KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

FACULTY OF RENEWABLE NATURAL RESOURCES

DEPARTMENT OF AGROFORESTRY

THE EFFECT OF CONFLICTS ON THE ATTAINMENT OF SUSTAINABLE LAND USE SYSTEMS IN TAMALE METROPOLIS, TOLON-KUMBUNGU, SEFWI WIAWSO AND KWAHU SOUTH DISTRICTS.

SRAKU EMMANUEL

SEPTEMBER, 2012.

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WIAWSO AND KWAHU SOUTH DISTRICTS.

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE DEGREE IN AGROFORESTRY

SRAKU EMMANUEL

SEPTEMBER, 2012.

DECLARATION

I, Sraku Emmanuel, hereby declare that except for references to the work of other researchers and authors who have been duly acknowledged, the work here is the result of my own investigation and that no previous submission for a degree has been made here or elsewhere.

Sraku Emmanuel …….....

(Candidate) Signature

Dr. Olivia Agbenyega ……..…….

(Supervisor) Signature

Dr. Olivia Agbenyega …….

(Head of Department) Signature

DEDICATION

I dedicate this work to my wife Mrs. Vida Sraku Addo and my son Emmanuel Sraku Addo Jnr for counseling and support.

It is also dedicated to all my family members including Bismark Asare and Andrews Wiafe.

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ABSTRACT

Conflicts of all kinds have been a major threat to sustainable development and socioeconomic growth and have continued to plague many African countries including Ghana in recent times. In the last two and half decades several civil strife such as ethnic conflicts, chieftaincy disputes and political clashes have plagued the nation. There are growing concerns about the effects of these conflicts on national stability, security and economic growth and development of the nation. In all kinds of conflicts the most vulnerable group of people to suffer the severest impact are the aged, women and children. This research examines the causes and effects of conflicts on sustainable land use. A total of eighty-nine respondents drawn from four districts that have been experiencing conflicts in recent times were interviewed between January and December 2009. The methods used in this research were focus group discussions; transect walk and review of secondary data. Chi-square was used to test for significance. All the 89 respondents confirmed that the major sources and types of conflict in Ghana are land litigation, chieftaincy disputes, political and ethnic clashes, among others. All the 89 respondents said that the impacts of conflicts on land use were the destruction of farms and vegetation and the demolishing of houses and properties, loss of lives, displacement of people and abandoning of crop land to save lives. About 83% of the respondents said that the common strategies adopted when conflicts erupted were moving from their town to a different town, moving to battle front to help, some hiring people to guard their businesses while others sell their assets and close down their businesses. About 69% of the respondents said that agroforestry technology that could be used to prevent conflict included clearly delineating boundaries with trees and planting fast growing ideotype, practicing fodder banks to feed farm animals and leaving big trees on farm as „tree god". It was recommended that farmers should be encouraged and assisted to ensure that they have written agreement on the land for farming as a way of reducing conflicts. Farmers should be educated on agroforestry technologies used in farming to prevent conflicts on land use. Also, there should be stakeholders meeting to help resolve various forms of conflicts at the initial stage to prevent more violent clashes in conflicts communities.

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CARE	Cooperative for American Relief Everywhere
CSIR	Centre for Scientific and Industrial Research
FAO	Food and Agriculture Organisation
IPCC	Intergovernmental Panel on Climate Change
GNA	Ghana News Agency
IUCN	International Union for the Conservation of Nature
JHPIP	Johns Hopkins Population Information Programme
JSS	Junior Secondary School
KNUST	Kwame Nkrumah University of Science and Technology
KOYA	Konkomba Youth Association
MSLC	Middle School Leaving Certificate
NGO	Non-Governmental Organization
PNDC	Provisional National Defence Council
SARD	Sustainable Agriculture and Rural Development
SARI	Savannah Agricultural Research Institute
SPSS	Statistical Package for Social Scientists
SDS	Simple Descriptive Statistics
UN	United Nations
UNCED	United Nations Conference on Environment and Development
WCED	World Commission on Environment and Development

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Armed conflicts and civil strife were major sources of food insecurity in the 1990s and will continue to be in this century (Fisher *et al.*, 2000). The World Bank estimated that more than 50 countries had been involved in civil conflicts between 1980 and 1995 with many lives and properties destroyed (World Bank, 1997). Depending on which of the various definitions of the term is used, from 30 to 40 countries were conflict-affected at the end of the twentieth century. Overall, hundreds of millions of people were involved. The vast majority of these people lived in low-income countries, in which agriculture represents a major source of livelihood, foreign exchange and social stability. A disproportionate number of the countries are in sub-Saharan Africa (World Bank, 1997).

Conflict is defined as an existing disagreement in a social situation that emerges when the goals, interests or values of different individuals or group are incompatible, and those individuals or groups block or thwart each other‟s attempt to achieve their objectives (Schmidt and Kochan, 1972; Litterer, 1996). Conflict also refers to observable differences in opinion, misunderstandings, clashes of interest, disagreements, complaints in public, protests by argument and physical assault, antipathy, filing cases with the local administration, police and courts (Upreti, 2002). Feelings of unfairness, suspicion, injustice, mistrust, among others ultimately lead to conflict. Resource conflicts produce both positive and negative consequences and alter existing social relations (Buckles, 1999).

It also induces change in resource management and utilization, policy processes and livelihood strategies (Buckles, 1999). Other changes are found in land and agriculture, gender relations, power structure, including individual and collective behavior (Upreti, 1999). In most cases the combined effect of some or many of these factors can escalate or resolve a conflict (Upreti, 1999). The oxford dictionary, (1998) defines conflict as "a situation in which people, groups, or countries disagree over issues". Conflict can also be defined as "all kinds of opposition or antagonistic interaction usually based on scarcity of resources, power or social opposition and differing value systems" (Fisher *et al*., 2000; Mushauri, 2002). For the purpose of this research a situation where two or more people or nations engage in fighting is adopted as the meaning of conflict. Conflicts arise from imbalance in ideas or values leading to problems such as discrimination, unemployment, poverty, oppressions and crime. Each level connects to others, forming a potentially powerful chain of forces, either destructive change or destructive violence (Fisher *et al.*, 2000). There are many land policies and laws formulated both internationally and locally, all of them have worked to achieve little success and our quest to achieve sustainable land use in Ghana still remains in vain

(Boafo-Arthur, 2001).

Several factors, including conflict, have a bearing on the sustainable land use system in Ghana (Fisher *et al*., 2000; Mushauri, 2002). Land use refers to the function of land to humans which is usually emphasized by the importance of land in an economic activity (UN 1994).

It includes all the arrangements, activities and inputs undertaken on a specific land cover in order to reap social, cultural and economic benefits (UN, 1994; CSD, 1996).

Sustainable land use encompasses all the activities that are undertaken on land in a manner which meets the needs of the present generation without jeopardizing the potential of future generations to meet their needs (WCED, 1987). A rural production system‟s sustainability corresponds to its ability to meet the ever increasing needs of mankind, without affecting the resources and if possible, improving the resource base on which the system depends. The goal of sustainable land use is to meet the needs of all prospective land users whiles at the same time ensuring the natural resource base is protected (WCED, 1987). To achieve these goals, Mwasi (2001) proposed that certain issues need to be considered when making decision on land use allocation. First of all, land use objectives need to be identified and where possible quantified in terms of how much land each of these objectives requires. Secondly, the ecological requirements for all land use need to be defined. Thirdly, there should be a mechanism for ecologically matching these objectives with the available land, that is, the ability to identify optimal lands for different objectives. Finally, there has to be a mechanism of decision making on the most optimal allocation. That is, the allocation which maximizes the attainment of all objectives while minimizing conflicts with other land users and land characteristics. According to Harmsen and Kelly (1993), sustainable agriculture and natural resource conservation is the one that over the long term enhances environmental quality and the resource based on which agriculture depends, provides for basic needs, is economically viable and enhances the farmers‟ quality of living and that of the society as a whole. Sustainable land use may be seen not only from physical and economic points of view but also in short and long term perspectives. In the short term economic sense, sustainability implies development that satisfies the needs of present generation, without compromising the need of the future generation.

Conflict can be classified under three broad groups, (Boafo-Arthur, 2001):

(a) Latent conflicts: These occur as hidden conflict and need to be brought to the open before they can be addressed

(b) Open conflict which are visible and have deep rooted causes, requiring action to address both aspects simultaneously, and

(c) Surface conflict which is shallow and has no root cause, arising mostly from misunderstanding and can be addressed by means of improved communication.

Land use conflict occurs when the same land can support different uses and those with interest in land disagree as to which use is the best, (CSD, 1996). There are many types of conflicts; some of them and how they affect land use are discussed in this study.

1.2 Problem Statement

Conflicts arise from many sources; some are caused by power struggles while others are due to scarcity of resources. There are various types of conflict, some of which are political clashes, chieftaincy disputes, and land litigation among others, all these contribute to undermining land use laws and policies. Violent conflicts often interrupt existing conservation activities both directly and indirectly; directly by destroying habitats, killing animals, and overexploiting natural resources, and indirectly by making conservation work too dangerous and difficult to undertake (Hammill *et al.*, 2009). Farming systems and other land use activities are negatively affected by conflict (Asumadu, 2003). For all conflicts, the most important impacts are the suffering, injury and death of men, women and children. Another issue is that the energetic youth expected to be in agriculture are recruited to fight in the battle front when wars break out.

In Ghana, land conflict affects the land on sustainable bases, (Asumadu, 2003). For instance, several restrictions are placed on a land user by the land owners. This prevents the land users from using their own initiative to choose what they are willing to do on the land. They may be prevented from growing trees or a particular crop of their choice since their tenancy is temporal. There are agroforestry technologies that could be used to address conflict issues. These have not been fully investigated into in many research works. This study seeks to determine the causes and effects of conflict on the attainment of sustainable land use in Ghana and come out with agroforestry technologies that can be used to address conflict.

1.3 Justification of the Study

According to Hammill *et al.*, (2009) and Tir and Ackerman (2009), conservation activities can be used to support peace building when they address the underlying causes of conflict, or when they repair ecosystems and strengthen livelihoods. It has been suggested that the presence of scarce water resources, if successfully managed, can prevent conflict since economic interdependence gives countries a vested interest in each other‟s future and encourages a level of mutual trust. It also provides a guide to the design of long – term policy for dealing with conflict situations. It has been found that the indirect costs of war are typically greater than the more straightforward direct costs; and that they continue long after the end of a conflict (Green, 1987 and 1994; Stewart, 1993; 1998). However, estimating the total direct and indirect costs of conflict is a complex procedure (Milward, 1984).

According to Agyapong (2006), sustainable land use or management is affected by the types of land tenure system and therefore affects sustainable land use. This means that as

long as conflict remains, the government strategy of sustainable land use to ensure food security as envisaged by vision 2020 will not be achieved. This research will not only serve as the baseline for further research into the causes and effects of conflicts on land use but could also serve as a guide to all policy makers. If findings from this research are applied to conflict situations it would potentially address issues related to conflicts and food security.

1.4 Aim, Specific Objectives and Research Questions

The aim of this research is to identify the effects of conflict on the attainment of sustainable land use system and how Agroforestry technologies can be used to resolve or minimize these conflicts.

The specific objectives were:

- To identify the sources and types of conflict associated with land use systems.
- To determine the impact of conflict on the attainment of sustainable land use system.
- To determine the strategies adopted by people in conflict zones to promote sustainable land use.
- To propose agroforestry technologies that could help to reduce conflicts in land use.

To achieve these specific objectives, the following research questions were proposed;

1. What are the sources and types of conflict that affect sustainable land use?
2. In what ways does conflict of any kind affect sustainable land use?
3. How do people cope with conflict situations?
4. What Agroforestry technologies can reduce conflict?
5. How can such technologies resolve or prevent conflicts?

CHAPTER TWO

LITERATURE REVIEW

2.1 Conflicts and Sustainable Economic Growth

Conflicts of all kinds have been a major threat to sustainable development and socioeconomic growth (Hammill *et al.,* 2009), and have continued to plague many African countries including Ghana in recent times. Armed conflict may have multiple impacts on development and on environmental and human well-being. The effects of conflicts are felt at various spatial levels, within the immediate area of conflict, and often in neighbouring countries, (Prinsloo *et al.,* 2004). Conflict may destroy environmental, physical, human and social capital, thereby negatively affecting sustainable development, (Prinsloo *et al.,* 2004). In the 1994 Nanumba-Kokomba guinea fowl conflict in Ghana for example, over 15,000 people were killed and 135,000 people displaced with 56 villages burnt down across Northern Ghana, (Ada-van-der and
Naylor, 1999).

Livelihoods are directly affected through decreased access to land. For instance, during the 1994 Nanumba-Kokomba conflict, agriculture was severely affected because seeds and agricultural implements were destroyed making it difficult for farmers to restart production (Ada-van-der and Naylor, 1999). Conflict can set in motion a cycle of degradation and human vulnerability; for instance, there were sporadic destruction of crops, livestock and other valuable properties in the 1994 Nanumba-Kokomba war, (Ada-van-der and Naylor, 1999; Brukum, 1999). Conflict contributes to the breakdown of social cohesion and the disruption of local governance systems. The increase in social and economic vulnerability, as a result of conflict, may in the face of environmental and land

degradation, trigger new tensions and conflict over critical resources, such as water or food (Prinsloo *et al.*, 2004).

In the last three decades, civil strife such as ethnic conflicts, chieftaincy disputes land litigations and political clashes have plagued the nation (Brukum, 1999; Kusimi *et al.*, 2006). In the course of examining the causes and effects of conflict, several sources and types of conflict have emerged.

2.2 Sources and Types of Conflict in Ghana

Conflicts can emanate from several sources. Some of the sources and types of conflict are chieftaincy issues, land litigation, ethnic or tribal conflicts and political clashes among others. The causes of conflict on land use are multifaceted and so are its effects.

The driving forces of conflict are diverse ranging from single to several (Brukum, 1999; Kusimi *et al.*, 2006). Depending on the context, land use programmes may spark, sustain, or be interrupted by conflict (Hammill *et al.*, 2009). Land use activities may unintentionally engender conflict if they aggravate prevailing social or economic tensions stemming from political marginalization, equity issues, or ethnic tensions. Land use programmes may also unintentionally sustain an ongoing conflict when they deprive people of their livelihoods or are manipulated by conflict participants. In the eastern Democratic Republic of the Congo, for example, armed groups have been known to target conservation beneficiaries who receive compensation in the form of cash or food. It is also believed that, people living in conflict areas have indigenous strategies (copping strategy) that make them cope with conflict situation in terms of land use (Hammill *et al.*, 2009). It is therefore imperative for a policy and a regulatory framework capable of reducing conflicts of lands be promulgated.

Another major source of conflict is scarcity of resources such as water and land. One of the best examples of strong and direct relationship between resource scarcity and conflict has been observed in water scarcity and resultant conflict around the world,

(JHPIP, 1998). According to a report from the Johns Hopkins Population Information Programme (JHPIP), nearly half a billion people worldwide are currently facing water shortages (JHPIP, 1998; Upreti, 2004). By 2025, one in every three people will live in short of water. At present, thirty-one countries are facing water stress or water scarcity and by 2025 the number will explode fivefold. 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, income, safety and freedom from drudgery. The World's projected total of eight billion people in 2025 will enormously increase pressure on natural resources and environmental services and may cause a catastrophe. The competition between industrial, urban, and agricultural use for natural resources is mounting and per capital consumption of natural resources is increasing (JHPIP, 1998). Regional conflicts over natural resources are brewing and could turn violent as shortages grow. Conflicts are of many types and emanate from many sources; examples are chieftaincy disputes, land litigation, ethnic and tribal wars, political clashes among others (Brukum, 1999; Kusimi *et al.*, 2006).

2.2.1 Chieftaincy Disputes

One of the major threats to sustainable land use is chieftaincy disputes (Brukum, 1999). In Ghana, most of our lands are stool lands; these lands are abandoned whenever there is a chieftaincy dispute. People who use the land for commercial purpose become greatly affected by chieftaincy disputes. Some unscrupulous people harass land users by behaviors which are anachronistic to land users (Boafo-Authur, 2000). Some of the policies prevent land users from planting permanent tree crops and unfriendly division of

farm proceeds, among others. Asumadu (2003) noted that traditional land-owning authorities (stool chiefs, clan heads and skins) hold allodia absolute ownership title to land on behalf of their people. In this case outright ownership of land is still a rare form of land tenure system in Ghana. A land user can only lease the land over a satisfactory period of time for his/her commercial activity from the allodia title holder. The land user is obliged to revert the land to the allodia land owner or the community at the end of the lease. The major problem associated with this is that the variety of customary arrangements coupled with some inconsistencies in the procedure for deeds and tittle registration makes it difficult for investors to acquire a large parcel of land for large scale economic activity (Asumadu, 2003).

2.2.2 Land Litigation

Another major source of conflict in land use is land litigation. Agyapong (2006) identifies that the unwarranted behavior of some land owners especially about the sale of land can trigger litigation. People buy land in Accra and Kumasi that have already been sold to so many other people; the practice is well embedded even in the minor towns. Agyapong (2006) again suggests the following as a way of addressing this challenge. Firstly, the private agencies in various communities should be licensed to be the sole authority required to sell land to the public, whether new allocations or resale of existing plot. This will reduce the incidence of multiple sales of plots. Secondly, in a situation where a chief has a land to sell to the public, he must employ his surveyors to do the demarcations, which must be approved by the Town and Country Planning Department. Resale of existing plot/ land must be the sole duty of the agencies to sell on behalf of the existing owners for a commission. Land litigation causes damage to properties and can even claim lives (Agyapong, 2006).

2.2.3 Ethnic and Tribal Wars

A tribe is defined in the Pan English Dictionary and Oxford Advance Leaner‟s Dictionary as a “social group of people especially in a primitive and nomadic culture, unified by language, religion, chieftaincy, claiming or occupying a particular area under one or more chiefs.” Horowitz (2000) defines ethnic groups as characterized by ascriptive differences identified by colour, language, religion, or some other attribute of common origin, including myths of collective ancestry, which usually carries with it traits believed to be innate. There have been many tribal or ethnic conflicts in Ghana in recent times. This usually emanate from land litigation. The past 28 years have witnessed a number of destructive ethnic conflicts in Northern Ghana (Brukun, 1999).

The very explosive ones are those of 1980 (Konkonbas against Nanumbas) and the Guinea fowl war of 1994 (between the Konkombas on one hand Nanumbas, Dagombas and Gonjas on the other hand). In 1980/86 and 2000, Mamprusi‟s and Kusasi‟s went to war in Bawku. Dagombas also fought among themselves at Vogu and Zabzugu (Alhassan, 1978). The most recent of this intertribal conflict were the Dagbon clashes between the Andani and Abudu gate in Yendi fought in 2002. There has been much similar communal violence among the Gonjas and other ethnic groups in the northern

Region of Ghana (Brukun, 1999).

In regional Africa and especially Africa south of the Sahara, ethnic based violence or civil strives are very common and continues to threaten the stability of the region (Brukun, 1999). Civil war has rolled back over 100 years in history, the development success made in both colonial and post-colonial era in several Africa countries. Some political commentators however, are of the view that the nation's leadership must acknowledge the

existence of the problem of the ethnic factions in Ghanaian politics and address it, instead of under – estimating it. According to Boafo-Arthur (2000), the relationship between the various ethnic groups in the Northern region has not been continuously stable.

A cursory look at all the conflicts on the African continent reveals tremendous ethnic and religious inclinations, albeit many of them also have subtle casual relationship with environmental degradation, land and the use of other resources. Nations on the African continent consciously motivated by the great diversity of ethnic groups, continue to trivialize national homogeneity and ethnic unification allowing for powerful disaggregated ethnic formations. The inevitable tendency of this phenomenon is that most national policies by government turned to be ethnocentric which creates suspicion, rivalry, discontent, mistrust and enmity among different ethnic groups resulting in ethnic conflict and civil wars in extreme cases. Focusing on Northern Ghana, a critical assessment of the causes of most of these conflicts can be traced to colonial and postcolonial actions of the government (Brukum, 1999). Certain actions and inactions of government have led to the marginalization, deprivation, exploitation and the exclusion of minority groups in the decision making process (Kusimi, *et al.*, 2006).

According to Brukum, (1999) in 1978 under the Acheampong regime, all lands were brought under the custody of the chiefs of some selected ethnic groups leaving most of the ethnic group landless. The Konkomba Youth Association (KOYA) contested the Alhassan report claiming that it was the root cause of the three major ethnic conflicts and the twenty minor ones between the chiefless and the chiefly people in the Northern Region (Brukum, 1999). Conflicts in the Northern Region are also caused by bad governance in the form of selective administrative justice due to tribal based biases and

stereotype by leaders. Government due to fear of losing votes do not seek permanent solutions to conflicts, consequently recommendations of conflict committees are not acted upon. For instance, the justice Lennily committee constituted by the president of the third republic to find out the underlining causes of the 1980 Konkomba-Nanumba conflicts has not been implemented (Brukum, 1999).

According to Boafo-Arthur (2000; 2001), the Dagombas claimed that the Kokombas are landless, intruders and settlers so have no authority over land. The year 1994 experienced the worse ethnic conflict event in Ghana. It is note-worthy that the definition of a tribe as a group claiming or occupying a particular territory gives a clue as to one possible source of conflict with another group, (Boafo-Arthur, 2001). In ethnocentrism, there is the tendency to believe in the absolute superiority of one's own group or cultures which may result in undermining other groups. The attitude of a tribe, belief as defined in ethnocentrism constitute a potential source of conflict when one group interact with another (Boafo-Arthur, 2001).

2.3 Positive Effects of conflict

It is generally believed that conflicts are always bad, but this is not the case. According to Commonwealth of Learning (2003), functional or constructive conflicts enhance progress among individuals, groups and organization in diverse ways. For instance conflict foster creativity, clarify goals and ultimately improve team performance (Commonwealth of Learning, 2003). According to Marfo (2006), forest conflicts positively provoke the formulation of some policies and regulations about the exploitation of forest resources by Timber Contractors.

Marfo (2006) further asserted that the long standing conflict between forest fringing communities and Timber Companies about benefits provoked the introduction of the Social Responsibility Agreements.

2.4 Sustainable Land Use

Land is internationally defined as "a delineable area of the earth"s terrestrial surface, encompassing all attributes of the biosphere immediately above or below this surface including those of near surface climate, the soil and the terrain forms, the surface hydrology (including shallow lakes, rivers, marshes and swamps), the plant and the animals populations, the human settlement pattern and physical resources of past and present human activity" (UN, 1994). FAO (1995) defines sustainability as "the management and conservation of natural resources and the orientation of technological and institutional change, in a manner to ensure the attainment and continuous satisfaction of human needs of present and future generations". Such sustainable development which conserves land, water, plant and animal genetic resources is environmentally non-degrading. The essential future is that sustainable land use achieves protection combined with conservation of the natural resources on which production depends (Young, 1997). Sustainability encompasses the practices that ensure meeting the needs of the present generation without compromising the ability of the future generation to meet their own needs (WCED, 1987; Nair, 1993). The term sustainable development originated in the 1970s and was first widely advocated within an international arena with the publication the *World Conservation Strategy* (IUCN, 1980).

Principles and directives of sustainable development have been established through the publication of *Agenda 21* (United Nations, 1993), which can be interpreted as an

alternative, operational definition to that of WCED (1987). Sustainable Agriculture and Rural Development (SARD) means making efforts to develop the rural inhabitants through the development of agriculture (UNCED, 1992). Within all the various interpretations of sustainable development certain key issues are common to all. These issues focus mainly on environmental protection and sustained economic growth (Selman, 1994; Mitchell, 1997; Fricker, 1998; George, 1999; Hussen, 2000). These are outlined as follows:

- Environmental protection and economic development cannot be perceived as antagonistic processes,
- Sustained economic growth is envisioned as a viable and desirable option,
- A non-declining capital stock (both human and natural) is considered as a prerequisite to sustainability,
- The use of the precautionary principle, that is, where there are threats of serious or irreversible damage such as conflicts, a lack of scientific uncertainty shall not be used as reason for postponing measures to prevent environmental degradation, advocating caution when in doubt (Mitchell, 1997),
- The need to consider both intergenerational and intragenerational equity. Intragenerational equity implies that the benefits and costs of development are shared equitably (social justice), and that the people that are affected by them have resolved these benefits and costs. It also implies development must stay within the carrying capacity of the environment to ensure equity for future generations.

The need to address the issue of transfrontier responsibility, development must not be at the expense of the environment elsewhere. There are biophysical limits (carrying capacity) to socio-economic growth. Considering these entire issues, one can realize that conflict is

a major threat to the goal of sustainable land use which, according to WCED (1987), is to meet the needs of all prospective land users whiles at the same time ensuring the natural resource base is protected.

2.5 Threats to Sustainable Land Use

Sustainable land use is threatened by many factors, crucial of these is conflicts, population growth, and bush fires among others, (Andre and Plateau, 1998; Deininger and Castagnini, 2006; Andrine *et al.*, 2011). As population increases exponentially, demand for land and other biological products for other purpose keep rising. These tend to increase pressure on land and its resources threatening sustainable land use.

Conflicts also tend to undermine the policy of sustainable land use.

Chieftaincy disputes, land litigation, ethnic and tribal conflicts also undermine sustainable land use policy (Asumadu, 2003). Land tenure system is one of the major threats to sustainable land use (Andrine *et al.*, 2011).

2.6 The Role of Agroforestry in Conflict Prevention

Agroforestry could potentially play many important roles in the prevention of conflict and ensuring sustainable land use, through the use of its numerous technologies such as boundary planting, hedgerow intercropping, wind breaks and shelterbelt, among others, (Nair, 1993). These technologies aim at delineating boundaries to prevent land litigation (Andrine *et al.*, 2011).

An Agroforestry technology refers to an innovation or improvement, usually though scientific intervention, to either modify an existing system or practice or develop a new one (Nair, 1993). Technologies that aim at preventing conflicts include all those that can contribute in one way or the other to prevent conflicts; an example is boundary planting

(Nair, 1993, Andrine *et al.*, 2011). This technology involves planting of trees along field boundaries or other borders e.g. along footpaths or irrigation channels. Buffer-zone agroforestry can be used to prevent conflict (Andrine *et al.*, 2011). This involves; the introduction of agroforestry practices into a buffer zone around a protected area. This may not only reduce pressure on the protected area but also improve the living standards of the rural populace. In order to have a constant supply or production of food, fibre and renewable natural resources on a long term basis, the natural environment should be treated and managed in such a way that the cycle and energy flaxes among the soil, bodies of water and atmosphere considered, pressured or restored (Nair, 1993).

Although land in Ghana is held in trust by the government of Ghana, most stool lands are under the chiefs. Boafo-Authur (2001) pointed out that the Convention Peoples Party government of Kwame Nkrumah adopted several measures to strip chiefs off power to control land revenues. It included the Local Government Ordinance of 1951, and then the State Council Ordinance in 1952. This was in addition to the enactment of the Administration of Land Act 1960 (Act 123) and the concessions Act 1962 (Act 124) among others, (Boafo-Authur, 2001). He did these to weaken even the most powerful chiefs. The PNDC promulgated the Land Title Registration Law 1986 (PNDCL 152) which gave certainty to land title and facilitated the proof thereof and also to render the dealing of land more economical. It is noted that all these laws and policies could not give the ultimate solution to land and its associated problems (Asumadu, 2003).

2.7 Land and Tree Tenure Systems in Ghana

The land tenure system, in Ghana, has become a major threat to socioeconomic development (Blocher, 2006). As in the case of Kasese district in Uganda, about 80% of the people depend on agricultural land; Land tenure system is one of the major challenges facing the people, (UBOS, 2002). Land tenure simply means land users enter into

agreement as to how to share the proceeds of the farm; such agreement may cover crops, trees (tree tenure) and even animals. The said agreement can sometimes be very hostile to land users so much that it can deter land users. It mainly occurs as a result of land scarcity (Andrine *et al.*, 2011).

There have been many reforms and policies which have failed because these programmes are state-driven, top-down and always undermine customary and tenure system (Brocher, 2006). Brocher (2006) further argued that rather than attempting to undermine customary norms about land as property, successive land tenure reforms must use those norms as the basis for an integrated property system that combines customs and statues. According to Asumadu (2003), Ghana‟s land tenure system impedes the country‟s socio-economic development.

2.8 The Effect of Conflicts on Land Use Systems in Ghana

Helle *et al*., (2000) noted that there is a linkage between resources and security and that resource degradation often occurs whenever there is a disaster or a breakdown of security such as conflicts. Helle *et al.*, (2000) also noted that loss of livelihoods, in turn, leads to social tension, migration and inappropriate settlement and often results in conflict. It is widely known that whenever conflicts break out one is unable to farm, build or continue to carry out any economic activity such as trading.

People‟s farms are burnt; sometimes houses, business and other valuable items are destroyed in conflicts. The consequences of these conflicts on the lives of people have been very inimical, (Kusimi *et al.,* 2006). These include a slack in economic activities, frequent losses of life and property, destruction of infrastructure and settlements, indiscipline, rural-urban migration as well as mass displacement of people and the overall

retardation of socio-economic development (Kusimi *et al.,* 2006). In the Eastern Democratic Republic of the Congo, for example, armed groups have been known to target conservation beneficiaries who receive compensation in the form of cash or food. It is also believed that, people living in conflict areas have indigenous strategies (copping strategy) that make them cope with conflict situation in terms of land use (Hammill *et al.,* 2009).

Intra-country wars affect agriculture in a variety of ways. The impact also varies with the characteristics of each country's agriculture. In some countries there may be surplus labour in rural areas. In such situations, victims of war, irrespective of the obvious human cost, would not necessarily weaken agricultural productivity and output trends (FAO, 1998).

The direct cost of war damage tends to be higher when agriculture is more capitalized, that is, when mechanization and irrigation are more advanced, purchased inputs are used and a large portion of the output is marketed (Hussain and Herens, 1997; FAO, 1998). Disruptions in marketing channels may have costs for commercialized output, but might not necessarily force households into food insecurity, should they still produce for own consumption.

A main feature of conflicts is the worsening of the already endemic poverty levels in the region, and people continue to live in perpetual fear and mistrust (FAO, 1998).

2.9 Land Use in Ghana

Land use refers to the function of the land to humans. It includes the arrangements, activities and inputs under taken on a specific land cover in order to reap social, cultural

and economic benefit. Land use is also defined as the total arrangements, activities and inputs that people under take on a certain land cover type (FAO, 1997a).

In Ghana, land is used for many purposes such as agriculture, forestry, agroforestry, and housing among others. The term land use encompasses not only land use for agriculture and forestry purpose but also use of the land for settlement, industrial site, road and other human activities.

2.9.1 Agricultural Land Use System in Ghana

This involves the growing of crops and the rearing of farm animals. In Ghana our systems of agricultural land use are mostly subsistence and rain fed; irrigation system of farming is not widespread especially in areas that depend on rainfall. Agriculture is in different categories. It is made up of conventional and sustainable agriculture. Conventional agriculture is most commonly practice in the United States. It involves changing the natural environment (cutting trees, tilling soil and installing irrigation systems, among other technologies). Crop growing is non-renewable after harvesting; the plot is bare again and requires another cycle of cultivation. Diversity is eliminated because uniformity is required. Sustainable agriculture involves farming in accordance with ecological principles. Examples are shade coffee, multiple crops in Germany. In
Italy, they grow both annual and perennial crops to create diverse home gardens.

The major attribute of sustainable agriculture is that biodiversity is conserved and also reduces land pollution because insecticides and other harmful agrochemicals are not used (FAO, 1997a).

2.9.2 Forestry Land Use System

In the forestry land use system, perennial trees are established or maintained on land management units for a long time. The cycle of nutrients is relatively close with low inputs with increased recycling (Young, 1997). There are various types associated with this type of land use. Notable among them is community forestry, farm forestry and social forestry (Nair, 1993). Social forestry is the practice of using trees/or tree planting to pursue social objectives for the betterment of the poor (Nair, 1993). Community forestry refers to tree planting activities undertaken by the community on communal or stool lands. Farm forestry is planting of trees on farms (Nair, 1993).

2.9.3 Agroforestry Land Use Systems and Their Potentials to Reduce Conflicts

Agroforestry is a collective name for land use systems and technologies where woody perennials (trees, palm, and bamboo) are deliberately planted on the same land management units as agricultural crops and/or animals in some form of spatial arrangement or temporal sequence (Nair, 1993; Lundgreen and Raintree, 1982). In Agroforestry system there are both ecological and economic interactions between the different components (Nair, 1993; Lundgreen and Raintree, 1982). Land degradation is one of the major land use constraint. When farmland becomes degraded, farmers migrate to occupy a new land and this puts pressure on land and can result in conflict. Agroforestry has the potential to alleviate land degradation and its associated constraints (Nair, 1993; Verheij and Waaijenberg, 2008).

According to Verheij and Waaijenberg (2008), agroforestry technologies such as home gardens, parkland trees, live fences, shelterbelts, hedgerow barriers and improved fallows contribute immensely to alleviate land use constraints.

One of the most important technologies that contribute to conflict prevention is boundary planting; with this technology fast growing ideotypes are planted along boundaries to clearly demarcate lands (Andrine *et al.,* 2011). Andrine *et al.,* (2011) further argued land related disputes were less common among the crops cultivated with clear boundary demarcation especially with fast growing ideotypes. Conflicts were also less common among cattle keepers who have planted fodder to supplement communal grazing. This also corroborates with the findings of Nyirenda *et al.,* (2001) who revealed that fodder trees and shrubs integrated in small holder farms as fodder bank can successfully reduce human- livestock conflicts. Apart from providing fodder for livestock, certain tree species have the potential to improve soil fertility through Nitrogen fixation; eg *Gliricidia spp, Acacia spp,* (Nair, 1993). This would potentially improve agricultural productivity of every unit of land there by reducing conflicts that would emanate from land scarcity (Andrine *et al.,* 2011).

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Area

In order to determine the impact of conflict on land use, four districts were selected for the purpose of this work. These were districts which had experienced protracted conflicts for a long time. These districts were Kwahu South, Sefwi Wiawso, Tolon Kumbungu and Tamale metropolis (Figure 3.1). The main reason for selecting these areas was because there were reported protracted conflicts in some communities in

these districts.

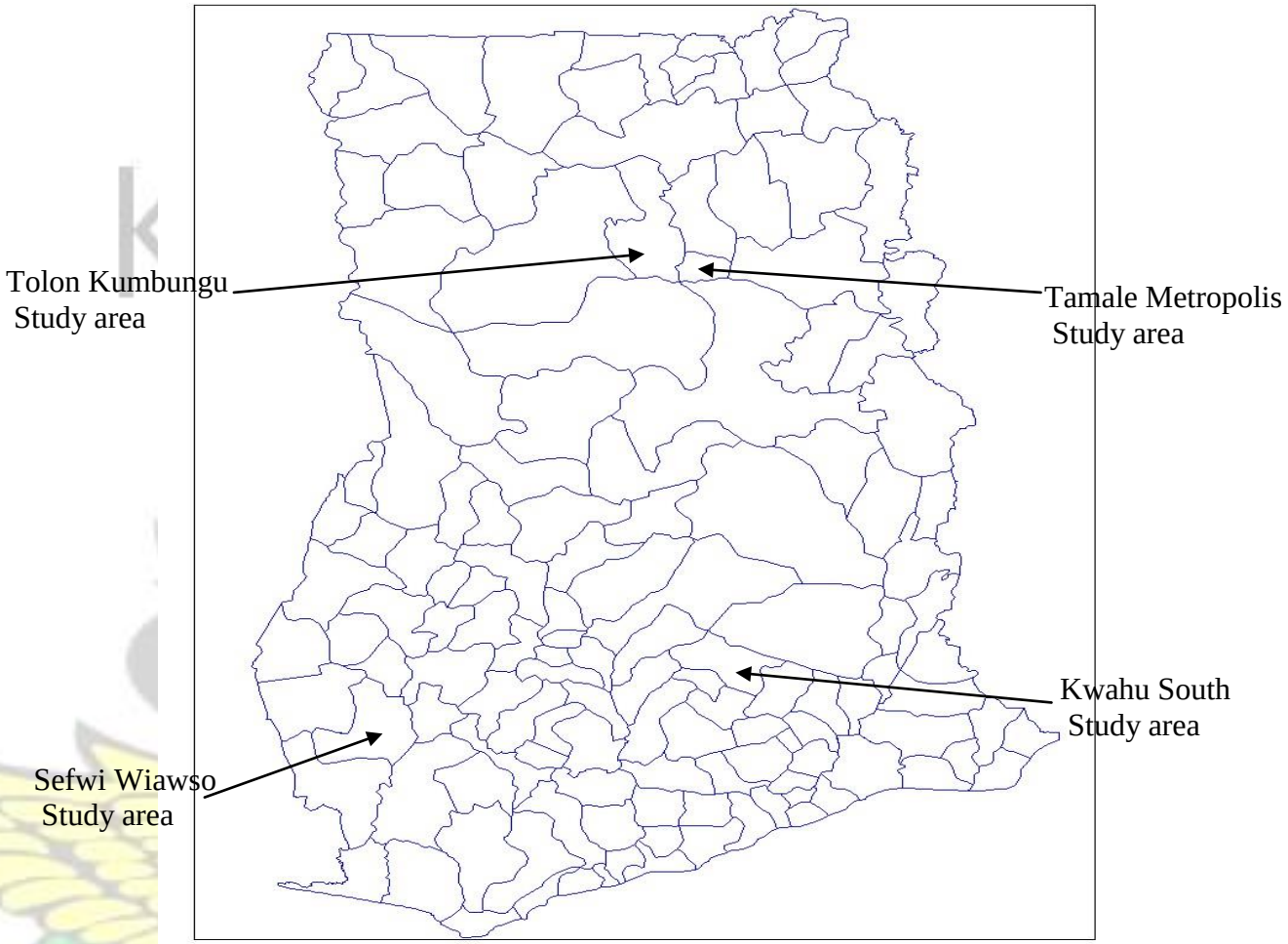

Figure 3.1: The Map of Ghana, showing the study areas (Ghana districts, 2010)

3.1.1 Tolon –Kumbungu District

Tolon-Kumbungu District is one of the 13 administrative districts of the Northern Region. According to (Ghanadistricts.com, 2010), the District covers an area of about 2,741 square kilometers. The District lies between latitude 10-20 north and Longitude 10 to 50 west. Tolon/Kumbugu District was carved out of the then Western Dagomba District in 1998. The district shares borders with the West Mamprusi District to the north, West Gonja to the west and with the Salvelugu-Nanton District and Tamale Municipality

to the east. The district was chosen because it has experienced protracted conflict; the most popular one is the Dagbon conflict which this District was the most affected.

The soils in the study area have very low fertility and are mostly sandy loam. As a result, farmers have to apply fertilizer before they have good yields and all these increase the cost of production and reduce marginal profits (Mbelayim, 2005). About 90% of the people are involved in farming activities while the others are involved in trading, weaving or rearing of animals (Ghanadistricts.com, 2010). Another problem is that land preparation is tedious and expensive as well due to high cost of ploughing and removal of stumps.

The total population of the District is 135,081 (Ghana Statistical Survey, 2000) with population growth rate of about 3.5% per annum. Out of the total population, about 90% are farmers. The average household size is 16.8 people in about 10,500 farm families. The district covers about 2400 Km^2 land area. Part of the District is not accessible as it forms part of the area called "overseas". The "overseas" as termed by the people means the land lies over the White Volta. This land is not accessible to farmers because of the difficulty in crossing the river. The vegetation is fire climax guinea savanna type with scattered drought resistant woody species and grassland. The predominant woody species are shea (*Buterospermum spp*), dawadawa (*Parkia biglobosa*), Mahogany (*Khaya spp*) and ebony trees. The predominant grass species are *Imperata cylindrical, Andropogon spp, Digitaria horizontalis* among others. The area experiences unimodal rainfall which starts in early May and ends in October with maximum rainfall of about 1000 mm. The maximum temperature occurs towards the end of October with maximum rainfall of about 1000 mm (Ghanadistricts.com, 2010). The maximum temperature occurs towards the end

of the dry season with the minimum temperature in December and January. The harmattan winds which occur during the months of December to early February has considerable effect on the temperature of the region, which may vary between 14ºC to 40ºC during the day. Humidity, however, which is very low, mitigates the effect of the daytime heat. The topography is gently undulating with a number of scattered depressions.

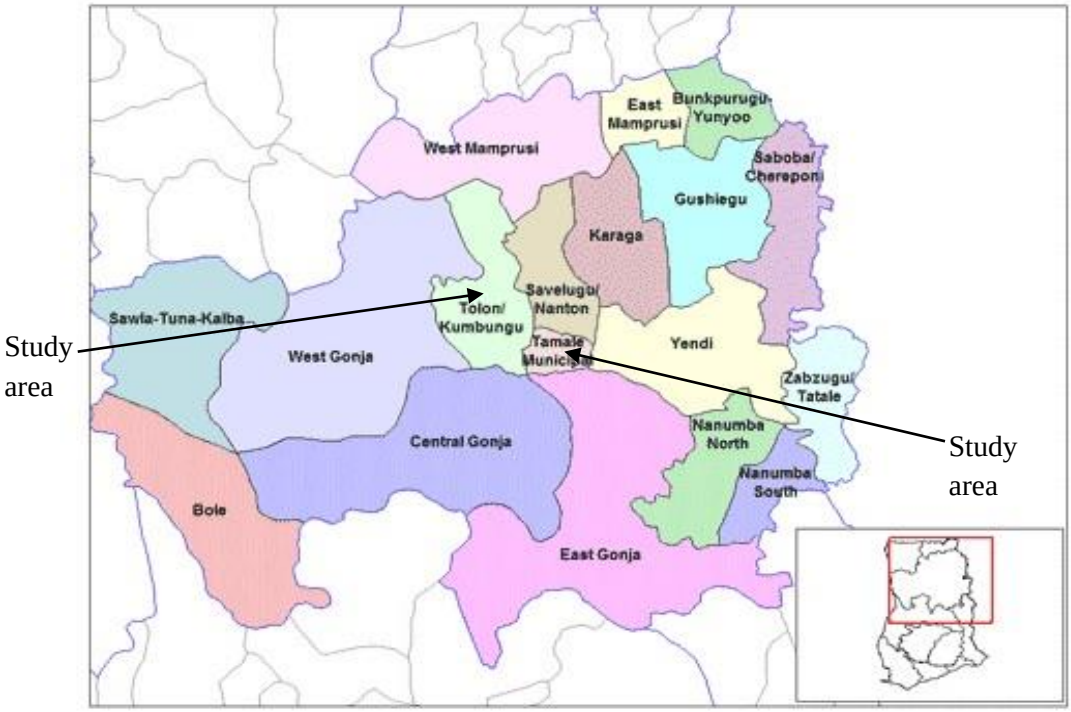

Figure 3.2: Tolon-Kumbungo District and Tamale Metropolis. Source: Northern Ghana (Ghana districts, 2010)

3.1.2 Tamale Metropolis

The Municipality of Tamale is one of the 18 Districts in the Northern Region. It is centrally located in the region and hence serves as a hub for administrative and commercial activities in the region. Tamale, the municipal capital is also the political, economic and financial capital of the region. The major government Departments, Ministries and NGO‟s have Tamale as their operational center. The Municipality shares boundaries with Savelugu-Nanton to the West, Yendi to the East and Gonja to the South (Ghanadistricts.com, 2010).

The 2000 Population Census gave the population of the Tamale Metropolis as 293,881. This is made up of 146,979 males and 146,902 females. This is far higher than the national growth rates of 2.7% and regional growth rates of 2.8%. The population density of 318.6 persons per square kilometers for the Metropolis is about 12 times higher than the Regional average density of 25.9 persons per square kilometers (Ghanadistricts.com, 2010).

There exist vast differences between the densities of the urban and rural areas. This is an indication of the influx of people to Urban Tamale, and gives credence to the assertion that facilities and opportunities for modern employment are concentrated in few central places. Islam is the predominant religion in the Metropolis with 84% of the population affiliated to it; Catholics follow this with a proportion of 6% (Kusimi *et al*., 2006). The metropolis experiences one rainy season starting from April/May to September/October with a peak season in July/August. The mean annual rainfall is 1100 mm within 95 days of intense rainfall. Consequently, staple crop farming is highly restricted by the short rainfall duration.

The dry season is usually from November to March. It is influenced by the dry NorthEasterly (Harmattan) winds while the rainy season is influenced by the moist South Westerly winds. The mean day temperatures range from 33^0 C to 39^0 C while mean night temperature range from 20^0 C to 22^0 C. The mean annual day sunshine is approximately 7.5 hours (Ghanadistricts.com, 2010)

The economy of the Metropolis until the 1980s was basically agrarian. During this period, over 70% of all indigenous people in the Metropolis were farmers. During the period

before the 1980s, production of primary commodities in the Metropolis was very high. This was a result of government policies towards agriculture. The introduction of subsidies on agricultural inputs raised production of both domestic and industrial crops such as tobacco and coffee. Significant among these were rice, maize, sorghum, groundnuts and beans. Currently it is estimated that 60% of the people are engaged in agriculture in the Metropolis. The major crops cultivated include maize, rice, sorghum, millet, cowpea, groundnuts, soya bean, yam and cassava. The total land area under cultivation is 38,352 hectares (Ghanadistricts.com, 2010).

3.1.3 Kwahu South District

The District is located in the north-western part of the Eastern Region. It shares boundaries with Sekyere East District to the north, Asante-Akim North Municipal and

Asante Akim South District to the West, Kwahu West District to the East and Birim North, East Akim Municipal and Fanteakwa District to the South. The District specifically lies between latitude 6° 30° N and 7° N and longitude 0° 30° W and 1° W. It covers a total land area of 1.462 km^2 (Ghanadistricts.com, 2010). The 2000 population census puts the population of the District at 217,485 people.

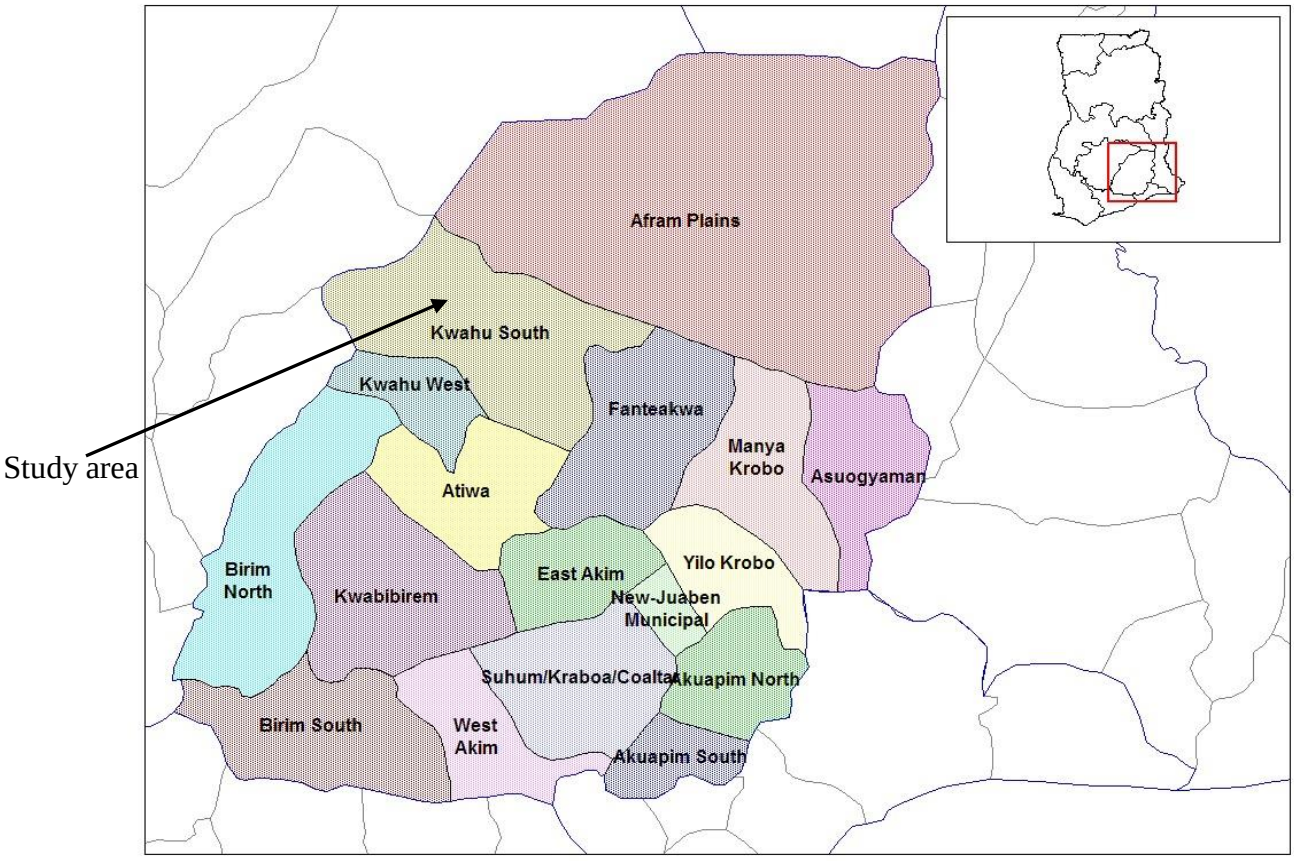

Figure 3.3: Kwahu South District. Source: (Ghanadistricts.com, 2010)

The age cohort 20 – 49 years is lower compared to the national average. This may be due to the out-migration in the district which the district is very well noted for due to the high interest in business and trading activities in Accra and parts of country. This means that when conflict breaks out the District figure of 31.4 will dwindle further since they will be people that would be mostly involved (Brukum, 1999). When this occurs, agriculture and other land use activities would be negatively affected. The comparatively higher population ratios of the district over the national of people above 50 years may also be due to senior citizens who have retired home. The sex ratio of male to female is 93.2:100. This is lower than the regional ratio of 97:100. Women and children are the most affected in all war torn zones so according to the ratio above women population are higher than

that of men and this makes war more devastating (Helle *et al.,* 2000; Kusimi *et a*l., 2006). In the rural areas, the medial age is 18.9 years as compared with 17.6 years in the urban centers. By implication, the urban population is more youthful than the rural probably due to rural-urban migration of the youth within the district.

Trees of economic value like Odum, Wawa, Sapele, among others are found in the forest. The forest is made of three layers namely the upper-canopy, middle and the understory. Areas noted for timber logging activities are Kwahu Tafo, Asakraka,

Asuboni, Adowso, Aduhema, Hweehwee and Abene among others. Since 1972 about 1,794 acres of tree have been planted in the district. The following are the trees that are planted: Teak, Casia, Leucaena and Adinam, among others. Bushfire still remains the biggest challenge of the tree planting project. Agriculture is the prominent subsistence occupation in the District and employs about 50.4% of the total labor force. Major crops cultivated by farmers include maize, yam, cassava, groundnuts, vegetable, oil palm, plantain, cocoyam, citrus, cola and coffee. Major livestock and poultry reared are cattle, sheep, goat, pigs, duck, turkey and Guinea fowl. Some local farmers also engage in inland fishing along the Afram River. Very few farmers engage in irrigated farming. The service sector is the biggest employer in the district employing about 42.2% while industry also employs only 7.4% of the labor force (Ghanadistricts.com, 2010).

3.1.4 Sefwi -Wiawso District

The Sefwi-Wiawso District is the seventh largest in the Western Region. Lying in the north-eastern part of the region, it is bordered to the north by Brong Ahafo Region. To the west, it is bordered by Juaboso and Bia District and by Aowin/Suaman to the south. It is also bordered by Bibiani-Ahwiaso-Bekwai to the coast and Wassa Amenfi West to the south-east (Ghanadistricts.com, 2010).

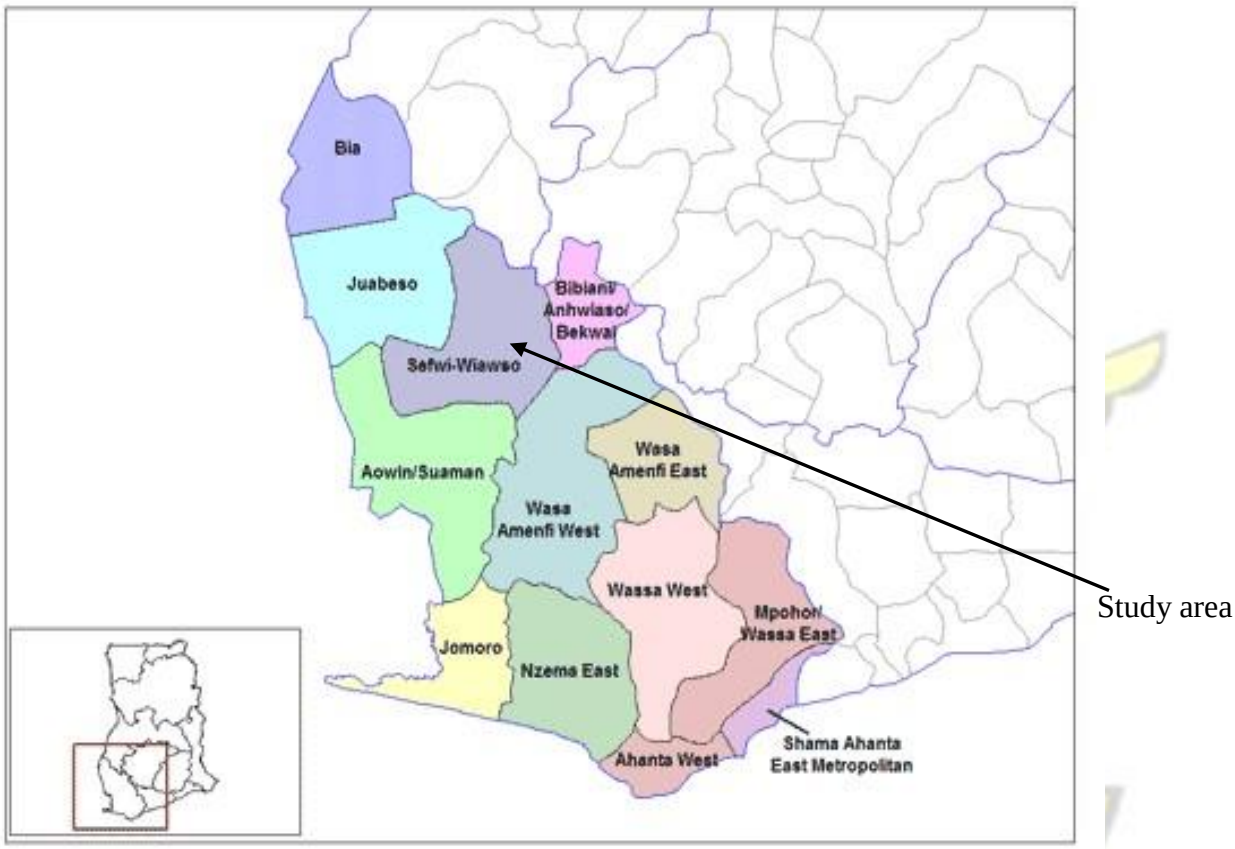

Figure 3.4: Sefwi Wiawso District. Source: (Ghanadistricts.com 2010)

The Sefwi-Wiawso District falls within the tropical rainforest climatic zone, with warm temperatures throughout the year and moderate to heavy rainfall. The District experiences two rainfal1 seasons. The major rains start from April to July and the minor from September to mid-November and lasts until July.

The highest rainfal1 of about 190 mm is recorded in the South and declines northwards to about 140 mm. The relative humidity is highest (75 -90%) during the rainy season and lowest (70-80%) during the rest of the year (Ghanadistricts.com, 2010).

Agriculture is the prominent subsistence occupation in the District and employs a large proportion of the total labor force. Major crops cultivated by farmers include maize, yam, cassava, groundnuts, vegetables, oil palm, plantain, cocoyam, citrus, cola and coffee. The service sector is the biggest employer in the district employing about 42.2% while industry also employs only 7.4% of the labor force (Ghanadistricts.com, 2010).

3.2 Research Design

The target population for this research is people involved in various land use activities such as farming, shop and restaurant operators, forestry among others in the Kwahu South, Sefwi Wiawso, Tolon-Kumbungu Districts and Tamale Metropolis. The study adopted a survey approach, which combined the relevant elements of sampling techniques. Stratified random sampling technique was used to select respondents to complete the questionnaires. This is because there are various land users such as farmers, store keepers, chop bar and restaurant operators in the study areas and each category of land user must equally be represented in the administration of the questionnaires (Marsh, 1979; De Vaus, 1991; Harvey, 1991; Blaikie, 2000). Purposive sampling was used to select key informants because the technique ensured that the selection of potential respondents were restricted to key officials or informants whose contributions and cooperation were considered fundamental to the realization of the objectives of the study. Combination of closed and open-ended questionnaires was administered to the respondents.

In addition, relevant data was obtained through discussions, correspondence and phone interviews. In all, 89 respondents were used selected for this research.

3.3 Selection of Towns in the Study Area

Four Districts were selected across the country. These Districts had experienced protracted conflicts or are still involved in conflicts. This is because in order to measure the effects of conflict, the District must be experiencing protracted conflict for such a long time that its effects are pronounced. In areas where conflicts have been brief; it is difficult to measure their effects since the effects may not be that significant to be seen clearly. In each District, towns and villages within the District which have been experiencing conflict for a long time were selected. In Kwahu South District, Yirenkyikrom and Adontengkrom villages were selected whiles Sefwi Wiawso township was selected in the Sefwi Wiawso District. Suburbs such as Lamashegu,

Chogu Tishegu and Sangnarigu were selected in the Tamale Metropolis. With respect to Tolon-Kumbungu District, Nyankpala, Kunbungu and Tolon were selected.

3.4 Selection of Respondents

In all, 89 respondents were interviewed. The number of people interviewed in the Tamale Metropolis was higher because the population of Tamale is higher and is almost always hit by conflict. The most popular one is the Dagbon Conflict which Tamale was the most affected. The houses in the Tamale Metropolis are mostly in rows, so to be more accurate in the selection of respondents, when one row is selected for data collection, the next row is left without interviewing anybody. After the selection of the rows, a household is then selected for an interview and a distance of about 200 m is left in-between before interviewing another household.

Suburbs were selected across the length and breadth of the Tamale Metropolis for the interview. For instance, Lamashegu is at the entrance of Tamale, Sangnarigu and Tishegu are at the Western and Eastern part of Tamale respectively. In the TolonKunbungu District, Nyankpala, Tolon and Kumbungu were selected because these were the areas where conflicts were almost reported. In Sefwi Wiawso, only the Wiawso Township was selected for the interview because this is the only area of major conflict. Sefwi Wiawso Traditional Area has been losing lives and properties worth millions of Ghana Cedis since 2003 through chieftaincy dispute. The most affected area is Sefwi Wiawso Township. The detail of this is presented in a Table 3.1.

Table 3.1: Sample Distribution in all the study areas

District	Town	Number of People Interviewed	**Total**
Kwahu South	Yirenkyikrom	8	**16**
	Adontenkrom	8	
Sefwi Wiawso	Wiawso Township	15	**15**
Tamale	Lamashegu	10	
Metropolis	Chogu	10	
	Tishegu	10	**39**
	Sangnarigu	9	
Tolon/	Nyamkpala	7	
Kumbungu	Kumbungu	7	
	Tolon	5	**19**
Total			**89**

3.5 Data Collection Methods

Data for this research was obtained from both primary and secondary sources. The secondary data are those taken from already written documents such as published thesis on the internet, Daily Newspapers, and books among others. The primary data are those obtained from discussions, interviews and phone calls among others (Blaikie, 2000). The following methods were used for primary data collection: Focus Group Discussions, Semi-Structured Interviews and Transect Walk.

3.5.1 Focus Group Discussions

Focus group discussions ensured that qualitative data was obtained through discussions, opinions and knowledge sharing among participants (Harvey, 1991, Blaikie, 2000). The youth were the specific group of people with whom the discussion was held. Group discussions were held at Kumbungu and Gbulagu. In each group discussion, a maximum number of six (6) individuals were allowed for discussions that lasted for about 30-40 minutes. Group members were made to share ideas about how conflict could be prevented using agroforestry technologies. The major problems that were encountered were the fact that it difficult to get the opinion leaders together. Extra care needed to be taken to prevent diversion of the topic to other matters such as politics by group members during discussions.

3.5.2 Semi-Structured Interviews

Information was further obtained through administering semi-structured questionnaires to key informants and relevant stakeholders. Semi structured questionnaire administration enabled a flexible use of guiding questions whenever appropriate (Harvey, 1991, Blaikie,

2000). Key aspects were formulated in open questions, giving the respondent enough time to answer.

Some opinion leaders in the community such as the chief, Tendana, the fetish priest were also interviewed using semi-structured questionnaire. The age groups were between 21 and 82 years because it is assumed that they have more knowledge so far as conflict and its effects are concerned. Seven respondents were interviewed at Nyankpala, seven at Kumbungu and five at Tolon. Thirty-nine respondents were interviewed in the Tamale Metropolis; fifteen were interviewed in Sefwi Wiawso township and twenty in the Kwahu South District. In all, 89 people were interviewed (Table 3.1).

3.5.3 Transect Walk

At Tolon and Kumbungu transect walks were taken across the town to serve as a tool for site selection and to identify major problems and possibilities perceived by the people in relation to features or areas along the transect (CARE, 2002). One adult person was interviewed in each house. This was done across the length and breadth of the town. The procedure described above was followed in Nyankpala, Tamale and all the places where respondents were reached.

3.6 Data Processing and Analysis

The data gathered was analyzed using Statistical Package Social Sciences (SPSS). The results were then expressed in percentages and interpreted using Simple Descriptive Statistics (SDS) such as bar chart, pie chart and tables (De Vaus, 1991). Chi-square was also used to test for significance of the data (Blaikie, 2000).

3.7 Limitations of the Research

The study was characterized with limitations. The first is based on the survey design and the data collection. Due to financial constraint, only 89 respondents were sampled for the survey even though at least 120 respondents were initially considered. Language barrier was a problem especially in the Northern Region. Some of the respondents could not express themselves in the English language and this made communication difficult. The service of an interpreter was solicited to translate the interviews. The unwillingness of farmers to participate in the survey was also a major concern. In Sefwi Wiawso, data collection was nearly marred since the people mistook me for a spy from the other faction of the conflict.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents results of descriptive analyses and it is made up of five main sections. The first section discusses the summary statistics of socio-demographic characteristics of the respondents. Farmers‟ landholding characteristics are discussed in section two. Section three looks at the sources and types of conflicts and its impact on land use. Section four presents agroforestry technologies which have the potential to reduce conflicts in land use. Coping strategies adopted by people in conflict zones are also discussed in section five of this chapter.

4.2 Socio-Demographic Characteristics

The results show that 55 out of the total of 89 respondents which is approximately 61% were males and 39% were females. On age distribution, 41 out of the 89 respondents representing 45.6% were aged between 21-40 years while 33.3% of the 89 respondents aged between 41-60 years. Only 18.9% of the 89 respondents were over 60 years (Table 4.1).

Table 4.1: Sex and Age distribution of Respondents

Variable	No. of Respondents	Percentage
Sex		
Male	54	60.7
Female	35	39.3
Total	**89**	**100**
Age (years)		
Below 20	1	1.1

21-40	41	45.6
41-60	29	33.3
61-80	17	18.9
Above 80	1	1.1
Total	**89**	**100**

Source: Field Survey, 2010

The results (Table 4.1) indicate that most of the farmers in the communities where the survey took place are young, that is, 41 out of 89 respondents were youth. This was evident because majority of the farmers were within 21-40 years. Only 18 respondents out of the 89 respondents were between the ages of 60 and 80 years. The National Population Census (2000) confirms this in the age structure of Kwahu South District Assembly which according to the census, people of age 20-45 years forms about 36.9% (National Population Census, 2000). It is worth noting that due to the fact that the youth are considered energetic in all societies they are placed in the fore front of wars (Brukum, 1999). According to Brukum, (1999), the Kokomba and Nanumba youth were involved in a bloody clash where many lives were lost. When the youth who are the majority group of people in the society and in agriculture become involved in bloody clashes it is certain to have negative effect on agriculture.

The distribution of farmers‟ marital status, religious affiliation and education level are presented in Figure 4.1, 4.2 and 4.3 respectively. Majority, (60%) of the respondents interviewed were married, 23.3% were widowed whiles 16.7% were single (Figure 4.1).

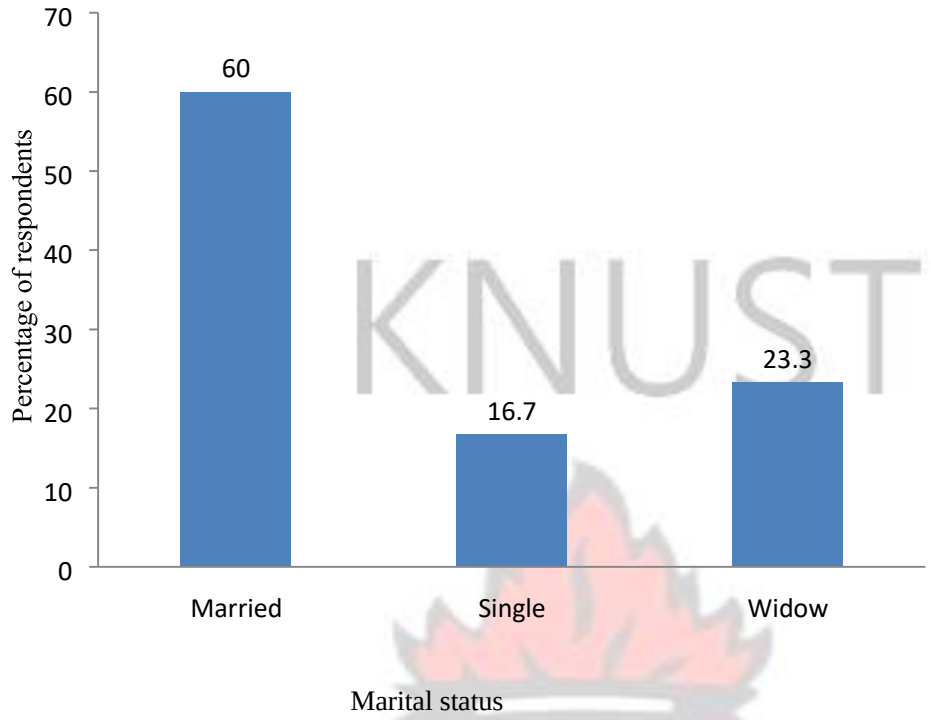

Figure 4.1: Marital status of Respondents

Approximately, 51% of farmers were Christians, whereas 43.2% and 5.7% of survey farmers were Muslim and Traditionalist respectively (Figure 4.2).

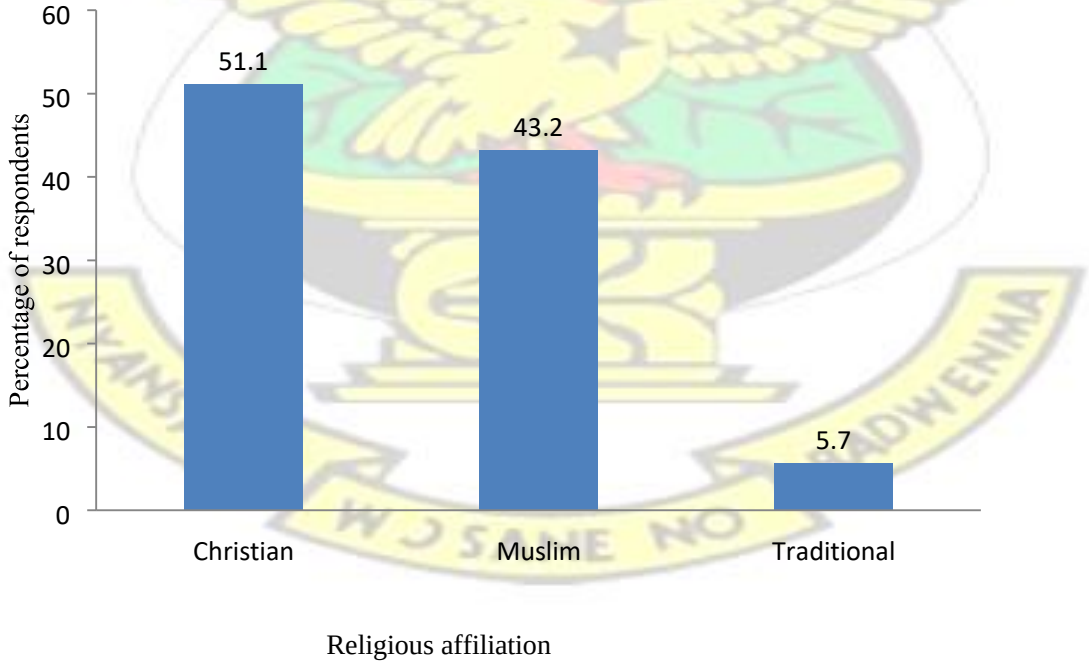

Figure 4.2: Religious affiliation of Respondents

The level of education of the respondents is presented in figure 4.3. About 54.5% of respondents had basic school, senior high and tertiary education. Thus, 16.7%, 12.2% and 25.6% had basic (JSS/MSLC), Secondary and Tertiary education respectively. However, (45.5%) of the farmers were illiterate or had no formal education.

4.3 Effects of Conflict on Education

These indicate that conflicts significantly affect the level of education because people are being displaced and properties and infrastructure destroyed in their various communities thereby impacting negatively on education (Mitchell, 1997; Hussen, 2000).

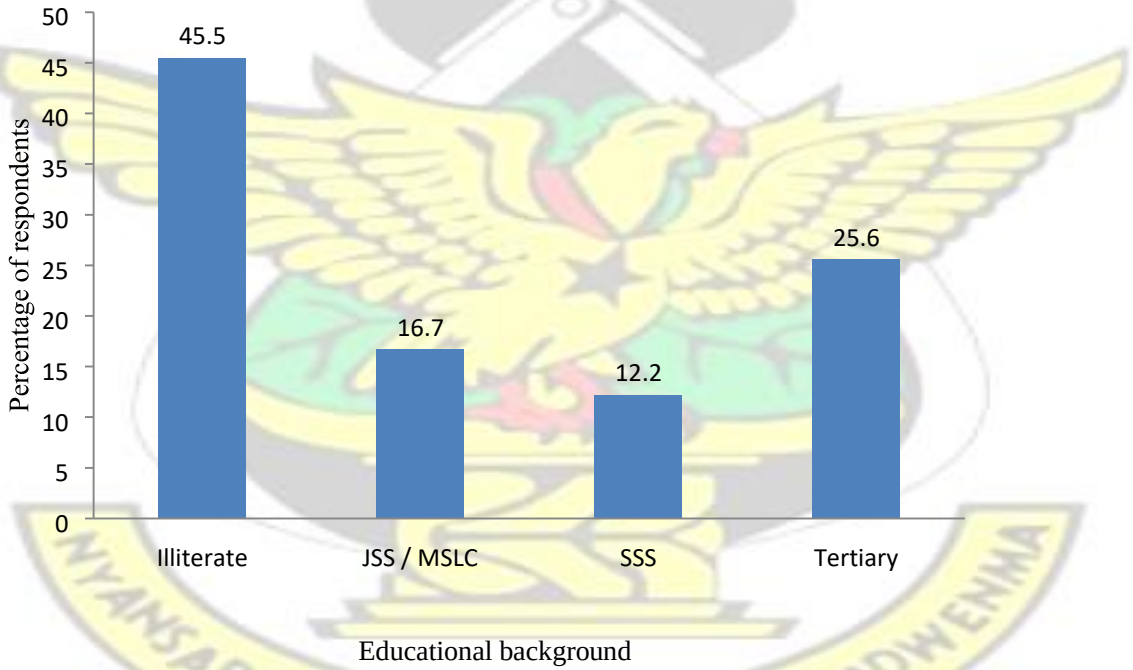

Figure 4.3: Educational background of Respondents

4.4 Occupation of Respondents in the study area

On the occupation of respondents in the study area (Table 4.2), majority (87.5%) of the respondents were farmers, 6.8% of respondents were civil servants, 4.6% of respondents owned stores while 1.1% were into carpentry work.

Table 4.2: Occupation of Respondents in the study area

Category	No. of Respondents	Percentage
Farmer	78	87.5
Civil servant	6	6.8
Own store	4	4.6
Carpenter	1	1.1
Total	**89**	**100**

4.5 Type of farming activity carried out by Respondents in the study area

The results indicated that the respondents interviewed were involved in different farming activities (Table 4.3). Out of the 89 respondents interviewed, 70.5% indicated that they were crop farmers, 23.1% indicated that they are into livestock production. However, about 6.4% of respondents indicated that they were into both crop and livestock farming. Both livestock and crop farming are greatly affected by violent conflicts and civil strife through destruction and overexploitation of natural resources. (Asumadu, 2003; Hammil *et al.,* 2009). The obvious consequence of violent conflicts on all agricultural land use is environmental destruction and ultimate reduction in economic growth. (Selman, 1994; Mitchell, 1997; Fricker, 1998; George, 1999; Hussen, 2000).

On the question of how long respondents have been living in the locality, the years ranged between 5 and 41 years with an average of 17 years. Out of the 89 respondents, 40.2% of respondents indicated that they came to the community purposely to work, 36.6% of respondents came entirely to farm in the community whiles 18.3% and 4.9% of the respondents had a combined motive of marriage and farming as well as to school and work respectively (Figure 4.4). The chi square statistic for five degree of freedom is 78.683. It indicates that the significance value (0.000) is less than the threshold value of 0.05. This suggests that people came to the community from other parts of the country purposely for Agriculture (farming) activities and not to school, marry or work in the formal sectors.

Table 4.3: Type of farming activity carried out by Respondents in the study area

Type of farming	No. of Respondents	Percentage
Crop farming	55	70.5
Livestock farming	18	23.1
Both crop and livestock farming	5	6.4 **100**
Total	**78**	

Figure 4.4: Reasons for staying in the study area

4.6 Farmers' Landholdings Characteristics

On the acreage of land used by farmers for their farming activities, about 46% of the respondents had 3 acres of land available for their farming activities, 30% of respondents had 2 acres available for their farming activities, while 20% of respondents had more than 3 acres (4-20 acres) of land available for their farming activities. However, only 3% of respondents had 1 acre of land available for their farming activity.

Majority of the respondents (55%) owned between 1-3 acres of land whiles 10% owned more than 3 acres of land as their own property. About 35% did not own the land and were therefore operating through leasing. The minimum and maximum numbers of acres owned by farmers were 1 acre and 15 acres respectively (Table 4.4). It can be deduced from the information above that majority of the respondents do not have access to a large track of land for commercial farming. This emphasizes the importance of land in the economy of developing countries for the improvement of the livelihood of the people; (FAO, 2002). The World Bank, (2002), revealed that land directly contributes to the

livelihood of about 90% of the 1.2 billion people living in extreme poverty. In some places, most of the people depend on agricultural land as a source of livelihood. In Kasese District in Uganda, for instance, 90% of the people depend on agriculture (UBOS, 2002). Scarcity of land for farming is of itself a source of conflict because due to pressure on the limited land available some land users employ dubious means to acquire land and this may result in land litigation (Agyapong, 2006; Andrine *et al*., 2011).

It can be observed from the results that only 20% have access to more than 3 acres of land for cultivation; about 80% of the respondents cultivate only 3 acres and below. This can be attributed to higher pressure on land which is also due to rapid population growth. Population growth exerts pressure on farm land which eventually causes loss of livelihood (Helle *et al*., 2002). Whenever conflict breaks out residents at the conflict zone may migrate to areas where there is no conflict and this may further increase pressure on the limited land available for farming. This is in agreement with the findings of Andre and Platteau (1998) and also Deiminger and Castagnini (2006) who said that land is increasingly becoming a source of conflict in Sub-Sahara Africa.

Andrine *et al.*, (2011) said that population increase tend to increase the demand for land and also cause land appreciation and unhealthy land tenure issues. Shortage of farm land as against rapid population growth affects sustainable land use systems and also tends to affect constant food supply and indeed is a threat to food security (WCED, 1987; Mwasi, 2001; Asumadu, 2003). Scarcity of land is also the main source of conflict in most communities (Andrine *et al.*, 2011).

Table 4.4: Size of farmers land holdings in the 4 selected districts

Size of farms	No. of Respondents	Percentage
1 acre	3	3.4
2 acres	27	30.3
3 acres	41	46.1
above 3 acres	18	20.2
Total	**89**	**100**

4.7 Mode of Land Acquisition by Respondents in the four Selected Districts

On the mode of land acquisition by farmers (Table 4.5), about 41% of respondents obtained their land through temporal leasing, 27% of farmers interviewed inherited their land while 26% hold titles to the land through outright purchase. However, 2% of the respondents were given the lands as gift. It can be observed from the result that most of the respondents acquire the land through leasing, (Andre and Patteau, (1998). This emphasizes the need for a sustainable land use policy as stated in Fisher *et al.*, (2000) and Kusimi *et al.,* (2006). Some of the problems faced by farmers are that they are not permitted to grow some crops of their choice or practice farming system such as agroforestry. This corroborates with Andre and Patteau, (1998) and also Deiminger and Castagnini, (2006) who said that land restriction can negatively affect productivity of a population and may be disincentive to investors. Land users sometimes get their cost of production increased due to the restrictions. In most cases if they fail to comply with the restrictions they are ejected from the land. Some of the respondents lamented that they

are restricted from practicing some agroforestry systems such as tree planting because their land owners think that they would occupy the land for a very long time. Due to the Indirect Rule in 1932 and also under the Acheampong regime in 1978, all lands were brought under the custody of the chiefs of some selected ethnic groups leaving most of the ethnic groups landless (Brukum, 1999). This was also in the case of the Dagombas and Kokombas in the Northern Region (Boafo- Authur, 2000).

Table 4.5: Mode of land acquisition by Respondents in the study area

Land acquisition	No. of Respondents	Percentage
Temporally lease	34	40.4
Inheritance	24	27
Purchase	26	29.2
Gift	2	2.2
Leasing and purchase	3	3.3 **100**
Total	**89**	

4.8 Land tenure agreement entered with the land owners

The agreement made with the landlord before using the land is summarized in (Table 4.6). Most of the respondents (42.5%) entered into the „Abusa" land tenure agreement while 20% of the respondents entered into the „Abunu" land tenure agreement. However, 37.5% of the farmers did not enter into any form of land tenure agreement.

Under the „Abunu‟ arrangements, the land owner takes either 50% of the total produce after harvesting whereas in the „Abusa‟ arrangement, the owner takes about 30% of the total produce after harvesting.

Table 4.6: Land tenure agreement entered with the land owners in all the 4 selected districts

Agreement	No. of Respondents	Percentage
Abunu	18	20.0
Abusa	37	42.5
None	34	37.5
Total	**89**	**100**

4.9 Land Use Systems in the Study Area

Land use type in communities (Table 4.7) such as Tolon, Tamale and Sefwi Wiawso ranged from agricultural activity to building projects (stores and houses). Agricultural land use constituted the highest proportion of total land use. In this case shortage of land for farming activities could undermine the practice of sustainable land use because increasing demand for land causes unhealthy practices (Andrine *et al*., 2011) and also pose a threat to food security (WCED, 1987 and Mwasi, 2001). About 24% of the respondents used their land for livestock farming, and 2.2% used their land for permanent tree crops, whereas 3.4% used their lands for both crop and livestock farming. However, 1.1% of the respondents used their land for agroforestry. This means that only a small percentage of the respondents practice agroforestry. Andrine *et al.,* (2011) argued that land disputes were less common among land users who practiced agroforestry especially those who clearly demarcated their boundaries with fast growing ideotypes. Practicing

agroforestry at land used sites also ensures that there is constant supply of fodder to supplement grazing (Nyirenda *et al.,* 2001). This means that only a small percentage of the respondents have a constant supply of fodder for livestock.

Table 4.7: Land use systems in all the selected study areas

Land use	No. of Respondents	Percentage
Crop farming	53	60.9
Livestock	21	24.1
Crop farming and livestock	3	3.4
Permanent tree crops	3	2.2
Agroforestry	2	1.1
Building projects	3	3.4
Farming and building projects	4	4.6
Total	**89**	**100**

4.10 Level of satisfaction of tenant land users

The question as to whether land users were satisfied with the agreement of the land owners was only applicable to 30 tenant land users. Land acquisition and use is subject to agreements made by the parties involved. Most of the respondents interviewed (Fig. 4.5) were not too satisfied with the agreement made with the landlord and yet cannot do anything about it. Some of the respondents expressed interest of buying land themselves but due to resource constraints they could not do so. This is in corroboration with World Bank findings that land contributes to the livelihood many people living in poverty (World Bank, 2002).

Rapid population growth is the main contributing factor to pressure on and its land appreciation (Andrine *et al*., 2011). About 40.2% of the respondents were satisfied with the agreement made.

Aside the respondent‟s level of satisfaction with agreements made with the landlords, reasons given by respondents interviewed included some restriction imposed on land use by land owners (Table 4.8). It delays the release of land and also brings about cheating by landlords. About 6.7% of the respondents said land becomes very expensive as a result of the restriction. Andrine *et al*., (2011), discussed the effects of such unhealthy land use restrictions on land users.

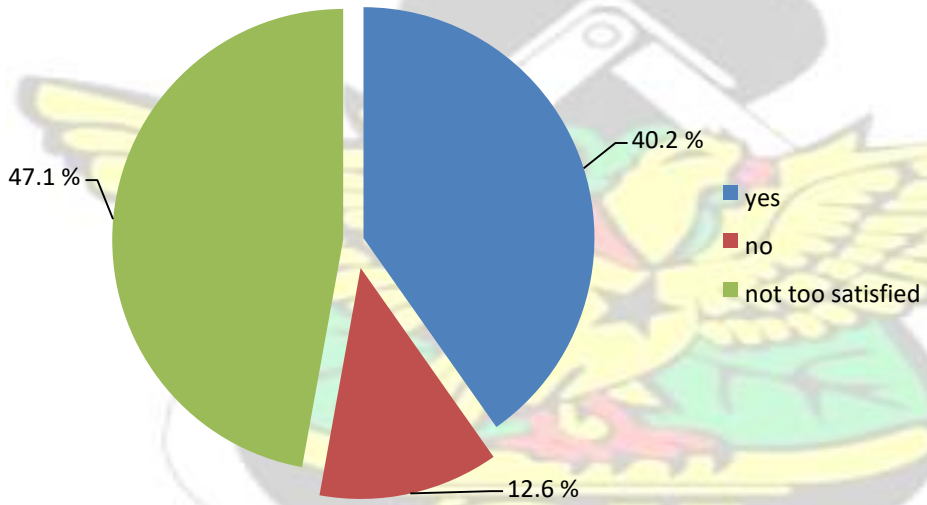

Figure 4.5: Level of satisfaction of agreement made with landlord

Table 4.8: Reasons assigned to level of satisfaction of agreement made with land owners in the study area

Reason assigned	No. of Respondents	Percentage
Some restriction	9	60.0
Delay in land released	2	13.3

No strict agreement	2	13.3
Cheating by landlords	1	6.7
Lands are too expensive	1	6.7 **100**
Total	**15**	

4.11 Effect of land use agreement on productivity

The study also tried to find out whether the land use agreements had any effect on farming activity (Table 4.9) Out of 89 respondents, 41% of the respondents said that poor land use agreement hampered productivity whereas 38.6% indicated that good land use agreements enhanced productivity. However, 20.5% of the respondents said land use agreements had no impact on productivity. It has been observed that land use agreement and its restriction come as a result of scarcity of land, (UBO, 2002). The fact that 41% of the respondents have attributed low productivity to poor land use agreement confirms what was said by Deininger and Castagnini, (2006) that the productivity of a population can negatively be affected by poor land use policy. Poor land use policy as described by the respondents does not only hamper productivity of the land users but also serves as a precursor for land use conflict and a disincentive to land users (Andre and Plateau, 1998).

Table 4.9: Effect of land use agreement on farming activity performance in all the selected study areas

Effect of agreement on business	No. of Respondents	Percentage
It enhances productivity	34	38.2
It has no effects on productivity	19	21.4

It hampers productivity	36	40.4
Total	**89**	**100**

4.12 Special tenancy arrangement made with land owners in all the selected study areas

Special tenancy agreements entered into by the respondents were as follows; food crops (48.5%), land tenure (45.5%) and tree tenure (6.0%) as seen in Table 4.10. This means that 48.5% share the food crops with the land owner and have no part in the land itself or trees on the land. This confirms the findings of Boafo-Authur (2001), about the Administration of Land Act 1960 (Act 123). According to Boafo-Authur (2001), the CPP government made several efforts to strip some people off power to control land revenue as a way of weakening some chiefs that were posing threat to his government. Even though these people are citizen of Ghana but have no access to land and can only survive by sharing their produce with land owners (Asumadu, 2003). The land tenure and the tree tenure systems, however, share the land and the trees respectively alongside with crops with the owner. The details of the tenancy agreement made with the land owners were also studied (Table 4.10).

About 25% of the respondents agreed to give part of their farm produce to the Tindana (Land Priest) while 10% agreed to crop sharing after harvesting. However, a large proportion of the respondents (65%) indicated that they did not enter into any agreement with the landowners (Table 4.10).

Table 4.10: Details of tenancy agreement made with land owners in the study area

Details of tenancy agreement	No. of Respondents	Percentage
Part given to the Tindana	5	25.0
Crop sharing	2	10.0
No agreement	13	65.0
Total	**20**	**100**

When respondents were asked whether there were other issues associated with the land acquisition process, half (50%) of the respondents said there exist other problems associated with land acquisition whilst the other half said there were no issues associated (Figure 4.8). Reasons assigned to the other problems encountered are listed in the Table 4.11. Most of the respondents pointed out that the lands acquired were too expensive (44.2%), over 20.9% of the respondents said the lands were not released on time, 16.3% said that lands were located at far places, 14% said there was too much restriction whiles 4.7% said the lands given were rocky, waterlogged and infertile.

Table 4.11: Reasons assigned to issues associated with land acquisition in all the selected study areas

Reasons	No. of Respondents	Percentage
Land not release on time	9	20.9
Too much restriction	6	14.0
Lands are located far away	7	16.3
Too expensive	19	44.2

Poor lands are given	2	4.7
		100
Total	**43**	

4.13 Sources of Conflict in Adontenkrom and Yirenkyikrom (Kwahu South District)

In all the two communities, a total of 16 respondents were interviewed. They all admitted that the conflict between the two communities was as a result of a parcel of land between the two communities which both chiefs claim ownership. This conflict could have been avoided if stake holders had agreed on a land use policy that would be a guideline for both communities (Boafo-Authur, 2001; Asumadu, 2003).

4.14 Sources of Conflict in the Tamale Metropolis, Tolon- Kumbungu and Sefwi Wiawso Districts

Tamale Metropolis, Tolon- Kumbungu and Sefwi Wiawso Districts have similar sources of conflict being chieftaincy disputes. In Sefwi Wiawso, a section of the people attempted to destool the chief and that became the source of conflict at the area. In Tamale Metropolis and Tolon- Kumbungu District the popular Dagbon conflict was the main source of conflict of which the Tamale Metropolis and Tolon- Kumbungu District were the most affected. Irrespective of the source of conflict at a particular area, land use is adversely affected (Asumadu, 2003).

4.15 Types of conflicts in the four Districts

According to the field survey, the main type of conflict in Adontenkrom and Yirenkyikrom (Kwahu South District) is land litigation and that of the Tamale Metropolis, Tolon- Kumbungu and Sefwi Wiawso Districts is chieftaincy dispute. The people living

in all these areas affected by conflict cannot engaged in sustainable land use system as a result of conflict as stated by Asumadu, (2003) and this can also be a threat to food security (WCED,1987 and Mwasi, 2001).

4.16 Land litigation in Adontenkrom and Yirenkyikrom (Kwahu South District)

Types of land litigation issues encountered in the entire four Districts are summarized in Table 4.12. Out of the many mentioned, 61% of the respondents indicated that litigation issues originating from the family was the major factor, because the size of each family keeps on increasing as against the same size of land. This puts pressure on land and eventually, result in conflicts.

Andrine *et al.,* (2011), said land scarcity is the main source of conflict and that population increase tends to increase the demand for land and promote unhealthy land tenure issues. Rukadya (2009); attributed land conflict to unsustainable agricultural practices. About 22% of the respondents attributed the source of their problem to farmers-farmer litigation. This kind of problem is mainly due to boundary demarcation.

Some said they solve the problem by planting trees on the boundaries (Verheij and Waaijenberg, 2008). About 9.8% of the respondents also attributed their source of conflict to destruction of property and businesses whiles 4.8% said conflict, sometimes, originate from landowners. However, litigation issues that originated from multiple ownerships constituted 2.4%.

Table 4.12: Types of land litigation issues encountered in the 4 selected districts

Litigation issues	No. of Respondents	Percentage
Families	25	61.0

Landlord	2	4.8
Multiple ownership	1	2.4
Farmer-farmer	9	22.0
Destruction of property and business	4	9.8 **100**
Total	**41**	

4.17 Ownership of land used by respondents in the 4 selected districts

From the survey, 47.7% of the land used by respondents was family or clan owned, 27.3% of the land fell under private ownership whiles community ownership constituted 22.7%. However, 2.2% of land used was community, family or privately owned (Table 4.13). The number of individuals in a community and a family keeps on increasing as against the same size of land; this brings about excessive land fragmentation and brings about land scarcity which is also a precursor of land use conflict (FAO, 2002, World Bank, 2002 and Andrine *et al.,* 2011).

Table 4.13: Ownership of land used by respondents in the 4 selected districts

Ownership	No. of Respondents	Percentage
Community own	20	22.5
Family / clan	42	47.2
Private ownership	25	28.0
Community/family/private ownership	2	2.2 **100**
Total	**89**	

4.18 Chieftaincy dispute in the communities visited

When asked about the existence of chieftaincy dispute in the communities visited, majority (63.6%) of respondents indicated that they exist whilst 36.4% of the respondents said there were no chieftaincy disputes. The fact that over 63% of the respondents accept that chieftaincy dispute exist corroborates with Kusimi *et al.*, (2006) who stated that conflict, irrespective of the type, affects land use.

They argued that prior to the indirect rule in 1932, chiefs and tribes coexisted; the indirect rule concept vested too much power into some chiefs over others. This has made some chiefs/tribes feel superior to others and disregard the views of others. The chiefs, whose views were constantly disregarded, over time, mobilized their subjects and started conflict with the „superior" chiefs (Brukum, 1999).

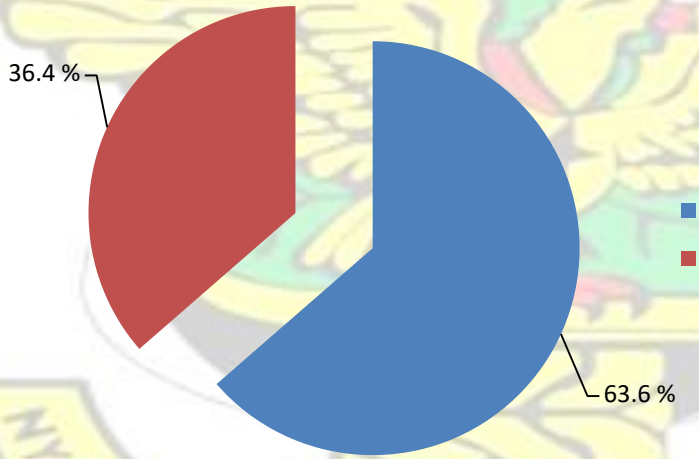

Figure 4.6: Chieftaincy disputes in the communities visited

4.19 Effects of chieftaincy dispute on land use in the 4 selected districts

When respondents were asked about the effects of chieftaincy disputes on farmer"s land use, 44.6% were of the opinion that these disputes slows down farming activities, 42.9%

said it destroyed life and property (Table 4.14), this has a bearing on economic growth and can be a major cause of poverty especially in the three Northern Regions. Chieftaincy dispute does not only destroy life and properties but also hampers development work, destroys vegetation and other natural resources (Brukum, 1999; Fisher *et al*., 2000). About 8.9% said it created fear whiles 3.6% (Table 4.14) were of the view that it placed too much restriction on the use of land.

Table 4.14: Effects of chieftaincy dispute on land use in the 4 selected districts

Effect of chieftaincy disputes	No. of Respondents	Percentage
Slow down work	25	44.6
Life and property destroy	24	42.9
Too much restriction	2	3.6
Creates fear	5	8.9 **100**
Total	**56**	

The results indicate that chieftaincy related conflicts have effects on age and gender of respondents (Table 4.15). For instance people between the ages of 21-60 years were the most affected because some of the youth actively participate in conflict while others go the battle front to help resolve conflict. This type of conflict slows down work and also destroys properties. According to Bukles, (1999) all types of conflicts have both negative and positive consequences; the main consequence of this type of conflict is that it significantly affects both male and female and poses a major threat to socioeconomic growth and sustainable development (Hammil *et al.*, 2009). The ultimate effect of conflict on the youth is death due to their active participation in war. In such a situation, future land use becomes affected (Harmsen and Kelly, 1993).

Table 4.15: Effects of chieftaincy disputes on gender and age in all the study areas

Sex	Effects on land use	Age (years)				
		21-40	41-60	61-80	Above 80	Total
Male	Slows down work	11	4	1	1	17
	Land and property destroyed	7	2	2	0	11
	Too much restriction	1	0	1	0	2
	Creates fear	2	2	0	0	4
Total		**21**	**8**	**4**	**1**	**34**
Female						
	Slow down work	4	2	2	0	8
	Life and property destroyed	6	1	5	0	12
	Creates fear	1	0	0	0	1
Total		**11**	**3**	**7**	**0**	**21**

Chi-square 20.801 and *P*=0.024 at 0.05

4.20 Ethnic clashes or tribal conflict in the Tamale Metropolis and Sefwi Wiawso

Majority of the respondents (59.1%) interviewed indicated that there were no ethnic clashes in their communities whereas 40.9% of respondents were of the opinion that there exist ethnic clashes. Contrary to the findings of Brukum, (1999) that the Nanumba and Kokomba was as a result of ethnic tension in the Northern, the conflict in Tamale

Metropolis and Tolon-Kumbungu District were mainly due to chieftaincy issue (the Abudu and Andane gate of Dagbon). Between 2002 and 2006 most of the people in the Northern Region abandon their business and migrated from the North to a safer destination due to the Dagbon conflict. Land use activities were negatively affected which also affected the livelihood of the people (Kusimi *et al*., 2006).

4.21 Effects of Ethnic clashes on Respondents in all the study areas

The respondents who indicated that there were ethnic clashes also reported that these clashes impacted on the general livelihood of the people in the community. This confirms the findings of Kusimi *et al*., (2006) that general livelihood is affected by all types of conflicts. About 45.7% reported that life and property are destroyed, 28.6% said it resulted in chaos whereas 25.7% said ethnic clashes created fear in the community (Table 4.16). Fisher *et al*., (2000) argues that conflict leads to problems such as discrimination, unemployment, poverty, oppressions and crime. When ethnic conflicts occur, they affect the use of land in the area because properties are destroyed; fear and chaos are created so people are unable to go about their normal activities. This creates insecurity (Helle *et al*., 2000).

Table 4.16: Effects of Ethnic clashes on Respondents in all the study areas

Effects of Ethnic clashes	No. of Respondents	Percentage
Life and property destroyed	16	45.7
There is chaos	10	28.6
Creates fear	9	25.7
Total	**35**	**100**

Ethnic conflicts affect various age group and gender with females mostly affected (Table 4.17) because they have to take care of children in such situations.

Table 4.17: Effects of ethnic clashes on Age and gender in all the study areas

Sex	How do they affect you	Age (years)				Total
		21-40	41-60	61-80	Above 80	
Male	Life & property destroyed	4	2	2	0	8
	There is chaos	4	1	1	1	7
	Creates fear	4	1	0	0	5
Total		**12**	**4**	**3**	**1**	**20**
Female	Life & property destroyed	4	1	2	0	7
	There is chaos	0	1	2	0	3
	Creates fear	3	1	0	0	4
Total		**7**	**3**	**4**	**0**	**14**

Chi-square=10.240 and *P*=.001 at 0.05

4.22 Political clashes in the Tamale Metropolis and Tolon-Kumbungu District

Political clashes were peculiar to Tamale Metropolis and Tolon-Kumbungu District but were not reported in Kwahu South and Sefwi Wiawso Districts. This means that the effect of conflict on the people of Tamale Metropolis and Tolon-Kumbungu District were more

severe because the conflict takes its source from both chieftaincy disputes and political clashes (Fisher *et al*., 2000).

Majority (52.3%) of the respondents interviewed were of the opinion that there were political clashes in their communities whilst 47.7% of respondents said political clashes did not exist in their area.

4.23 Effects of political clashes on land use in all the study areas

Majority (65.2%) of the respondents indicated that political clashes resulted in the destruction of life and property. About 23.9% of the respondents also mentioned that it resulted in work being interrupted whiles 10.9% responded that there was no peace in the community (Table 4.18). It can be noticed from the result that the combined effect of all conflict is insecurity and a threat to sustainability (Helle *et al*., 2000).

Aside the three major sources of conflicts discussed, namely chieftaincy disputes, ethnic or tribal conflict and political conflicts, other sources of conflict identified from the community visited such as Adontengkrom and Yirenkyikrom (all in Kwahu South District) included religious conflicts, family conflicts, conflicts resulting from Fulani herdsmen, sporting activities and finally festival celebrations. A cross tabulation between political clashes‟ and gender and age (Table 4.19) showed that political conflicts has a significant effect on gender significantly (p= 0.001 at 0.05).these conflicts affect both male and female members of the community. The youth were the most affected victims. Most of the youth lose their lives because they are placed in the battle front; this confirms the findings of Ada-van-der and Naylor (1999) and Prinsloo *et al.*, (2004).

Table 4.18: Effects of political clashes on land use in all the study areas

Political clashes	No. of Respondents	Percentage
Life and property destroyed	30	65.2
Work is interrupted	11	23.9
There is no peace	5	10.9
Total	**46**	**100**

Table 4.19: Effects of political clashes on gender and age in all selected districts

Sex	How do they affect you	Age (years)			Total
		21-40	41-60	61-80	
Male	Slow down work	4	0	1	5
	Life and property destroyed	9	6	1	16
	Work interrupted	3	0	0	3
	There is no peace	2	1	0	3
Total		**18**	**7**	**2**	**27**
Female	Life & property destroyed	5	3	5	13
	Work is interrupted	2	0	1	3
	There is no peace	1	1	0	2
Total		**8**	**4**	**6**	**18**

Pearson chi-square =22.974, *P*=.001 at 0.05

4.24 Impact of Conflict on Land Use in the Study area

The impact of frequent conflict breakout summarized in (Table 4.20) affects all aspects of life. According to FAO (2000), civil wars affect agriculture in a variety of ways. The impact also varies with the characteristics of each country‟s agriculture. In some countries there may be surplus labour in rural areas. In such cases, war casualties, regardless of these obvious human costs, would not necessarily weaken agricultural productivity and output trends. In other circumstances, agriculture may be constrained by labour shortage especially, at seasonal peak (harvesting, weeding). In this case, diversion of men from agricultural production to the armed forces will undermine the viability of agriculture there by creating food insecurity (Carter, 1999 and Kusimi *et al.*, 2006). According to World Bank (1997), over 40 countries would be affected by conflict at the end of the twentieth century. The vast majority of these people lived in low-income countries, in which agriculture and its associated products represent a major source of livelihood, foreign exchange and social stability.

Considering the numerous impacts of conflict (Table 4.20), the findings of the World Bank (1997) has been confirmed. The finding of this research in (Table 4.20), confirms World Bank (1997) report that economic losses and the disruptions of food supply and access associated with conflicts can be disastrous, especially in low-income countries where there are no effective social safety nets. While conflicts forms the basis of food insecurity situations in many countries, it is also true that raising agricultural productivity and reducing hunger and malnutrition in poor countries is an obvious path to peace (Carter, 1999). The responses gathered from respondents in all the study areas indicated that farming activities involving crops and livestock production were the major economic activity affected. The environment was also affected as the vegetation is set on fire, houses and properties are also destroyed.

In extreme cases, lives are lost and people become displaced. Finally, lands used for farming and other activities are abandoned to save lives.

Table 4.20: Impact of conflict in the study areas

Impact of conflict	No. of Respondents	Percentage
Unable to farm	57	63.3
Farms / crops are destroyed	57	63.3
Livestock are destroyed	51	56.7
Vegetation are burned	45	50.0
Properties / houses are destroyed	45	50.0
People are displaced	37	41.1
People are killed	32	35.6
Land use and activities are abandoned	20	22.2

4.25 Agroforestry Technologies used to reduce Land Litigation Conflicts in Land Use

When respondents were asked how they employed agroforestry technologies in farming to prevent land litigation conflicts on land uses, majority (69.8%) of the respondents said clearly delineating boundaries with trees prevented conflicts whiles 9.3% of respondents said planting fast growing ideotype at strategic points on land use sites prevented land use conflicts (Table 4.21). These responses are in line with Buffer Zone Agroforestry as described in Nair (1993). Specifically, the people of Adontenkrom and Yirenkyikrom solved their land litigation problem by planting fast growing ideotypes along their boundaries.

The fast growing ideotype does not only prevent conflict but also provides a means of sustenance for the land users; some parts of these trees are used for fuel wood, medicines, fruits, forage for farm animals and other products for livelihood (Nyirenda *et al.*, 2001). This is also part of the positive roles conflicts play as asserted by Marfo (2006) and Commonwealth of Learning (2003). About 17.4% said clearly delineating boundaries with trees and planting fast growing ideotype in land sites both prevented conflicts on land use whereas 1.2% said planting of fast growing ideotype and leaving big trees on farm as „tree god" was used in addressing land use conflicts. This is in line with boundary planning, an agroforestry technology stated in Nair (1993).

Table 4.21: Conflict prevention using Agroforestry as land use system in the study area

Agroforestry systems	No. of Respondents	Percentage
Clearly delineating boundaries using trees	60	69.8
Planting of fast growing ideotype in land use site	9	9.3
Clearly delineating boundaries using trees and planting of fast growing ideotype in land use site	15	17.4
Planting of fast growing ideotype in land use site and leaving big trees on farm as „tree god"	3	1.2
Clearly delineating boundaries using trees, planting of fast growing ideotype in land use site and leaving big trees on farm as „tree god"	2	2.3
Total	**89**	**100**

However, 2.3% of respondents indicated that clearly delineating boundaries using trees, planting of fast growing ideotype in land use site and leaving big trees on farm as „tree god" were used in tackling conflicts in land use. Andrine *et al.,* (2011) stipulated that land related disputes were less common among the crops cultivated with clear boundary demarcations with fast growing ideotype such as Acacia spp. and cattle keepers who have planted fodder to supplement communal grazing. This also corroborates the finding of Nyirenda *et al.,* (2001) who revealed that fodder trees and shrubs integrated in small holder"s farms as fodder bank can successfully reduce conflict. In places where the activities of Fulani herdsmen are the cause of conflict, such agroforestry technology is a remedy for reducing conflict. Majority of the respondents considered agroforestry as a suitable land conflict remedy because apart from providing fodder for livestock, certain tree species such as Gliricidea, Accacia among others can improve soil fertility by Nitrogen Fixation into the soil. This will improve agricultural productivity of every unit of land hence reducing conflict that would emanate from scarcity of land; (Andrine *et al*., 2011). Some multipurpose trees such as Gliricidea, Accacia are an important source of fodder, fruit, and shade and can also be used as the boundary plants which are important in land conflict management.

4.26 Coping Strategy Adopted by People in Conflict Zones

Coping strategies are methods which people adopt to protect their resource base and to improve their access to food in difficult years when there is a shortfall in the availability of food (Corbett, 1988). From Figure 4.7, most affected place in the community as a result of conflicts was in the business centres. About 73.5% of the total respondents confirmed this. The report of FAO (2000) outlines many effects of conflicts including destruction of vegetation and homes about 14.5%of respondents in the residential areas,

8.4% in the bush and farms and 3.6% in business areas. In the conflict between the Andani and the Abudus, several houses and business centres were burnt down as a way of revenge against their enemies.

An interview with the Assembly man of Nyankpala in the Northern Region revealed that there are many ways by which people in conflict zones cope with conflict situation (Personal communication with Assemblyman, 2010). The first is to increase their access to alternative sources of food or income by collecting wild foods, obtaining remittances from relatives abroad, working for others in the locality or farther away. Apart from collecting wild foods and fruits, some also collect firewood and sell; Korf, *et al.*, (2001) which are all ways by which they can get alternative livelihoods through agroforestry. If these strategies are not successful, they tend to reduce their food consumption. The second method is the disposal of productive assets such as sewing machines and livestock (cattle, sheep and goats) - this occurs when the food deficit is very severe and this erodes the resource base of the household. This corroborates with the findings of Korf, (2002). However, when violence within conflict is extreme many of the economic and social networks that households normally employ during times of crisis may be shattered. In these cases, coping strategies may differ from those listed because the community is no longer available as a safety net for the household.

Coping strategies also vary according to cultural habits, knowledge and beliefs, Korf, (2002); for instance, the need to adapt to risk during famine can lead to young children missing meals in some cultures, while in others this was considered as a last resort, mothers preferred to see everyone else go without meals before the children's intake was reduced (Curtis, 1995).

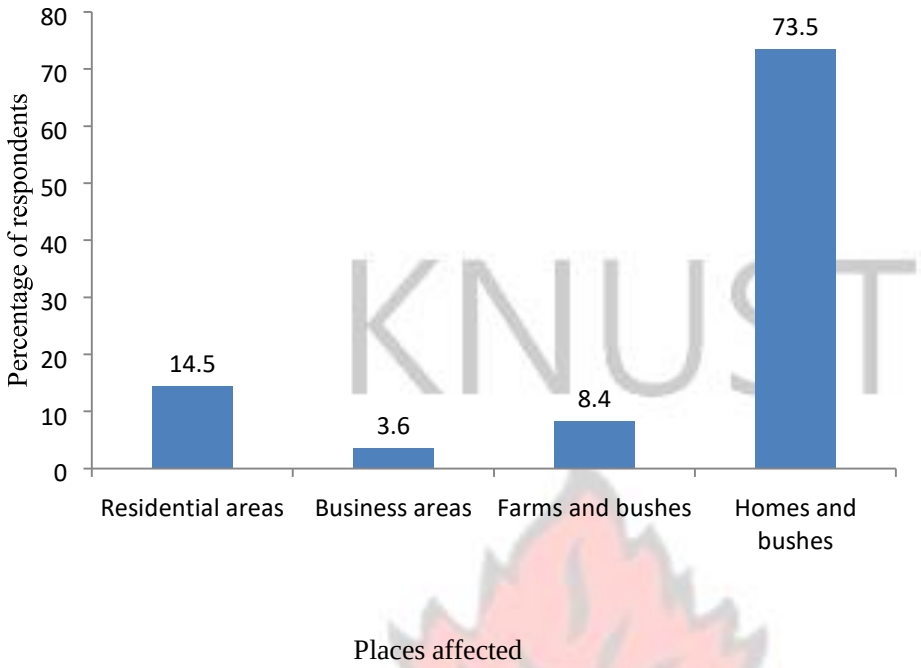

Figure 4.7: Places in the community affected by recent conflict

4.27 Actions Taken by Respondents in dealing with conflict in the Study Areas

The responds obtained from the respondents in the study areas on actions taken when conflict breaks out are presented in Fig. 4.8. On the action taken when conflicts erupt, majority (83.2%) of the respondents said they move from their locality to a different town, this means that as long as conflict continues various land users abandon all land use activities. This confirms what Helle *et al.*, (2000) said the land use activities are interrupted whenever conflict breaks out. About 11.2% of the respondents said they always go into the battle front to help their people. This sometimes result in loss of lives and properties as stated in Helle *et al.*, (2000); Kusimi *et al.*, (2006). It results in many war casualties and also brings about diversion of men from agricultural production to the war front to fight and this may undermine the viability of agriculture (FAO, 1998). About 5.6% of the respondents interviewed said they always stay at home when conflicts break out.

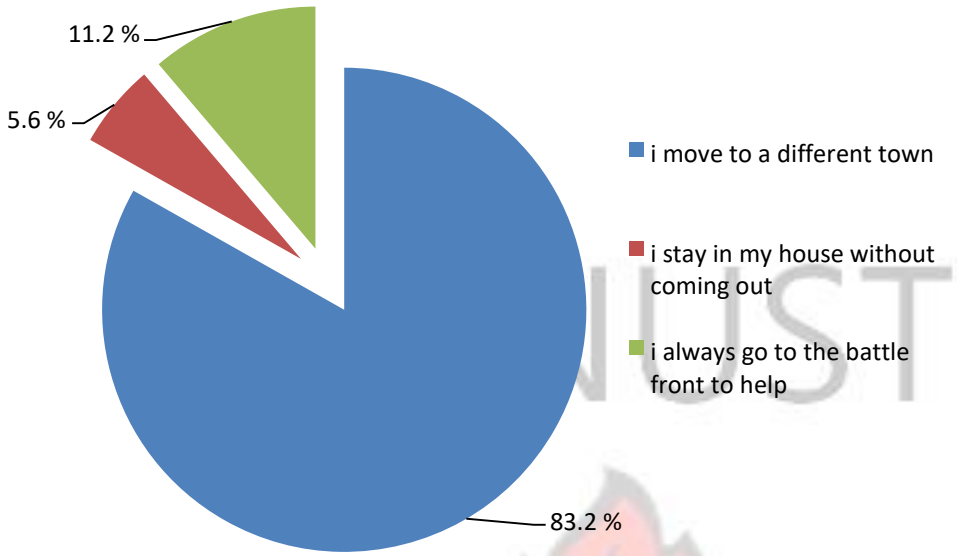

Figure 4.8: Actions taken in case of conflict in the study area

4.28 State of business activity when conflict is in progress in the 4 selected districts

On the state of business activity in the communities visited when conflict breaks out, majority (88.8%) of the respondents (Fig. 4.9) indicated that they abandon their businesses when there was conflict whiles 2.2% of the respondents hire labourers to take charge of the business for them. This could also create scarcity of labour because the same people available to be used as labour are those who go fight to maintain peace (FAO, 1998). About 4.5% of the respondents also said they sell all their assets and in extreme cases close down their business, whereas others continue to do business irrespective of the state of the conflict (4.5%). According to JHPIP, (1998) those who sell their assets and abandon business contribute to worsening the already endemic poverty condition of the area.

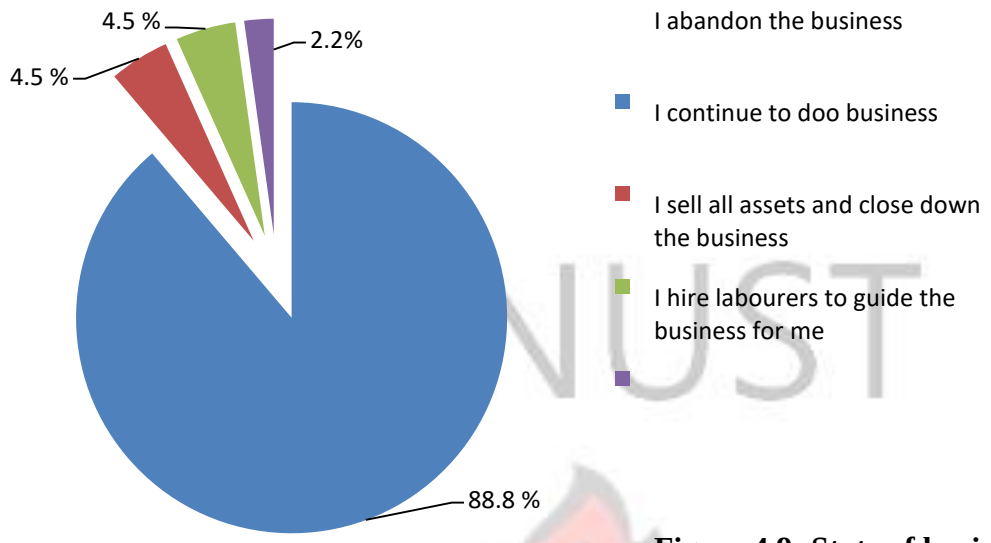

Figure 4.9: State of business activity when conflict is in progress in the 4 selected districts

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

This study examined the effect of conflict in the attainment of sustainable land use systems. The study examines the sources and types of conflict associated with land use systems and the impact of conflict on the attainment of sustainable land use systems. The agroforestry technologies that can help to reduce conflicts in relation to land use system were investigated. It also explored the strategies adopted by people in conflict zones to promote sustainable land use systems. Most of the people interviewed were aged between 21-40 years. Majority (60%) of them was married and about 51% were Christians. Most of the respondents were illiterate (45.5%). Major occupation identified included farming, civil servant, store owners and carpentry. Crop farming (70.5%) dominated farming activities carried out. Averagely, the respondents interviewed had lived in the locality for

over 17 years. About 40.2% of respondents indicated that they came to the community purposely to work.

Land acquisition by farmers was mainly through temporal lease (40.9%), inheritance (27.3%) and purchase (26.1%). Between 1-3 acres of the land (55%) was privately owned by the respondents. Most of the respondents (42.5%) entered into the „Abusa" land tenure agreement, which means that proceeds (crops) were divided into three with the farmer taking two parts.

The sources and types of conflicts identified included land litigation issues, chieftaincy disputes, ethnic clashes, political clashes, religious conflicts, family disputes, invasion by Fulani herdsmen, sporting disputes and finally festival celebrations.

About 59.1% of the 89 respondents said that land litigation issues were present in their respective communities. From the study, the land used by respondents was either family, private or community owned. The impact of conflicts affected farming (both crops and livestock production), destruction of the vegetation by fire, destroying of houses and properties, loss of lives and displacement of people as well as abandoning of land to save life.

Most of the respondents interviewed were not too satisfied with the agreement made with the landlords. Reasons assigned included restriction on land use, delays in releasing land, cheating by landlords and the land being too expensive. However, poor land use agreement hampered productivity. Special tenancy agreements such as food crops, land tenure and tree tenure were agreements some of the respondents enter with the landlords.

Interestingly, a large proportion of the respondents interviewed did not have such agreements.

About half of the respondents said there were other problems associated with the land acquisition process. Most of the respondents mentioned that lands were located farther away from residential communities and/or comes with a lot of restriction. Some also said lands were rocky, waterlogged and infertile in nature. On the action taken when conflict erupt, majority of the respondents move from their town to a different town.

Others also abandoned their businesses for safety.

5.2 CONCLUSIONS

The study examined the effects of conflicts in the attainment of sustainable land use. Among other things which were examined were the sources and types of conflict, the impact of conflict on lives and properties, agroforestry technologies that can help to minimize conflicts in land use as well as the coping strategies adopted by people in conflict zones.

5.2.1 Sources and Types of Conflict

The study revealed that land litigation issues, chieftaincy disputes, ethnic clashes, political clashes, religious conflicts, family disputes, conflicts resulting from Fulani herdsmen, sporting activities and during festival celebrations are the sources and the types of conflicts in the study area. However, litigation issues, chieftaincy disputes, ethnic clashes, and political clashes were the major ones.

5.2.2 Impacts of Conflict on Land Use In the Study Area

Conflicts have a lot of impacts on land use being the destruction of farms and vegetation and the demolishing of houses and properties. Some also included loss of lives, displacement of people and abandoning of crop land to save lives in the study area.

5.2.3 Coping Strategies Adopted By People in Conflict Zones

Although, a lot of strategies were adopted by people when conflict erupted, the most common strategy adopted by the farmers according to the research was moving from their town to a different town.

Some also went to the battle front to help, some hire people to guard their businesses for them while others sell their asset and close down their businesses.

5.2.4 Agroforestry technology used in preventing conflicts on land use

The agroforestry technologies used in farming for preventing conflicts on land use included clearly delineating boundaries with trees and planting fast growing ideotype in land use sites and leaving big trees on farm as „tree god". It was also revealed that some practice fodder bank agroforestry technology in order to get feed for their livestock thereby reducing pressure on farm land.

5.3 RECOMMENDATIONS

Based on the findings of the study, the following policy recommendations therefore need to be put in place by Non-Governmental Organizations and other stakeholders to resolve conflicts associated with land use. Some of the recommendations are:

1. Government should help farmers" secure large land and encourage them to practice agroforestry systems in farming as a way of stepping down land related conflict.

2. Farmers should be encouraged and assisted to ensure that they have written agreement on the land for farming.
3. Farmers should be educated on agroforestry technologies used in farming to prevent conflicts on land use.
4. There should be stakeholders meeting to help resolve various forms of conflicts at the initial stage to prevent more violent clashes in conflicts communities.

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY FACULTY OF RENEWABLE NATURAL RESOURCES DEPARTMENT OF AGROFORESTRY

QUESTIONNAIRE FOR MSC THESIS

TOPIC: THE EFFECTS OF CONFLICT ON THE ATTAINMENT OF SUSTAINABLE LAND USE SYSTEMS IN GHANA

1. PERSONAL CHARACTERISTICS OF RESPONDENT

(a) Name of Respondent…… (b)

Sex: male ( ) female ( )

(c) Age……

(i) Below 20, (ii) 21 – 40, (iii) 41-60, iv) 61-80, (v) above 80

(d) Malaria status (i) Single ( )

(ii) Married ( )

(iii) Widow ( )

(e) Place of birth……Region……

(f) If your home town is outside locality, when did you come here?.....

……

(g) Why did you come here?.....

(h) Ethnicity……..

(i) Region (a) Christian b) Muslim (c) others (specify) (d) None

2. LEVEL OF EDUCATION

(I) Illiterate

(II) JSS

(III) SSS

(IV) Tertiary

(V) Others

3. OCCUPATION

(a) Crop farming

(b) Livestock farming

(c) Public/civil servant

(d) Other (specify)

4. TO IDENTIFY THE SOURCES AND TYPES OF CONFLICT IN LAND USE SYSTEM

- Land Acquisition or Tenure Related Source of Conflicts (j)

How many acres of land do you have for your business?

< 1 acre ( ) 1 acre ( ) 2 acres ( ) 3 acres ( ) above 3 acres (specify)……

(ii) How many acres of land personally owned?.....

(iii) What agreement do you enter into the land lord before using the land?

(a) Abunu ( ) (b) Abusu ( ) (c) Others (specify)…… (iv) How did you acquire the land?

(a) By purchase

(b) By temporally lease

(c) By inheritance

(d) Others (specify)…….

(v) What do you use land for?

a) Farming (permanent tree crops)

b) Livestock

c) Forestry/agroforestry

d) Others…….

(vii) Are you satisfied with the agreement made by the land Lord?

(a) Yes (b) No c) no too satisfied

(viii) In which way does the agreement affect your business?

(a) It enhances productivity

(b) It has no effect on productivity

(c) It hampers productivity

(d) Others (specify)……

(ix) If you are a tenant explain any special tenancy arrangement with your landlord with respect to

(1) Tree tenure

(2) Land tenure

(3) Food crops

(4) Others

specify……..

(x) Any other problem associated with land acquisition? (a) Yes b) No

Give reasons for your choice…….

➢ Chieftaincy Dispute and its Related Source of Conflict.

(i) Is there any litigation on your land? (a) Yes b) No

If yes explain……

(ii) What is the ownership of your land?

a) Community own (communal land Tenure)

b) Family/clan

c) Private ownership

d) Others (specify)

(iii) Is there any chieftaincy dispute in your area? (a) Yes b) No

(iv) If yes how does it affect your land use?.....

(v) Are there any ethnic clashes or tribal conflicts in your community? (a) Yes b) No

(vi) If yes how do they affect you?.....

……..

(vii) Is there any political clashes? (a) Yes b) No

(viii) If yes how do they affect your land use?.....

……..

(ix) Is there any other source of conflict?.....

5. TO DETERMINE THE IMPACT OF CONFLICT ON LAND USE

Which of the following happens to you when conflict breaks out?

(i) I am unable to farm

(ii) Farms/crops are destroyed

(iii) Livestock are destroyed

(iv) Vegetations are burned

(v) Properties/houses are destroyed

(vi) People are displaced

(vii) People are killed

(viii) Land use and its activities are abandoned

(ix) Others

……

6. TO PROPOSE AGROFORESTRY TECHNOLOGY THAT CAN HELP TO REDUCE CONFLICT IN THE LAND USE.

How do you prevent conflict using your land use system?

(i) clearly delineating boundaries using trees

(ii) planting of fast growing ideotype in land use sight

(iii) leaving big trees on farm as "tree god" (iv) others (specify)

7. TO DETERMINE THE VARIOUS COPING STRATEGIES ADOPTED BY THE PEOPLE IN CONFLICT ZONES.

(a) Which place in your community was the most affected in the recent conflict in your place?

(i) In the residential areas

(ii) In business/industrial areas

(iii) In bush and farms

(iv) In both bush and houses

(v) Others ……

(b) What do you do in case of conflict?

(i) I move to different town

(ii) I stay in my house without coming out

(iii) I always go to the battle front to help

c) How do you go about your business at the time conflict is in progress?

(i) I abandon the business

(ii) I continue to do business

(iii) I sell all the assets of the business and close down the business (iv) I hire labourers to guide the business for me.