1	3	4	3	1	1
Maximum	30	25	84	31	16	23	84
Mean	9	11	12	11	7	9	10

Source: Field data (2001)

Household size in the study area was above the district average (6). As observed by SMUWC (2000), rural households are larger and more complex than urban households because of strong kinship links and the nature of subsistence economy. In rural areas large household sizes are desired because the household would like to cultivate more land with the help of extra family labour. The study also showed that, there was a significant correlation between total land owned and family size (Table 12). This implies that, the land holdings increased as household size increased. These observations tend to support Barlowe's contention that, family obligations affect the demand for land resources (Barlowe, 1986). In this case the more the number of people in a household, the more the mouths to feed and so more land is required to produce the needed foodstuffs and other requirements of the household. One of the strategies pursued by farmers to meet such demands is to encroach into grazing lands and thus exacerbating land use conflicts in respective villages.

4.3.4.2 Age structure of respondents

It is important to study the age structure of the population because several social relationships within the community depend on age. An examination of the age structure of the heads of households in the study villages indicates that 8.5% of the household heads were between 21 to 30 years. The majority of the household heads were in the age group of 31-40 years (36.4%) followed by age group of 41-50 accounting for 21.8% and those above 61 years accounted for 12.7%(Figure 5).

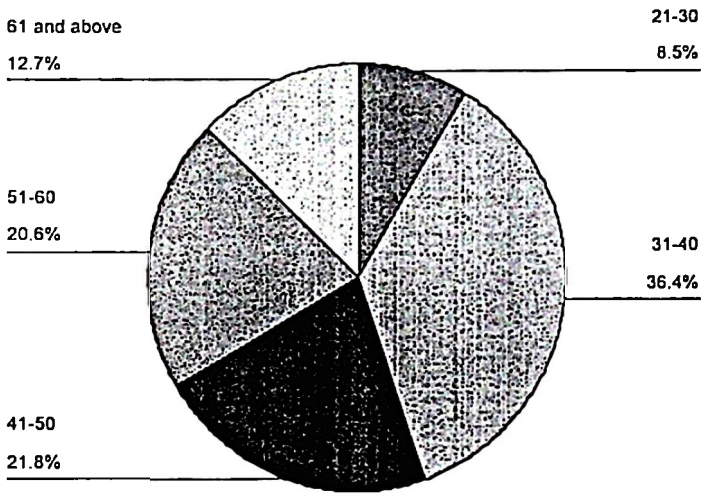

Figure 5: Age group categories in the study villages at Usangu plains

The study also showed that age of the household head was positively correlated to the total land holding owned by the household but not significant (Table 12), implying that the old household heads had bigger landholdings than young household heads. This may be due to the fact that old people had large family size to take care of than were the young household heads. As asserted by Hirsch *et al*, (1999) age has a significant contribution in resource management. During this survey older respondents contributed more effectively on information concerning traditional land

use, pastoral immigration patterns, resource use changes and some management problems they perceived to have contributed to the resource use changes in Usangu plains as they have stayed longer in the plains and observed most of the changes that have taken place.

When comparing land and cattle ownership between the age groups, it is clear that older respondents had more land and more cattle than the younger heads of households (Figure 6 and 7), respectively. As asserted by Barlowe (1986), this may be due to the fact that older heads of house holds had more family obligations than the younger heads of households and by virtue of the fact that they have lived longer, they had enough time to accumulate both landholdings and cattle than had the young ones.

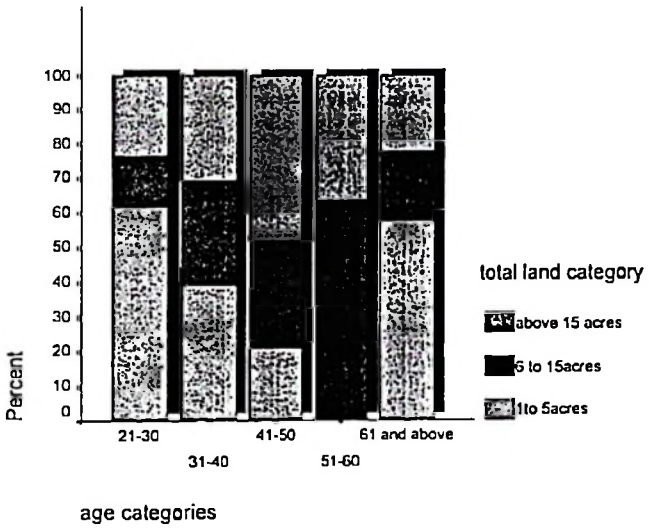

Figure 6: Land ownership by age group at Usangu plains
Source: Field data (2001)

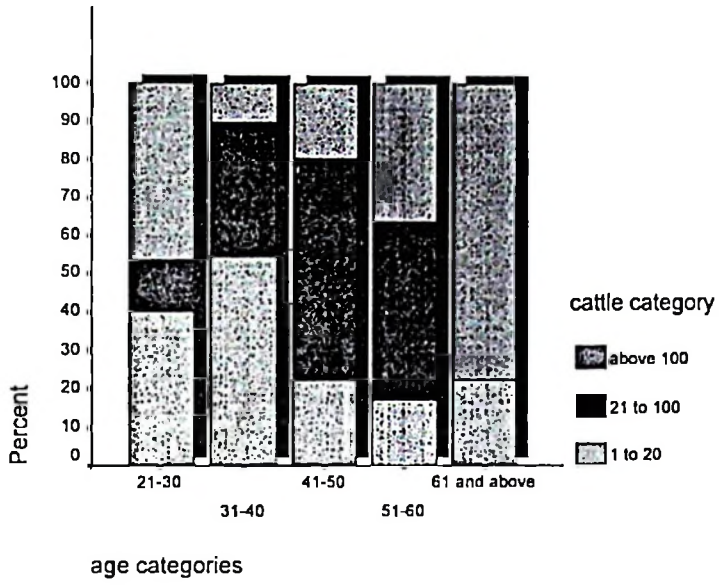

Figure 7: Cattle ownership by age category at Usangu plains
Source: Field data (2001)

4.3.4.3 Education level of respondents

In this study, respondents with primary education constituted the highest proportion 52.2%. Those with no formal education constituted the second highest proportion (34%). Those with secondary school and adult education constituted 7.2% and 6.6% respectively (Table 14). In comparison, the proportions of those without formal education were higher in Imalilo and Matebete villages than those with primary education. This might be due to the nature of the inhabitants of these villages i.e. the Maasai and Sukuma are very much tied to their livestock herds. They pay little attention to education as this deprives them of the manpower to herd their cattle.

Table 14: Education level of respondents in study villages

Information	Mahango (n=47)	Mwanaval a (n=24)	Imalilo (n=40)	Ukwavil a (n=16)	Matebete (n=17)	Kapung a (n=21)	Total (N=165)
Level of education							
No formal education	8.5(14)	5.5(9)	10.9(18)	2.4(4)	5.5(9)	1.2(2)	34(56)
Adult education	4.2(7)	-	1.8(3)	0.6(1)	_	_	6.6(11)
Primary education	14.6(24)	9.1(15)	9.1(15)	6.7(11)	4.8(8)	7.9(13)	52.2(73)
Secondary education	1.2(2)	_	2.4(4)	_	_	3.6(6)	7.2(12)

Figures in parenthesis denotes number of respondents, not in parenthesis indicate percentage
Source; Field data (2001)

The study showed that total land owned was negatively correlated with education level (Table 12). This implies that respondents with higher education level had smaller farm holdings than the less educated ones. This may be due to the fact that educated people employed improved methods of farming which allows intensification as opposed to extensive farming practised by most of the less educated people. As asserted by Maro (1995) education fosters human creativity and influences farmers' readiness to integrate innovations into traditional systems of land use and management. As noted above among the groups in the study villages, the Sukuma had lower levels of education but had considerable pieces of land (Figure 6) and were among the people practicing extensive cultivation.

4.3.4.4 Cultural background of respondents

Usangu plains have the most diversified ethnic composition in the southern highlands. Besides the Sangu, other ethnic groups encountered in study villages

include: Kimbu, Bena, Kinga, Safwa, Wanji,Sukuma, Maasai, Pangwa, Luguru, Nyamwanga, Gogo, Ngoni and Ndali (Table 15).

Cultural background of a respondent has a considerable influence in the use of resources. As observed in this study, some ethnic groups were associated more with livestock keeping (Maasai and Sukuma) whereas others were more associated with cultivation. Competition between cultivation and livestock keeping was based on the cultural background of the ethnic groups residing in the study villages. The study showed that there was a positive and significant correlation between ethnicity and total land owned (Table 12), implying that ethnicity influenced land ownership in the study area. A comparison of land and livestock ownership among ethnic groups revealed that, the agropastoralist Sukuma kept considerable large herds of cattle and also cultivated considerable large farm holdings (Figure 3 and 4).

Table 15: Ethnic groups in study villages

Ethnic group	Mahango	Mwanavala	Imalilo Songwe	Ukwavila	Matebete	Kapunga	Total
Sangu	6.1(10)	3.0(2)	13.3(22)	3.6(6)	1.2(2)	.6(1)	27.9(46)
Bena	1.8(3)	1.2(2)	3.6(6)	0.6(1)		1.8(3)	9.1(15)
Hehe	9.7(16)	_	_	0.6(1)	_	1.8(3)	12.1(20)
Maasai	_	8.5(14)	_	_	4.8(8)	_	13.3(22)
Sukuma	6.1(10)	1.2(2)	7.3(12)	1.2(2)	3.0(5)	2.4(4)	21.2(35)
Others	4.8(8)	0.6(1)	_	3.6(6)	1.2(2)	6.1(10)	16.4(27)
Total	28.5(47)	14.5(24)	24.2(40)	9.7916)	10.3(17)	12.7(21)	100(165)

Figures in parenthesis indicate number of respondents, not in parenthesis denote percent Source: field data (2001)

This culture of keeping large herds of cattle has affected land resource in the study villages where the Sukuma have settled. This also has been one of the causes of

herder-farmer conflicts in the study villages. This observation supports the contention by Barlowe (1986) who asserts that custom and habit affect the use of resources in many different ways. For example, the author points out that the Hindu belief in transmigration of souls has resulted into the toleration of large populations of cattle and monkey in India which at times has contributed to losses in agricultural productivity. Similarly Hirsch *et al.* (1999) contend that the difference in ethnicity may influence the use of natural resources. The fact that among the ethic groups encountered in the study villages, the Sukuma were the only group with large herds of cattle (Figure 3) supports the observation by Hirsch *et al* (1999). SMUWC (2000) noted that, despite mixing of ethnic groups in Usangu plains, each group has retained its cultural identity and its livestock types. Several remarks had been made about the way in which Sukuma tend to look down upon other groups because they are comparatively few in number and own few livestock (SMUWC, 2000).

Discussion with respondents on how they interact with each other showed that 42.4% indicated good relationship, 3.8% indicated good relationship but complained of Sukuma large herds of cattle as being destructive. 50% Indicated bad relationship (Table 16).

Table 16: Relationship between ethnic groups in study villages

Interaction	Mahango	Mwanavala	Imalilo Songwe	Ukwavila	Matebete	Kapunga	Total
Good	10.1	4.4	13.3	3.8	8.2	2.5	42.4
Bad	17.1	9.5	7.0	5.7	1.3	9.5	50.0
Fair	1.9	0.6	1.3	–	–	–	3.8
Worse	0	0	3.8	–	–	–	3.8
Total	29.1	14.6	25.3	9.5	9.5	12.0	100

Figures indicate percent.

Those who indicated bad relationship accused Sukuma agro-pastoralists as being arrogant and destructive of the environment and the farmers' crops. Examples were cited where cultivators had refused to allow Sukuma herders to graze on stovers but were beaten by herders who then drove animals on to the fields. However, as indicated in (Table 16) 42.4 percent of the respondents showed good relationship between the different ethnic groups and pointed out that, they have benefited from the Sukuma in terms of land renting, cattle hiring for cultivation and in some villages like Kapunga and Ukwavila, herders have adopted the traditional self-defense mechanism (the sungusungu) to contain cattle rustlers. This shows that, although cultural backgrounds can exacerbate resource use conflicts, it is equally an important social capital upon which collective actions can be built upon.

The regression analysis has revealed some very fundamental relationship that exist between land ownership and some socio-economic factors and their implication on land use conflicts in the study area. The regression coefficients of these factors were statistically significant supporting the hypothesis that socio-economic factors influence land ownership and hence contribute towards land use conflicts.

4.4 Resource use conflicts between pastoralists and crop cultivators and their underlying causes.

4.4.1 Resource use conflicts

There are several dimensions to resource competition and actual or potential conflict in Usangu plains. Competition between people of different ethnic groups in villages

arises from different traditional production systems. Some ethnic groups are associated more with livestock (Sukuma and Maasai) while other groups are associated more with cultivation (Sangu,Bena,Hehe etc.). Conflicts over the use of resources arise, from extraction of water and opening up new, often fragile lands for cultivation. Resource competition between subsistence and commercial resource use is also increasing. Yet another dimension is competition between uses for national development and local livelihoods. For example the establishment of Usangu game reserve has displaced pastoralists from their dry season feed resources. The above situation has created a number of managerial and administrative problems on land and other related natural resources.

Findings from the study villages show that, resource use conflicts between farmers (crop producers) and pastoralists are very prominent. Among the 165 respondents interviewed during the survey, 63.6% (105) of them were aware of resource use conflicts between pastoralists and crop cultivators in the study villages where as 36.4% (60) of them did not indicate the presence of resource use conflicts in these villages (Table 17)

Table 17: Awareness on resource uses conflicts

Aware of conflicts	Mahango (n=47)	Mwanavala (n=24)	Imalilo (n=40)	Ukwavila (n=16)	Matebete (n=17)	Kapunga (n=21)	Total (N=165)
Yes	20.2(33)	9.8(16)	9.2(15)	9.8(16)	4.9(8)	10.4(17)	63.6(105
No	8.0(13)	4.3(7)	15.3(25)	-	5.5.(9)	2.5(4)	36.4(60)

Figures in parenthesis indicate number of respondents not in parenthesis denote percent
Source: Field survey (2001)

This high percent of responses acknowledging the presence of conflicts in the study villages supports the observation made by DePaw (1995); Charnley (1994); and Odgaard and Maganga, (1995) who observed that, at the micro-scale, the main current land use conflict is situated between crop production and pastoral production systems. The results show that most of the respondents were aware of resource use conflicts in their respective villages.

4.4.2 Causes of resource use conflicts

The use of resources is susceptible to conflicts for a number of reasons. It is clear from the results that resource use conflict between pastoralists and crop cultivators are due to several causes linked to environmental problems caused by irrigation development, land alienation, uncontrolled immigration, demographic pressure, insecure tenure and ineffective resource management practices. Of the 105 respondents who were aware of resource use conflicts 30.2%(32) indicated several causes for the conflicts prevalent in their respective villages. Crop damage by livestock ranked second with 24.5% of the respondents indicating it as a cause of resource use conflicts in their study villages, blocking of cattle routes to water and grazing land by crop cultivators ranked third with 10.4% of the respondents, where as competition for water ranked fourth with 8.5% of the respondents. Other causes in order of their ranks include- encroachment of farming into grazing lands by neighboring villages 7.5% (8), furrow damage by livestock 6.6%(7), confiscation of livestock by farmers while grazing in harvested fields 4.8%(4), and alienation from dry season grazing lands by the game reserve 3.8% (4) (Table 18).

Table 18: Causes of resource use conflicts in study villages

	Water competition	Crop damage	Forced cattle grazing	Furrow damage	Encroachment in grazingland	Blocking of cattle routes	Grazing land alienation	Confiscation of livestock	Several of these	Total
Mahango	3.8	5.7	3.8	3.8	_	_	_	3.8	11.3	32.1
Mwanavala	1.9	0.9	_	1,9	_	8.5	_	_	1.9	15.1
Imalilo	0.9	7.5	_	_	_	_	_	_	5.7	14.2
Ukwavila	1.9	4.7	_	_	_	_	2.8	_	5.7	15.1
Matebete	_	_	_	_	7.5	_	_	_	_	7.5
Kapunga	_	5.7	_	0.9	_	1.9	0.9	0.9	5.7	16
Total	8.5	24.5	3.8	6.6	7.5	10.4	3.8	4.7	30.2	100
Rank	4	3	8	6	5	2	8	7	1	

Figures indicate percent of responses
Source: Field data (2001)

The results show that crop damage by livestock, blocking of stock routes by crop cultivators and water competition were the main causes of resource use conflicts in the study villages. In Matebete village, respondents indicated encroachment of village grazing lands by farmers from neighbouring villages as the main cause of inter-village conflicts.

4.4.2.1 Crop damage by Livestock

Crop damage by livestock was a very common problem in all villages studied except Matebete village. This is due to the fact that most of the inhabitants of these villages are crop cultivators; livestock keeping is mainly done by the Sukuma agropastoralists

who usually keep large herds of cattle. During the interview with some respondents in Mahango, Imalilo and Ukwavila, Mwanavala and Kapunga villages they complained of crop damage mostly by Sukuma herds (Table 18). Sukuma are said to have moved into these villages with substantial herds which graze widely, both within the village and beyond. Occasionally, these herds of cattle damage crops, causing conflicts between cultivators and agropastoralists. In Mahango village, conflicts between pastoralists and cultivators also arise as a result of forced cattle herding in harvested field, especially in rice fields, because of damage by livestock to irrigation furrows while grazing in these fields. As a result of such problems, herders are prohibited from entering post- harvested rice fields because of fear of damaging permanent canals. Some cultivators usually burn crop residues in order to discourage livestock from entering their fields. Maganga (2000) reported similar observations in his study of resource use conflicts in Usangu.

There were no complaints on crop damage in Matebete village, which may be attributed to the fact that in this village the Maasai pastoralists form a major proportion of the inhabitants. Although they also do some crop cultivation, they are not as aggressive as the Sukuma in their use of resources both for livestock and crop cultivation. On average 10.5% of the livestock owners in this village kept between 1 and 20 heads of cattle whereas only 2.3% kept between 21 and 100 heads of cattle and no one had more than 100 heads of cattle (Table 19).

Table 19: Livestock category in study villages at Usangu plains

Cattle category	Mahango (n=15)	Mwanavala (n=18)	Imalilo (n=21)	Ukwavila (n=9)	Matebete (n=11)	Kapunga (n=12)	Total (N=86)
1 to 20	7.0(6)	8.1(7)	4.7(4)	4.8(5)	10.5(9)	8.1(7)	44.2(38)
21 to 100	5.8 (5)	10.5(9)	15.1(13)	4.7(4)	2.3(2)	4.7(4)	42.1(37)
Above 100	4.7 (4)	2.5(2)	4.7(4)	-	-	1.2(1)	12.9(11)

Figure in parenthesis indicate the number of respondents, not in parenthesis denote percent
Source: Field data (2001)

To the Maasai, livestock is a primary cash asset. Heads of households interviewed during this study stated that their households obtain the money they need to meet household expenses by selling livestock whereas the Sukuma spend most of the income from rice cultivation to purchase more cattle since they regard cattle as a store of wealth. The results clearly show that crop damage by livestock was very prominent in villages where the agropastoralist Sukuma are residing.

4.4.2.2 Competition for water

Competition for water is another cause of resource use conflict between livestock keeping and crop cultivation. Water demand for irrigation is ever increasing as more land is being developed for irrigated agriculture in the plains. Recent surveys by the Sustainable Management of Usangu Wetlands and its Catchment (SMUWC) Project have shown that the area under irrigation in Usangu plains is estimated at 40,000 ha in the wet season and 2,500ha in the dry season. The irrigated crops include rice, maize and vegetables.

Traditional schemes by small holders constitute a major part of the irrigated area in Usangu and there seems to be a substantial increase in the area under this type of irrigated agriculture. Frequent shortage of water in the rivers during the dry season limits the irrigated area. During this time, even the perennial rivers dry up completely, within short distance in the plains, because of large water obstruction by irrigation schemes. The occurrence of droughts and irregular timing of the rain season also worsen these problems.

These observations support the arguments by Homer-Dixon and Blitt (1996) who assert that natural resources are susceptible to conflict due to increased scarcity caused by rapid environmental change, increased demand and their unequal distribution. Among the study villages, competition for water between livestock and irrigated agriculture was more pronounced in Mahango, Mwanavala and Ukwavila villages as indicated by the percentage of responses 3.8%, 1.9% and 1.9% respectively (Table 18). Large scale rice farming by National Agriculture and Food Cooperation (NAFCO) - Mbalali, and Madibira have obstructed water upstream for irrigation purposes, leading to drying up of water downstream. This has forced livestock owners down stream to migrate upstream to find water for their livestock and thus bringing about the increased water competition between livestock and irrigation.

4.4.2.3 Obstruction of Livestock routes

In Mwanavala village, it was reported that, a well organized network of stock routes to water and grazing lands had existed, but from 1970s the inflow of other ethnic groups into this village have resulted into the expansion of cropland at the expense of the grazing lands and stock routes became obstructed by increased crop cultivation. This has inconvenienced Maasai pastoralists in respect to water for their animals. Some elders also claimed that, Mbalali rice irrigation project has diverted water from streams which in the past used to provide water in Mwanavala pastoral grazing lands. This has led to drying up of these steams, compelling the pastoral herds to move upstream to find water. On their way to water, these herds trample through farmers fields as they can not find the old routes to the water points due to obstruction by encroaching farmers' fields. The problem is prevalent during the dry season when most of the crops in the fields are harvested. However, this has often resulted into serious conflicts between the pastoralists and cultivators as most of the cultivators resent livestock herding in their fields even after harvest due to the claim that herding in the fields damages their land by creating a dusty condition and thus subjecting their fields to wind erosion. During the field observation crop residues were seen burning in some fields as a means to control livestock entry into these fields.

4.4.2.4 Inter-village competition for resources

Inter-village conflicts may result due to inter-village cultivation. Inter-village cultivation occurs because of a variety of reasons. One of the reasons is that some of the villages especially those created during the villagisation program were located

according to administrative convenience and accessibility, rather than according to ecological considerations. Hence villagers cultivate plots in different places in order to spread the risk of crop failure, or cultivate crops, which thrive in specific areas so as to exploit different ecological and micro-climatic opportunities. Inter-village cultivation also occurs because people are reluctant to give up their ancestral lands, even when they have moved to other villages. The fact that such farmers do not reside in places where they cultivate may result in their failure to adhere to any by-laws that a particular village may have laid down, especially regarding the use of natural resources

In Matebete village, the respondents interviewed did not mention problems about resource use conflicts amongst villagers but rather with farmers from neighboring villages. 7.5% of the respondents (Table 18) indicated that farmers from neighboring villages are encroaching into their village lands. During the interviews with village leaders, it was claimed that Chimala ward authorities have allocated part of their village land to farmers from outside Matebete without the consent of the village council. It was claimed that most of the residents in neighboring villages, including the ward authorities regard Matebete grazing lands as being nobody's property after the closure of the Usangu ranch. As observed by SMUWC (2000) rights of land occupancy are not clearly defined for non-sedentary users, such as pastoralists. In practice there is an inherent assumption in favour of sedentary cultivators, which underlies many of the conflicts in Usangu plains as exemplified by what is happening in Matebete.

Discussion with the village leadership in Matebete revealed that the village covers an area that formally was a cattle ranch belonging to Usangu-Mbeya Cooperation (USAMBECO). The Maasai pastoralists had resided in this area even before the establishment of the ranch. At its closure in 1980s the ranch had an outstanding debt at the Cooperative and Rural Development Bank (CRDB) in Mbeya. In order to recover the loan it was decided that the ranch be mortgaged. The Maasai pastoralists, who had remained in this area, decided to join forces and paid the required sum to CRDB and thus they are now the legal owners of the defunct ranch, but neighbouring villages, including ward and district authorities have failed to recognize this. As observed by SMUWC (2000), the new land laws are not fully grasped at the local level, the new powers and responsibilities of village governments is not necessarily embraced and supported by district officials.

According to the new land policy (1995), procedure followed in allocating land in a village to a non-villager is as follows: An applicant is advised to forward his/ her application to the village council of the village where the land is situated and obtain the minutes of the village council signed by the chairperson and the secretary of the village showing that the council had no objection to such allocation. It is on the basis of such minutes that the district allocation committee grants land rights to the applicant. The same procedure has to be followed where a villager resident wants to have his/her land surveyed for the purpose of obtaining a title deed.

Evidence from Matebete indicates abuse of this process leading to alienation of tracts of land to outsiders. Discussion with respondents in Matebete village revealed that village assemblies had never discussed such applications. The survey carried out by the Land Commission in several parts of the country in 1995, observed that there is evidence that the chairperson and the secretary of the village may sign such minutes without even holding a meeting of the village council. The Commission further noted that there are complaints of collusion between village leaders and district authorities to grant land to outsiders contrary to the interest and wishes of the villagers. Similar complains were noted in Mahango village during this study.

To solve the problem of land encroachment and interference in decision-making by ward authorities the village leadership in Matebete had contacted the district authorities, including those responsible for lands, but up to the time of this study nothing has happened in resolving these problems.

4.5 Local institutions and their role in regulating resource use and conflict management.

Both traditional and externally sponsored local institutions were encountered in this study.

4.5.1 Traditional institutions

Traditional institutions are important in natural resource management and play a greater role in regulating access and utilization of various natural resources in a given society. Traditional institutions present established local system of authority and

other phenomena derived from the sociocultural and historical process of a given society (Appia-Opoku and Hyma, 1999 in Mbwambo 2000). Traditional institutions, which originate from local cultures, have firm roots in the past and reflect knowledge and experience of the local people. Identification of these institutions can serve as a point of entry in the search for local level and broad based approaches to the management of natural resources. Traditional institutions identified during this study include; the council of village elders, and the traditional guards (Table 20)

Table 20: Local institutions in study villages

	Mahango	Mwanavala	Imalilo	Ukwavila	Matebete	Kapunga	Total
Council of village elders	_	8.0(11)	0.7(1)	_	2.2(3)	_	10..9(15)
Traditional guards	_	_	5.8(8)	4.3(6)	_	2.9(4)	13.0(18)
Irrigation comittee	5.8(8)	_	_	_	_	5.8(8)	11.6(16)
Listock groups	_	_	_	_	6.5(9)	_	6.5(9)
Village council	6.5(9)	5.8(8)	15.2(21)	7.2(10)	3.6(5)	6.5(9)	44.9(62)
Police	13.0(18)	_	_	_	_	_	13.0(18)
Total	25.4(35)	13.0(19)	21.7(30)	11.6(16)	12.3(17)	15.2(21)	100(138)

Figures in parenthesis indicate number of respondents, not in parenthesis denote percent

Source: Field data (2001)

4.5.1.1 Council of village elders

The council of elders is essentially an informal institution, which play an important role in a society with respect to regulating peoples behaviour. In this study 8% of respondents in Mwanavala village and 2.2% in Matebete as indicated in (Table 20)

acknowledged the existence of the council of elders. As observed by Kajembe, (1994) informal procedures are part of the social fabric of the local societies in the tropics; where the kinship system and the rules and obligations set up by culture provide the stabilizing force. Jacobs (1980 in Kajembe 1994) point out that, the Maasai regularly use social rebuke and avoidance of the individual who fails to adhere to good resource management practices. Similarly Maganga and Odgaard (1995) observed that councils of elders played an important role in distribution of rights and in conflict resolution in their study of resource management in Ruaha river basin. The fact that the Maasai still practise these resource use management mechanisms shows that there still exist potential institutions at the local level upon which new local institutions can be built on or strengthened to perform different functions related to natural resources management at the local level. However, traditional institutions have their own problems. They may have lost some of their local authority and legitimacy as a result of an emergent democratic order which makes the election of accountable representatives rather than the inheritance of traditional authority more acceptable to many in general populace as well as to the new, democratic state. Also they are not representative even though they have often continued to retain a degree of popular support and status in post-colonial era. However, as asserted by swift (1995), recognizing the limitations of traditional institutions should not lead to their being jettisoned. Rather those elements that are appropriate in contemporary circumstances should be retained, stregthened and given legal recognition.

4.5.1.2 Traditional self-defense force (Sungusungu)

The means of enforcing rules and regulations vary among different groups. Some have local police force, but, most local societies in the tropics rely on the observations of each individual member to report transgression and trespass (Kajembe, 1994). Interviews with household heads in Kapunga, Imalilo, and Ukwavila Villages revealed the existence of traditional police force brought in by the Sukuma agropastoralists - the "Sungusungu" traditional guards (Table 20). It was asserted that increased cattle thefts in Usangu have prompted the residents to adopt the Sukuma traditional self-defense institution (Sungusungu). According to Maganga (2000), Sungusungu was formed in Sukuma dominated regions of Mwanza and Shinyanga, in the early 1980s in response to increased thefts of their cattle by some bandits and the inability of the state to protect them.

Commenting on the use of traditions by these defense groups, Campbell (1987) in Maganga (2000) noted that the members "reverted to the type of dress, weapons and medicinal practices of the pre-colonial village, developed a method of self-organization and self-mobilization which by-passed the courts, the police and the party structures of governance in rural villages". Commenting further on the community – empowering features of the Sungusungu, the author observes: singing songs of resistance, dancing over long distances and affecting new forms of communication in the rural areas, the Sungusungu stamped a new sense of collective justice which established itself as a cultural reference point in the community between 1981 and 1986 (Campbell, 1987 in Maganga, 2000). The author further

observes that the Sungusungu movement became very successful in combating cattle rustlers and even the government became afraid of it and decided to copt it, and in some villages it was officially recognized as a village security organ. The adoption of this institution by residents in the three villages confirms the strengths of traditional institutions in local resource management. As contended by Ostrom (1996) such institution need strengthening and legal identity so that it may effectively carry on regulatory functions in respect to natural resources in respective villages.

4.5.2 Externally sponsored local institutions

Externally sponsored local institutions encountered in this study include; the Village Council, Irrigation Committees, Livestock Associations, Ward Tribunal, and the Police.

4.5.2.1 The village council

The current administrative structure in most of the villages is as stipulated in the 1982 Local government Act. Ideally, this organizational step-up should promote community control of power, and facilitate participation by the villagers in matters which affect them and which are initiated by themselves. In reality, however, the village governments have become subordinated to the more powerful local government, and central government administrative superstructures. Consequently, the village governments have increasingly become instruments of implementing policies and directives of superstructures other than their own.

The village council, in principle, implements the policies of the assembly, in practice, village assemblies are rarely convened and are ill-attended, often leaving councils essentially unanswerable. An interview with village leaders in most of the study villages, revealed that most of them did not even remember when they had convened the last council meeting except in Ukwavila village where records of council meetings were well documented. Village governments have broad powers, extended under the recent legistrative changes, and may make by-laws to implement decisions. It is important to note that management rules and regulations need to be known by all resource users in order to avoid unintended violation. The study showed that 53.9% of the respondents were aware of by-laws governing the use of resources in their respective villages where as 46.1% of them were not aware of any by-law governing the use of resources in their respective villages (Table 21).

Table 21: Awareness of by-laws in study villages

	Mahang o	Mwan avala	Imalil o	Ukwavil a	Mateb ete	Kapunga	Total
Yes	19.7	11.8	5.3	3.3	3.9	9.9	53.9
No	9.2	3.9	15.8	7.2	7.2	2.6	46.1
Total	28..9	15.8	21.1	10.5	11..2	12.5	100

Figures indicate percent of respondents

Source: Field data (2001)

The study also revealed that the present by-laws are not adhered to and there is lack of responsibility in the enforcement of these by-laws by the responsible parties (village councils) as confirmed by increasing land use conflicts observed in these

villages. Enactment of by laws is potentially an important tool in land management. However, the ability to do so was found to be weak while the confirmation by the district administration was reported to be excessively tardy. For example, it was claimed that the village council at Mahango had established village by-laws and forwarded them to the District council for approval in 1998, but up to the time I was conducting this study they were still unapproved.

Election to council is democratic, but still tends to favour the powerful with vested interests. Hamlet representation sometimes emphasizes the settled farming community. Pastoral groups living in the village may not be accorded full civic rights. During this study it was observed that hamlets dominated by Sukuma agropastoralists were represented on village council by non- Sukuma cultivators. A run down through the registers of the members of the village council in Mahango, Imalilo , Kapunga, and Ukwavila villages revealed that of the 25 mandatory members of the councils, 75% came from the cultivators' group (Table 22).

Table 22: Village council representation in study villages at Usangu plains.

Group	Mahango	Mwanavala	Imalilo	Ukwavila	Matebete	Kapunga	Total
cultivators	14.7(22)	10.0(15)	16.6(25)	12.7(19)	4.7(7)	16.6(25)	75.3(113)
Herders	2.0(3)	6.7(10)	_	4.0(6)	12.0(18)	_	24.7(37)

Figures in parenthesis denote number of respondents; not in parenthesis indicate percent

Source: Field data (2001)

More importantly the village chairpersons of the four villages, Mahango, Imalilo, Ukwavila and Kapunga also came from the cultivators group except in Matebete and Mwanavala where the chairpersons came from the pastoral groups.

Although responsibilities of the village government include land allocation and natural resource management and protection, a responsibility reinforced and extended under the new land and village land Acts of 1999 which among other things, call for village land management plans, there was no specific committee charged with these responsibilities in any of the study villages.

Weak leadership at village level is not unique to the study villages. Partial concentration of control over the natural resources on part of the village government had also been observed by Kauzeni (1994) in his study on land tenure and natural resource management in Gitting village, Hanang district. The author noted that the village government had less effective control of resources, unable to settle land disputes among villagers, failed to control land ownership in unallocated lands and encroachers of foot paths between farms and also that it failed to control overgrazing on communally owned land.

4.5.2.2 Irrigation committees

Other important externally sponsored institutions encountered in this study were irrigation committees. The existence of irrigation committees was acknowledged in Mahango and Kapunga villages by 5.8% of respondents in each village. Irrigation

committees were involved in the day to day management of the irrigation system. A number of tasks were supposed to be organized by the committees to operate irrigation systems. These tasks include: (1) Water acquisition- the task of obtaining water for irrigation system through regular or extraordinary means; (2) Water allocation-the task of dividing and distributing the systems supply to its users; (3) system maintenance- the task of repairing, clearing and otherwise reconditioning the physical apparatus of the system; (4) resource mobilization- the task of activating and accumulating labour, materials, funds, and other resources needed to implement tasks such as system maintenance; and (5) conflict management - the task of containing and adjudicating (through not necessarily resolving) disputes and disagreements arising from operations such as water allocation. However, field observation revealed that, water committees were not effective. For example it was reported that in times of water shortage, temporary allocation systems were imposed, but since smallholders preferred a continuous supply of water in their fields, scheduled allocations were not adhered to and, most often, control gates were removed. Resource mobilization was also found to be poor and small holder farmers continued to rely on donor support in maintaining the irrigation systems.

External donors based on the philosophy that small holders used water inefficiently had funded irrigation improvement projects. However, planning of these small holder irrigation schemes appeared to have not based on an assessment of the institutional and organizational arrangement for irrigation tasks. Indications were that irrigation improvement schemes had led to increased inequalities between top-enders and tail-

enders, had increased water use, and total obstructions from the rivers. User groups generally tried to obstruct as much water as the intake structure and source flow could allow.

Opportunities for small-scale paddy cultivation had drawn immigrant cultivators into these villages, and as asserted by Chanley (1994), the different ethnic groups had retained their cultural practices and no one group was inclined to adhere to the practices of another. This situation provided for a complex of irrigation water management systems observed in the study villages.

Although the irrigation schemes and their operation were solely for the benefit of the users, it seems beneficiaries were made to think that the ultimate control and custodianship of the irrigation systems lay with a somewhat nebulous body outside, viz. the state, whose powers and responsibilities were exercised by the irrigation project through its officials at the district and the village level. The community had failed to evolve new institutional arrangements that were consonant with the contemporary state presence, and there was thus a certain degree of community malaise with regard to irrigation system maintenance and operations as observed during the study.

An important related issue was that of water rights. To obtain a water right, the irrigation system had to be formally registered as an association or a co-operative. Obtaining a water right was normally a prerequisite to externally funded irrigation

improvements. Water rights place limits on approved abstractions, and these may vary between wet and dry seasons. However, in most systems there were either no structures to allow control of off take, or the gates had been removed, or there was an absence of the will to regulate flow. In the absence of any water use policing capacity, water obstructions remained essentially unregulated and hence open access.

4.5.3 The role of local institutions in regulating resources use and conflict management.

Institutions are created to perform certain functions. The institutions identified in this study perform several functions in relation to resource use as indicated in section 4.4.1 and 4.4.2 above. With respect to conflict management, respondents identified a number of conflict resolution mechanisms they employ in resolving emerging resource use conflicts in their respective villages as shown in Table 23.

28.1% of the respondents indicated the village council as an institution through which they resolved resource use conflicts and disputes where as an equal proportion (28.1%) of respondents indicated personal negotiations as appropriate mechanism through which conflicts and disputes could be resolved. 12.6% indicated both personal negotiations and village council as the appropriate means while ward tribunal and the police each had 7.8% of the respondents acknowledging them as appropriate institutions through which conflicts and disputes were resolved. 6.8% indicated both police and courts of law where as 5.6% and 2.9% indicated courts of law and village elders respectively (Table 23).

Table 23: Conflict resolution mechanisms in study villages at Usangu plains

Mechanisms	Mahango	Mwanavala	Imalilo	Ukwavila	Matebete	Kapunga	Total
Report to police	6.8 (7)	-	1.0 (1)	-	-	-	7.8 (8)
Resolve through courts of law	4.9 (5)	-	1.0 (1)	-	-	-	5.9 (6)
Through Negotiations	6.8 (7)	5.8 (6)	5.8 (6)	2.9 (3)	-	6.8 (7)	28.1 (29)
Through Elders committee	-	2.9 (3)	-	-	-	-	2.9 (3)
Through village council	1.9(2)	4.9.(5)	4.9(5)	6.8(7)	-	9.6(10)	28.1(29)
Through the ward tribunal	-	-	-	-	7.8.(8)	-	7.8.(8)
Police and courts	6.8.(7)	-	-	-	-	-	6.8(7)
Negotiations and village committee	4.9(5)	1.9(2)	2.9(3)	2.9(3)	-	-	12.6(13)

Figures in parenthesis indicate number of respondents, not in parenthesis denote percent

Source: Field data (2001)

When comparing conflict resolution mechanisms across the study villages, Mahango respondents seemed to resort to the police and courts of law mostly. This may be explained by the fact that, Sukuma agropastoralists had moved in with substantial herds of cattle and as claimed by some villagers, the Sukuma are very aggressive in their use of the natural resources both for livestock and crop cultivation. It was asserted that Sukuma agropastoralists usually clear big tracts of land as a means of demarcating their holdings and also do keep substantial big herds of cattle, which graze widely without respect for the cultivators' fields. It was also noted that sometimes they force cultivators to harvest their crops in the fields and when the cultivators don't comply they may drive their cattle into cultivators fields damaging the crops.

Although land use is supervised by the village government, the respondents in Mahango village reported various problems related to increased pressure on the available land and failure of the village government to restrict the number of people moving in. The respondents complained about some village leaders being open to bribes and allowing big herd owners (Sukuma agropastoralists) to bring their cattle in for grazing. Some villagers had also reported these problems to the district authorities but, the authorities did not respond for reasons well known to themselves.

Since the sources of conflicts remained unadressed, tension among the conflicting parties grew up and ended up into a violent dispute. In the process Sukuma houses were set on fire and some of their livestock herds were attacked. This rose the attention of authorities at the district, regional and national level, prompting the district authorities to take disciplinary measures against the village leadership on allegation that they had failed to maintain peace in the village. It was also during this time that a police post was put in place in Madibira ward to deal with these conflicts. To date most resource related problems are referred to the police and magistrate courts as confirmed by the percentage of responses (6.8%, 4.9% and 6.8%) (Table 23).

As discussed in section 4.5.2.1.the village assemblies are never convened in most of the villages leaving village councils unaccountable to the people who elected them. The result is that most of the decisions at the village level are taking place out side the formally recognized "loci" for decision making i.e. the village assembly. The

most important decisions are made by loosely bounded groups of individuals or factions. Kajembe (1994:128) asserts that it is competition for power which establishes a "faction". The author further contend that, a faction is not a legitimate agent within an administrative structure. It may be "loci" for decision making but the rules, which govern it, are not prescribed by the institutional framework in which it operates.

Experience from Usangu plains reveal that Communities are stratified. In all stratified communities, interests of some actors are represented inadequately (Kajembe and Mgoo 1999). As pointed out in section 4.4.2.1, in Usangu plains pastoral and agropastoral groups are not represented adequately in the village councils. It is common for example to see hamlets dominated by Sukuma agropastoralists being represented by non-Sukuma cultivators in a village council. Because of hierarchies and problems of representation and accountability as revealed in most of the study villages, it is important to create institutional structures of representation and accountability that can undermine existing asymmetries and prevent new ones from becoming entrenched.

Besides power struggles at a micro- level, another challenge is on part of the government leadership at the macro level. Government officials usually have very mixed feelings about community action in natural resources (Kajembe and Monela, 2000). Displinary measures taken against the village leadership by the district authority on allegations of mismanagement of resource use conflicts at the village level in Mahango village is a clear evidence of

how government officials strongly believe that they are better prepared and better organized to lead communities in natural resource management activities as asserted by Ascher (1995 in Kajembe and Monela 2000).

In Ukwavila and Kapunga villages, most of the respondents indicated negotiations between individuals and settlement through the village committee 2.9%, 6.8% and 6.8%, 9.8% respectively as the appropriate mechanisms in conflict resolution. Nobody mentioned the police or courts of law a fact that may explain the effectiveness of village governments in these two villages. Observation by SMUWC (2000) show that, villagers in Ukwavila have established a well organized village government, which implements many of its activities such as tax collection, land allocation, enforcing by-laws and managing emerging resources use conflicts and other problems.

The village elders were reported to be important conflict settlement institution in Mwanavala village as indicated by the 2.9% of the respondents no other village did mention this institution. This may be explained by the fact that the Masaai who are the major ethnic group in this village still adhere to the old norms and most of the Masaai elders are key members in the village government and so most of the conflicts involving the Maasai are reported to the council of village elders.

In Matebete, some respondents (7.8%) indicated the ward tribunal as an appropriate institution through which resource use conflicts can be settled. This may be explained by the fact that most of the conflicts in this village as previously described

(section 4.4) were due to encroachment in Matebete lands by farmers from neighboring villages and so it was difficult for the village leadership to take action against individuals from outside the village and thus the only appropriate place for them was the ward tribunal. However, as discussed before (section 4.3.2.4) ward authorities do not recognize the land rights of the pastoral Maasai in Matebete and often have decided cases bought by pastoralists in favour of cultivators.

4.6 Relationship between some variables

4.6.1 General over view

Relationship between some qualitative variables was assessed by identifying statistical association that might exist, given different levels of each variable. In this case, Chi-square test was employed

Table : 24 relationship between variables

Variables	Person Chi-square value	Degrees of freedom	Level of significance
Conflict resolution mechanism and local institutions	33.069	12	0.001*
Institutional rights over resources and means of land acquisition	141.155	12	0.000*
Grazing management and fertility improvement	6.74	2	0.034*
Pasture shortage mitigation and accessibility to crop residues	2.12	2	0.347NS
Purpose of keeping livestock and measures taken to improve soil fertility	16.035	8	0.042*

Source: field data (2001).
* = Significant
NS = non significant

4.6.2 Local institutions and mechanisms for conflict resolution

Results show that there was a statistically significant ($P<0.001$) association between local institutions and mechanisms for conflict resolution. Suggesting that local institutions were effective in carrying out their role of ensuring efficient and effective resource use. The findings support observation made by Maganga and Odgaard (1995) who observed that, councils of village elders played an important role in the distribution of rights and conflict resolution in Usangu.This argument could also be evidenced by the acknowledgment of the presence of effective village elders committees in Maasai dominated settlements like Mwanavala and Matebete villages and an effective local defence force (the sungusungu) in Ukwavila, Kapunga and Imalilo villages which have been very effective in combating cattle rustling in the respective villages. However, some of these local institutions, such as the village councils and irrigation committees were not well organized in terms of operation and management of local resources. For example it was observed that resource management rules and regulations were not known to most of the stakeholders. Among the respondents interviewed during this study, only 53.9% were aware of the by-laws governing resource use in their respective villages whereas 46.1% of them were not aware of these by-laws. The enforcement of these by laws by the responsible parties (village councils) was found to be weak as confirmed by increasing land use conflicts observed in these villages. Irrigation committees failed to mobilize resources; control water use and irrigation system maintenance and generally there was a certain degree of community malaise with regard to irrigation system maintenance and operations.These observations support the hypothesis that

although local institutions are in place in the study area, their roles and functions in respect to natural resource management are not clear.

4.6.3 Pasture shortage mitigation measures and measures to improve soil fertility.

According to results on (Table 24), there was a statistically significant ($P<0.5$) association between measures taken to improve soil fertility and pasture shortage mitigation measures. These results suggest that there was a good livestock-crop integration in the farming systems of the study area. The findings are supported by interview results whereby 29% of the respondents acknowledged the use of livestock manure as a measure to improve soil fertility in their crop fields, where as 12.2% acknowledged the use of crop residues as a source of feed to their livestock and 20% use livestock for draft purposes. However, field observations revealed that, only those crop fields, which were close to the cattle bomas and those within the vicinity of the village, were fertilized using manure. The use of manure was practiced mainly by people keeping livestock. Burning of crop residues as a way of preventing livestock trampling into the fields was also very prevalent in the study area, suggesting that crop livestock integration is not well organized in the area.

4.6.4 Pasture shortage mitigation measures and accessibility to crop residues.

The results in (Table 24), reveal that the association between pasture shortage mitigation measures and accessibility to crop residues was not statistically significant ($p>0.5$). The results support the hypothesis that crop- livestock integration is lacking in the farming system of the study area. These findings are further supported by interview results, which show that among the strategies to cope with pasture shortage, crop residues was mentioned by only 12.2% of the respondents where as 53.7% indicated that they usually move to other areas with ample pastures outside

their villages, as a strategy to cope with pasture shortage (Table 11). Also among the causes of land use conflicts in the area, crop damage by livestock was mentioned by 24.5% of the respondents, blocking of livestock routes to water and grazing lands was mentioned by 10.4% of the respondents, where as 8.5% 7.5% and 6.6% of the respondents indicated water competition, encroachment of crop cultivation into grazing lands and irrigation for furrow damage by livestock respectively. These findings clearly show that crop-livestock integration is lacking in the study area and support findings by Maganga(2000) and SMUWC (2000) who contend that, pastoralism forms a distinct farming system, with limited integration of livestock with cultivation and that there is often a marked division between pastoralists and cultivators which at times leads to conflicts.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

From the results and discussion in chapter four, five lessons emerge. First, changes in land use in the study villages are a function of both the biophysical as well as of complex changes in the socio- economic factors. As observed in this study, there exist some fundamental relationship between land ownership and socio-economic factors. The regression coefficients of these factors were statistically significant indicating that, competition for land resources and hence land use conflicts increased as a result of socio-economic factors. Immigration of different ethnic groups in Usangu has exacerbated the problem of resource utilization due to the fact that although each ethnic group had tried to implement customary resource management practices, the activities of the different groups undermined each other, and no one had been willing to follow the cultural practices of another ethnic group. This has led to the breakdown of traditional collective arrangements for management of resources that were in place before the coming of other ethnic groups in Usangu plains.

Second, most of the existing local institutions in the study area are not well organized in terms of operation and management of local resources. Locally available expertise in the management of land resources lagged behind expectation, a fact that may be proved by observed land use conflicts and unsustainable use of the land resources in the area. Pastoralists and agro-pastoralists are not well represented in the village

governments, a situation that limit their potential to contribute to the decision making on the management and conservation of natural resources in their respective villages. This lack of popular participation in resource use decision-making seems to have curtailed negotiations between different social groups. It seems also to have hindered the establishment of democratic and efficient institutional arrangements at the local level to monitor and control the imprudent resources use patterns and to manage the recurring resource use conflicts.

Third, there is little integration of livestock in the farming systems of the study area. This was clearly seen both in terms of inefficient use of crop residues and livestock manure in the farming system of the study area. Crop-livestock integration in the context of this study is defined as a flow of products between crop and livestock enterprises. The possible flows are manure as fertilizer, draft power for tillage and crop residues for fodder. Among 165 respondents interviewed during this study, 55.8% of them own cattle but only 29% of the respondents acknowledged that they used livestock manure to improve soil fertility in their crop fields. 20.4% used draft power and only 12.2% used crop residues as fodder. Burning of crop residues was also very prominent in the study area. Most of the land use conflicts observed in the area were due to competition between livestock and crop cultivation. Generally the findings show that, there is clear-cut distinction between livestock and crop cultivation in the area.

Fourth, a significant number of stakeholders of natural resource use were not aware of or have not clearly articulated the local resource management strategy. For example, among the 165 respondents interviewed during this study only 53.9% were aware of by-laws guiding resource use in their respective villages where as 46.1% were not aware of by-law. This means that many actors in local resource management do not clearly know their roles a situation that might have contributed to resource use conflicts in the area.

Fifth, the presence of traditional institutions such as the village elders in Mwanavala and the traditional guards in Ukwavila and Kapunga, clearly show that there exist institutional potential at the local level from which new institutions could be built upon or strengthened to carry out desired resource management functions.

5.2 Recommendations.

5.2.1 Formulation of flexible policies

In the study villages, the land problems are products of socio-economic factors. In this respect, it is recommended that the government should formulate policies that are flexible to adjust to the changing socio-economic conditions and needs of society. Village land use planning should be participatory. Local resource users should define problems and priorities, formulate objectives and strategies, mobilize and contribute resources and plan implementation. Mechanisms must be evolved to ensure that the needs of the local people are taken into account.

5.2.2 Creation of new roles and functions for local institutions

The study has also showed that, although local institutions exist in the study villages their roles and functions with respect to natural resource management are not very clear. In this view, it is recommended that new roles and functions of existing local institutions be developed. These may involve organizing seminars to clarify legal rights, policies and responsibilities of the leaders and the community members in respect to natural resource management and community development. Organizing joint workshops between community groups, village government, district council and village population to identify gaps and measures for action. Conducting civic education to both leaders and community members at large.

5.2.3 Enhancement of crop-livestock linkages

The level of crop livestock integration observed in this study, call for concerted effort to educate the farmers, pastoralists and agropastoralists on crop-livestock linkages, so that they may improve their levels of productivity and get away with agricultural extensification which is leading to land scarcity and hence increased land use conflicts in the study area. In order to enhance, sustainable resource management, it is necessary to balance emphasis regarding the hardware (technical) and software (social) aspects of resource management.

5.2.4 Community mobilization and environmental education.

The study has demonstrated that, Leaders and the community at large are not well informed and lack the technical know-how needed to make crucial decisions regarding the management of natural resources in their respective villages. In this respect, it is recommended that people should be mobilized to form local groups and be trained on resource management issues. Emphasis should be put on education programs that emphasize the significance of human relationships with natural resources and the society based legal rights over the resources. This will provide an important first step towards a wide acceptance of common goals and stewardship philosophy in the use of land resources. There is hope that once organized and empowered with knowledge and skills, the groups will embark on their own resource management initiatives, including development of environmentally friendly livelihood options and networking with other groups

5.2.5 Building up new institutions and strengthening the weak ones.

In a situation like the one observed in study villages, it is unlikely that one local level resource management body, e.g. "Village government" can handle all local matters of natural resource management. It is thus recommended that various types of institutions be initiated or strengthened to manage different resources at different levels, with various means of interaction. For example herder groups could be strengthened to manage grazing lands, and dipping where as farmer groups could be strengthened to manage irrigation schemes. While water uses associations could be formed to manage water for different uses.

5.2.6 Re- defining land tenure.

Land rights for pastoralists and agropastoralists in the study villages is not clearly defined. The result had been that cultivation has taken much of the rangelands resulting into resource use conflicts between headers and cultivators. The resolution of these conflicts lies to a great extent on solving the dilemma faced by pastoralists in the area. Since they are the more vulnerable group than the cultivators due to the fact that they are forced to become sedentary, a process that may lead to loss of their way of life. The only option remaining for them is to compete with the encroaching farmers by bringing their livestock herds into cultivators' fields whether harvested or not. This calls for policies that address the grazing needs of the pastoralists if sustainable resource management is to be achieved. In this respect re- defining land tenure categories and tenure system is advisable. This will require evaluation of all land development projects currently being undertaken in Usangu such as the state rice farms, Usangu game reserve, and smallholder paddy irrigation schemes whether they are economically and socially viable enterprises so that the government may consider surrendering some of these areas to the local people as a way of easening the conflicts between different land uses. Conflict management should be based on local knowledge and participation of the communities and local authorities in each village

5.2.7 Carrying out a stakeholder analysis

Stakeholder analysis should be carried out well before any resource management initiative is started so as to identify all-important stakeholders in the use of local resources, their interest and their potential impact on the resource base. The analysis can be used to resolve conflicting interest of the stakeholders, thereby avoiding the potential conflicts that can be detrimental to the local resources and the community in general.

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APPENDICES

Appendix 1. Sample questionnaire for household data.

1. Name of village..... .Date.....
2. Name of respondent.....Age.....

   Level of education..... Marital status.....
3. Head of household. Male..... Female.....
4. Household composition

   Total number of people in the household.....

   Sex and Age groups

   (i) Males below 18years [ ] Above 18years[ ]

   (ii) Female below 18years [ ] Above 18years[ ]
5. Ethnicity.....
6. Main occupation.....
7. Length of residence in the village.....
8. Reasons for migration.....

LAND USE AND OWNERSHIP.

9. Total agricultural land owned.....Number of plots.....
10. How did you acquire the land you own?

    a) Bought [ ] b) Rented [ ]

    c) Inherited [ ] d) Allocated by government [ ]

    e) Other(specify).....
11. If the land was bought, how much did you pay per plot?.....
12. If is a rented one, how much do you pay per plot?.....
13. Location of farm in the landscape

    a) Beside the stream/ river[ ] b) Around homestead[ ]

    c) Near the grazinglands [ ] d) Other.....
14. How far is your farmholding located from the village?.....
15. Why is your farmholding far away from the homestead?.....
16. Is your land holding adequate?.....

17. If not why?.....

18. How much additional land do you need?.....

19. For how long have you been cropping the same field?.....

20. Do you think soil fertility in your farm have changed?.....

in which direction?.....

a Decreased a lot [ ] b) Decreased a lot [ ]

c) Little decrease [ ] d) Remained the same [ ]

e) Little increase [ ] f) Increased a lot [ ]

g) I don't know [ ]

21. If there are increases in soil fertility what are the main reasons?.....,.....,.....,.....

22. What measures do you use to improve soil fertility in your farm?.....,

23. What institutional rights do you have over your farmholding?

a) Have tittle deed [ ] b) Have customary rights [ ]

c) Village protection[ ] d) No rights [ ]

24. How does the land rights influence your investment decisions with regard to resource conservation?

a) Expansion of farholding.....

b) Improving farming methods.....

c) Diversification of enterprises.....

25. Have the in-migration of other ethnic groups affected the land holdings you previously had traditional rights to?.....

26. If yes in 25,how did you manage the situation?.....

27. If you are a pastoralist/ agropastoralist, what type of livestock do you keep?

	Type	Number	Feeding System	Purpose
i)	.....	.....	.....	.....
ii)	.....	.....	.....	.....
iii)	.....	.....	.....	.....

28. Where do you graze your livestock?

a) Communal grazing lands [ ] b) Fallow lands [ ]

c) Harvested fields [ ] d) Established pasture [ ]

29. Is the available grazing land adequate? a) Yes[ ] b) No [ ]

30. If no in 29,why? a) Too many animals[ ] b) Poor pastures [ ]

c). Encroachment by farmers[ ] d) Other (specify).....

31. How do you manage the problems in 30 ?.....

32. At what time of the year do you experience shortage of pastures for your livestock? a) Dry season[ ] b) Rain season[ ] c) Year round[ ]

33. Do you have access to crop residues on fields belonging to farmers?.....

34. If yes in 33, how? a) freely [ ] b) Purchase[ ]

c) Exchange with livestock manure [ ] d) Other (specify).....

35. Do immigrant pastoralists have rights of access to the grazinglands and fallowlands in this village?.....

36. How do immigrant pastoralists interact with other groups of farmers in the village?.....

37. What incentives attracted you to immigrate to this valley?

a) Grazing lands [ ] b) Water needs [ ]

c) Land for cultivation [ ] d) Ecological stability [ ]

e) Other (specify).....

38. Who decides on general grazing matters in this village?

a) Village leaders [ ] b) Grazing management groups[ ]

c) Farmer groups[ ] d) Others (specify).....

39. Are there any restrictions on stocking rates in this village?.....

40. If yes in 39,who imposes these restrictions?.....

41. Do you have any institutions for regulating resource use in this village?.....

42. If yes in 41,what are these institutions?

a) Customary authority [ ] b) Farmer groups[ ]

c) Grazing management groups[ ]

d) Formal institutions set by the government[ ]

e) Mixed institutions[ ]

.43. Which of the institutions in 44 has legitimacy and exercise the real power over resource control.....

44. Are there any by-laws which bar grazing to be done in some areas?.....

45. If yes in 44,what are these areas?.....

46. Do you think benefits from the grazing lands could be improved without degrading the resource base?.....

47. If yes, how? a) Demarcating grazing lands[ ] b) Destocking[ ]

c) Restricting stocking rates[ ] d) pasture improvement[ ]

e) Establish management agreements between pastoralists and the farmers[ ]

48. What incentives would attract you to participate in grazing land improvement?

a) Casual employment[ ] b) Grazing rights[ ]

c) Conservation values[ ]

d) Others (specify).....

49. What are the incentives encouraging community-led resource management institutions? a) Environmental education[ ]

b) Community empowerment[ ]

c) Economic aspirations[ ] d) Social welfare[ ]

50. What are indigenous attitudes towards immigrants?.....

Appendix 2. Village questionnaire

1. Name of the village.....
2. Human population : Male ..... Female.....
   a) Active population (15-60 years) [ ]
   b) Children below 15 years [ ]
   c) Aged people above 60 years [ ]
3. Number of households.....
4. Average size of household.....
5. Female headed households.....
6. Male headed households.....
7. Social services in the village
   a) School [ ] b) Healthcare units[ ] c) Markets [ ]
   d) Shops [ ] e) Piped water [ ]
   f) All weather roads [ ] g) Cooperative society [ ]
8. Main activities in the village
   a) Farming [ ] b) Livestock keeping[ ]
   c) Causal employment [ ] d) Petty business [ ]
   f) Other.....
9. Livestock population owned in the village;
   a) Cattle [ ] b) Goats [ ] c) Sheep [ ]
   d) Donkey[ ] e) pigs [ ] f) Poultry [ ]
10. Land utilization pattern
    a) Total geographical area[ ] b) Forest[ ]
    c) Area put to non agricultural use d)Barren and uncultivable land [ ]
    e) Permanent pasture [ ] f) Other grazing lands [ ]
    g) Cultivable wasteland [ ] h) Fallow land [ ]
    i) Total cropped area [ ] j) Cropping intensity [ ]
    k) Irrigated area [ ]

LAND AVILABILITY

11. Is there room for new immigrants here?.....

12. Are many moving in?.....

13. What is the usual fallow length here?.....

14. Are there any potential conflicts between pastoralists and farmers?.....

What about commercial versus subsistence producers?.....

15. At what time of the year are conflicts between pastoralists and farmers increasing?.....

16. What are the copping strategies in response to emerging resource use conflicts?.....

17. What are the institutional mechanisms for conflict resolution within and between user groups?

a) Negotiations [ ] b) Court proceedings [ ]

c) Mediation [ ] d) Joint management [ ]

e) Other (specify).....

18. What operational rules governing the use of common-pool resources in this village?.....

19. Does the existing institutional arrangements, allow all groups of stakeholders to have an effective voice in decision making and rule enforcement?.....

20. Are there any forums for resolving resource use conflicts?.....

21. I not, what kid of forums would be most useful?.....

22. What are the incentives for ensuring compliance with resource use rules and regulations?

a) Strong enforcement [ ] b) Resource use rights [ ]

c) Conservation values [ ] d) Other (specify).....

23. Which ethnic groups has the long standing claims to the use of natural resources of this area?.....

24. What factors are perceived as the main causes of ecological damage in this area? a) Pastoral system [ ]b)Inappropriate agricultural practices [ ]

c) Tenure insecurity [ ]

d) lack of appropriate institutions to regulate resource use [ ]

e) Weak enforcement of resource use regulations f) Other (specify).....

25. What incentives are in place to encourage immigrants in this village?.