

**INSTITUTIONS ANALYSIS OF RESOURCE GOVERNANCE
AMONG KITI WATER USERS ASSOCIATION IN CHUNYA
DISTRICT**

By

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**Thesis Submitted to the Institute of Development Studies in Partial Fulfillment of
the Requirement of Masters of Science in Development Policy of**

Mzumbe University

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CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled “**Institutions Analysis of Water Resource Governance in Chunya District**” as a partial fulfillment of the requirements of the degree of Masters of Science in Development Policy.

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DEDICATION

To my parents Fletcher Franley Nzota and Aishi Abraham Nzota. Thank you for your endless love and valuable contribution to this success.

LIST OF ABBREVIATIONS AND ACRONYMS

ADB	Africa Development Bank
DWE	District Water Engineer
FGD	Focus Group discussion
GWP	Global Water Partnership
IWRM	Integrated Water Resource Management
KITI	Kanga, Ileya, Tete and Infwenkenya
NAWAPO	National Water Policy
UNDP	United National Development Programme
VEOs	Village Executive Officer
WRMA	Water Resources Management Act
WTP	Willing to Pay
WUAs	Water User Associations
WUGs	Water User Groups
WUO	Water User Organization
WEOs	Ward Executive Officer

ABSTRACT

This study assesses resource governance related to water user association in Chunya district, Mbeya region as a case. Specifically, the study intended to explain the process of carrying out collective bargaining in order to govern water resources and explain how conflicts in water user are resolved in Chunya District. It has also assessed willingness to pay for water as a public good, and the role of property right in mitigate the tragedy of the commons.

Qualitative research methodology was employed to collect primary data. Whereas the collected data using structured questionnaires, interviews, focus group discussion and observation were used in the analysis. The documentary review research method was also employed to collect secondary data. The analysis was done using the Statistical Package for Social Sciences (SPSS) and Excel Computer Software to analyse descriptive statistics such as cross-tabulations, percentages and averages of the sample size of 98 respondents.

Results show that the process of carrying out collective bargaining is not participatory enough since only 33.3% of the members of Water Users Association were involved. However, conflict resolutions in water use are effectively resolved using WUAs. The willingness to pay for water services was relatively high up to 82.7% of the respondents who were interested to pay for using water. The property right assignment was reported to be a stimulate sense of ownership and provides the legal capacity to WUAs in dealing with deviants of water source regulations

In order to increase effectiveness in resource governance especially in water resource; WUAs and other water institutions must recognize the role of community in governance of natural resources. Furthermore, the study provided areas for further research.

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CHAPTER ONE: INTRODUCTION

1.1 Overview

Studying ‘Resource Governance’ in Tanzania is a new, theoretical, empirical and academic stimulating study. Different water users in Tanzania use practical updated findings, which intend to find out the way resources are governed. Natural Resource Governance and Natural Resource Management (NRM) are not very much different, Governance of the natural resources is more specific because it calls for enactment of the laws and regulations which may tame misconducts towards depleting of limited natural resources. While management of natural resources calls for different managerial structured of different ranks relevant to intervene in sustainable resources use, but the line between governance of resources and management of the resources is very narrow. However, in a Tanzanian context, governance and management of natural resources is a talk of a day in different media.

To find out how natural resources can be governed and benefit the majority of Tanzania is timely because many Tanzanians own different natural resources in a common pool. Governing natural resources in a common pool lead to the tragedy of the commons. The resources may be available, but if not well -assigned to different users and make them responsible to pay for using them, may lead to depletion of those resources and breed conflicts amongst the user. Therefore, this study established as to found out how water as one of natural resources is governed in Chunya District. This chapter presents background information, a statement of the problem, objectives, research questions, scope, and significance of the study

1.2 Background of the Problem

In most of the developed countries, governance is the cornerstone of sustainable resource utilization. To utilize resources efficiently requires the communities to take into consideration of the core principles of governance which include among others accountability, transparency, participation and the rule of law. In this study, institutions

are regarded as the rules governing resources. North (1991) defines institutions as the rules of the game which includes laws governing resources.

Ideas about how to govern natural resources have evolved significantly over the last 30 years. There have been different efforts being made at local, national, bilateral, and multilateral levels to ensure that policies that direct resource utilization and resource users are well-informed. Many perceive that centralized, top down approaches have failed and therefore advocacy for more decentralized policies is becoming more important than before (Anderson, Gibson and Lehoucq, 2004). In developing countries, there is increased pressure from foreign investors to pursue development through ethical behaviour and corporate social responsibility (Howe, Schurmeier and Shaw, 2008). Stakeholder participation is vital in ensuring that quality and equity of governance drive the management of resources and ensure that resource earnings support the livelihoods of local populations and sustainable economic development of African countries (Juana, Kirsten and Strzepek, 2006).

In Tanzania, governance is expressed carried out by individuals, institutions, public and private sector to provide equitable distribution of natural resources (Meena and Raphael, 2008). Governing is a continuous process through which conflicting or diverse interests are addressed. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest Mauro and Matiza (2002). In applying different governance instruments, conflicts are regarded as tensions, oppositions, and arguments between social units (individuals, groups, and organizations).

Resources are sources of subsistence and income for rural people and revenue for the government. The productivity and sustainability of most rural economic activities depend on availability of resources and the institutions that govern access and management of the utilization of those resources. Governance in relation to natural resources is a relatively new policy area within the Central and Local Government contextual framework of Tanzania.

Resource governance is a key strategy for sustainable development to promote sustainable management, participatory governance, and equitable sharing of benefits from local resources. Levite, Sally and Cour (2002) defined resource governance as "the interaction of formal and informal laws and rules, institutions and processes through which a society exercises powers and responsibilities to make and implement policies. Resource governance, therefore, plays an important role in promoting income and livelihood growth of the community.

1.3 Statement of the problem

Good governance is closely correlated with the successful implementation of processes to improve access to resources. There is a very broad consensus that good governance is an essential to have equitable ownership of the resources transparently. At present, 31 countries are facing resources governance challenges and by 2025 the number will have exploded in fivefold (Rijsberman, 2004). The World Water Forum (2000) also stresses that more than one billion people in the world have no access to water of sufficient quantity and quality to meet even a minimum level of health, safety, and freedom.

Ineffective management of common property resource can often lead to competition, over-exploitation and eventually the degradation of the resources. Regarding to water resources, poor governance has been reported as the source of the deterioration of water resources, for example in Asia it is being reported that Large areas within the irrigation systems suffer from chronic and severe water shortages, due to poor governance system in water resource (Hussain & Biltonen, 2001). The poor performances of central governments in the protection of natural resources have led to new ideas about their governance of the past few decades such as ways to privatize negative externalities like population or advocate the decentralization of the formal power of government to its own subunits (Anderson, Gibson and Lehoucq, 2004). For example, in managing forest resources in Ghana, in 2003, there has been bilateral voluntary partnership agreement between the government of Ghana and European Union in forest law enforcement and trade action plan on natural resources. These laws represented a comprehensive attempt to

use the power of timber consuming countries to reduce the extent of illegal logging (Moran and Dann, 2008). Hence, there has been a suggestion for formulating legal frameworks which have the ability to establish basic rules for market, income distribution, institution, and transparency.

Despite legal and institutional framework governing resource of the country to be in place there is a rising concern about ineffective governance of natural resource in Tanzania figuring every day in the media, on the agenda of the politicians and in the mind of the public. Thus, this study intended to answer four questions in order to assess' resource governance in Tanzania taking Water Users Associations (WUA) such as Kanga, Ileya, Tete and Infwenkenya (KITI) in Chunya District as a study case.

1.4 Objectives of the Study

1.4.1 General objective

The overall objective of this study was to assess power bestowed to Water Users Associations (WUAs) members by Water Resource Management Act (WRMA) of 2009 to carry out collective bargaining, conflict resolution, fees collection, and property right.

1.4.2 Specific objectives

The following were the specific objectives of the study:

1. To explain the process of carrying out collective bargaining in order to govern water resource
2. To explain how conflicts in water use are resolved in Chunya District
3. To assess willingness to pay for water as a public good by the water user in water resource governance
4. To find out the role of property right assignment in mitigating tragedy of the commons that depletes natural resources.

1.5 Research Questions

1. What is the process of carrying out collective bargaining in order to govern water resource?
2. How are the conflicts in water use resolved in Chunya District
3. In what extent are water users willing to pay for water as a public good in water resource governance?
4. What is the role of property right assignment in mitigating the tragedy of the commons?

1.6 Significance of the Study

This study will inform the government, local communities and academicians in different ways:

- First, knowledge in understanding the institutions that are involved in governance of natural resources such as Water User Associations (WUAs). Also, it has found the effectiveness of these WUAs in governance of natural resources. It will inform various stakeholders on different issues that can enhance the use of WUAs in management and sustainability of the resources.
- Furthermore, the results will enable the district council to have a good understanding of the WUAs performance and how accrued benefits can be copied to other areas. In addition, this study will provide useful reference material for a researcher who is interested in pursuing further research on resource governance especially in relation to water.

1.7 Scope of the Study

The study focused on the resource governance whereby the principles of good governance and approaches of governing resources were considered. Hence, for the purpose of this study, the researcher was interested in studying how water resources are governed. The study was conducted in four villages in Chunya District.

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview

This chapter presents literature relevant to the study pertaining to resource governance. The essence of this chapter is to shed light on what other scholars and researchers did on the same topic, such as substantial research, experimentation, and actual application of behavioural science concepts that focus on resource governance especially in relation to the water resource. This chapter is divided into two parts. Section 2.1 is about theoretical concepts and Section 2.3 explains empirical literature review discussing some findings from other researchers.

2.1.1 Theoretical Frameworks/ Conceptual framework

Studying Institutional Analysis of Resource Governance is guided by the conceptual framework indicated in figure 2.1

Figure 2.1 Conceptual Frame work

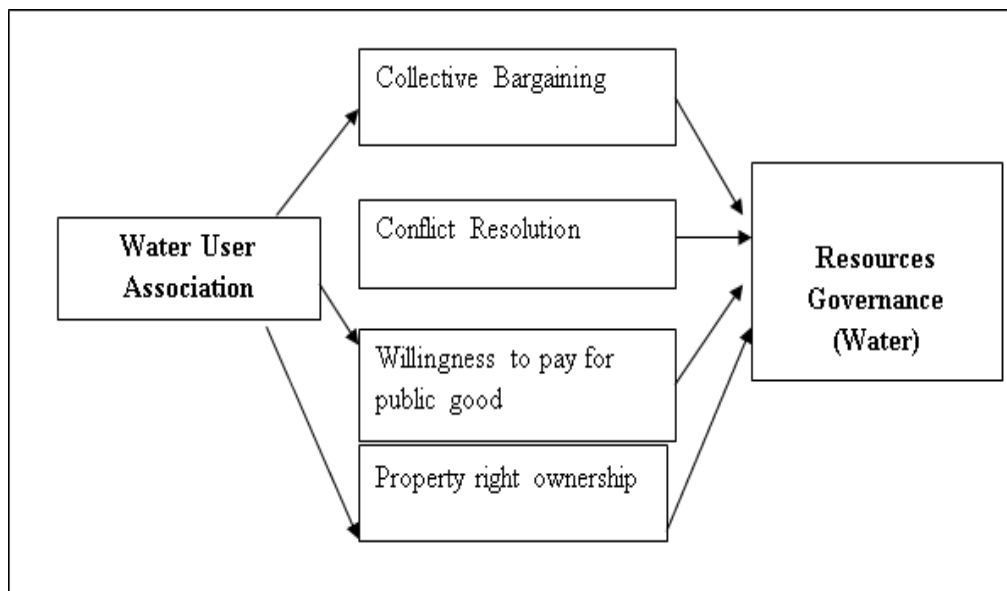


Figure 2.1; represents the conceptualization of this study of resource governance in Chunya District.

The conceptual framework starts by presenting WUA as an institution entrusted to oversee governance of water resource in the district efficiently and effectively following The Water Resource Management Act, 2009 (URT, 2009). The Act provides for the creation of autonomous registered Water Users Association (WUAs) in Article 80-83 of the Act. The Act bestows a mandate to WUAs to govern water resource in their area of jurisdiction especially in the Water Basin. So does KITI. KITI carries out collective bargaining and resolves water user's conflicts. Apart from what KITI does as governance instruments, the study will investigate the ability of KITI to promote willingness to pay for water as a public good. The property rights have been investigated as variables that influence governing water as natural resource in Chunya district, Mbeya in Tanzania.

The theories governing this study are tragedy of the commons theory, collective bargaining theory, property right theory, willingness to pay theory, and good governance theory.

2.1.2 Theory of property right

The government of Tanzania allocates water users the right to own water resources through The Water Natural Resources Management Act, 1999 (URT 2009). This Act provides for the sense of ownership of water resources in the communities. The sense of ownership of resources can be established in the community when property right are assigned to the individuals in the community. This means that those who live within the Water Basin are assigned the right to create an association of water users in order to set some by-laws which can protect the basin which they depend on water supply. The community is the most important stakeholders in the management and improvement of the natural resources such as land, water, and forest (Ostrom, 2000) The property rights provided by the government (central and local) support the water user association to improve the resources available in terms of management.

Coase (1988) defines "property right as a right of individual or association represented by individual to possess a legal right to prevent others from stealing, invading, destroying or otherwise interfering with their property". Property right theory in this study explains the

correlation between property right and management of resources in a way that the owner or user of water resource holds rights and can manage to exclude others in using the water resource in the Water Basin where the WUA is allocated.

2.1.3 The tragedy of the commons theory

Resources that are held commonly are vulnerable to over-exploitation, it is usual to assume that degradation is inevitable unless common property is converted into private property or government regulations are instituted to rescue “*tragedy of the commons*”. The term tragedy of the commons was first introduced by Garrett Hardin in 1968. Hardin describes how shared resources are overused and eventually depleted. In his article in Science entitled “The Tragedy of the Commons”. Hardin (1968) offered a compelling story about the inevitable “tragedy” of commonly shared resources. In his story, there is a village of commons in which any herdsman could freely graze his cattle. Hardin noted that inevitably the commons would have overused the grasses resources to detriment all the villagers. He then argued that establishing property rights would resolve the problem.

The tragedy of the commons theory focuses on the proper utilization of the resources in the community to ensure sustainable development. Poor utilization of the resources can lead to disruption of the available resources. So, Hardin (1968) created community awareness on the issues related to the good allocation and improvement of resources available in the society. The author argues that, “shared resources may be overused and eventually be depleted, if resources are held in common to be used by everybody without observing the individual users rights, ultimately those resources will be depleted” (Rehm and Rush, 1992).

This tragedy of the common theory was formulated when it was difficult and costly to exclude potential users from the common-pool resources that yield finite flows of benefit as a result those resources would be exhausted by rational utility maximizing individuals rather than being conserved for the benefit of all. This theory is used in this study to help to asses’ applicability of exclude potential user in using water resources as the

management strategy of resource governance in Tanzania, taking Chunya District as a case.

2.1.4 Collective bargaining theory

The importance of the joint resources ownership among the community and shareholders to the much extent can be explained by the collective bargaining (Ostrom 2000). The community and water user association as well as government are assumed by this theory that they can come together to bargain or negotiate in the uses of the available water resources in order to govern it efficiently for future use. Collective bargaining in resource governance is not different from labour union negotiations.

Bell (2001) argued that government and project officials, policymakers, environmentalists and other practitioners are not the only people possessing wisdom, information, and knowledge on the management of natural resources. Water user participation is always helpful for improving relations and reducing conflicts, not only between water user association and community but among water-users as well. Participating in providing an effective channel to solve problems create understanding among parties and by so doing the transaction costs attributable to fetching water of connecting water taps may be lessened.

When water users bargain collectively, reduce misunderstandings between them and other water stakeholders. This may result in efficient and effective governance of water resources. Borrowing from Ostrom (1990), community level governance allowing stakeholders articulate their interests, share information, communicate and bargain, and take collective decisions. Likewise, collective bargaining among water users and other stakeholders is essential to water users who operate at multiple levels of action in order to preserve and use water efficient.

Water is a common pool resource because it has a low excludability and high rivalry. A resource which is not used in a common pool is privately owned and hence it has four characteristics of market property rights which are Exclusive, Transferability, and

Divisibility. Excludability implies that the owner can exclude the use of his property (Hart and Moore, 1990). The individual member's attitude and behaviours in using the water available to the group cannot be excluded. This low excludability stems from the high costs of developing and implementing means of individual regulation, while the rivalry stems from the fact that the consumption of a unit of the good by one individual makes it unavailable to others. It is the combination of these two factors (low excludability and rivalry) that leads to the well-known common pool resource dilemma. Institutions in the form of collective bargaining may be one way in which societies can overcome this dilemma.

2.1.5 Willingness to pay theory

The price of good supports the accessibility of the good especially for the price that is affordable to the community. The willingness to pay describes the amount that a person has to support the resource utilization. According to Horowitz and McConnell (2003) the willingness to pay theory states that, “it is the maximum amount a person would be willing to pay, sacrifice or exchange in order to receive resources or to avoid something undesired, such as pollution”. So, it is the total value of the resources available, use of the resources, none uses, the value of the resources as well as optional value of the resources which are demanded in the community.

Willingness to pay is an economic concept which aims to determine the amount of money a consumer will pay for the supply of water. It is a concept applied to many research studies worldwide revealing very high levels of willingness to pay for water in developing countries. The revenues generated through the purchase of water have been shown to equate to the cost of developing a city's public water utility. This has been an important revelation for water planning managers in developing countries where urbanization is increasing rapidly and the demand for water is growing faster than the existing weak infrastructure can meet with supply.

Willingness-to-pay (WTP) in cash, materials, labour, and upkeep can be taken as a useful indicator of the demand for improved and sustained water services (Bhandari and Grant,

2007). Some people in the community have a notion that government is responsible for provide goods and services to its community which as a results affects the WTP. A study done in Ethiopia by Beyene (2012) on the sustainability of the rural project found that, community did not contribute money for operation and maintenance on water project because they believe that fetching water is free from payment and it is a gift from government or non-governmental organization.

2.1.6 Good governance theory

Good governance creates the resources improvement in the community. The importance of good governance supports to reduce the community conflicts and enhances the resource sustainability. The terms of democracy, transparency and accountability influence the community to improve resource management. According to Bekke, Kickert and Koiman (1995) in the theory of conflict resolution states that “Social conflicts may be resolved not only by a sovereign (that is, a national) government, but also by international organizations composed of multiple sovereign governments and non-governmental actors”

The theory implies the improvement of governance among the community due to the transparency, democracy, free expression in the provision of the information toward the resource governance. So, the theory urges the community to be aware of the impacts and constraints facing the resources due to the conflict that happened.

2.2 The differences between governance, leadership and management

Good Governance system, competent leadership and effective management systems are critical components of any organization to produce desirable sustainable development while utilizing resources efficiently. Governance refers to representing the will or interests of a group of people; it may be owners or shareholders. The governing body represents those owners and directs the management to achieve particular results that are desired by the owners.

Management is the process of planning, organizing, leading and controls various resources to achieve organizational goals effectively and efficiently. The management is accountable to the governing body which is in turn accountable to the owners while leadership is a process by which a person influences others to accomplish an objective and directs the organization in a way that makes it more cohesive and coherent. Northouse (2007) contends that leadership refers to a condition whereby an individual controls a group of individuals to attain a certain goal.

Governance sets policy in such areas as governance, fiscal management, personnel and conflict of interest; reviews procedures, recommends updates and changes as needed, and monitors organization's compliance with policies and procedures, While Management develops procedures that match board policy; provides directors with the information they need to monitor compliance; implementation of the board's policies on a daily basis. IEG (Independent Evaluation Group) - World Bank (2012) explain that, management concerns the day-to-day operation of the programme within the context of the strategies, policies, processes, and procedures that have been established by the governing body.

While governance is concerned with "doing the right thing," management is concerned with "doing things right." Leadership represents the organization of people into manageable groups and influencing them in a specific direction for the purposes of harnessing available resources for the general good of all.

These three concepts, governance, management and leadership are quite different though they depend to each other. Good governance mainly depends on the quality of leadership, the strength of the institutions and how efficiently, effectively, sustainable, and transparently the resources are managed by sector institutions and main stakeholders. Leadership is not just an ability of leading people towards a goal but it depends on the strong governance to ensure that they are doing the right thing and the existence of good management system for doing things right.

2.3 Empirical Theories of Water Governance

Water resource governance usually refers to “the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society” (Global Water Partnership, 2003). Water is essential for all life on earth. Humans can survive for several weeks without food, but for only a few days without water. A constant supply is needed to replenish the fluids lost through normal physiological activities, such as respiration, sweating and urination.

Water scarcity is becoming a critical issue as the global population expands. Rijsberman (2004) define water scarcity as situation whereby a large number of people in an area are water insecure for a significant period of time, when an individual does not have access to safe and affordable water to satisfy her or his needs for drinking, washing, or their livelihoods, Meanwhile Integrated Water Resources Management (IWRM) is continuously receiving attention from the international conference held in 1992 in Dublin on water and environmental issues and then Rio de Janeiro Brazil. IWRM is seen as a promising approach in ensuring sustainable use of water resources.

According to Abu-Zed (1998), nearly 20% of the world population do not have ready access to drinking safe water and 40% lack sanitation facilities. Generally, the occurrence of waterborne diseases in developed countries is low due to a generally good system of water treatment, distribution and monitoring, waterborne diseases are among the leading causes of morbidity and mortality in low-and middle-income countries, frequently called developing countries. According to the United Nations (2006), over 1.1 billion of people are currently without safe drinking water.

The study conducted by the National Round Table on the Environment and the Economy (NRTEE) (2010) in Canada; entitled ‘water sustainability’ found that as significant users of water and as drivers of economic growth, the natural resource sectors will likely exert increasing pressure on our water resources into the future. Despite the recession of 2008–09 and projected modest growth in 2010, forecasts predict a period of recovery-

paced growth in 2010–13 for the Canadian economy as a whole and for the natural resource sectors. Even though natural resource sectors have been heavily impacted by the recession, very few sectors are expected to contract between the years 2008 to 2013. Based on the projections of forecasting organizations, natural resource sectors are expected to grow about 50% to 65% between now and 2030. It is reasonable to expect their water uses to increase with production levels.

The study conducted in Cameroon (2001) found that the water situation in the continent of Africa is highly problematic. Approximately 16% of the continent's population (230 million) will be subject to water scarcity by 2025 (ECOSOC 2000). According to WBGU (1999), 25 countries in Africa will face water stress or scarcity by 2025 and nearly 51% of the people in sub-Saharan countries lack access to safe supply and 41% lack adequate sanitation. Fourteen countries are already experiencing water stress; another 11 countries are expected to join them by 2025.

In Tanzania, as in many other sub-Saharan countries, is not so much the scarcity of water as the variability and unpredictably over season and years (Van Koppen *et al.* 2004). In fact, it is estimated 50% of all annual surface run-offs flowing into the Indian Ocean and the large lakes while growing demands intensify water scarcity in the dry season. The main reasons for poor access to safe water are overpopulation and scarcity of water resource. Also, the inability to finance and to adequately maintain the necessary infrastructure is a contributing factor. Effective and sustainable management of water resources is vital for ensuring sustainable development. However, efforts of water resource management seem to demonstrate inappropriate practices, especially when compared to water consumption trends in developing countries in general and in Tanzania in particular. Being a major and vital ingredient to human kind, water resources influence all sectors.

2.3.1 Water User Association as a Water Resource Governance Instrument

At the second World Water Forum held in The Hague in the Netherlands in 2000, governance was identified as the missing link in effective water resource management. By proclaiming that the current world water crisis was a governance crisis, governance was firmly put on the water agenda. Since then there have been attempts to explore governance in terms of its conceptualisation and application.

Water governance is a complex and dynamic process that calls for adaptive analysis, as highlighted in the World Water Development Report II: “conventional water planning remains rigid and the challenge remains to develop adaptive governance frameworks and institutions”. The most appropriate solutions may be those that emphasize both the importance of enabling processes and frameworks that can be applied to resolve issues in situations of economic and other constraints. Rogers and Hall (2004) outline ‘principles and performance for effective water governance’ such as Open and transparent, Inclusive and communicative (sic), Coherent and integrative, Equitable and ethical and that in its performance and operation it should be accountable, efficient, responsive and sustainable.

Communities are the most appropriate units to govern water resources as they are the targeted water users (key beneficiaries). They should own and manage water resource so that the costs and benefits accrue directly to them. Communities are the best units to govern resources inspired by the appeal of ‘smallness’, with identifiable groups of interdependent water users sharing common interests, norms and beliefs (McCay and Acheson, 1987; Ostrom, 1990). Water User Associations (WUAs) or Water User Groups (WUGs) were formulated as a local institution at the lowest appropriate level of management for the purpose of owning, managing and protecting water resources, and controlling, operating and maintaining water supply services. A study conducted by African water supply and sanitation (AFDB, 2011), found that local and national institutions have the most visible role to play in governing the water sector, it is the sector’s underlying policies, legislation and regulations that provide the foundation for its

overall governance. Water User Associations (WUAs) have been formulated all over the world, the main objectives of formulating water user association is to ensure that communities are empowered to play more active roles in managing and utilizing the water resources in sustainable ways through containing the problems related to the use of water resources.

Following this objective, in the NEN - region for example water user association have been established from the late 1980s onwards, institutional reforms have been introduced to water management in almost all of the NEN countries, as in many other parts of the world. With the support of donor-funded programmes, governments established formal Water Users Organizations (WUOs) or Water Users Associations (WUAs) to take over some of the irrigation management tasks that were publicly managed before.

In Tanzania the Water Resources Management Act (WRMA) No.11/2009 and the Water Supply and Sanitation Act No.12/2009 were enacted recently to repeal and replace WUA Cap. 331 and WWA Cap 272, respectively. The WRMA was enacted as a result of the 2002 National Water Policy (NAWAPO), which emphasizes the principle of involvement of water user organizations and the private sector so as to attain equitable, efficient and sustainable water resources management. Based on Tanzania's decentralization policies the mandate for the management responsibility is devolved to WUAs which are lower levels of governance.

2.3.2 Water user's association potentials in Water Resource Management

Water resource management refers to the institutionalized activities of water resource development, utilization, allocation, conservation, and control (African Development Bank, 2011). The role of local institutions in managing common pool resources is a theme that has risen in prominence in recent years and it resonates strongly in low-income countries where conventional approaches for water resource management may be inappropriate and many states are seeking ways in which to improve on current governance strategies. If we go by the UN statistics, it will necessitate the massive 30%

of world population making water association to coordinate and provide water. It has increasingly acknowledged that the water user association provides a vital force in water resource management (USAID, 2009).

Water users associations are themselves the best resource for promoting water resource governance. In terms of both architects and agents in meeting the challenges and solving the problems related to water resource governance, it is imperative therefore, to ensure that they are fully empowered to take charge of the further sustainable challenges. Water users association deserves to be considered as full in water resource governance. They are capable of assuming responsibility, determining roles in water resource governance, required to be given the opportunity and guidance to prove their ability.

2.3.3 Gender perspectives

The concept of gender involves both men and women in any development initiatives. Women are often excluded from decision-making, from the household up to the highest levels of policymaking. In resource governance, women's equal participation in governance is, therefore, an important end in itself recognition of their right to speak and be heard. However, a study conducted in South Asia by Dick & Zwarteveen (1997) found that female participation is minimal in water users' organizations. This is due to the cost and benefit analysis because of their high domestic and productive workloads, the opportunity cost of time to attend meetings and do other work for the organizations is different (and often higher) for women as compared to men. Timing and location of meetings may also impose a higher cost on women than on men which affects also participation of women in development activities.

A similar study done in Usangu Plain in Mbarali District by Facius (2008) found that the main reason for low participation of women in the WUA meetings is the lack of experience in attending meetings and fear to talking in front of men. Another reason is that, male members of the family do not send them to the meetings. Women members reported that they are illiterate and hardly understood the matters discussed in the

meetings. Cultural barriers also make women withdraw from effective participation and decision-making.

In addition to gender there is an issue of gender roles which can be integrated on the issue of family size. In resources governance family size play an important role in management of natural resources. A study conducted in Malagarasi - Moyowosi Ramsar Site by IRA, 2002 indicated that there is a strong relationship between family size and resource degradation. According to Mahinnya (2005) large family size tends to over-exploit resources in order to meet their needs while undermining resources of their livelihood. Over-exploitation of these resources is commonly referred to as the “*tragedy of the commons*”.

2.3.4 Recognition of water as an economic good

During the 1960s and 1970s there was a heavy investment in water schemes which resulted in the proportion of population with access to improved water supply rising from 12% to 46% in the period from 1971-1980. Water was recognized as a public good and the Government undertook to cover all capital costs of investment (Cleaver, 2006).

However, this early investment could not be maintained and many schemes fell into disrepair. As a result, NAWAPO acknowledges that water is an economic good, moving towards recovery of operations and maintenance for rural schemes to ensure their sustainability. Water has an economic value; water should be seen from the perspective of its economic value because the absence of an economic perspective in the past explains existing unsustainable uses of water. Literatures tell that many past failures in water management have been attributed to many factors including regarding water as a free good. So, following that no one was taking responsibility in water management but later on the water users were supposed to pay for the services, through water charges, water were sustained. After independence the government started to finance the operation and maintenance activities. General understanding is that people tend to value things they

pay. In this premise therefore using water for free provides no incentives for water usage and conservation rendering failure in water resource.

Another important change brought about by the notion that water is an economic good, that all water services must be based on the principle of (full) cost-recovery. The policy is now to make water users pay at least for the operation and maintenance charges linked to the provision, water users have to take up partial responsibility for the capital cost of water infrastructure and full responsibility for operation and maintenance. Further, cost recovery is, for instance, seen by the Asian Development Bank as the first instrument for conserving water. Recognition of water being a public good requiring collective bargaining education, Mayetta (2004) reported that illiteracy is one of causes of resource disturbance. The author further revealed that increase in the education of the household tends to increase people's awareness on the importance of natural resource.

This may result in effective resource governance for sustainable development, hence it will influence community willingness to participate in collective bargaining, management of natural resource activities, increase in willingness to pay for water services and it will also reduce conflict among the water user. Chen and Wang (2009) also support this by arguing that, highly educated and higher income population tends to be more involved in conservation activities or payments. This study explains that more educated people are more likely to be involved in conservation because they are exposed to more information about the environmental degradation and harm, and higher income people can pay more for conservation since they have more degrees of freedom to emphasize when their needs are well satisfied.

2.3.5 The process of carrying out collective bargaining in order to govern water resource

Collective bargaining is one of the types of collective action; the other includes collective maintenance. Collective action can simply be defined as "action taken by a group (either directly or on its behalf through an organization) in pursuit of members' perceived shared

interests”. In the context of irrigation systems, farmers participate in collective action by following the dictates of their respective WUAs; paying irrigation service fees, not violating irrigation schedules, taking care of irrigation infrastructure and contributing to maintenance. WUAs provide a coordination mechanism or “structured bargaining forum” which enables individuals to more efficiently and effectively organize their actions for the successful governance of resources.

The process of carrying out collective bargaining involves different actors depending on the actions they are bargaining. The actors may be government, water user association, community and other stakeholders. Community as water users themselves need to participate in the decision as to whether an external intervention is actually appropriate. Collective bargaining situations (where resource users work together to use and manage the resource in question sustainably, such as with indigenous water users) have a better chance of success where there is minimal external interference, especially from the government (Hassan, 2004).

It is argued that interventions ignored by the water users as inappropriate, and at worst may undermine the working rules that ensure that the system is sustainable, resulting in the collapse of the water users association (Rodgers and Zaafrano, 2002). The government is responsible for managing the water resource. This includes the allocation of water (rivers, streams and groundwater) through resource consent applications, setting minimum flows (rivers and streams) and levels (groundwater) as well as maintaining or enhancing water quality; so, it should also be involved in the bargaining process.

Prior to the actual bargaining sessions, enough care should be taken by both parties to have a thorough preparation for the negotiations (Baur *et al.*, 2008). This has become a pre-requisite to collective bargaining in view of several reasons. Consultation with the lower level members of their respective organizations can help both parties to obtain valuable information and evolve specific bargaining table approaches. However, it has been reported by Lockwood (2002), administrative structures and institutional support levels in rural areas in most parts of the world are often too weak to address advocacy,

encourage citizen engagement, and facilitate financing and management initiatives for the community.

The technical assistance of legal and public relations experts can also be utilized gainfully in the collective bargaining process. Finally, care should be taken to pre-plan with mutual consent the meeting places, ground rules relating to transcripts of the sessions, publicity releases, the payment system of union representatives and allied issues. For bargaining, is very important in negotiating process in any community. It will help the negotiator to develop those personal and managerial (administrative) qualities of preparedness, knowledge, ability, sensitivity, timing, analytical abilities, composure and patience. These qualities develop as a result of observation, experience involvement and conscious individual effort and experience.

The parties already have an existing contract; it specifically mentions that either party proposing changes in the existing agreement should notify the other party (Berkes, 2009). The nature and extent of such changes must be notified usually 30 to 90 days prior to the termination of the contract. The chief negotiator evolves a strategy of action and of the tactics to be adopted during the negotiations. It is necessary that the roles to be played by each member of the team are properly pre assigned and each member knows when to take over the discussions.

The agreement shall at all times be subject to the prior rights of landowners in the Buckeye Water Conservation & the Drainage District to receive water, and user hereby expressly waives, on behalf of user, and any of the user's affiliates, agents, officers, directors, employees, representatives, and insurers any claim for loss as a result of the inability of District to deliver water as provided hereunder. The user knows, understands, and agrees the nature of the District's business is such that it cannot be the guarantor of water availability, and User expressly assumes the risk of unavailability of water. District assumes no responsibility whatsoever for loss or damages that may be suffered by User occasioned by any water shortage or for any other cause whatsoever; including water

shortages caused by drought or because of demands on a District for service beyond its available supply.

The collective bargaining process also involves signing agreement. Water uses is responsible for protecting the drinking water supply from contamination or pollution; which could result from improper private water distribution system construction or configuration (Beach *et al.*, 2008). The purpose of this service agreement is to notify each customer of the plumbing restrictions, which are in place to provide this protection. The utility enforces these restrictions to ensure the public health and welfare. Payment for all water delivered or used pursuant to this Agreement shall be made in advance and shall be in the form of cash, cashier's check, certified funds, or wire transfer. Upon receipt of payment as provided hereunder, the District shall provide "seals" to User indicating the number of water deliveries that User is entitled to receive; such seals are to be surrendered to District's agents as water is received. From time to time during the Term, the Parties may agree on additional quantities of water to be delivered to or used by User, with User pre-paying there for and receiving seals that shall be surrendered to the District's agent upon each delivery of water made pursuant to this Agreement.

2.3.6 Conflict resolution in water resources

With the increasing population of this world the resources have become more stressed. Many conditions may trigger conflicts, including jurisdictional ambiguities, miscommunication, and competition between sectors and users. Conflicts over resource use quite often originate in the different perceptions regarding access, use and management of resources.

In water resources conflicts may easily arise if water is scarce as being mentioned by Center for Environment and Development for Arab Region and Europe (CEDARE), (2006) water conflicts occurring in developing countries are associated with water scarcity and hence competition for the resource, it is scarcity and competition that trigger tensions leading to dispute and conflicts.

Water conflict may also arise if water is perceived as being overused and/or degraded by other actors at a cost to oneself. The possibility of conflicts at international, regional and local level regarding access to and use of fresh water therefore poses a serious threat to both human security and the security of states. A study conducted by Mtalo (2005), showed that different people have different goals and interests while using the same resource, when people in the course of using a resource reach a point of incompatibility or non-reconciliation, the situation is described as a dispute or a conflict.

These different goal and interest may arise between Domestic user and livestock keeper, Communities and conservationists, Upstream and downstream users, Hydroelectricity producers and other users, Communities and donor agencies, Farmers and pastoralists, Rural and urban areas or domestic user among themselves. Fore stance a study by Facius (2008) regarding to water scarcity in Tanzania found that there is an incidence of a conflict between domestic users among themselves in Mbarali District, Tanzania.

Different methods were used to solve water conflicts in the world, In Tanzania conflicts were resolved by the use of meetings, dialogue, and using the existing by-laws these methods were prove to do well in many part of the country. Fore stance the study conducted by Mtalo (2005), found that dialogue has been considered as one method, which can be used to reduce the upstream and downstream conflicts. Initiatives by NGOs such as PAMOJA (an NGO registered in Moshi) which use this method have brought the conflicting parties together and have been able to bear some fruits. The upstream water users were sent to the downstream areas to see the effect of their abstractions on the downstream users. Agreements on equitable use and sharing of the water were reached. In Pangani Basin, the tradition or local efforts to improve water management has being used to control water user conflicts.

In resolve water conflicts different actors are involved the actors may be Government both central and local government, Non government institution, Water user association together with community depending on the situation of the conflicts. A study done by CEDARE (2006) in the Middle East and North Africa region argues that, for conflict

which involve the user, it is important to use user participation. They further explained the pre-requisite for getting the users involved in decision making and conflict resolution is to provide them with complete information about the problem under consideration.

2.3.7 Willingness' to Pay for public good

WTP is a powerful tool used for assessing the perception and acceptability of a social service. Different scholars have been using this tool to assess the WTP in resources for ensure sustainability to natural resources for instance Mekonen (2000) use peasants willingness to pay to assess community woodlots projects that are financed, managed and used by the communities themselves in rural Ethiopia. Sabiti and Tegegne (1994) also used this phenomenon in Mbarali District for the Dry land Husbandry Project and they found that, about 68% of the respondents supported the idea of cost-sharing as far as water resource management is concerned.

Demeke (2009), while assessing determinants of Household Participation in Water Source Management found that a focal issue in the water supply and sanitation sector in developing countries is gauging the willingness of individuals to manage their water sources through the contribution of time and resources. The rationale is that contributing more time and resources to the protection and maintenance of rural water supply sources is a positive action that may potentially improve the sustainability of water supply infrastructure

2.3.8 Factors affecting willingness to pay for public goods

There many factors which may enhanced or hinder the willingness to pay of the communities for public goods the followings are some of the factors;-

Quality and quantity of goods and services affects the WTP of the community to resources, community may have high or low WTP on a resources depending in its quality and quantity, a study conducted in China found that village communities changed to using the public water system and abandoning poor quality water from wells because the public water system was providing water of good quality (Ping, 2000).

In Kumasi town, Ghana the demand for improved sanitation provided the incentive for willing to pay for water provision to households (Whittington *et al.* 1993). Pearce and Turner (1990) underscores the concept of benefit and willingness to pay and observes that, the benefit measure is established when individuals are presented with enough of goods and services. If the communities are willing to contribute cash and labour useful for the management of water sources, it is clear that the service that they obtain from a source is valued; and that water users in both wards have a positive attitude towards promoting its sustainability. As Ntengwe (2004), conclude a high level of willingness to pay can be achieved if the consumers derive a high social value from water service. In order to reach a high level of willingness to pay, consumers should have a high level of awareness on issues of water management so that they can enjoy a high social value from water service.

The availability of alternative good and services and price may also affect the WTP of the community the study conducted in Achefer-Woreda region by Demeke (2009) found that the availability of alternative sources affected the willingness of the community to pay cash for maintenance and operation. Related study conducted by Menard and Clarke (2000) in Conakry, Guinea, showed how consumers refused to be connected to the public water system but opted to use an alternative water source from wells dug in their yards because of high tariffs set by the water company.

Mistrust of the public provider also affects WTP of the community. An analysis made by Bhandari and Grant (2007) also showed that, WTP for water is highly correlated with source reliability, trustworthiness of WUAs, convenience of location, and water quality. Related study carried out in Nigeria by Whittington, Brisco, Mu and Barron (1990) revealed that, rural customers in Nigeria do not want to pay for water in advance or commit themselves to a fixed monthly payment due to their mistrust of public providers.

Income of the community also play a big role in increase WTP for goods and services Ntengwe (2004) argue that in order for the consumer to be able to afford and able to pay

the water bills, they should be earning an income that covers essential household needs such as food, clothing, shelter, education for children, health care, energy and water.

2.3.9 Property right assignment in natural resources

Property rights refers to control over and access to resources, that is, the way in which people (individually or collectively) hold rights and responsibilities to land and natural resources upon it. Property rights and the role they play in control tragedy of the commons of natural resource are gaining significant in development perspective in many parts of the world. Resources require some sort of property right arrangement to control access and use of scarcity resources, property right provides the power to owners (individual or group) to provide restriction for the use of resources so as to avoid overexploitation or what Hardin (1968) has called tragedy of the commons.

Regardless of the property rights regime, robust monitoring and enforcement arrangements should including a system of penalties, this is crucial to sustainable governance of any land and natural resource, and appropriate enforcement of property rights. Also necessary reliable systems of dispute resolution in the event that rights are challenged, Aggarwal and Elbow (2006), When property rights over resources are absent and unforced no individual bears the full cost of resource degradation. As Bichsel *et al.* (2010) argued with ownership, it is expected that people will bestow new values on resources and therefore help to protect degradation. As it assigns ownership to private individuals, groups or state property right in water resources helps to reduce water resource degradation hence it gives the holder the right ability to use a resource and the ability to exclude others from using it.

2.3.10 Legal and regulatory frameworks governing the water sector in Tanzania

The legal and regulatory framework of water management in Tanzania is a mix of written Ordinances that were made by the Legislative Council before independence and the contemporary legislations in one hand, and the set of local, community based practices that are normally determined by local customs, traditions and culture of the water users

(Maganga, Barterworth and Moriarty, 2002). In Tanzania, the legislation governing the water sector is divided into two regimes i.e. water resources and water supply and sanitation services.

The Water Resources Management Act (WRMA) No.11/2009 and the Water Supply and Sanitation Act No.12/2009 were enacted recently to repeal and replace WUA Cap 331 and WWA Cap 272, respectively. Together the Water Resources Management Act No. 11 (2009) and the Water Supply and Sanitation Act No. 12 (2009) form the core of the legal framework for the water and sanitation sector. The WRMA was enacted as a result of the 2002 National Water Policy (NAWAPO), which emphasizes the principle of involvement of water user organizations and the private sector so as to attain equitable, efficient and sustainable water resources management.

According to the policy, Management of water resource will have five main levels which are National level, Basin level, Catchment level, District level, and Community or Water User Association level; the policy indicates that “Water User Associations (WUAs) or Water User Groups (WUGs) will be the lowest appropriate level of management. Part viii; section 80, (1) of WRMA 2009 provides the power to the formation of the WUAs including their registration and supervision of their activities as well as the establishment of the Catchments or Sub-catchment’s Water Committees according to the Act, is to be facilitated by the Basin Water Board.

According to WRMA 2009, WUAs may be formed by the agreement of the majority of a group of water users for one or a combination of the following purposes to-

- Manage, distribute and conserve water from a source used jointly by the members of water users associations.
- Acquire and operate any permit under the provisions of this act
- Resolve conflicts between members of the associations related to the joint use of water resources
- Collect water fees on behalf of the basin Water Board

- Represent the special interest and value arising from water used for a public purpose, such as in an environmental or conservation area or for the purpose of Managing a Ground water controlled area.

The National Water Policy (2002), the National Water Sector Development Strategy (2006) and the Water Acts (2009) provide a progressive institutional and legal framework for the development of the water sector all aimed at the Vision 2025 target of universal access to safe water, as well as to provide a platform for national social and economic development. Together the Water Resources Management Act No. 11 (2009) and the Water Supply and Sanitation Act No. 12 (2009) form the core of the legal framework for the water and sanitation sector. Bucknall (2006) notes that Good water governance depends on a number of factors including strong policy, legal, and regulatory frameworks more effective implementing organizations a civic determination to improve water governance; and appropriate investments. Each of these factors is elusive, particularly in developing and middle-income countries, but several countries are beginning to address these issues.

2.3.11 Institutional Framework involvement in Water resource governance

An effective institutional framework that clearly defines the role and responsibilities of each stakeholder is critical for a successful integrated water resources management. Institutional framework that aims at effective water supply and water resources management needs to come up with good policy, regulations, and operational management of both quality and quantity of water.

The institutional framework of water sector consist of four main levels of management National level, Basin level, catchments level, and Community or Water User Association level which will be the lowest level and will bring integrate users of the same source. At the national level, water management is predominantly governed by formal institutions, mainly policies, acts and legislations, and related organizations that are judiciously established in accordance with the formal provisions. At the basin level, there is a mix of

formal and informal arrangements, At the catchment's and sub catchment's levels, informal institutions such as Water User Association (WUA) gain strength and the patterns of the formal-informal interface become clearer.

2.3.12 Water policy of Tanzania

The National Water Policy (2002) direction is to ensure “an adequate and reliable supply of clean safe water will be made available to improve the public health situation, and water resources protected, and used to stimulate socio-economic activities aimed at reducing poverty”. The corresponding goal is: “Water resources are managed equitably and water supply, sewerage and sanitation services are improved so as to contribute effectively in the Nation's poverty eradication efforts”.

Tanzania National water policy of 2002 explains the mandatory of these WUAs in management of water, the policy state that these associations will be responsible for local level management of allocated water resources, mediation of disputes among users and between groups within their areas of jurisdiction, collection of various data and information, participate in the preparation of water utilization plans, conservation and protecting water sources, and catchment's areas, efficient and effective water use and ensuring return flows, enforcement of the law and implementation of conditions of water rights, and control of pollution. They provide legitimate representatives in Basin Boards and Catchments Committees.

2.3.13 Gap in previous studies

Many researchers have drawn attention in governance studies, a study conducted by Mumma, Lane, Kairu, Tuinhof and Hirji (2011) in Kenya for example assessed the governance of ground water and found ineffective governance emanating from lack or weak implementation of the legal frameworks including policies and laws. The study found that Kenya does not have policies, laws, and institutions dedicated specifically to the management of its groundwater. Rather, groundwater management is subsumed under broader policy, legal, and institutional frameworks dealing with the management of

water resources, or more broadly, natural resources, and with land use and physical planning.

Existing policy, legal, and institutional frameworks in Kenya are deficient from the perspective of ground water management, as a results this accelerated growth in groundwater exploitation, unplanned and unmanaged. The study found that overall, groundwater governance in Kenya is weak and ineffective, and is characterized by a lack of strategic focus and limited resources.

Likewise related study conducted toward effective governance of water services in the same country (Kenya) by Akumu (2006) indicates that, the legal-policy framework has created commendable policy institutions and networks for good governance of water services in Kenya. This is especially true when it comes to the creation of public interest institutions, conflict resolution institutions and procedures and participatory systems. This framework has strived to achieve a structure for effective governance but falls slightly short of it due to lack of principles and performance for effective water governance 'in their water policy.

However a study done in India by the Planning Commission's Expert Group on Groundwater Management and Ownership has argued that the legislative framework is reasonably robust since, in principle, it enables the groundwater management practices that are likely to be pragmatic and effective in India (Garduño, 2011).

Conclusively, it can be established that, since independence to date, no study has been conducted in Tanzania on water resource governance specifically to assess functionality of water user association in the light of collective bargaining, resolution of water related conflicts, willingness to pay and the role of property rights in mitigating the tragedy of the commons. Previous researchers on the water sector have concentrated their efforts in other broad areas. For instance, a study conducted in Uchira, Moshi by Toner, Msuya, Mdee and Mfinanga (2005) investigated the role of small scale donor projects such as private companies and Civil Society organizations in contributing to development and implementation of an effective water policy in Tanzania. Another study conducted by

Lein and Tagseth (2009), assesses' Tanzanian water policy reforms between principles and practical applications and investigates different approaches to water management to find out how and by whom limited water resources best could and should be managed. Likewise a study conducted in Tanga by Juma, Kapile and Wahure (2004) analyse customary and statutory systems of utilizing and managing land and water to investigate how conflicts over land and water resources are managed in Pangani river basin

Little has been done in assessing the implementation of legal frame works in governing water resources in Tanzania by involving the local communities. Therefore this is one of the first studies to assess resources governance at grass-root level specifically to Water User Associations (WUA) in search to fill the existing research gap.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Overview

This section describes the research methodology and techniques that were used to carry out the study. It highlights the study area, types of data, research design, , sampling frame/ study population, sample size, sampling techniques, methods of data collection and data processing, analysis and presentation. It also discusses validity and reliability issues.

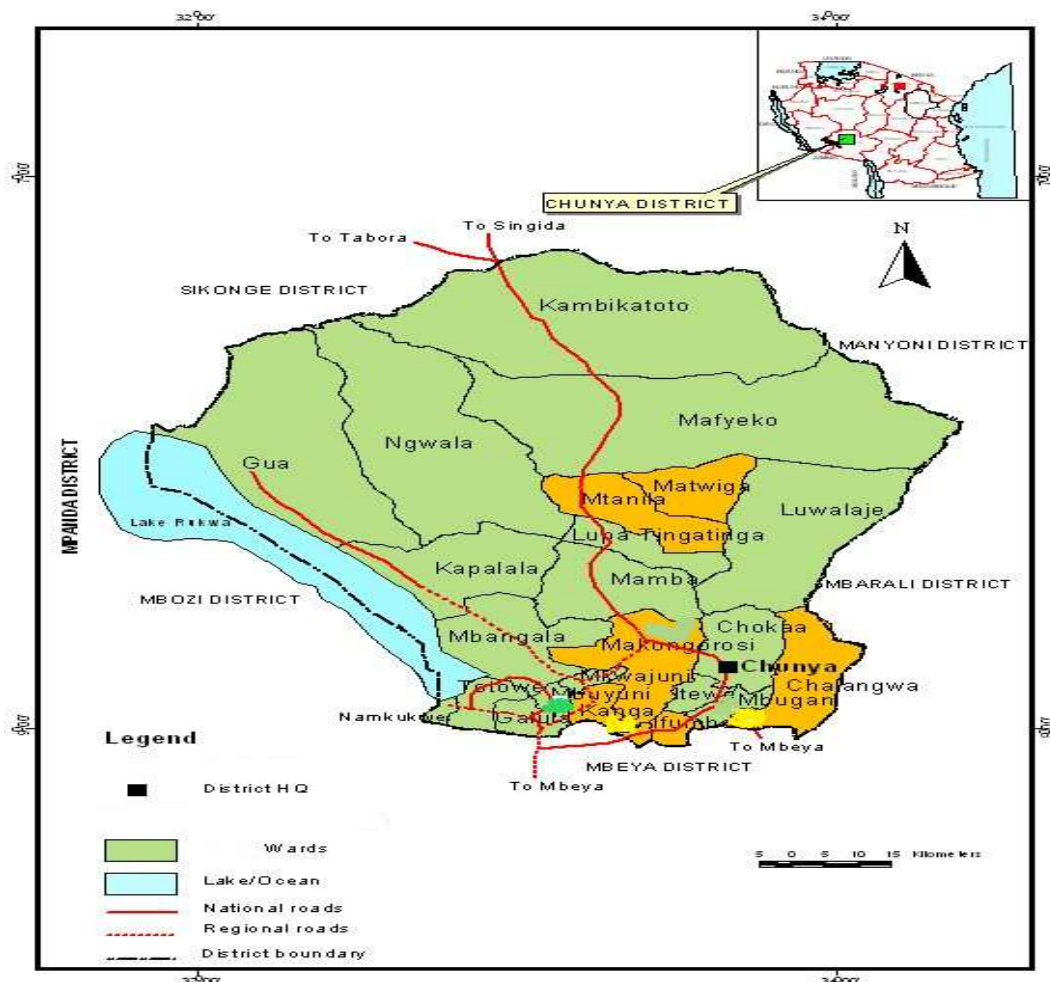
3.2 The Study Area

The study was carried out in Chunya district, Mbeya region. Chunya district is located in the north-western Mbeya region. The district is one of seven (7) districts in Mbeya region and lies between 7⁰ and 9⁰ latitudes south of the equator, and between 32⁰ and 34⁰ longitudes east of Greenwich. The district is bordered by Singida and Tabora regions to the north; Iringa and Mbarali districts to the east; Mbozi and Mbeya districts to the south; Rukwa region and Lake Rukwa to the west

The district has a total land area of 29,919 square kilometers, of which 28 114 square kilometers is land and 1705 square kilometers is covered by water including Songwe, Lupa, Zira rivers and part of Lake Rukwa which is an inland water body. Chunya district is the largest district compared to the other districts in the Mbeya region.

The study was conducted in Chunya District particularly in two wards of Kanga and Ifwenkenya. In these two wards, four villages were selected as the area of the study due to the reason that WUA covers those villages of Kanga, Ifwekenya, Tete and Ileya also the researcher chose this area due to convenience of data collection because of the prior experience she had on WUA in Chunya District. The study area is illustrated in Figure 2

Figure 3.1: Map of Chunya District



Source: Chunya District Council profile, 2010.

Figure 3.1 shows the map of Chunya District. It has an area of about 29,219 square km. The district lies between 7° and 9° latitudes south of the equator, and between 32° and 34° longitudes east of Greenwich. The district average temperature ranges between 21° centigrade and 23° centigrade annually and this is very much influenced by physiographic condition and altitude. Mean annual rainfall ranges from 600 mm, and 1000 mm. normally, the peak period of heavy rains is recorded during the months of December and

March almost every year. Despite the fact that about 78% of the total land is arable it is estimated that only 12% of the land is currently under cultivation. This indicates that, a large portion of land is still covered by natural vegetation.

The most predominant natural vegetation is miombo woodlands, with vast areas in Kwimba and Kipembawe Divisions. Common vegetative species include those of *brachystegia*, *dalbergia*, *pterocarpus*.

Administratively, Chunya District Council is divided into 4 major divisions, namely Kiwanja, Kipembawe, Kwimba and Songwe. The four divisions are sub divided into 30 Wards in total, and the wards are further sub-divided into 73 villages. According to 2012 National Census report, Chunya District population was 290,478 of which 145,420 were males and 145,058 were females. The average growth rate was 1.6% and there were 58,096 households with an average of 5 people. (URT, 2012)

Major economic activities in the district include agriculture and livestock, Forest, Fishing and Mining. Agriculture dominates the source of revenue and economic concert of the Chunya District. The sector contributes 69% to the income of the district revenue and employs 85% of the working population in the District; livestock farming contributes 17% to the District revenue and employs 2,357 of the total population. About 9% of the population is engaged in forest, fishing and mining. On the other hand, trade and commerce are practiced by 1.5% of the population while 2% of the populations are engaged in public administration and education sector and the rest 1.5 are engaged in other social economic activities (Chunya district profile, 2010).

3.3 Data collection techniques and sources of data

In carrying out this study, two main sources of data that is primary and secondary data sources were used. Secondary data sources entailed government documents, past report, journal, published reports, books, pamphlets, and magazine, and primary data sources entailed gathering data from the field area. Different techniques were used in order to

acquire primary and secondary data. Questionnaire, focus group discussion and observation for primary data, documents analysis was used to obtain secondary data.

3.3.1 Primary data

Primary data were collected in the field through administration of structured questionnaires. The questionnaire designed was administered by the researcher during the field to different respondents who gave the useful information.

3.3.2 Secondary data

Secondary data were sought from documents and records in District water office file and books in the study area. Also, data from libraries, institutions and websites were collected and then used in order to complement the information obtained from sample respondents.

3.4 Research Design

The study was conducted under non experimental cross-sectional design. A cross-sectional survey consisted of asking questions to a representative sample of the population at a single point in time where instruments like self-administered structured questionnaires and focused group discussions were used. This enabled the ease of getting viable and reliable data from various sources which conclusions and recommendations based upon.

3.4.1 Sampling frame/ Study population

Sample frame constituted a list of individual water users, WUA members and leaders of water user association in the village of Kanga and Infwenkenya catchments with a grand total of 9261 population.

3.4.2 Sampling Unit

The sampling unit of the study was water user at the individual household's level, WUAs leader and members of management committee of Kanga and Infwenkenya wards and villages, and water office staff in Chunya district. Respondents were selected from village registers maintained by Village Executive Officer (VEO).

3.4.3 Sample size

The sample size of the study was 98 (100%) and it included 81 (82.7%) water user members' respondents, these households were selected from four villages in two wards of Kanga and Infwenkenya, and 8 (8.2%) respondent's members of management committee. Also, the study included 2 leaders from WUAs office (2%) and 1 (1%) respondents from Water Office because it is the office which is coordinating the management of water and the establishment of WUAs in the district. The study also included 2 (2%) leaders from Ward and 4 (4.1%) leaders from village level, Ward Executive Officers and Village Executive officer were included in the study because they are the leaders in the areas concerned. These made the total sample size of 98 respondents.

Table3.1; Respondent sample composition

Category of respondent	Sample size				
	Kanga village	Tete village	Infwenkenya village	Ileya village	Total
Water user households	20	20	20	21	81
VEO	1	1	1	1	4
WEO	1		1		2
WUAs leaders	1		1		2
WUAs member of the committee	2	2	2	2	8
District water Officer	1				1
Total	98				

The researcher believed that this number was reasonable and helpful to obtain useful data/information for achievement of the study. The sample size also based on the cost, time availability and nature of the study, the distribution of respondents by unit is illustrated in the Table 3.1.

3.5 Sampling Technique/ Sampling procedure

The study used both probability and non-probability sampling techniques as shown in Table 3.2 below. Probability sampling is a type of sampling whereby every member of the population has an equal chance of being selected, under probability sampling simple

random sampling was used to select water user households in the study area, so that there was no bias in selecting water user groups to be interviewed.

Table 3.2; Sampling techniques and sample size

Sampling technique	Sample size	Percentage
Randomly sampling	81	82.7
Purposively sampling	17	17.3
Total	98	100

In non-probability sampling technique, the study used purposive sampling to select 17 respondents, these were experts in their field and there was a guarantee that they could give out relevant information, basing on their profession and working experience on water resources management, These include 1 from District water office, 2 from selected Wards (WEOs), 4 from selected Villages (VEOs), 1 WUAs leader, and 8 WUA committee member.

3.6 Data Collection Methods/ Techniques

The study employed three techniques of data collection in order to generate the information needed in this study, namely interviews, focus group discussion and observation. The instruments involved in each technique were questionnaires, checklist and observation schedule.

3.6.1 Interviews

Structured interviews were carried out in four villages of Kanga, Tete, Ileya and Infwenkenya where the interviewer was asking a predetermined set of questions using basically the same wording and order of questions within an interview schedule. A structured interview was useful in collecting data from water user villages' respondents. The purpose was to investigate individual's awareness on the governance of water resource performed by WUAs.

The main tool used in data collection during the interview was questionnaire whose copies were administered by the researcher. A questionnaire was used to capture both qualitative

and quantitative data. Open-ended and closed-ended questions were used. An open-ended question was giving an opportunity to the respondents to explain in detail the answers to the questions. Closed-ended questions are those in which the possible answers are already set out in the questionnaire and the respondents tick the relevant answers.

3.6.2 Focus group discussions

This method involves interviewing a small group of respondents drawn from people of similar background. In this study, focus group discussion was used to verify information obtained from interviews and observations. In each village one focus group discussion was held, the FGD consisted of 8-10 water user members, Members were selected using random sampling technique. The advantage of this method is that it allows an interaction with a range of key informants and allows the researcher to focus on group norms and dynamics around the issue being investigated.

3.6.3 Observation

Observation was the also the technique used for gathering information in this study. The researcher prepared an observation guide which was observed at the time of data collection.

The researcher has the opportunity to observe a number of KITI water user association activities such as water source protected area, and water infrastructures such as water tanks and water points constructed by WUA for water supply.

3.7 Data Processing, Analysis and Presentation

The researcher processed and analysed data by using computer programme such as Excel and the Statistical Package Software for Social Sciences (SPSS). The processing stage involved editing, classification, coding, transcription, and tabulation of data collected.

3.7.1 Data analysis and presentation

Qualitative data were analysed verbally and descriptively. The quantitative data was analysed using a Statistical Package Software for Social Sciences (SPSS).

The use of computer entailed application of SPSS version 16 (Statistical Package for Social Science) and Ms- Excel. The researcher decided to use SPSS version 16 because is the easiest way which can help the researcher to draw the data into logical order and organize them so that the useful information can be extracted from it as suggested by Patton, (2002). Data presentation was presented by using bar Charts, figures, Tables and Graphs.

3.7.2 Reliability and Validity

Reliability and validity are the two most important quality control objects in research. The issue of reliability was ensured by the use of different methods and tools during data collection including; questionnaires, interviews, observation, and review of secondary data. Also, reliability was ensured by the use of appropriate sampling techniques including random sampling and purposive and selection of appropriate sample size.

To increase validity, the interview and FGD schedules used in the study were constructed around relevant and important themes. In order to make sure that those important issues were not left out and results are of quality, more credible and trustworthy for generalization, prompts were used to guide discussions for each theme.

CHAPTER FOUR: PRESENTATION OF THE FINDINGS

4.1 Overview

This chapter is devoted to the presentation of the data collected regarding the four research questions. The presentation of the data would be done in the sequential orders as they appear in research specific objectives, which explains first the process of carrying out collective bargaining in order to govern water resource. Secondly to explain how conflicts in water use are resolved. Moreover, the study assessed willingness of water users to pay for water as a public good and natural resources which needs to be governed and lastly to find out the role of property right assignment in the mitigating tragedy of the commons which could deplete water resource. As it has been explained in chapter three research findings and analysis of the results obtained through questionnaires, interview, observation and documents.

This chapter starts by presenting descriptive characteristics of the studied population focusing on, age, sex, education level, marital status, family size and economic status of the respondents. This is done in order to reveal the sample size used in the study area. Then, the chapter presents the process of carrying out collective bargaining in order to govern water resources, water user conflict resolution in Chunya district, Willingness of community to pay for water as a public good and the role of property right assignment in mitigating tragedy of the commons.

4.2 Demographic and social economic characteristics of the study respondents

In any community, respondent characteristics and social economic characteristic play an important role in resource utilization with the aim of improving its livelihood. However, in absence of resource governance it may lead to unsustainable natural resource utilization resulting in resource depletion or degradation. The general characteristics of the respondents that were examined in this study were age, sex, family size, marital status, and household education level.

4.2.1 Gendering Water Resource Governance

Out of 98 respondents, 61 (62.2%) were males and 37 (37.8%) were female. The results revealed that a greater number of men (60.4%) had a greater representation in expression of the information concerning water resource governance in the study area than women (39.5%) respondents.

Table 4.1: Number and sex of respondents

No.	Type of respondent	Respondent by Sex		Total number	Percentage (%)
		Male	Female		
1	Water user h/h	49	32	81	82.7
2	WUAs leader	2	0	2	2
3	WUAs committee	5	03	8	8.2
4	WEOs	2	0	2	2
5	VEOs	2	2	4	4.1
6	DWEs	1	0	1	1
TOTAL		61	37	98	100%

Table 4.1 shows the findings that are reflecting on gender aspect of water as natural resources governed by both men and women. The table shows that male water users dominated women in making decisions related to water resource governance in Chunya district. This means that in the study area, few women were involved in the discussion-concerning resource governance although women are the main users of water for domestic purpose.

Gender was also considered in the management committee, Figure 4.1 below the respondents' sex distribution in the management committee.

Figure 4.1; Sex distribution in the Management Committee

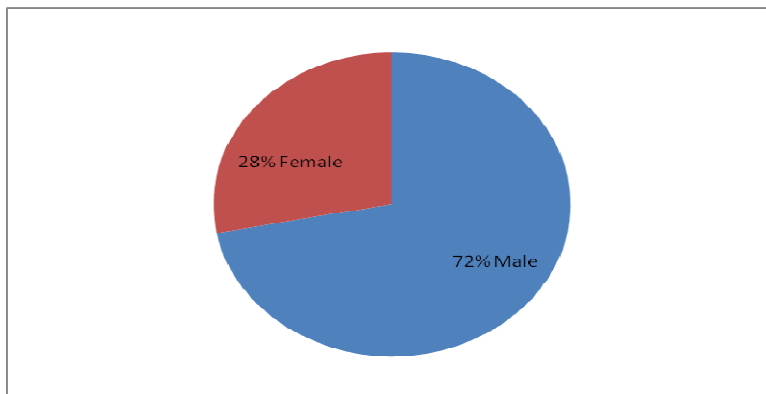


Figure 4.1, shows the respondents' gender distribution in the Management Committee of KITI in Chunya District. It shows that in water user association out of 25 members of the Management Committee, only 18 (72%) members were men and 7 (28%) members were female this means that female representation in the management committee is lower than that of men.

4.2.2 Age of Respondents

Four groups were considered in this study, the first group was that of 18-25 years; second group was of 25-34, third group of 35-54 and the last one was for those with above 55 years

Table 4.2 Distribution of respondents by age

Age of respondents	Number	Percent
18-24	0	0
25-34	41	41.8
35-54	46	46.9
55 ++	11	11.2
TOTAL	98	100

Table 4.2, presents the distribution of respondent by age. The age of respondent range from 25 and above 55 years of age, results show that about 41.8% of respondents were

aged between 25 to 34 years, 46.9% between 35 to 54 years and only 11.2% in the age of category 55 years and above. The findings reveal that people who are between 35 – 55 years and above were more involved in discussions concerning resource governance in the study area; this helped the researcher to get more useful information as people in this group are mature enough and have more experience in resources management than others. This also helped the researcher to get the real information on the role of resource governance especially in water issues.

4.2.3 Marital Status and family size

Respondents were also requested to state their marital status which has a relationship with governance of water resources.

Table 4.3; Distribution of respondents by marital status

Respondents		Marital status									
		Married		Single		Divorced		Widow		Total	
		No	%	No	%	No	%	No	%	No	%
SEX	Male	53	54.1	5	5.1	0	0	0	0	58	59.1
	Female	30	30.6	6	6.1	0	0	4	4.1	40	40.8
	Total	83	84.7	11	11.2	0	0	4	4.1	98	100

Table 4.3 shows the distribution of the respondents by marital status. Considering the marital status of the respondents, the results indicated that the majority of the respondents (84.7%) were married, 11.2% single, 8.6% and 4.1% were widowed. Marriage increases household size and therefore increases demand of water resources. Family size also has relationship with governance of natural resources

Table 4.4: Respondents' Family size

Number	Family size	Frequency	Percent
1	1-3	22	22.4
2	4-6	47	48.0
3	7+	29	29.6
Total		98	100

The family size is assumed to increase demand for water resources. Table 6 shows that the range of 4-6 and the range of 7 and above family size were found to be 48.0% and 29.6% respectively, this implies that most of the households had larger families size which might lead to destruction of natural resource if the property right is not well assigned in Chunya District.

4.2.4 Education level

Education is one of the long term strategies that may be used to improve governance of resources. Respondents were asked about the level of their education, results are illustrated in Table 4.5.

Table 4.5 Respondents' education level

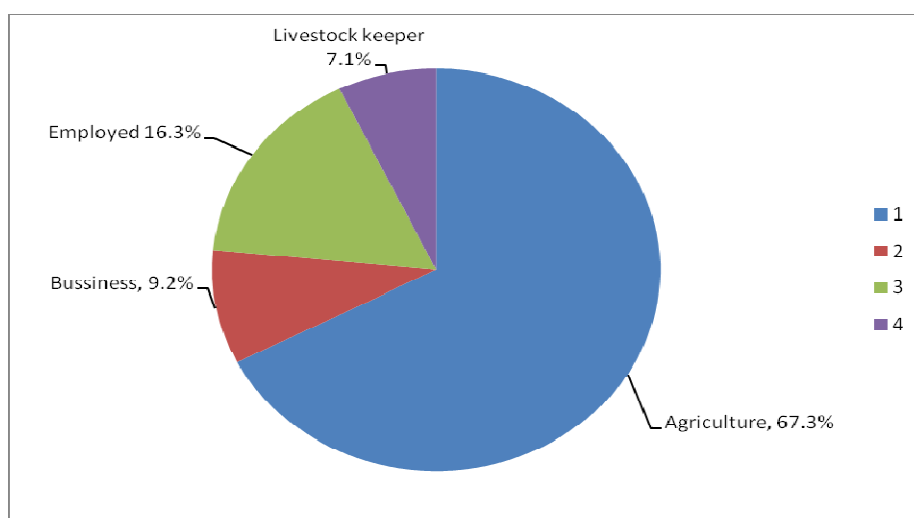
Education level	Frequency	Per cent
None	3	3.1
Primary Education	74	74.5
Secondary education	18	18.4
Certificate	2	2
Higher education	1	1
Total	98	100

Result in Table 4.5, revealed that 74 (75.5%) of respondents complete primary education and only 18 (18.4%) completed secondary education while 3 (3.1%) had not attended any form of education. The findings also revealed that only 1 (1%) of respondents had attended higher education, this indicates high rate of illiteracy in Chunya District which may lead to ineffectiveness of resource governance as explained in Chapter 2, (section 2.3.4).

4.2.5 Economic activities

Figure 4.2 examines the respondents' sources of income. About 66 (67.3%) of the respondents are engaged in agriculture activities as the main source of income, 9 (9.2 %) of the respondents in business, and 16 (16.3%) employed and 7 (7.1%) of the respondents are livestock keepers.

Figure 4.2 Distributions of respondents by sources of income

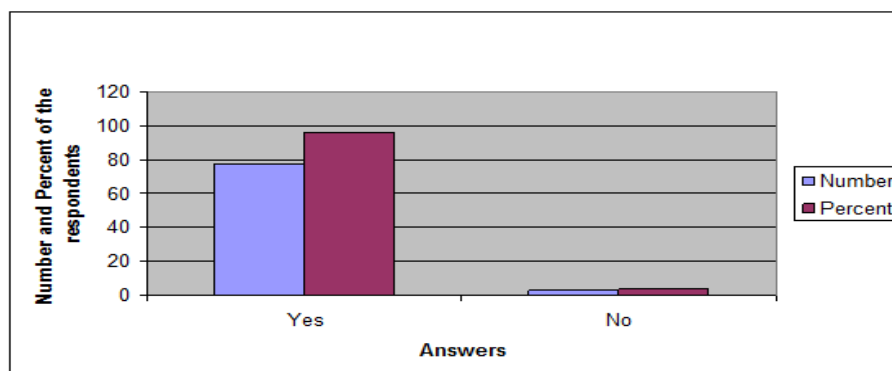


The findings reveal that many households are engaged in different activities to increase their income this enhance the community to afford to pay for water fees and to be able to contribute to the maintenance of water infrastructures for sustainability of water management.

4.3 Awareness of Existence of water user association

Being aware that WUA is an institution that governs water resources was equally important to study. The finding of the study reveals that community are aware of the existence of water user association

Figure 4.3 Existing of water user association



Results in figure 4.3 shows that 78 (96.3) of the respondents indicated that they were aware of a registered WUA in their area called KITI in which membership is drawn from the water unions and committees from the villages of Kanga, Infwenkenya, Tete and Ileya, while 3 (3.7%) answered that there was no existing registered WUA in Chunya District. These findings reveal that established and registered WUA (KITI) in the area is functioning and its functions are known by a majority of the respondents, KITI was established as a vehicle through which communities participate in the management of water resources. KITI is known by a majority of the respondents (96.3%) due to the fact that it has been established by the community themselves and it was established in response to the aspirations of its members.

4.3.1 Process of carrying out collective bargaining in order to govern water resources

The study was interested to find out how the process of carrying out collective bargaining is done in water resources governance by WUAs in Chunya district. Involvement of the community in collective bargaining especially in resource use creates the community awareness in the improvement of that resource for future generation.

Table 4.6: Water user involvement in collective bargaining process

Respondent sex	Yes (N= 27)		No (N= 54)		Total (N=81)	
	Number	(%)	Number	(%)	Number	(%)
Male	22	27.1	27	33.35	49	60.5
Female	5	6.2	27	33.35	32	39.5
Total	27	33.3	54	66.7	81	100

The findings in Table 4.6 show that only 27 (33.3%) of the respondents were involved in the process of collective bargaining and 54 (66.7%) respondents were not involved in any collective bargaining.

The results reveal that most of the people in the study area were not informed to attend any meeting conducted by WUA as KITI constitution (1999) section 29 (ii) instructed. The participation of water user in collective bargaining process was found to be very limited this indicates that the KITI associations dominate the process of planning and that there was less collective decision-making in the use and management of water resources. When the researcher wanted to know why the community were not involved in the bargaining process during focus group discussion in Tete village, one water user member was quoted saying;

“KITI has a poor leadership system; we are not involved in any decision making. Collective bargaining in resources use and management are not well organised by the WUA, the association’s leaders tend to make decisions on their own without considering community opinions, the manager of the association operates it like a private entity instead of community association” a water user explained.

Results in Table 8 also show that out of 27 respondents who were involved in the process of collective bargaining, twenty two (22) members who responded to be involved in collective bargaining were male and only five (5) respondents were female. This result is similar to what was explained in section 4.2.1 and Section 2.3.3.

4.3.2 Collective bargaining in water resource governance

Respondents who are involved in collective bargaining were also asked to mention type of collective bargaining which was involved by water user association

Table 4.7 Collective bargaining in water resource governance

Type of collective bargaining	Respondent sex (N= 27)		Total	Percent
	Male	Female		
Water Distribution Schedule allocation	3	0	3	11.1
Price of water fees	13	5	18	66.7
Maintenance of water infrastructures	4	0	4	14.8
All of the above	2	0	2	7.4
Total	22	5	27	100

Table 4.7 above shows that out of 27 respondents for those who are involved in collective bargaining, 3 (11.1%) respondents have been involved in arrangement of water distribution schedule and water allocation, 18 (66.7%) have involved in discussion of the price of water fee, 4 (14.8%) respondents have involved in collective bargaining for maintenance of water infrastructures and only 2 (7.4%) were involved in all kinds of the collective bargaining as mentioned above. The findings reveal that there some of water user members who were involved in water distribution schedule and water allocation, bargaining for water prices and maintenances of water infrastructure; this can complement broader water resource management.

4.3.3 The main actors in carrying out collective bargaining

The main actors involved in collective bargaining were identified in order to get the real information about the actors that support the improvement of resource governance through joint decision in Chunya District.

Figure 4.4; Actors involved in the collective bargaining process

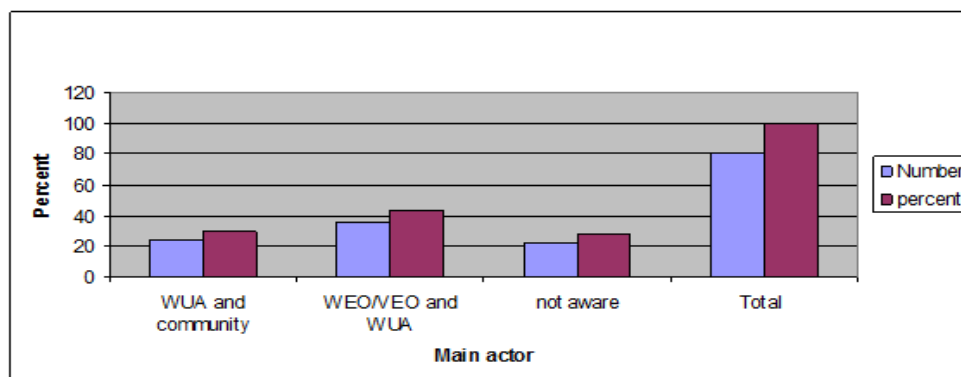


Figure 4.4 shows that 35 (43.2%) of the respondents indicated that Ward/Village leaders and Water user associations are main actors in carrying out collective bargaining, again, another 24 (29.6%) of the respondents mentioned that the main actors are community and water user association while 22 (27.2%) of the respondents were not aware of who are the main actors in the bargaining process.

This result implies that, the main actors involved in collective bargaining in the study area are Ward government leaders Community and Water User Association. This enables the community to get the chance to be involved in the improvement of the water use for sustainable water resource management. As Ostrom (1990) argued, community level governance allowing stakeholders articulate their interests, share information, communicate and bargain, and take collective decisions is essential to the ability of water users to operate at multiple levels of action, which is a key to sustaining successful resource preservation and efficient use of resources.

4.3.4 Steps water user members are involved in collective bargaining

Table 4.8, shows number of respondents involved in different steps in the collective bargaining process. The findings show that, out of 27 respondents who are involved in bargaining process 5 (18.5%) of the respondent were involved in preparation of

bargaining, 16 (59.3%) were involved in the negotiation process, 3 (11.1%) were involved in follow up action while 23 (11.1%) were involved in all steps of collective bargaining

Table 4.8; Step water users involved in the bargaining process

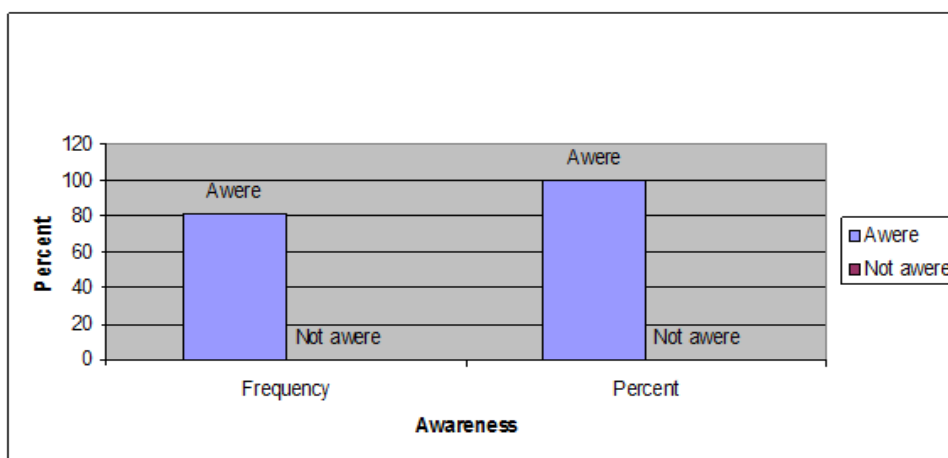
Step involved	Number of the respondent (N= 27)	Percent
Preparation of bargaining	5	18.5
Negotiation process	16	59.3
Follow up action	3	11.1
All of the above	3	11.1
Total	27	100

The findings reveal that community who were involved in bargaining process were involved in each step of bargaining process conducted by water user association in the study area.

4.3.5 Awareness on the importance of collective bargaining in water resource governance

The researcher was interested in knowing if the respondents are aware of the importance of carrying out collective bargaining in the management of water resources. Figure 4.5 shows that all of the respondents interviewed with a total number of 81 (100%) were aware that it is important to conduct collective bargaining for better water resources governance.

Figure 4.5: Awareness on the importance of collective bargaining



The finding reveals that communities in the study area know the importance of carrying out collective bargaining for management of resources. Collective bargaining is important in resource governance hence it is a means of increasing the agreement of the governed by involving them in the decisions that affect them directly.

4.4 Conflicts in water user associations

In this part, the researcher wanted to investigate the power bestowed to WUAs in solving water user conflict. The aim was to know if there is occurrences of water user conflict to understand the nature, type and causes of water conflicts as well as whom the actors involved are, and how the various conflicts are solved in the study area.

4.4.1 Existence of water user conflicts

The findings of the study have revealed that community are aware of water conflicts arise , results show that (as presented in Table 4.9) out of 81 respondents interviewed 77 (95%) of the respondent experience the problem of water user conflicts and only 4 (4.9%) respondents were not experiencing the incidence of water user conflicts in their surrounding environments.

Table 4.9; Experience of water user conflict in relation to age of respondent

Age	Experience of any water user conflict in the area		Total
	Yes	No	
18-24	3.7	1.2	4.9
25-34	35.8	1.2	37.0
35-54	42.0	2.5	44.4
55 +	13.6	0.0	13.6
Total	95.1	4.9	100.0

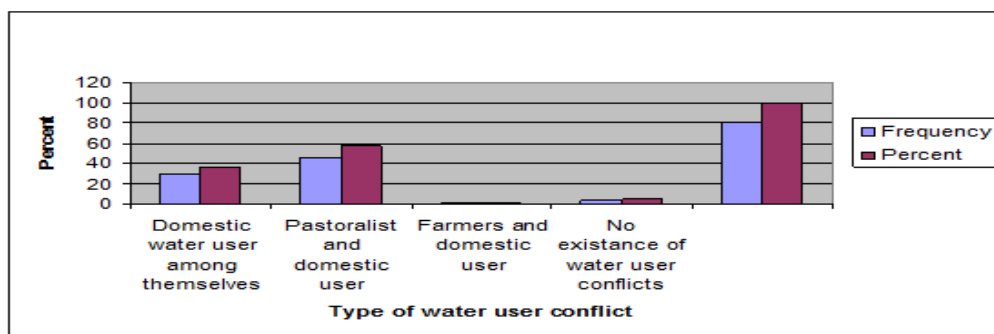
The findings reveal that respondents aged 35-55 years and above have high experience on water use conflict while in the same group also there are few people who have no idea of water use conflict. This implies that, the majority of the people who are in the aged group

have high knowledge and experience on dynamic and event that happened in the society than young peoples.

4.4.2 Common characteristics of water user conflicts

The respondents were also asked to identify the nature/ characteristics of water user conflicts in the study area. The conflict occurs are related between three user groups, domestic users among themselves, pastoralist and domestic user and farmers and domestic user.

Figure 4.6: Common characteristics of water user conflict



As shown in Figure 4.6, 30 (37%) of the respondents indicated the conflicts were between the domestic user among themselves, 46 (56.8%) of the respondents indicated conflict were between pastoralists and domestic users, and only 1 (1.2%) respondent pointed out that the conflict was between domestic users and farmers while 4 (4.9%) did not experience any water user conflict in their surrounding environment. The ladies who were fetching water when asked to explain why domestic water user conflicted themselves she explaining

It happens usually that the person who fetches water may decide not to queue like others and push them away in order to be the first to get water given that he is stronger than the others and this often leads to misunderstanding between users when the users start a scorn each other.

Figure 4.7: Women in the queue waiting for their turn to get water at a water point



The picture above show women in the queue waiting for water at water point in one of water point located in Infwenkenya village, much time is wasted in the collection of water, and women lose opportunities for them to participate in development activities because of the time that water collection consumes.

The study also revealed that major common characteristic of conflicts in the study area emerging from pastoralist and domestic user as have been mentioned by majority of the respondents (57%). During a household interview, most of the households raised serious concerns about the problem of pastoralist to cut off the water pipe for them to water their animals. In focus group discussion one respondent said;

The problem of water user conflict between livestock keepers and domestic users happened mainly in dry season. During the dry season it is very difficult to get water from the water point because livestock keepers cut off the water pipes for them to water their animal hence there are no alternative sources of water nearby and water received from the point is not sufficient to be used for watering the animal due to the fact that water available is not enough for daily requirement.

4.4.3 Main cause of water user conflicts

Respondents were also asked to mention main causes of water user conflict in their area. The results show that 50 (65%) of the respondents mentioned the problem of water scarcity as the main cause of water user conflict, 19 (25%) of the respondents mentioned the problem of destruction of water infrastructures by livestock keeper as the cause and 7 (9.1%) of the respondents mentioned grazing around catchment area while only 1 (1.3%) respondent mentioned the problem of crop cultivation near water sources.

Table 4.10: Main causes of water user conflict

Main Causes	No. of Respondents	% of Respondents
crop cultivation near water sources	1	1.2
Livestock grazing around catchment area	7	8.6
Water scarcity	50	61.7
Livestock keeper cut of water pipe	19	23.5
Total	81	100.0

The study found that the main source of water user conflict in Chunya District is water scarcity as it has been mentioned by the majority of the respondents (61%). During the focus group discussion one of the group members was quoted saying;

In our village water is not sufficient for our daily requirement and sometimes it may take two to three months to get water from the water points, so people find alternative sources from traditional wells which are not safe at all, and when water flows from the points that is where conflicts arise because every ones fights to get water.

Livestock keepers are also the main cause of water user conflicts it was mentioned by 32.1% of the respondents as shown in Table 12 above (Both grazing around catchment area and those destruct water pipe).

4.4.4 Main actors responsible for managing water user conflict

Respondents were asked to identify the main actors responsible for managing water resource conflict. Respondents mentioned various actors who are involved in water user conflicts as shown Table 4.11

Table 4.11: Actors responsible for managing water user conflict

Actor responsible for managing water user conflicts	Number of respondents	Percent
Water user association	38	46.9
Ward and Village leader	26	32.1
Community	2	2.5
Government	2	2.5
Ward/village leader and Water user association	8	9.9
Water office	1	1.2
Not aware	4	4.9
Total	81	100

The research finding in Table 4.11 indicate that 38 (46.9%) of the respondents agreed that water user association were responsible for managing water resources conflict, 26 (32.1%) of the respondents indicated ward and village leader was responsible for managing water user conflict while 2 (2.5%) of the respondents mentioned the community and other 2 (2.5%) of the respondents mentioned the government as a responsible actor in managing water user conflict. Also, 8 (9.9) respondents mentioned that ward/village leaders and Water user association were responsible to solve water user conflict and only 1 (1.2%) respondent mentioned water office was responsible for managing water user conflict while 4 (4.9) of the respondents were not aware about who are actors responsible to manage water user conflict in the study area. The finding reveal that different actors were involved in solving water user conflicts, involving different parties in resolution process help the parties in reaching agreement.

Respondents were also asked if they were involved in solving the water user conflicts in their area. Results in Table 4.12 show that about 39 (48 %) of the surveyed household were involved in solving water user conflicts while 42 (52%) were not involved in solving water user conflicts.

Table 4.12: Community involvement in solving water user conflict

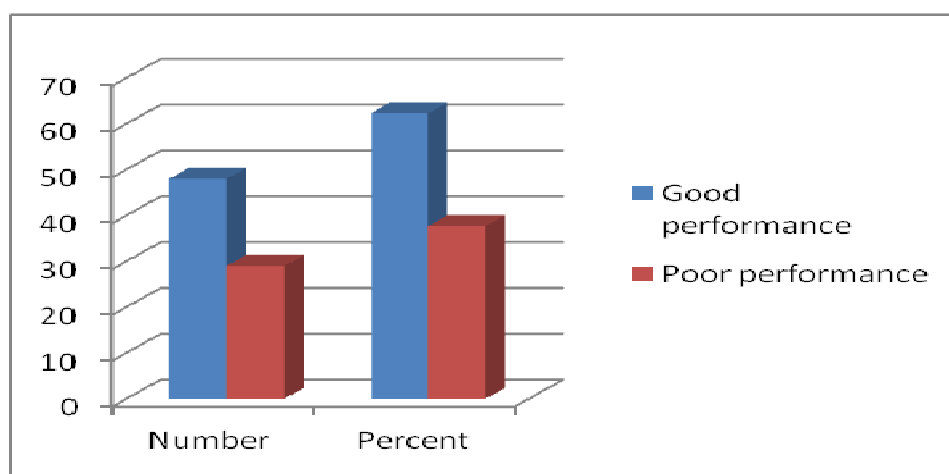
Age of respondents	Community involvement in solving water user conflict			
	YES	%	NO	%
18-24	0	0	0	0
25-34	2	2.5	22	27.2
35-54	30	37	16	19.8
55 ++	7	8.6	4	4.9
TOTAL	39	48.1	42	52

The findings reveal that majority of the respondents who are aged between 35- 55 and above who are elderly people were more involved in solving water user conflict than young people. This enhances the conflict parties to reach the agreement hence peoples in this age has a good knowledge of events that have been taking place.

4.4.5 Actors' performance in solving water user conflicts

Respondents also gave their views on the performance of the actors in solving water user conflict, as shown in Figure 4.8, most of the respondents about 48 (62.3%) commented on the good performance of actors who are involved in solving conflicts while 29 (37.7%) respondents claimed that there was poor performance.

Figure 4.8: Actors' performance in solving water user conflict



The findings reveal that water user conflicts in the study area are solved well even though there are some shortcomings reported by some of the respondents. During household

interview when the researcher asked respondent to comment on the performance of actors involved in solving water user conflict the respondent was quoted saying,

“The associations are biased in solving water conflict their only take action to some of the wrong does while some people were not dealt with, that’s why the problem of water user conflict still occurs.

4.4.6 Conflict resolution Methods in WUAs

Various methods have been used by WUA to solve conflicts which arise in their area of jurisdictions. Respondents were asked if they aware of the methods used to solve conflict in the study area.

Figure 4.9; Respondents’ awareness of the methods used to resolve conflicts

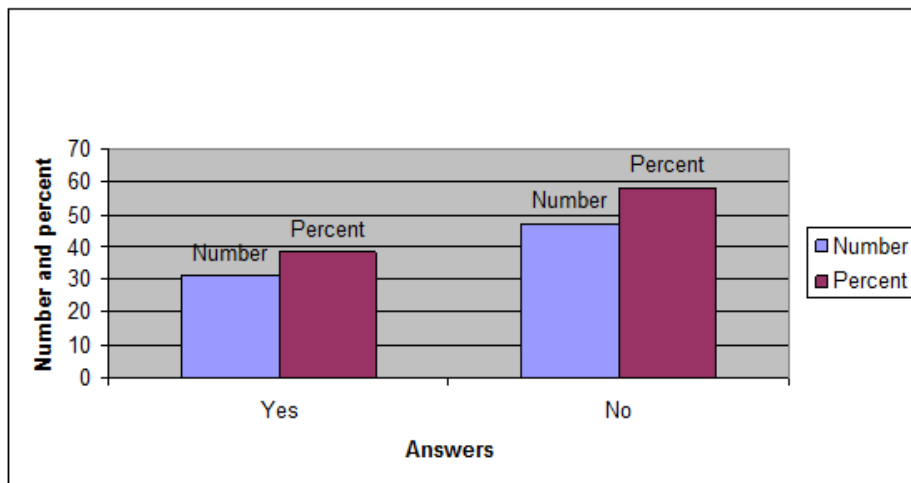


Figure 4.9 shows that out of 77 respondents who experience the problem of water conflict, 31 (40.3%) they aware on the methods used by KITI to resolve water conflict, while 46 (59.7%) they didn’t aware on the method used by the water user association in solving water user conflict.

Respondents were also asked to identify the various method they knew which were used by the association in solving water user conflict.

Table 4.13; Methods used by WUA for solving water user conflict

Methods used in conflict resolution	Respondents (N=31)	Percents
Using the existing bylaw	4	12.9
Meetings	8	25.8
Dialogue	7	22.6
Meetings, dialogue, and using the existing by-laws	12	38.7
Total	31	100

The results in Table 4.13, show that out of 31 respondents who knew the methods used by the association in solving conflict 4 (12.9%) respondents indicate the use of existing by law, 8 (25.8%) of the respondents mentioned the use of meetings, 7 (22.6%) of the respondent mentioned the use of dialogue while 12 (38.7) of the respondent mentioned the use of meetings, dialogue, and existing bylaws.

4.4.7 Strategy to prevent water user conflicts

Strategy to prevent future water user conflict has been used by WUA to governing water resources. Results in Table 4.14 show that 13 (16%) of the respondents indicates penalties, 26 (32.1%) of the respondents mention the use of warning and 10 (12.3%) of the respondents mention provision of education (awareness creation) while 32 (39.5%) of the respondents mention both warning and penalties as the strategy used by KITI to prevent water user conflict.

Table 4.14; Strategy to prevent water user conflicts

Strategy used	Respondents	Percents
Penalties	13	16
Warning	26	32.1
Penalties and warning	10	12.3
Awareness creation (Education)	32	39.5
Total	81	100

The findings reveal that KITI use different ways to prevent water user conflicts WUA these included the provision of education on the effects of water user conflicts together with the provision of bylaws which govern water resources. Water user association liaises with local leaders in their vicinity to provide the awareness to the community on the

effects of water use conflicts. Also, different methods were used to punish those who went against the bylaws to prevent water conflicts. The findings also reveal that WUA used both penalties' and warning as the strategy to prevent future water user conflict as it has been mentioned by the majority of the respondents.

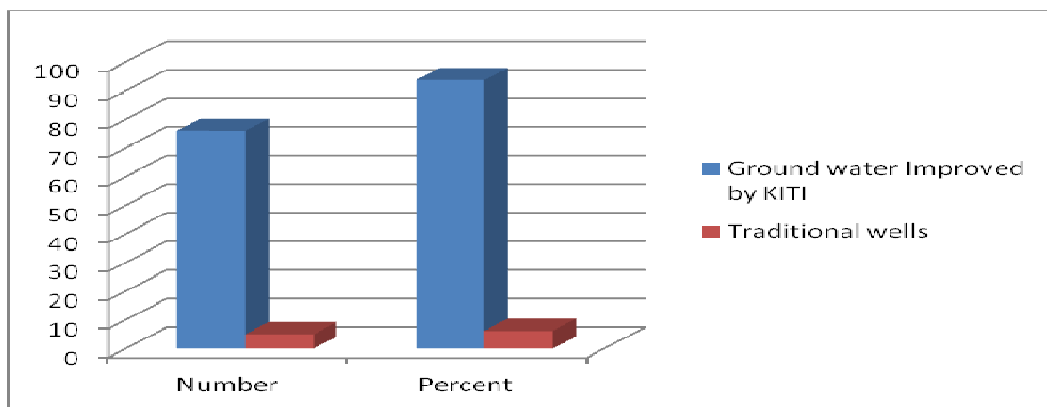
4.5 Willingness to pay for water as a public good by the water users in water resource

For the researcher to asses this specific objective, the following issues were analysed main sources of water, demand of water in relation to its availability, causes of water shortage, water distribution satisfaction, willingness to pay, and the awareness on the use of fees collected as water charges in Chunya District.

4.5.1 Main sources of water

The findings of the study in figure 4.10 indicate that 93.8% of the surveyed households depended entirely on the improved ground water sources developed by KITI while 6.2 % of the respondents have additional alternatives in their surrounding area from traditional wells.

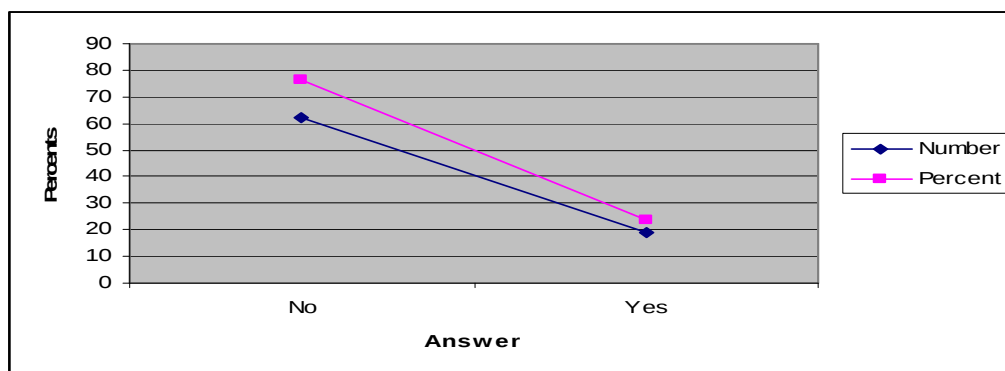
Figure 4.10 Main sources of water



The findings reveal that the main source of water in the study area was underground water improved by KITI and the community has no safe alternative sources of water.

The respondents were also asked if they are able to get sufficient quantity of water to meet their daily requirements, about 62 (76.5%) of the respondents indicated that quantity of water received was not sufficient for their daily requirements while 19 (23.4%) of the respondents agreed that quantity received from the sources was sufficient to fulfill their daily requirements as illustrated in Figure 4.11.

Figure 4.11 Sufficiency of quantity of water available



The community may have low willingness to pay for resources which they are not able to get enough benefit. Pearce *et al.* (1990), underscores the concept of benefit and willingness to pay, and observes that the benefit measure is established when individuals are presented with enough of goods and services. It could be agreed with the finding that most of the respondents were claiming about insufficient amount of water received from the sources, this in turn may affect the willingness to pay of the respondents.

4.5.2 Water distribution schedule satisfaction

According to the rules governing WUA in Tanzania, the water has to be distributed among members on an equal and fair basis. Hence, all members should have a share of the available water resources, as shown in Table 4.15, about 30.9% of respondents indicated that they were satisfied with water distribution while 69.1% of the respondents were not satisfied.

Table 4.15; Satisfaction with water distribution by family size

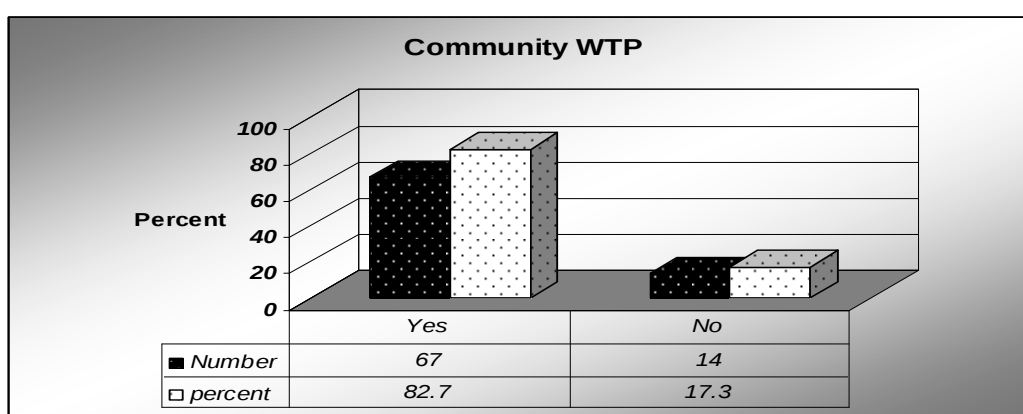
Family size	Are you satisfied with water distribution in your area?				Total	Percent
	Yes	%	No	%		
1-3	15	18.5	3	3.7	18	22.2
4-6	6	7.4	33	40.7	39	48.1
7+	4	4.9	20	24.7	24	29.7
Total	25	30.9	56	69.1	81	100

It was observed from findings that the majority of the respondents in the study area who are not satisfied with water distribution have families of larger size than those who are satisfied with the distribution of water in the study area larger family size increase demand of water than small family size.

4.5.3 Willingness to pay for water as a public good by the water users in water resource governance

Respondents were asked if they were willing to pay for the water services there are getting in order to assess if community were aware of the importance of contributing to projects as the way to ensure its sustainability through cost sharing. The results show that 67 (82.7%) of all respondents were willing to pay for the water service while 14 (17.3%) of the respondents were not, as illustrated in Figure 4.12.

Figure 4.12; Community willingness to pay for water



The findings also reveal that some of the respondents are not willing to pay for water services; majority of respondent who are not willing to pay for the water services

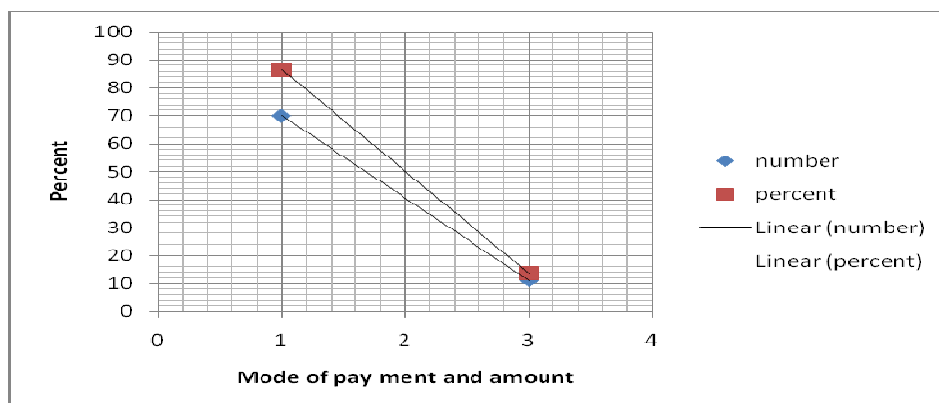
mentioned that water is a free commodity. During household interview one of the respondents was quoted saying,

“I’m not willing to pay for water fees because water is a gift from God, it’s also the role of government to supply water in our village to be used free of charge.

4.5.4 Amount and mode of water payment services

The response from Figure 4.13 show that, 70 (86.4%) of the respondents use public water point and pay 500/= TSH per month. While 11 (13.6%) of the respondents use private water pipe and pay 2500/= TSH per month. The findings implies that majority of water user pay only 500 Tsh for access water at a water point per month and only 2500 Tsh per month for private tape.

Figure 4.13 Mode of payment and the amount paid for water fees



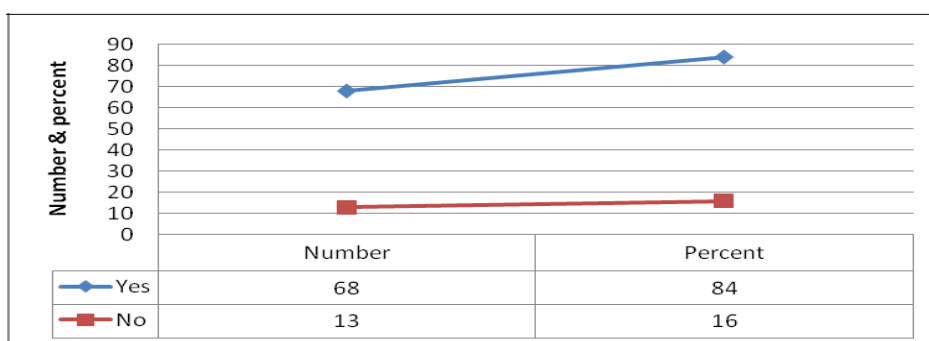
The findings reveals WTP is affected by prices, the amount paid for water fees by water user members compares reasonably to their low income, hence it will be easy for the community at rural area to afford to paid especially for domestic water user.

4.5.5 Community awareness' on the use of collected water fees

Community awareness of the use of water charges collected will increase WTP. Figure 4.14, show the response of the community in awareness of the uses of the collected water

user fees, about 68 (84%) of the respondents were aware of the uses of fees collected from households while 13 (16%) of the respondents did not aware of the uses of collected fees.

Figure 4.14; Community awareness on the uses of water fees



The findings reveal that the majority of the respondents who were aware of the uses of the fees collected mentioned that the fees collected were used for maintenance and to cover of office running costs. The findings also reveal that 16% of the respondents who were not aware on the uses of the fees collected some of them were claiming that the collected money was misused. During FGD in one of the villages also respondents were claiming that the fees collected were misused by WUA management and they always refused to present revenue and expenditure reports to water user members.

4.6 Role of property right assignment in mitigating tragedy of the commons

The researcher wanted to know if respondents especially water user members were aware of the meaning of property right and if the same have any importance (role to play) in mitigating tragedy to water resources in the study area. For this reason, questions about the meaning of property rights and its role in mitigating tragedy of the commons were included in the questionnaire and results were presented as shown in Table 4.15 and Table 4.16, respectively.

4.6.1 Community awareness' on the role of property right

Respondents were asked to indicate if the property right has a role to play in controlling the tragedy of the commons in Chunya District, as shown in Table 4.16 Among the surveyed households, 63 (77.8%) of the respondents agreed that property right has helped to prevent degradation of water resource in the study area, while 18 (22.2%) were disagreeing.

Table 4.16: Awareness of respondents on the concept of water property right

Awareness on the concept of property right	Number (Frequency)	Percentage (%)
Aware	63	77.8
Not aware	18	22.2
Total	81	100

Respondents were also asked to explain the role of property right in mitigating tragedy of the commons results in Table 4.17 show that 47 (58%) of the respondents explains that property rights increase motivation, legal capacity and sense of ownership for WUA and community in Chunya District while 34(42%) indicates that are not aware on the role of property right in mitigating tragedy of the commons in Chunya District as illustrated in Table 4.17.

Table 4.17: Role of Property right in mitigating tragedy of the commons

Role played by Property Right in Mitigation of Tragedy of the commons	Frequency	Percentage (%)
Increase motivation, legal capacity and sense of ownership for WUAs and community	47	58
No role played	-	-
Not aware	34	41.9
Total	81	100

4.6.2 Water user restrictions

In identifying the role of property right in mitigating the tragedy of the commons the researcher was interested to know if there water any water use restrictions provided by WUA as the way to limit the use of water due to its shortage to avoid the tragedy. Respondents were asked to identify any water use restriction they knew.

Table 4.18: Water use restrictions

Water use restriction	Numbers	Percent
Irrigation	28	34.6
Bricks making	32	39.5
Watering animal	21	25.9
Total	81	100

Results in Table 4.18, indicate that 28 (34.6%) of the respondents point out that water use was limited to irrigation, 32 (39.5%) mentioned that water was restricted for brick making and 21 (25.9%) mentioned that water was restricted to watering animals.

During the interview, the leader of the water user association explain that water received from the sources was not enough for daily requirements so they agreed with community to use water only for domestic purpose and the community should find alternative sources if they needed to use water for other purposes. He further explained before they had property right it was hard to control the use of scarce resources as every individual wanted to use water to fulfil their interest as a result the water resource was overused and degraded Property right has helped the association to limit the quantity of water resource use and ensure sustainability of water resources.

CHAPTER FIVE: DISCUSSION OF THE FINDINGS

5.1 Overview

Chapter four was devoted to the presentation of the data collected from the selected respondents. The general presentation was made using table and graphs which gave a very general picture of the respondents' attitude towards each question. But such a presentation would not be enough to answer the research questions, unless the answers are analyzed and discussed in details and a correct conclusion is driven out of them. The discussions of the findings are also presented in sequential orders as they appear in research specific objective.

5.2 Demographic and social economic characteristics of the study respondents

5.2.1 Gendering in Resources governance

Based on the findings gender issues in resources governance is misrepresented in WUA. Presentation of women in KITI management is also minimal; as it has been discussed by Dick and Zwarteveen (1997) in Chapter two (section 2.3.3). Women are misrepresented even in collective bargaining process as it has been presented in section 4.3.1. This implies that in the Chunya District, few women were involved in the discussion-concerning resource governance this in turn affect governance of water resources hence women are the main users of water for domestic purpose. Men and women have different priorities and responsibilities. Therefore, gender plays a big role in recognizing the roles of both males and females in water resources governance. As managers of the resource, women and men often have different knowledge, skills, and resources to offer.

WUA will be better able to manage the resource sustainably if they tap these various resources at a minimum, sustainable resource governance requires that the institutions to ensure the compliance of all users.

5.2.2 Economic activities of the Respondents

Agriculture is the main occupation of the sample households in Chunya District; this was revealed from the findings in which vast of the respondent were engaged in agricultural activities as a source of income. The findings reveal that many households are engaged in different activities to boost their income this affects water user management hence higher income enhances the community to afford to pay for water fees and to be able to contribute to the maintenance of water infrastructures for sustainability of water management as it has been discussed by Ntengwe (2004) in Chapter two section 2.3.7.

5.3 Awareness of Existence of water user association

Basing on the findings it can be agreed that established and registered (KITI) is known by a majority of the respondents, KITI was established by community themselves to manage their natural resources (Water) as the institution operate at lower level of management.

5.3.1 Process of carrying out collective bargaining in order to govern water resources

To refresh the minds of the readers, The respondents have been asked to indicate if they have involved in collective bargaining process, Basing on the findings most of the respondents were not involve in collective bargaining process This implies that water user do not participated in decision making KITI associations make decision on their own as being claimed by the one of respondents (refer section 4.3.1).

Community participation is one of the factors leading to success of many conservation programmes, involvement of the community in the bargaining process for managing water resources is very important for sustainable resource governance. However KITI is too weak to address advocate and influence community participations as Lockwood (2002), discussed in Chapter two (section 2.3.5).

5.3.2 Types of involvement in Collective Bargaining

The findings reveal that some of water user members were involved in different collective bargaining which has been carried out by KITI such as in water distribution schedule, water allocation, bargaining for water prices and maintenances of water infrastructure.

Community involvement in bargaining process has significance contribution to the good governance of water resources as it has been also argued by Bell (2001) in chapter two (section 2.2.3).

5.3.3 Main actors in caring out collective bargaining

Basing on the findings it can be argued that the main actors involved in collective bargaining in the Chunya District are Ward government leaders, Community and Water User Association. This enables the both parts to get a chance to be involved in the improvement of the water use for sustainable water resource management, As it has been also discussed by Ostrom (1990) in chapter two (section 2.1.4). The findings also reveal that representatives of the government in both wards are also involved in this process of the bargaining, this is also supported by Hassan (2004) in chapter two (section 2.3.5) that government should be represented in minimal.

5.3.4 Step community involve in collective bargaining process

Basing on the findings some of the community were involved in each step of bargaining process conducted by water user association in Chunya District while the majority of the respondents were not involved at all. Involvement of the community in preparation, negotiation, follow up action in the collective bargaining process ensure effective management of resources.

Hence, consultation between WUA with the lower level members of their respective organizations and Government are required, this can help both parties to obtain valuable information and improve governance of resources.

5.3. 5 Awareness of water user on importance of collective bargaining

Basing on the findings communities are aware on the importance of carrying out collective bargaining for management of water resources. Collective bargaining is important in resource governance hence it is a means of increasing the agreement of the governed with community by involving community in the decisions that affect them directly. WUA

needs to involve the community in bargaining for their resources for effective resource governance.

5.4 Existence of water user conflicts in water resources governance

Basing on the finding water user conflict existed in Chunya District as it has been agreed by respondents who in aged group; these peoples have high experience on different events that have been taking place in the village. Water user conflict existence might be the result of what have been discussed by Mitalo (2005) in Chapter two sections (2.3.6).

5.4.1 Common characteristic of water user conflicts

Basing on the findings as presented in chapter four (sections 4.4.2) main common characteristics of water user conflict were between domestic users among themselves and between pastoralist and domestic user. Domestic user conflicts occur between women who are primarily fetch water in both villages. The conflict occurs in a case that a woman tries to get water at a water point before her turn and push others who have waited longer than her, the others will object and it often leads to quarreling and even a fighting.

Also the finding show that another main conflict arise between domestic user and livestock keeper, this occurs because of the increasing number of livestock in the study area which causes insufficiency of water place for their animals due to their heavy consumption of water mainly during the dry season. In wet season supplying the cattle with water is fairly easy as they can find the small water dams in the area. But during the dry season, pastoralists cut off water pipe for the aim of getting water, leading to conflicts with domestic water users as they end up causing the problem of water shortage due to destruction of water infrastructure.

5.4.2 Main causes of water user conflicts

It can be envisaged from the findings that the problem of water scarcity in the study area is largely the source of water user conflict as it has been discussed by CEDARE (2006) in chapter two (refer section 2.3.6). All of the conflicts between livestock keeper and domestic user and between domestic users among themselves are associated with water

scarcity, due to the water scarcity water user conflict to each other to get their share from the scarcity resources as they resulting to conflict.

It was also observed from the finding that Livestock keepers are also main cause of water user conflicts (Both grazing around catchment area and those destruct water pipe). The explanation behind could be, in the study area there is no water nearby where livestock keepers and farmers could use for their activities as main economic activity in the study area is agriculture (both farming and livestock keeping refer), this leads to the destruction of water resources infrastructure.

5.4.3 Main actors responsible for managing water user conflict

The findings reveal that different stakeholders participate in managing water user conflict. Each of the stake holders have essential part to play in solving water user conflict, participatory of different stake holder in conflict resolution provide platform for dialogue hence help the parties in conflict to reach agreement.

5.4.4 Community involvement in solving water user conflicts

Focus on the findings majority of the respondents who are elderly people were more involved in solving water user conflict than young people. Attribute for qualifying in this group is originality from the village with a good knowledge of events that have been taking place. These people were selected both pastoralist and farming societies in the village to avoid the bias in making decisions. Discussion of involve community in they own problem have a better chance of success than discussion done only at higher level of management.

5.4.5 Respondents Awareness on the methods used to solve water use conflicts in Chunya District

Based on the findings three methods were mainly used by the association in solving conflict in Chunya District. This methods are meetings, dialogue, and the using of existing bylaws, KITI have been performed well in solving water user conflict through those

methods Those methods also have also being reported by other scholar as the effective ways of solving water user conflict in the community for effective water resources management as it has been discussed by Mtaló (2005), see chapter two (section 2.3.6).

5.5 Main sources of water

Basing on the finding the main source of water in the study area was underground water improved by WUA and the community has no safe alternative sources of water. The non-existence of an alternative source of water is one of the factors that affect the WTP of the community as it has been discussed by Demeke (2009) and Ping (2000) see chapter two (section 2.3.7). Quality of water governed by KITI in the study area influences the willingness to pay of the community. The water user association has to ensure good governance in the management of water source in the area for sustainable basis as a community in this area depends totally on this source for getting water for domestic purpose.

5.5.1 Satisfaction with water distribution schedule

Basing on the findings it can be agreed there unequal distribution of water among members. The rules governing WUA in Tanzania, explain that water has to be distributed among members on an equal and fair basis. KITI does not have a stable formulated distribution schedule, which determines who is to receive water, and when and how much water is to be distributed to the water user. This has been result of week participations of the community in bargaining process The WUA rules stipulate that information is to be shared and that members are to be involved in the decision-making process. However, in KITI there was no bottom-up flow of information and therefore there was no participation in WUA decision-making.

5.5.2 Willingness to pay for water as a public good

It was observed from the results that, the majority of the respondents in the study area were willing to pay for the water services. This implies that community in Chunya District were aware of the importance of contributing to projects as the way to ensure its

sustainability. The findings also reveal that some of the respondents were not willing to pay for water services, majority of respondent who are not willing to pay for the water services were claimed that they don't know the use of funds collected as water fees, Mistrust of the community to the management may affect WTP as it discussed by Bhandari *et al* 2007 and Whitting *et al* 1990 in chapter two sections (2.3.7) This peoples has also lack of awareness on cost sharing.

5.5.3 Amount and mode of water user payment

The finding show that in the study area majority of the water user use public water pipe and pay only 500/= Tsh. per month while minority of the water user use private water pipe and pay 2500/=. This implies that community with low income may also afford to pay this small amount of water fees; lower price tends to raise the WTP for water services.

With regards to amount planned, the amount paid for water fees by water user members is reasonably to their low income; hence it will be easy for the community at rural area to afford to pay for the services especially for domestic water user. This aspect increases the WTP of the community hence it will be easy for majority of respondent to afford.

5.5.4 Awareness on the use of the funds collected

Focus on the findings majority of the respondents who were aware of the uses of the fees collected mentioned that the fees collected were used for maintenance and cover office running costs. This knowledge increased the WTP for water resources. The findings also reveal that some of the respondents were claiming that the collected money was misused by KITI management, Management always refused to present revenue and expenditure reports to water user members. This could be one of the factors of low WTP for some of the respondents due to lack of awareness and distrust to the management. It could be agreed with the finding that distrust which some of the community have to KITI has led to unwillingness of some of the community to pay for water.

5.6 Role of property right assignment in mitigating tragedy of the commons

Basing on the findings from the study it can be noted that, the majority of the community members are aware of the issue of property rights, especially related to water, while a few of the respondents reported to be unaware. Majority of the respondents also agreed that property right has a role to play in mitigating tragedy of the commons in Chunya Districts by explain that property right in water resource would help to mitigate tragedy of the commons mainly because it strengthen the legal capacity of KITI to prosecute and hence manage defaulters of water resource in their area of jurisdiction. Those who were not aware of the concept had no comment on the role played by property right. (Refer Table 4.16).

Likewise the District water officials reported to be aware of the concept and commented that property right would contribute to a great extent to the effective and efficient control and management of water to reduce the tragedy in the area and in Tanzania as a whole through the increased sense of ownership, and strengthened by legal capacity. Through water right, communities would be able to sue anybody who misuses the water source or any part of the built water infrastructure and hence, defaulters will gradually decrease, and as a result sustainability of water services assured.

5.6.1 Water use restrictions

Basing on the findings to some extent the property right has able to control over exploitation of water resource by provide water use restriction as the way to avoid tragedy of the commons. It can be observed from the findings that there were restrictions in use water from the sources improved by KITI to control overuse of water resources. KITI decided to use water only for the domestic purpose to ensure it sustainability hence water available from the sources is not sufficient to use in other human needs.

CHAPTER SIX: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

6.1 Overview

This chapter presents summary, conclusion and policy implication. The purpose of the presented study was to assess power bestowed to WUA by WRMA of 2009; where by the following functions were assessed; to carry out collective bargaining, to resolve conflicts, to asses' willingness and the role of property right. Based on the literature reviewed (Chapter two) frames of references were emerged which built the basis of the research question in chapter five. The finding were presented generally in chapter four and discussed in chapter five.

6.2 Summary

The major objective of this study was to assess power bestowed to WUA members by WRMA of 2009. It assessed resource governance in water user association. The study specifically explains the process of carrying out collective bargaining in order to govern water resource, explains how conflicts in water use are resolved in Chunya District, assessed willingness to pay for water as a public good by the water user in water resource governance and found out the role of property right assignment in the mitigating tragedy of the commons, ways of carrying out collective bargaining and conflict resolution.

The study was conducted under non experimental cross sectional design; the sample size was 98 including key informants. Descriptive statistics including frequency averages and cross tabulations were used to analyze data. Besides, group discussion was undertaken at different levels to grasp more detailed information from water user members. Interview also was conducted with experts on water management issues.

The study revealed that resources governance is effective in the study area although there are some challenges. The findings of the study imply that resource governance in water management may be more beneficial and more effective in areas with active participation of beneficiaries in the management of natural resources.

In this respect, some recommendations for improvement have been given to the government and other stakeholders involved in the governance of water resource for more effective resource governance.

6.3 Conclusions

6.3.1 The Process of carrying out collective bargaining in order to govern water resources

From the above findings as it has been discussed in chapter five, it can be concluded that the process of carrying out collective bargaining in order to govern resources governances is done ineffectively by the Water user association in the study area hence there was little involvement of the community in the collective bargaining process in both two wards of Kanga and Infwenkenya as the decisions were based on top -down approach. Also, majority of the community were involved in bargaining forum for water prices and minority were involved in bargaining for water distribution schedules and maintenance of water infrastructure, this could be the cause of low satisfaction with water distribution and occurrence of water conflicts hence community will be willing to pay for water fees but not willing to contribute in terms of cash or labour in maintenance due to low involvement during the bargaining process. Low involvement of community in bargaining for water distribution schedule results to unequal water distribution among water users in the study area.

On the other hand, the existence of water user associations (KITI) has important effect on collective maintenance and bargaining process conducted in Chunya District, this is due to the fact that KITI facilitates collective bargaining and empowers water user members to undertake maintenance which requires coordination, like scheduling work days, determining labour and cash contributions, monitoring and supervising those who do not participate etc. Water user awareness on the importance of the bargaining process is also determined high; this can also improve the sustainability of the KITI themselves.

6.3.2 Conflicts resolution among water users in Chunya District

Water resource is a scarce resource which is under pressure which results in conflict as different people have different goals and interest while using the same resource. It can be concluded from the findings that KITI in the study area plays vital role in solving water user conflicts; the study found that KITI provides the education to prevent future water conflicts and solve existing conflict by involving both community and KITI management to avoid the bias. The study also concludes that two common types of water user conflict occur in Chunya District, these include pastoralists and domestic users and domestic user among themselves. The main cause of these conflicts is water shortage. Pastoralists were cutting off the water pipe for them to get water for animals while domestic users compete to each other to save time for fetching water and to maximize their demand, as a result they both result in water user conflicts.

The study also conclude that in Chunya District methods used to solves water user conflict are dialogue, meeting and using of existing bylaws in solving water user conflict in the study area. These methods were reported by other scholars as the effective way of solving water user conflict. The study also explain different methods used to prevent conflict as the strategy to prevent future water user conflicts, these include the use of penalties and warning together with the education provided to the members to create the awareness to avoid water user conflicts. It can be concluded that water user plays a great role in the study area in solving water use conflict and providing peace in use the water resources.

6.3.3 Extent of the community's willingness to pay for water as a public good by the water user in water resource governance

Research at the household level in both the wards of Kanga and Infwenkenya revealed that there was a high willingness to pay for water services at the household level. It can be concluded from the findings that majority of the community members are willing to pay for improved water supply governed by a water user association in Chunya District.

However, due to other factors like insufficiency of water amount supplied in relation to demand, lack of transparency on the use of fees collected by KITI and water shortage in some of the villages tend to hamper the existing willingness to pay. For instance, in Tete village the lack of KITI capacity to supply water efficiently has reduced the willingness for individuals to pay for water services since villagers did not get the services for a very long time; hence they could hardly contribute to unavailable water service.

6.3.4 The role of property right assignment in the mitigating tragedy of the commons

Property right has a role to play in mitigating tragedy of the commons, The findings reveal that property right has bestowed power to KITI to bear the full cost of water resources degradation, it can be concluded from the findings that property right stimulates sense of ownership, provides the legal capacity to KITI to deal with defaulters of water source regulations and provide motivation for the community to bargain for the use and management of resources.

When property rights over resources are absent and unforced no individual bears the full cost of resource degradation. Basing on the findings of this study it can be concluded that the implementations of the functions of KITI adhere to existing policy and legal framework of the country, which the administration of bylaws were based upon.

6.4 Policy implications

In the light of the findings of the study, the following are the recommended for improvement of water resource governance in Tanzania.

- For collective bargaining to be done effectively by WUA, the role of the community should be formally recognised by water institutions, so that water users can be active participants in the bargaining process over water allocation, distribution, and maintenance of water infrastructure for effective resource governance. Communities need to be involved not just with the building and maintenance of water supply and

other water infrastructures but also significant, with monitoring how much water is available so as to be distributed equally among the users and to bargain over water allocation. The association should arrange general meetings, where water user members will interact with each other and exchange information. This may also increase social ties. Therefore, regular general meetings between WUA and water user members could also be one factor which may lead to successful collective bargaining process.

- Developing collective bargaining is a process which needs careful action and decision making. Delaying in decision making at one stage can affect the whole process. For local communities to participate fully in the conservation and protection of water resource, cost benefit sharing mechanism needs to be developed as a prerequisite for effective resource governance.
- Conflict resolution mechanisms in the study area must be designed to suit the type of water conflict they seek to address. For example, resolving the conflict between the community and pastoralists requires protecting water infrastructure and construction of water dam for the livestock keepers to ensure a sustainable supply of water and control future water conflicts in the area.
- It also has been found that transparency is minimal in the association, reports have not been shared all the time among stakeholders, it is recommended that the association should be fully transparent to increase efficiency in the implementation of its functions.
- Central or local government should provide capacity building to WUA for the association to perform its function effective and ensure stake holder participations of the roles performed by the water user association. Also human capacity is needed at the lower level of the community where the associations operate as the association needs to work closer with its community.

6.5 Recommendations for further research

Further research should be conducted to assess the governance of other resources such as forest, land, mining resources etc, in Tanzania and Chunya District in particular. Also, further research can be conducted to assess the performance of COWSOs/WUAs in Tanzania. Or the same topic may be repeated using different research designs such as case study design in order to deeply investigate the situation of water resource governance in Tanzania. Besides, the same research should be replicated in some other areas of Tanzania apart from Chunya in order to compare the situation countrywide

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APPENDICES

Appendix 1: Questionnaires to Household Head in Chunya District (Kanga and Infwenkenya Wards)

Dear respondent,

This interview guide is designed to help collection of data that will be used to assess resource governance in Water user Association within Chunya District.

Kindly respond to the questions attached as accurately as possible. A researcher asking for your good cooperation in this assignment and the information collected will be used for academic purpose and will be treated confidential. The researcher will not disclose the identified information of the respondent under any circumstances.

Name (option)..... village.....
Ward.....

1. Sex a). Male1 () b) Female2 ()
2. Age a). 18– 24.... 1 () b) 25-34.... 2 () c). 35-44...3 () d) 45-44...4 ()
e). 55+.....5 ()
3. Marital status – a). Single1 () b) Married..... 2 () c) Divorced.....3
d) Widow4 ()
4. Family size – a) 1 – 3....1 () b) 4 – 62 () c) 7 >.....3()
5. Education level
 1. Primary level
 2. Secondary level ()
 3. Tertiary level
 4. Others
 5. No formal education
6. Main source of income in household
 - 1: Agriculture
 - 2: Business
 - 3: Employed (Private/Government) ()
 - 4: Livestock

- 5: Other (explain).....
7. Do you have registered water user association in your area?
- 1: Yes ()
- 2: No

Part B: Process of Carrying out Collective Bargaining for Governing Water Resources

8. Do you involved in any kind of collective bargaining which conducted in this area
for water resources governing?

1: Yes 2: No ()
9. If yes what kind of a collective bargaining for water resource have you involved?

1: water distribution schedules

2: Paying water fees

3: Taking care of water infrastructure and contributing to maintenance

4: Right to use water ()

5: Decision making on allocation of water

5: other specify.....
10. If no why don't you involved.....
11. Who is the main actor toward collective bargaining?

1: Water User Association and community

2: Government (Local/Central) and water user association

3: Community ()

4: Private Organization

5: other (specify).....
12. In which step/part did you involve in collective bargaining toward water governance?

1: Preparation of bargaining

2: Negotiation of bargaining ()

3: Signing the agreement

4: Follow up action

5: Other specify.....

13. Do you think, the collective bargaining is important to support water governance in this area?

1: Yes

2: No ()

14. If the answer is “no”, why is not important?

Part C: Resolution of Water Use Conflicts

15. Did you experience any water use conflict in this area?

1: Yes ()

2: No

16. If the answer is “yes”, what is the main cause of water use conflict?

1: Crops cultivation in water sources

2: Livestock activities along catchment area ()

3: Water scarcity

4: None

17. What are common characteristics of water user conflict in your area?

1: Domestic water user among themselves

2: Livestock keeper and domestic user ()

3: Irrigators and domestic user

4: Other (explain).....

18. Who is the main source of water use conflict in this area?

1: Crops cultivators

2: Livestock keepers ()

3: Domestic user

4: None

5: Other (specify).....

19. Who are main actors to solve water user conflict in your area?

- 1: Water user association
- 2: Ward and village leader ()
- 3: Water user themselves
- 4: Government (Local/Central)
- 5: Other (explain).....

20. Do you think, the actor involved perform well in water use conflict?

- 1: Yes
- 2: No ()

21. Is there any method or technique which used to resolve water conflict you know?

- 1: Yes
- 2: No ()

What methods are used in solving water use conflicts in this area?

- 1: Meeting
- 2: Using the existing by- laws ()
- 3: Dialogue
- 4: other (explain)

22. For how many times do you experience the water use conflict resolved per year in this area?

- 1: Many times
- 2: Very rarely ()
- 3: Most of the time
- 4: None

23. What kind of methods formulated to punish those who involved in water use conflicts do you experienced?

- 1: Warning
- 2: penalties ()
- 3: None
- 4: Other (explain).....

24. What are measures taken by WUAs to prevent future water use conflict in this area?

.....

Part D: Willingness of Water Users in Water Payment as a Public Good

25. What are the main sources of water you use in your area?

1. Rain harvesting
2. River ()
3. Ground water
4. Other (specify).....

26. Is the source of water you identify enough for your daily requirement?

- 1: Yes
- 2: No ()

27. If the answer is “no”, what is the main cause of water shortage?

- 1: Water scarcity
- 2: Low density of pipelines
- 3: Unequal distribution
- 4: Others (mention).....

28. Do you satisfy with the water distribution in this area?

- 1: Yes ()
- 2: No

29. If the answer is “no”, why?

30. Is there fair distribution of water among the user?

- 1: Yes
- 2: No

31. If no, what causes the unfair distribution of water among user?

32. Are you willing to pay for water service you get?

- 1: Yes
- 2: No

33. If no why?

1: Water is a common/free good

2: I don't see the reason why should I pay for water ()

3: I'm not satisfied with the water services provided

4: It's the responsibility of government to provide water service

5: Other reason (explain).....

34. What is the mode of water payment and how much do you pay for water fees.....

35. Are you satisfied with the amount you pay for water services?

1) Yes 2) No ()

36. If no explain why.....

37. Do you afford to pay in that amount arranged?

1: Yes

2: No ()

38. Do you aware with the uses of fees collected from the water sources?

1: Yes ()

2: No

39. If the answer is "yes", where do the funds collected used?

Part E: Role of Property Right Assignment in Mitigating Tragedy of the Commons

40. Does the Property right own by WUA assist to protect water resources in your area?

1: Yes ()

2: No

41. If yes How.....

42. Do you aware with any water use restriction that established in this area?

1: Yes

2: No

43. If there is any restriction, mention.....

**APPENDIX II, QUESTIONNAIRES FOR WATER USERS ASSOCIATION
MEMBER (WUAs)**

District Name: ----- **Ward Name:** -----

Designation: ----- **Date:** -----

1. Age (Write in bracket provided the letter of appropriate answer)
 1. 19-24
 2. 25- 34 ()
 3. 35-44
 4. 55- Above
2. Sex 1) Male 2) Female ()
3. Marital status
 1. Married
 2. Single ()
 3. Separated
 4. Widow
4. Family size – a) 1 – 3....1 () b) 4 – 62 () c) 7 >.....3()
5. Education level
 1. No formal education
 2. Primary education
 3. Secondary education ()
 4. Collage education
6. Main source of income in household
 - 1: Agriculture
 - 2: Business
 - 3: Employed (Private/Government) ()
 - 4: Livestock
 - 5: Other (explain).....
7. Are you a member of Water User Association?
 - 1) Yes 2) No ()

8. What is your position in the Water User Associations?
 1. Member of committee
 2. Secretary
 3. Chair person
 4. User ()
 5. Other (specify).....
9. Is your Water User Association registered?
 - 1) Yes 2) No ()
10. If yes what are the reasons for its establishment
11. What are your roles in the Association?
.....
12. Do you facilitate any kind of collective bargaining which conducted in this area for water resources governing?
 - 1: Yes ()
 - 2: No
13. Who are the actors on carrying out collective bargaining?
.....
14. What are the main procedures in preparation of collective bargaining?
.....
15. What is the main negotiation during collective bargaining?
16. What strategy do you use to conserve water catchments in your area?
.....
17. What mode of distribution do WUAs use in distribute water to the water user
.....
18. Is the water distributed equally between water users?
 - 1) Yes 2) No ()
19. If no why?
20. What is the amount of water provided per day (in litter)?
21. How many water points available in this community?

1. Water points-----

22. Does water user satisfied with the amounts of water their gets from the catchments?

1) Yes 2) No ()

23. Do you experience water user conflict in your area?

1) Yes 2) No ()

24. If yes are you involved in solving those conflicts?

1) Yes 2) No ()

25. What methods used in water use conflict resolution?

26. Who are the main actors in water use conflict resolution?

27. What are the penalties planned for those engaged in water use conflict?

28. What are the challenges facing you in conflict resolution process?

.....

29. Does water user willing to pay for water user fee in your association?

1) Yes 2) No ()

30. What are the uses of funds collected from the water sources?

.....

31. What is your opinion toward water governance in this area?

.....

32. What is your opinion toward water use conflict in this area?

.....

33. Does the Property right own by WUA assist to protect water resources in your area?

1: Yes ()

2: No

34. If yes How.....

Thank you for your cooperation

APPENDIX III, QUESTIONNAIRES FOR KEY INFORMANTS (DWE, WEO & VEO)

Name of the District..... Ward.....Village
.....

District/Ward/ Village officer name.....

1. Age (Write in bracket provided the letter of appropriate answer)
 1. 19-24
 2. 25- 34 ()
 3. 35-44
 4. 55- Above
2. Sex 1) Male 2) Female ()
3. Marital status
 1. Married
 2. Single ()
 3. Separated
 4. Widow
4. Family size – a) 1 – 3....1 () b) 4 – 62 () c) 7 >.....3()
5. Education level
 1. No formal education
 2. Primary education
 3. Secondary education ()
 4. Collage education
6. Main source of income in household
 1. Agriculture
 2. Business
 3. Employed (Private/Government) ()
 4. Livestock
 5. Other (explain).....

7. Is your office responsible for management of water resources in your area?
1....Yes 2..... No ()
8. If yes please give the explanations on the role played by your office in the management of the existing water resources in your area
.....
9. If no who are responsible for water resources management in your area?
.....
10. Do you have registered water user association in your area?
1...Yes 2..... No ()
11. How many of them?
12. What are the reasons for establishing them?
13. How do people in your area benefit from existing WUA in your area?
.....
14. What are the functions of WUA in managing water resource in your area?
.....
15. Does water user participate in conservation of water resources?
1....Yes 2...No ()
16. If yes how water users participate in conservation of water resources?
.....
17. If no why and how do your offices take measure for community to participate?.....
18. Does water user willing to pay for water user fees?
.....
19. If yes How.....
20. If no why.....
21. 17. What are the conflict occur between user in water resource use in your area?.....
22. 18. Who solve the conflict?.....

23. How does your office support WUA in fulfil their daily obligations?

24. Do WUAs have constitution?
 1....Yes 2... No ()
25. 21. If yes are their aware of the contents of the constitution?
 1...Yes 2.....No ()
26. 22. Do you think the association is operating according to the constitutions?
 1.....Yes 2.... No ()
27. If no why.....
28. Does WUA have skilled personnel staffs?
 1....Yes 2.... No ()
29. If yes how many.....
30. Have your office provide any capacity building in WUA members
 1....Yes 2....No ()
31. If yes how many times have being provided?
 1. Rarely
 2. Several times ()
 3. Never
32. If no why.....
33. What is the coordination between WUA and your office in water resources management.....
34. Do you think property right has mitigating tragedy of commons in what way?
35. How property right has help in management of water resources in your area

36. In which ways does the property right support water sustainability?

Thank you for your cooperation

APPENDIX IV, CHECKLISTS TO WATER USE ASSOCIATION LEADERS

District Name: ----- **Ward Name:** -----

Designation: ----- **Date:** -----

1. Age (Write in bracket provided the letter of appropriate answer)
 1. 19-24
 2. 25- 34 ()
 3. 35-44
 4. 55- Above
2. Sex 1) Male 2) Female ()
3. Marital status
 1. Married
 2. Single ()
 3. Separated
 4. Widow
4. Family size – a) 1 – 3....1 () b) 4 – 62 () c) 7 >.....3()
5. Education level
 1. No formal education
 2. Primary education
 3. Secondary education ()
 4. Collage education
6. Main source of income in household
 1. Agriculture
 2. Business
 3. Employed (Private/Government) ()
 4. Livestock
 5. Other (explain).....
7. Who are main actors on carrying out collective bargaining
.....

8. What is the processes of collective bargaining
.....
9. Aim of carrying out collective bargaining
.....
10. Actors in negotiation
.....
11. Main actor involved in the signing agreement
.....
12. Duration of follow up
13. Main methods used in water use conflicts resolution
.....
14. Actors involved in water conflict resolution
.....
15. Types of capacity building/training [provided to community on water governance
.....
16. Types of penalties planned for wrong does in management of water resources
.....
17. Does the community have wiliness to pay for water service?
.....
18. Amount of money collected from water resources per month
.....
19. What are uses of the funds collected
.....
20. Methods used to provide information to water members
.....
21. Do you think property right has mitigating tragedy of commons in what way?
.....
22. How property right has help you in management of water resources
.....

16. In which ways does the property right support water sustainability?

17. What is the extent of water availability in the ward

.....

18. Number of water points available in your area

.....

19. Opinions that the WUA have toward water governance

.....

.....

Thank you for your cooperation

APPENDIX V, INTERVIEW GUIDE FOR FOCUS GROUP DISCUSSION

Village name Ward name

1. Do you have registered water user association in your area?
1: Yes ()
2: No
2. Does WUAs in your area involved water user members in carrying out collective bargain?
1: Yes
2: No ()
3. Do you think, the collective bargaining is important to support water governance in this area?
1: Yes
2: No ()
4. If the answer is “no”, why is not important?
.....
5. Is there existence of water user conflicts in your area
1: Yes
2: No ()
6. What is the main cause of water user conflicts in your area?
.....
7. Do the community involved in solving water user conflicts?
.....
8. Does the actor involved to solve conflicts perform well?
1. Yes
2. No ()
9. If no why.....
10. Does the community have wiliness to pay for water service?
.....

11. Do you satisfy with the water distribution in your area?

1: Yes ()

2: No

12. If no why.....

13. How property right has help WUA in management of water resources

Thank you for your cooperation