UNIVERSITY FOR DEVELOPMENT STUDIES

AGRICULTURAL LAND DEALS, FARM LAND ACCESS AND LIVELIHOOD CHOICE DECISIONS IN NORTHERN GHANA

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BY

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THESIS SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL AND RESOURCE ECONOMICS, FACULTY OF AGRIBUSINESS AND COMMUNICATION SCIENCES, UNIVERSITY FOR DEVELOPMENT STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PHILOSOPHY DEGREE

IN

AGRICULTURAL ECONOMICS

AUGUST, 2017

DECLARATION

Candidate's Declaration

I hereby declare that this thesis titled **"Agricultural Land Deals, Farm Land Access and Livelihood Choice Decisions in Northern Ghana"** is my own original work and has never been submitted in whole or in part for the award of any degree in this university or elsewhere.

Name	**Signature**	**Date**
Prince Nketiah	_____	_____

Supervisors' Declaration

We hereby declare that the preparation and presentation of this thesis was supervised in accordance with the guidelines on supervision of thesis laid down by University for Development Studies.

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Dr. Michael Ayamga **Principal Supervisor**	_____	_____

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Mr. Franklin Nantui Mabe **Co-Supervisor**	_____	_____

ABSTRACT

The study was conducted in Kassena Nankana East Municipal and Gushiegu District where there are highest recordings of registered medium and large scale lands within the northern belt of Ghana. This study assesses how agricultural land grabs affect farm households' access to land and also their access to other alternative land based resources and services. It then considers livelihood strategy adaptation among farm households within affected communities in Northern Ghana. A two stage sampling technique was used to stratify communities into affected and non-affected, then 302 respondents were randomly sampled to gather primary data for the study. The study compared affected and non-affected responses using a t-test analysis and found out that the non-affected respondents unexpectedly had difficult access to alternative land based assets than affected communities. Also, Chi-square analysis on fallowing decision of farmers showed that direct impact category of respondents had the shortest of fallow periods. Using a multinomial logit model, the study estimated how acquisition specific characteristics influence the decision of a farm household to choose either intensive, semi-intensive or low intensification farming regime. The study adds to existing argument on commercial land deals that farmers in affected communities do not benefit directly from these arrangements but rather suffer limited farm land access and low land fallowing periods. The study also found that actors engaged in land deals within the study area are mostly endogenous investors rather than transnational. Farmers within affected communities were also found to engage investors to negotiate for rights to use parts of acquired lands. These agreements results in the payment of token to investors and represents an emerging form of land commoditization. Longer years of acquisition within affected communities also contributed to farmers' choice of intensive farming. The study recommends among other suggestions that regulation must be put across to check the limits to which medium and large scale lands can be taken from a particular district in Ghana. Also, community-investor partnerships are also to be prioritized for gaining access to government and donor backed acquisitions. Commercialisation of land must then also be accompanied by efforts to diversify livelihoods away from land-based systems.

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DEDICATION

I dedicate this work to God for Him and through Him all things were made perfect. Secondly, to my parents Mr. Kwesi Nketsia and Mrs. Veronica Snyper and also to the loving memory of the late Jerry Aboagye Nketia.

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LIST OF ACRONYMS

ACRONYM	DEFINITION
AfDB	African Development Bank
AUC	African Union Commission
DI	Direct Impact
ECA	Economic Commission of Africa
EDAIF	Export Trade, Agriculture and Investment Fund
FFI	Fauna and Flora International
FIAN	Food First Information and Action Network
GCAP	Ghana Commercial Agriculture Project
GRSSP	Ghana Rice Sector Support Project
GSOP	Ghana Social Opportunities Project
ICOUR	Irrigation Company of the Upper Region
IWAD	Irrigated Water and Agriculture Development
KNEM	Kassena Nankana East Municipal
MOFA	Ministry of Food and Agriculture
NI	No Impact
OECD	Organisation for Economic Cooperation and Development
RUF	Random Utility Framework

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Land is indisputably one of the most important livelihood resources of the rural population in sub-Saharan Africa. As a resource, land indirectly supports the livelihood of rural people extensively as it provides suitable medium from which raw materials used for shelter, food and medicine are acquired. Also, land directly provide livelihood assets such as water, herbs, timber and non-timber trees of high economic value especially Shea among others. Rural livelihood depends largely on subsistence farming, where individual households cultivate portions of community land basically for the production of food for domestic consumption.

In developing countries, rural farm households derive income from foraging the forests (Wunder *et al.*, 2014). The increasing dependence of rural farm households on land and other land based resources like forest means that activities that impact on land and forest would have direct implications for rural farm households and their livelihoods. Biodiversity loss in itself has a direct influence on forest-livelihood linkages which are increasingly exposed to risk as human activity continues to diminish habitat for other flora and fauna. One example of risk to biodiversity and forest ecosystems is the increasing demand on land for commercial agriculture purposes (Somorin, 2010). Human activity affecting the existence and inter-dependence of the environment and mankind; as habitats

are continually transformed for agriculture, managed forest or urban development (Polasky *et al*., 2005).

Apart from land for farming, rural farm households derive other essential forest products and services such as wild fruit, game and fuelwood through ownership and use rights to land. The increasing significance of land and forest to the socio economic development of rural smallholder farmers means that activities and factors that affect existence, access and use of land by rural households must be understood. This should include analysis of the factors that impact on the sustainable use of land.

Agribusiness opportunities triggered by rising food prices coupled with investments by government to modernise agriculture has increased demand for farmland in Ghana. This demand is manifested in medium and large scale land acquisitions for agricultural and energy production purposes. Notable among these uses are cultivation of biofuel crops, commercial agriculture as well as concessions for mining (Kranjac-Berisavljevic, 2015). In 2009 it was estimated that about 8.8 % of arable land in Ghana was already under the cultivation of Jatropha (*Jatrophacurcas)* and this translates into 4.6 % of total land size of Ghana (Schoneveld *et al.*, 2011). The worldwide upsurge in land deals for commercial purposes became globally known as land grabs (Rulli *et al*., 2012).

This regime of land grabbing is partly necessitated by the great need to attract foreign investments and the government's quest to enhance rural livelihoods. There is an absence of high earning rural industries in Africa (Headey and Jayne, 2014) to which Ghana is no

exception. In the quest to facilitate agricultural and rural development, the government of Ghana has on a number of occasions exercised its statutory right to appropriate land under Article 257 of the 1992 Constitution of Ghana, to facilitate land acquisition by foreign transnationals. Among such arrangements is the World Bank and Ghana government partnership that brought about the Irrigation Company of the Upper Region (ICOUR) managed Tono irrigation system, Irrigated Water and Agriculture Development Ghana Limited (IWAD) irrigation project in Mamprusi Moaduri, Aveyime rice project and the Ghana Social Opportunities Project (GSOP) facilitated mango plantations among others. Traditional authorities also initiate both transnational and domestic land deals by leasing out land. The Fieve rice project and Kusawgu Jatropha plantations are notable examples of such arrangements.

It is estimated that 80 % of land ownership and right falls in the domain of customary land titling in Ghana (Sarpong, 2006). This system of land ownership puts allodial title in the custody of chiefs and Earth Priests on behalf of the people and future generations (Ayamga *et al*., 2015). In the three northern regions of Ghana, it is common to find heads of clans and families having control over who get access to land within the clan or family. There exist also what is known as freehold where land is owned by individuals, families and clans.

1.2 Problem Statement

Farm households make decisions against risk factors towards achieving the best outcomes as they guard against events and incidences that reduce their perceived incomes and/or increase their cost of production. Such undesired events and incidences (i.e. escalating cost of inputs, high climate variability, land loss, etc.) constitute farmers' risk. Onset and persistence land grabbing increases the farmers' likelihood of loosing their productive lands.

The risk is much pronounced when rural people are deprived of usufruct rights and access to the benefits of land under customary tenure systems. Hardship on rural households is exacerbated when access to important livelihood assets such as water bodies, wild fruits, herbs, game, timber and economic trees is curtailed. This situation diminishes the livelihood options of rural farm households (Kranjac-Berisavljevic., 2015). Reduced livelihood assets have direct forward linkage to increased migration, diversification and the intensification of farm lands as evident from the livelihood framework developed by Scoones (1998). Land deals by domestic and transnational corporations has been shown to have profound effects on land relations and access to land for smallholders as they contribute to reduced livelihood assets, which in turn have direct effect on livelihood strategies.

A key feature of the customary land tenure system is the inherent mechanism that protects the usufruct rights of peasants such that farmlands are virtually never lost while under cultivation (Goldstein and Udry, 2008; Quisumbin *et al*., 2001). The interest of medium

and large scale agricultural investors in cultivated farmland is a relatively new dynamic in land relations. Goldstein and Udry (2008) also demonstrated that, farmers who lacked local political power and were not confident of maintaining their land rights fallowed their land for less than technically optimal durations at the expense of large proportion of their potential farm output.

Within the framework of Goldstein and Udry (2008), increasing demand for land is a source of risk. A risk that limits usufruct land right holders ability to fallow land in an optimal manner. There is a risk to the farming system in that gaining access to more land to for extended fallowing to regenerate depleted land is limited. Land deals by domestic investors and transnational corporations is a source of risk to smallholder farmers and has a bearing on their livelihood and farming system choices.

There has been outcry against the selling of land by chiefs and other customary authorities in Ghana as land commercialisation spreads across the length and breadth of the country over the past three decades (Yaro and Tsikata, 2014). The widespread appropriation of land by chiefs and major clan heads has implications for smallholder inclusive development (Jayne *et al*., 2014) and the ability of households to acquire land to build and develop sustainable livelihood systems around agriculture.

Land grabs is an evolving phenomenon and there continues to be debate on the dimensions of issues that studies on land grabs should cover. Eldman *et al*. (2013) outline the key issues studies on land grabs need to address:

1. What to include and what to exclude in the definition of land grabbing because they have important implications for where we turn our analytical gaze.
2. How do we count land deals and how do we measure the extent of the phenomenon.
3. How do we understand processes of social change—including antecedents, 'drivers', legal frameworks, contentious politics and impacts of land grabbing? These issues have major implications for how we explain existing and emerging social structures. For example, some observers limit their examinations of land grabbing to land transactions dedicated to food production by foreign (state and/or corporate) entities, while others broaden the definition to include 'green grabbing' or deals aimed at profiting from carbon sequestration.
4. What range of actors are involved? What relations or links exist between foreign and domestic capital, old and new investors, or state and non-state players in land grabbing.
5. How may we understand the varied political reactions to land deals by affected social groups.

Stemming from point four of Eldman's framework, it is important for a research to identify the actors of land deals in the study area and highlight the dimensions by which their operations affect rural farm households with reference to their statuses as trans-nationals or domestic actors.

The 1992 Constitution of Ghana vested the power of land management in the hands of chiefs and principal landowners. This divestiture provided the basis that facilitates the acquisition and consolidation of land on the large-scale by the local elites and foreign companies from the chiefs and principal landowners for food and non-food crop

production. Despite arguments that much of the land grabs in Ghana occur in "so-called open lands," Yaro and Tsikata (2014) argue that grabbed lands include bush lands and common lands, which are the sources of valuable resources which supplement other agrarian livelihood activities and protect the long term survival of smallholder agriculture. The observation by Yaro and Tsikata (2014) points to three scenarios at least. In the first, land deals either by transnational corporations or medium scale domestic investors squeeze land access for smallholders and increase the risk of landlessness. Secondly, smallholders lose access to other land based natural resources such as wild fruits and fuel. Thirdly, there is the risk to the survival of smallholder farming systems thus threatening the livelihood alternatives for smallholders. The effects of land deals on farmer risk perception and response behaviour is the main focus of this study. While there is documented evidence Kranjac-Berisavljevic (2015); Schoneveld *et al*. (2011) of medium and large scale land grabs across Ghana, the study of its impact on farm households as agricultural risk and livelihood choice decision making remains less explored.

Despite widespread land deals across Ghana and particularly in northern Ghana, there is little attempt to emphasize on how land deals influence farmers' perception of risks and their livelihood choice decisions. This study explores land deals in northern Ghana and how they influence agricultural livelihoods in the study area. Four key research questions explored are:

1. What are the dynamics of medium and large scale agricultural land acquisition in northern Ghana?

2. How do land deals affect access to land and its associated resources?

3. To what extent do medium and large scale land deals affect alternative land resources and services in the study areas?

4. What relationship exist between land deals and livelihood decisions?

1.3 Objectives of the Research

This study sought to analyse the scale and dynamics of large and medium scale land deals and how these affect risk of land access and livelihood alternatives for smallholder farm households. The specific objectives are to:

1. Examine scale, actors and drivers of land deals in Northern Ghana.

2. Analyse the extent to which land deals influence land availability and land access in the study area.

3. Determine the effect of land deals on alternative land resources and services in the study area.

4. Examine how land deals influence the livelihood choice decisions of farm households.

1.4 Scope of Study

1.4.1 Geographical Scope

This study focused on farm households within the two districts which on record has the most registered parcels of land in the Northern and Upper East regions of Ghana (See appendix 5 and 6).

1.4.2 Contextual Scope

This context of land deals in the study would include medium and large scale actors; private and public actors; and state and non-state actors. The study focused on examining the drivers which includes motivations and incentives driving both domestic and multinational corporations. The scope of the study also included the impact of commercial scale land deals on smallholder farmers who depend on customary arrangements to gain access to land and land services. It examined both direct and indirect impacts of land deals in the study area.

1.4.3 Time Scope

The study made use of relevant secondary and field data readily available as at October, 2016.

1.5 Justification of the Study

The study is expected to provide information that will help government achieve the United Nation's Sustainable Development Goal (10) - to reduce inequality. The study is intended to contribute to the advocacy towards curtailing the deepening effect of medium and large scale land deals on rural farmers' access and use of land by providing information on risks and coping strategies within affected communities. It is important for policy makers to be clear on the underpinning issues of land deals carried out in the study area in order to design appropriate policies.

On the other hand, further studies on the subject of land grabbing would be guided by the outcome of this study as the categorisation of the degrees to which livelihood assets and farming activities are affected by the influx of commercial land deals has been determined.

Policy makers can also rely on the determinants of farmers' livelihood strategy adaptation in the midst of medium and large scale land acquisitions explored by this study to factor into decisions and directions on the dimensions of land grabbing and the overall effect it would have on the agriculture sector of the Ghanaian economy.

This study will also add to existing knowledge as it has analysed both direct and indirect effects of land acquisitions based on a statistical comparison between affected and non-affected categories of respondents within the districts where lands have been acquired. Such analysis has not yet been found in available literatures.

1.6 Organization of the Study

This thesis is organised into five chapters. Chapter two contains a review of related literature on land, livelihood and socio-economic implication of land as well as related knowledge gaps identified in the literature. The chapter also reviews literature on the economic relations and underpinnings of the research.

Chapter three gives insight on the research methodology, study area, sources of the data, sampling methods, data collection techniques and the techniques for data analysis. The chapter also includes the theoretical framework with basic assumptions and definition of terms which form the basis for the conceptual framework.

Chapter four presents the results and an evaluation of the findings of the study and discusses extensively the relationship among policy variables. Chapter five comprises the summary and conclusions derived from the data analysis as well as the policy or planning implications of this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter has been thematically organized to enhance understanding of the main issues covered in this study. Section 2.2 discusses the land ownership and right in Ghana; section 2.3 discusses the concept of land grabs; section 2.4 elaborates farm household livelihood dynamics whiles 2.5 discusses farm household characteristics in northern Ghana. In section 2.6, forest livelihood assets are discussed; 2.7 also discusses farmers' risk behaviour, whilst 2.8 elaborates the framework of land deals and farmers' decision; 2.9 to 2.11 discusses the multinomial logit model.

2.2 Land Ownership and Right in Ghana

In Africa, the subject of who owns land in Africa is dynamic and depends on the societies, regions and countries. This means land administration is country specific and in some cases regime specific. Elbow *et al*. (1998) assert that different colonisers and post-independence legal trials have resulted in this particular feature of a differentiated form of land administration system in Africa. Even though the continent basically shows an inter-marriage of statutory and customary land tenure systems, it differs across the length and breadth of the continent.

Customary land tenure is the most common and widely practiced form of ownership in West Africa. Customary land tenure is more of a social construct from which land is vested in chiefs and head of clans who manage land on behalf of the people (Ayamga *et al*., 2015).

Customary ownership often results in two types of ownership rights; the primary and secondary type of ownerships (DFID, 1999). The former is gained by virtue of ancestral lineage or kingship, while the latter is a derived form of right gained from a primary right holder. Both primary and secondary types of land ownership rights are very common to rural community dwellers in West Africa and in Ghana. The state also owns land in most of the countries in West Africa but the percentages owned are almost always small as compared to that of the customarily owned land. For instance, the state owns 20% of the total land size in Ghana (Auc-Eca-AfDB consortium, 2011).

2.3 The Concept of Land Grabs

Land grabs mostly refer to the sale of land to either a local or foreign commercial agent. Nunow (2011) defines land grabbing as any form of acquiring large tracts of land, mostly in developing nations, by local government agencies, individual venture capitalist and richer food insecure countries, usually with the aim of producing agricultural and non-agricultural commodities (crops, bio-fuel or minerals) for export. Crabtree-Condor and Casey (2012) also define land grabbing as the acquisition of land by foreign firms, investors and governments, as well as by domestic investors in developing countries.

Both definitions highlight a form of exchanges or payments for a parcel of land. Also common to both definitions is the feature of 'developing countries' as the domain where the sale of huge tracts of land mostly occur. FIAN international (2010) takes a drift of the excessive focus on international or external paid acquisitions and defines land grabbing as

acquiring a scale of land which is disproportionate in size in comparison to the average land holding in a particular area for commercial agricultural production. FIAN's definition of land grabbing portrays the phenomenon as being an endogenous and exogenous affair from which similar effects may arise. Table 2.1 shows the five (5) leading nations contributing to major land deals worldwide whilst table 2.2 shows twenty-four (24) most targeted nations in the world.

Table 2. 1: Leading contributors to global land grabs

	Grabbed land size	
Grabbing country	Grabbed area (A_g) $(10^5 ha)$	% of total global grabbed land
China	34.116	7.272
Israel	20.000	4.263
United Arab Emirates	26.772	5.707
United Kingdom	44.092	9.399
United States	37.002	7.887

Source: FAOSTAT (36), accessed in May, 2016

Table 2. 2: Most grabbed nations that makes up 90% of all land grabbing world-wide

Grabbed country	Grabbed area (A_g) $(10^5 ha)$	% of total global grabbed land	% of country's cultivated land	% of country area
Argentina	63.1	1.34	1.97	2.26
Australia	46.45	9.9	9.78	0.6
Brazil	22.55	4.8	3.29	0.26
Cameroon	2.95	0.63	4.01	0.62
Congo	6.64	1.41	8.91	0.28
Ethiopia	10.01	2.13	6.68	0.91
Gabon	4.07	0.87	85.75	1.52
Indonesia	71.39	15.21	16.76	3.75
Liberia	6.5	1.38	106.52	5.83
Madagascar	3.69	0.79	10.4	0.63
Morocco	7	1.49	7.73	1.57
Mozambique	14.97	3.19	28.24	1.87
Nigeria	3.62	0.77	0.98	0.39
Pakistan	3.34	0.71	1.57	0.42
Papua new Guinea	3.14	0.67	32.75	0.68
Philippines	51.71	11.02	49.48	17.24
DR. Congo	80.5	17.15	1.08	3.43
Russia	28.31	6.03	2.29	0.17
Sierra Leone	4.94	1.05	40.62	6.88
Sudan	46.9	9.99	23	1.87
Tanzania	20.27	4.32	17.63	2.14
Uganda	8.59	1.83	9.7	3.56
Ukraine	12.08	2.57	35.53	2
Uruguay	3.46	0.74	18.08	19.61

Source: FAOSTAT (36), accessed in May, 2016

The sale of land is not as important as the contention that arises from the deepening effect it has on the already unequal access to land and the capacity of target nations to equally transmit the benefits from these transactions efficiently. De Schutter (2011) argues that, effective supervision and monitoring of these land investments would curb the institutional failure in trickling down the benefits from commercial land deals. Schutter added a dimension to the debate emphasising the dangers associated with the emerging export oriented monocrop plantations as having the potential to increase the susceptibility of target countries to price shocks and also increase the pressure on indigenes demand for land in the long run.

Most endogenous land deals in Africa are unregistered, even if registered, the transaction is kept secret. Negotiations and discussions on exogenous land deals equally are kept out of public scrutiny in Africa (Cotula, 2011). The big question has therefore been that how have these commercial deals contributed to alleviating poverty and livelihoods enhancement of the rural poor as well as lessening the plight of developing nations at large? This question has intrigued many researchers, hence arousing their inquest in attempting to find answers. Such research include that of Cotula *et al*. (2009) which studied commercial land contracts using data from five African countries (Ethiopia, Ghana, Madagascar, Mali and Sudan) within the period from 2004 to 2009. The study concluded that macroeconomic incentives and food security improvement promises by host parties has seen no fruition in these countries.

2.3.1 Commercial land acquisition in Ghana

Ghana has in recent times recorded several commercial land deals. Investment in agriculture has been the primal objective of these transactions but quite a number of these lands are also acquired for the cultivation of biofuel crops and as mining concessions (Kranjac-Berisavljevic, 2015). There are quite significant parcels of land allocated to the commercial cultivation of oil palm, rice, mango, pineapple and other export oriented agro commodities. Most of these acquisitions can be located in the south western and south central parts of Ghana.

There are about twenty different companies growing energy crops in Ghana, mostly of foreign origin and sometimes with Ghanaian counterparts (Kranjac-Berisavljevic, 2015). Incessant volatility of fossil fuel prices on the international market have arisen the interest of many nations to the acquisition of land for Jatropha. The cultivation of Jatropha in Ghana is mainly aimed at biodiesel production. Fertile agricultural lands that were, in most cases, under active use by rural farm households have been acquired through traditional authorities and Ghanaian middlemen (Antwi-Bediako, 2013). In Ghana, there have been concrete efforts to promote the use of biofuels while at the same time the cultivation of Jatropha, a plant with little alternative use and value to farmers is on the increase. According to Schoneveld *et al*. (2011) these Jatropha companies collectively had access to 1.184 million ha of land, which in estimate takes an equivalent to approximately 8.8% of arable land in Ghana is already under the cultivation of Jatropha (*Jatropha curcas)* and this translates into 4.6% of total land size of Ghana. In some instances, only 10% of the total

land acquired for Jatropha production has been used for actual cultivation whilst the remaining 90% was abandoned due reasons such as lack of ready market for Jatropha in Ghana and unavailability of funds to sustain such projects. These abandoned lands have led to pockets of conflict between the investors and local people who need the land for other agricultural uses.

A critical look at various angles of the expected win-win outcomes of commercial land deals on the improvement of rural livelihood in Ghana has been embarked by researchers. ElHadary and Oben-Odoom (2012) found out that land deals benefit the signatories but not the interest of the public. Potential aggravation of rural poverty looms as societal wellbeing of many Ghanaians in farming communities continue to lose access to vital livelihood resources owing to the promotion of monoculture plantation crops (Schoneveld *et al*., 2011).

2.3.2 Land deals in Northern Ghana

The trajectories of land tenure, land right transfer and use of land in northern Ghana have been well explored by many researchers in recent years. Notable among these is the anthropological perspective of medium and large scale land deals studied by Yaro and Tsikata (2014). In the study of Yaro and Tsikata they explored key transnational acquisitions to establish among other things, the different interest groups affected by land deals as well as establishing the scenarios through which those agreements were reached.

From the account of Yaro and Tsikata (2014) these transnational agreements have lived far below the expectation of communities who originally were supposed to have benefited from these investments either by way of job opportunities or technology adaptation. The study further concludes that, biodiversity stands a great risk as very large stretches of land were cleared with no regard to the existing fauna and flora.

Nyari (2008) and Kranjac-Berisavljevic (2015) are in one accord in describing the spate of huge land released to transnational agencies to cultivate Jatropha (a biofuel plant). Nyari describes the method by which a Norwegian company took ownership of 38,000 ha of land from Kusawgu in the northern region as colonial and inferior.

A gender perspective of the land discussion has also been explored in Adolwine and Dudima (2010) as they took a gaze at women right to own urban lands in a patrilineal setting of Sisala East district of northern Ghana. Adolwine and Dudima found out that, women with right financial standing have no limitations to own and operate urban lands in the study area. Bambangi and Abubakari (2013) arrived at similar finding in their study of ownership and access to land in urban Mamprugu.

2.3.3 Impact of land acquisitions on farmland availability

Land is an economic, a political and socio-cultural issue. It is essential to address issues of land in Ghana because about 56 % of the population lives in rural areas and 51 % of the total population of Ghana earn their livelihood through agriculture (MOFA, 2011). This

notwithstanding, the sector also contributes to 19 % to the total Gross Domestic Product of the country (GSS, 2017). This shows that a significant number of the people in Ghana use land for their agricultural activities or would need land for farming in the near future. Agricultural land area and use in Ghana is best described in the table 2.3.

Table 2. 3: Ghana's agricultural land area and use

Type of Land Use	Hectares	Percentage
Agric. Land Area (A.L.A.)	13,628,179	57
Area under inland waters	1,100,000	5
Others (forest reserves, savannah woodland, etc)	9,125,721	38
Total Land Area (T.L.A.)	**23,853,900**	**100.0**

Agric. Land Area (A.L.A.)	Hectares	%
Area under cultivation (2010)	7,846,551	57.6
Area not under cultivation (2010)	5,781,628	42.4
Total	**13,628,179**	**100.0**

Sources: The Ghana Survey Dep't. and MOFA, (2010)

Land has social, economic and political dimensions. The political dimension bothers on land management, distribution and equity in access. The economic dimensions focus on the value of land and the fact that it is a means of livelihood. Social cohesion, peace and intra and inter community conflicts in many instances revolve around land. Therefore national stability and harmony depends largely on land dispute settlements at all level of

the social strata. Apart from the economic and political nature of land issues, socio-cultural connotations of land in Ghana are of much importance and cannot easily be over-looked. In Ghana, having ownership right and access to land may depict self-actualization, prestige, belongingness, power, wealth among others.

Agricultural land usage in Ghana is characterised by a high level farm land fragmentation and subsistence farming. It is estimated that 90% of farms in Ghana are less than two (2) hectares in size (MOFA, 2011).

Table 2. 4: Ghana's agricultural land area by region

Region	Area (000 sq. km.)	% of Total
Northern	70.38	29.5
Brong-Ahafo	39.56	16.6
Ashanti	24.39	10.2
Western	23.92	10.0
Volta	20.57	8.6
Eastern	19.32	8.1
Upper West	18.48	7.7
Central	9.83	4.1
Upper East	8.84	3.7
Greater Accra	3.24	1.5
Total	**238.53**	**100.0**

Source: The Ghana Survey Dep't. and MOFA, (2010)

The existing scope and nature of land ownership, access and use becomes more complicated when threats such as unduly paid or unpaid compensation from large scale acquisitions is coupled with compulsory acquisition by government (Crabtree-Condor and

Casey, 2012). Either of the two scenarios poses a degree of uncertainty to the rural farmer as well as increasing his or her risk probability.

2.4 Farm Household Livelihood Dynamics

Livelihood strategy is defined by Adi (2007) as any activity a household actively participates in to make a living which may either be linked with agriculture, non-agriculture or both. Adi (2007) focuses on the executable deeds of the person or group of persons involved in a particular activity through which they earn a living but fails to acknowledge the need for resources or assets availability. Economic Commission of Africa (2004) defines livelihood strategy as "the ways in which assets or resources are used to generate access to food and other basic needs".

A further understanding of livelihood presents livelihood as a 'totality of life' rather than it been perceived as a means of earning a living (FFI, 2013; De Haan and Zoomers, 2005). Livelihood is pivoted on availability and access to assets; be it economic, human, social or natural as shown by Scoones (1998). Assets according to De Haan and Zoomers (2005) include also the authorization for individuals to act and replicate, contest the prevailing status quo on the use and transformation as well as control over resources. The use of naturally occurring assets has been prioritized in the evolution of development since the days of Karl Max with the assertion of inequality in terms of access to resources that undermines the poor in society.

Rural community dwellers in Africa are mostly farmers. Rural livelihood is mostly characterised by a subsistence system of farming where farm households produce basically for consumption and on smallholder farms. It is estimated that 95 percent of farms within the Sub-Sahara region of Africa are smaller than five (5) hectares (Lowder *et al*. 2014). These smallholder farms rely heavily on rain-fed agriculture and rudimentary farm implements. Morton (2007) states that smallholder farming is deeply grounded in social relations among rural farmers in developing countries. Ghana is of no exception, since majority of farmers are predominantly smallholders whose labour is mostly provided by household and community members.

Farm households in Ghana do engage in other income generating activities outside farming. Some of these activities include; petty trading, processing, craftsmanship, artisanship and others. These forms of engagements differ from community to community depending on the depth of opportunities available to the individuals as well as the entire community. Exploitation of such opportunities also depends on the knowledge, skill levels and the extent of institutional support available to the individual or the community. A study by Adi (2007) found out that the key determinants of non-agricultural livelihood strategies are human capital and agro-climatic variables.

The discourse on development also stirs up contention over the need for alternative livelihood as against sustainable livelihood. Such discussion is much prominent in the structuring and evaluation of interventions for beneficiary communities usually under stress of low incomes and poverty in developing countries. Sustainable livelihood

emphasizes the development of skill that empowers beneficiaries to withstand uncertainties and recover from shocks whilst alternative livelihood seeks to provide beneficiaries with another avenue for income earning.

2.5 Farm Household Characteristics in Northern Ghana

The three northern regions of Ghana shares seemingly equal household and communal characteristics. According to the Ghana statistical service (2010), the average household size in the northern region is 7.7, which is higher than the national average of 4.4 members. Households with 10 members or more constitute the highest proportion (28.6 %) in the region. The reasons for this are high fertility, polygyny and the practice of nuclear and extended family members living together. However, the average agricultural household size in this region is 8.5 members compared to the national average of 5.3 members. This implies that, when one farmer loses access to his farm land, its effect is felt by approximately 9 members. This shows how serious the issues of land grabs can be. Among these are children of school going age and aged unproductive adults in the households. Research has shown that, these people's life depend on the little income and the consumption of farm produce for survival and other necessary livelihood activities to improve upon their well-being in their communities and the nation at large.

Land grabs would have had less effect on these farm households if a greater percentage of these households had diversified livelihood activities, but this is not the case. Changes in the portfolio of assets (such as land and its resources), productivity and the extent to which households have access are the attributes that are critical in determining livelihood

diversification and ultimately household welfare (Dorward *et al*., 2003). Farm household normally collect and use or sell firewood, Shea nuts and other wild fruits to earn something little for their survival. The lack of access to credit, institutional support and lower formal education has been the undermining factors influencing farmers' capacity to diversify their livelihood strategies and be resilient in Ghana. However, a good number of small scale farmers who are the majority in Ghana have low level of education or not educated at all. Asmah (2011) finds that non-farm diversification activities and household welfare are mostly driven by household assets and compositions including household age structure, education level and gender.

2.6 Forest Livelihood Asset

The study focuses on naturally occurring assets such as game, wild fruits and fuelwood. The importance of game to farm households cannot be underscored enough by this study. Some of the wild animal species found within the study areas include; *Marinae* (African Giant Rat), *Oryctolagus caniculus* (Rabit) and *Veranus seterosaurus* (Monitor lizard).

Wild fruit comprises of all those types of fruits which develop naturally in the forest without the supervision of man (Haule, 2016). Wild fruit gathering, processing and utilization serve as food for man as well as livestock. There is established evidence on the contribution of wild fruit to the economic status of rural dwellers in terms of incomes and food nutrient supplementation (Kwesiga *et al*., 2000). Among the most common tree species with edible wild fruit within the Guinea Savanna of Northern Ghana are *Parkia biglobosa* (Dawadawa), *Mangifera indica* (Mango), *Vitellaria paradoxa* (Shea tree),

Adansonia digitata (Baobab) among others. Apart from picking wild fruit for food and selling for income, most wild fruit are further processed into secondary product for food, cosmetic or medicinal purpose and secondary employment. Fruit such as Shea tree has outstanding properties in terms of secondary product extraction. These fruits and their associated economic contribution to rural livelihood remains threatened in the wake of medium and large scale land acquisitions.

Another important land based asset to rural livelihood is fuelwood. Farm households' dependence on wood as main domestic fuel source is significantly heavy across the country. In Ghana, fuelwood remains the cheapest source of fuel. Depending on the availability levels of natural vegetation, residents mostly gain a livelihood as they engage in gathering, transportation and sale of fuelwood as the demand from resource deficient communities continues to strive. This situation lingers on and has no end in sight in spite of the availability of alternative sources because of the fact that incomes are low in rural communities and also the absence of better income earning livelihoods. Studies by Couture *et al*. (2012) and Abebaw (2007) emphasize that the demand for fuel wood is driven mainly by income levels. Rural farm households are less privileged in terms of structural facilitation of modern energy sources, hence the importance of fuelwood in the lives of the rural settlers cannot be underestimated (Bekele, 2001). Onoja and Ijoko (2012) agrees with Dovie *et al*., (2004); An *et al*., (2002); Karekezi *et al*., (2002); and Israel, (2002) that there is an absence of substitutability among alternative sources of energy choices for rural community dwellers.

2.7 Farmers' Risk Behaviour

Events and incidences that reduce the perceived incomes or increase production cost of farmers are the main constituents of farmers' risk. OECD (2009) describe agricultural risk as a system of interactions between markets, governmental policies and decisions of farmers. Risk can be better described either by the frequency of occurrence or extent of damage.

Farmers have been observed to be risk averse in their approach to managerial and day-to-day decisions they make on risky events affecting both farm and off-farm activities. A study by Bardsley and Harris (1987) showed that farmers risk aversion increases among farmers with high income statuses but decreases with wealth of farmers. Isik and Khana (2003) built on this idea to study farmers' risk preference and adoption of site-specific technologies. Recent studies revisit the use of utility in measuring risk preference and attitude of farmers, such inquest is appropriate to enhance better quantitative interpretation and for refined policy directions. Lence (2009) looked at whether absolute or relative risk aversion is influenced by changes in wealth. He found out that, the use of distinct production data does not effectively project this relationship in the structure of risk aversion.

Eventually, the choices made by farmers end up as either a coping or adaptive strategy. Coping strategy as defined by ECA (2004) refers to the short term measure put in place by farm households in response to crisis such as income or food shortages. Coping strategy basically one of the two kinds of responses to unwelcomed situations and is the foremost

attempt towards attending to a crisis. In the long term adaptive measures replaces coping mechanisms (Berkes and Jolly, 2001). Regassa (2011) defines adaptive strategies as a set of defined activities put together towards a planned adaptation by a group of people usually a region or a sector in responds to livelihood alterations brought about by a crisis. Adaptation studies are often constrained as it is very difficult to determine actual geographical band width of the specific strategy being studied (Osbahr *et al*. 2010). This study tries to address this limitation by sampling both affected and non-affected communities to help establish the extent of spread of adverse effect of large and medium scale acquisitions on the livelihood of farmers.

2.8 Medium and Large Scale Land Deals and Farmers' Perception of Risk

In an event of a commercial land acquisition, farm households do not only suffer current risk of losing essential livelihood assets but they are also exposed to an extended form of risk that may arise from a potential future land grab in terms of aggravating livelihood asset losses. Such future occurrence is peculiar to land arrangements as there is a very high tendency of an expansion and/or increased demand for land around areas that has already been acquired; as such these areas become target zones for local elites and commercial agents. This concept takes its root from the seminal work of Ester Boserup (Boserup, 1965). The Boserupian theory states that, a farm land stands a high probability of being sold to the highest bidders who can invest in land, which then would lead to agricultural intensification (Boserup, 1965). Even though her original perspective was in reference to an event of increased population, the ideology connects perfectly to the situation under

study, stemming from the fact that agricultural intensification forms the baseline objective of land grabs. Mamlberg and Tegenu (2007) argued that population pressure on livelihood assets increases as land labour ratio decreases. They made their case from the view point that population increase result also from land loss. Therefore, as land increasingly become scarce in these target areas, land custodians would be persuaded to further release land to affluent commercial agents due to demand pressures.

Researchers have made inquiry into the argument of whether famers' engagement in non-agricultural activities has any negative influence on agricultural outputs. Yaro (2006) and Adi (2007) concludes that in spite of the engagement of farm households in non-agrarian ventures, their secondary activities have no significant adverse effect on farm activities or outputs. This shows the versatility of the rural farm households as they meander the seasons and the natural patterns of weather to earn substantial income on which they survive. Yaro further argued that if there would be deagrarianisation, it would arise as a function of social change due to reverse causal relationship between livelihood engaged by both farm and non-farm households.

2.9 Empirical dimension of land tenure and farming system decision making

It is difficult to theoretically ground the relationship between land and livelihood choices as Headey and Jayne (2014) asserts, but they acknowledge also the fact that behavioral change (adaptation) can be inherently influenced by land pressures. In order to avert the effects of undesired circumstances, farm households may engage in different livelihood strategies in their quest to adapt. From Goldstein and Udry (2008), farmers' fallow decision was postulated as a measure of land tenure security. The paper examined this relationship

based on the micro-economic theory of utility maximization where longer fallow years corresponds to better soil fertility and a resultant higher potential yield. Goldstein and Udry (2008) further argued that, given a secured tenure over land, a rational farmer would maximize his or her potential yield from a given piece of land if he or she prefers a longer fallow period. A build-up of Goldstein and Udry's study is made in this research to assess the relationship between land acquisitions and farm choice.

2.10 Multinomial Logit Model

From the sustainable livelihood framework of Scoones (1998), rural farm households base their livelihood on the capital assets including natural capital such as land. When land is constrained due to commercial land deals, farming strategy would also be affected. The multinomial logit model would allow for the determination of particular strategy farm households are adopting ahead of the other base strategy.

Cramer (2002) states that, the history of statistical methods that considers the analysis of multinomial logit can be traced back to Cox (1966). Few years after, Theil (1969) in the late 1960's made first attempts at modelling shares using multinomial logit techniques. The theoretical grounding of multinomial logit into Random Utility Framework (RUF) is credited to McFadden (1973) in his work that won him a Nobel Prize in the year 2000.

Multinomial logit model has been widely used as the most appropriate technique in applications that analyze polytomous response categories. Multinomial models are often generalized forms of logit or probit models. These are fitted for categorical response variables having more than two categories of logit model (Lall, 2004). For these models,

since the underlying response is categorical, a member in group i can have response which falls into one of n possible categories $(j = 1, 2, ...n)$. We let the indicator random variable Y_{ij} equal 1 if a member in group i has response j and equal 0 if otherwise,

$$\sum_{j=i}^{n} Y_{ij} = 1 \qquad (1)$$

We can accumulate the all Y_{ij} together to form the response vector $Y_i = (Y_{i1}, ... Y_{i_n})$. The generalized function of multinomial logit regression can be put as;

$$P_{ij} = \frac{\exp(X_i^{'} \beta_j)}{\sum_{j=1}^{n} \exp(X_i^{'} \beta_j)} \qquad (2)$$

The multinomial logit model is a probability model derived from the RUF theory; it is best suited in this situation where the dependent variable is categorized in a no definite order. Multinomial logit regression compares multiple groups through a combination of binary logistic regressions. It produces separate estimates for each dependent variable by giving a unique coefficient to each corresponding independent variable.

The theoretical basis of multinomial logit model is the Random Utility Theory (RUT). The RUT is built on a key assumption that the utility functions of goods can be broken down into two parts, deterministic and stochastic (Othman, 2007). Assume utility for an option *i* which depends on environmental attributes (P) and socioeconomic characteristics (N) is given as;

$$U_{iz} = S(P_{iz}, N_z) + e(P_{iz}, N_z) \quad (3)$$

The probability that individual *z* will choose option *i* over other option *j* is given by:

$$\text{Prob (i/C)} = E(U_{iz}) > (U_{jz}) \quad (4)$$

Where C is the complete choice set. It is assumed that the error terms of the utility function are independently and identically distributed (IID). Another property of RUT is the independence of irrelevant alternatives (IIA). The IIA states that the probability of choosing one alternative over the other is solely dependent on the utility derived by the consumer from a particular alternative (Othman, 2007). This property may be violated by the presence of close substitutes in the choice sets as well as heterogeneity in preferences.

2.11 Empirical Application of Multinomial Logit Analysis to Livelihood Choices

Livelihood choice among rural dwellers which emphasizes farm and non-farm activities has been extensively explored in the literature (Kuiper *et al*., 2007; Ogola *et al*., 2015; Bonabana-Wabbi *et al*., 2015). Prior research work undertaken by Yaro (2006) in northern Ghana revealed that diversification of farmers' livelihood does not only directly translate into off-farm activities but rather an intensification of farm work as well. Livelihood choice of farmers within land grab zones in northern Ghana is to be explored in this study. Yizengaw and Okoy (2014) also assessed the determinants of livelihood diversification strategies among smallholder farmers in Ethiopia using a multinomial logit model. Their finding was consistent with that of Yaro (2006) as they join the call for strengthening both agricultural intensification and non/off-farm diversification.

Gecho et al. (2014) employed a multinomial logit to analyse farmers' choice of diversifying along on-farm, off-farm and on/off farm livelihood of farmers affected by land scarcity and recurrent drought in southern Ethiopia. Rahman and Akter (2014) also used multinomial logit in identifying factors that influence rural households' choice of wage employment, agricultural and non-agricultural employment in Bangladesh. An enquiry into rural households' livelihood diversification strategies from the Himalayas was also carried out by Rahut and Micevska (2012) using multinomial logit analysis.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter of the study presents description of the study area, sampling methodology, methods of data analysis and the analytical frameworks of the study. It further discusses the theoretical, conceptual and empirical approaches that would help in explaining what underlies risk levels and the behaviour of farm households in their adoption of different livelihood strategies.

3.2 Description of Study Areas

The study was conducted in the Gushiegu district and Kassena Nankana East Municipal of Northern and Upper East regions of Ghana respectively. Northern Ghana administratively comprises of mainly Upper East region (10.7082^0 N, 0.9821^0 W), Upper West region (10.2530^0 N, 2.1450^0 W), and Northern region (9.5439^0 N, 0.9057^0 W) and some portions of Volta and Brong-Ahafo regions. Its land size covers about 41 % of the total land area of the country, with about 20 % inhabitation of the people of Ghana. Northern Ghana lies almost entirely within the Guinea Savannah Agro-ecological Zone and is characterised by a unimodal rainy season, starting in April/May and ending in October, with annual rainfall between 900-1100mm per annum.

Data from the Lands Commission of Ghana shows that most of the acquisitions in Northern Ghana occur within the Northern and Upper East Regions. The data further confirms that 21 different parcels of land ranging between 10.12 ha to 24.28 ha have already been acquired and registered in the Kassena Nankana East Municipality in the Upper East Region alone. In the Northern Region, 27 different parcels of land ranging between 20.00 ha to 50.00 ha are also registered in the Gushiegu District. This study takes special interest in these high recording areas within the two regions for a better appreciation of the land grab situation in northern Ghana.

Kassena Nankana Municipal has been reported by the Ghana Statistical Service (2014) to have 82.7 percent of households engaging in agriculture. In the rural localities, 93.1 percent of households are agricultural households while in the urban localities, 56.8 percent of households are into agriculture. Most households in the Municipality (96.1 %) are involved in crop farming with poultry (chicken) as the dominant animal reared in the municipality. The Ghana Lands Commission recorded twenty-five (25) counts of registered lands which are within the rages of 10.24 Ha to 50 Ha across the municipality by the end of 2016 (Ghana Lands Commission, 2016).

The municipality covers a total land size of 851.5 km² and a density ratio of 129.1 inh./km² (GSS, 2014). It shares boundaries with the Kassena-Nankana West District to the North, Bolgatanga Municipal to the East, to the West with the Builsa North and the Kassena-Nankana West Districts and to the South with the West Mamprusi District of the Northern Region.

Gushiegu District is one of the twenty-six (26) administrative districts of the Northern Region of Ghana. It shares boundaries to the East with Saboba and Chereponi Districts, Karaga District to the West, East Mamprusi District to the North and Yendi Municipality and Mion District to the South (Ghana Statistical Service, 2014). The GSS further establishes that about 91.8 % of the households in the district are engaged in agriculture. In the rural localities, it is estimated that 96.9 % are agricultural households while in the urban localities, 75.2 percent of households are into agriculture. Most households in the District (98.0 %) are involved in crop farming and 62.4 percent are into Livestock rearing.

In Northern Ghana the legitimacy to privatize common property resources such as land is permissible by the provisions in the 1992 Constitution in returning land to customary control (Yaro, 2010). Ghana Lands Commission (2016) recorded also that the Gushiegu district had twenty seven (27) registered lands which fell within the range of 20 Ha to 50 Ha as at the field time of data collection in this study.

3.3 Data Collection and Instrumentation

The basic unit of analysis was the household. This means that data and observations were collected at the household level. Household is defined by the GSS as; individuals and groups who agree to share pooled resources irrespective of the degree of its tangibility in order to earn a living (GSS, 2012). Such people may most at time share the same compound. The study focused on the head of the farm household who is in control of almost all economic resources available to the household for the general upkeep of the entire members of the household. The household head therefore assumed to be in the best position

to offer an account of the various degrees of opportunities, shocks and treats to the entire household.

Using a semi-structured questionnaire with closed-ended and open-ended questions, data were gathered from all required individuals and groups targeted for this study. Focus group discussions and key informant interviews were also employed in order to get in-depth information and enhance the comprehensiveness of the study. Land and its related issues are multi-stakeholder in nature and hence there was the need to capture as many interest groups and individuals as possible.

To effectively achieve the aim of this research, the study grouped the communities under two broad divisions: 'Affected and Non-affected'. Within the affected community, a sub-division was further used to define individual respondents as 'Direct Impact (DI) and No Impact (NI)'.

Affected: This refers to any community which has one or more commercialized land parcels acquired within its defined boundaries.

Non-affected: This refers to any community which has no grabbed land parcel within its defined boundaries. For the purpose of this study, all respondents captured within such communities automatically fall in the 'non-affected' category.

Direct Impact (DI): This category of respondents is defined by their loss of one or more farm land to the activities of commercial land acquisitions within an affected community.

No Impact (NI): This category of respondents has not lost any farm land to the activities of commercial land acquisitions within an affected community.

3.4 Sampling Technique

The study employed a survey technique and selected a district each within the Upper East Region and the Northern Region with known records of having highest number of registered commercial lands. A two-stage sampling technique was then used in the study to stratify communities within each selected district into affected and non-affected categories. From these two strata, five (5) affected and five (5) non-affected communities were also randomly selected from each district making a total of 10 affected and 10 non-affected communities.

Random sampling was then used in each of the ten (10) affected communities to capture 20 respondents each of both DI and NI. A random sampling technique was repeated to sample 10 respondents each within the 10 non-affected communities. Selected respondents in each of the twenty communities were presented a questionnaire schedule to be guided by way of interview to enhance better understanding of the questions and also for accurate recording of information. In all, three hundred and two (302) respondents were interviewed.

3.4.1 Sample size determination

According to Ghana Statistical Service (2014), the total population of Kassena Nankana East (KNE) and Gushiegu Districts are 107,435 and 110,039 respectively. The census report also shows that Gushiegu District has a total household count of 19,790 as against 11,150 of the KNE Municipal. Furthermore, the report indicated in the two districts lies the fact that 82.7 % of the households in KNE are engaged in agriculture whilst 91.8 % of the farm households in Gushiegu are engaged in agriculture. The household survey embarked by this study relied on the respective percentage of agricultural household out of the total household count as the sample frame for the determination of appropriate sample size. The mathematical formula adopted for the estimation of the sample size in this study is given as;

$$n = \frac{N Z^{*} \times P(1-P)}{e^{2}(N-1) + Z^{*} P(1-P)} \quad (5)$$

Where:

n = Sample size

N = Sample frame

Z* = Z-score

P = Standard deviation

e = Margin of error

Substituting a 95 % confidence level, standard deviation of 0.5 and a 10 % margin of error to the sample frame of KNE gives,

$$n = \frac{9221 \times 1.96[0.5(0.5)]}{0.1^2(9920) + 1.96[0.5(0.5)]} = 48.75$$

$$n = 49$$

Whereas Gushiegu also gives,

$$n = \frac{18167 \times 1.96[0.5(0.5)]}{0.1^2(18166) + 1.96[0.5(0.5)]} = 48.87$$

$$n = 49$$

Based on the specific interest of this study, it was very necessary to have more respondents from the grab-affected communities. Hence a proportion of 1:2 units were adopted, where respondents in affected communities within each district had doubled sample sizes compared to the non-affected using the determined sample size of 49 respondents as basic unit. This procedure was important in helping the study assess effect of land deals among many affected category of respondents than non-affected. Also, the nominal strength of Gushiegu District in terms of population size influenced a difference of 24 respondents over the KNE. The study finally recorded 139 and 163 total respondents from KNE and Gushiegu District respectively.

3.4.2 Types and sources of data

Both secondary and primary data were used in this study. Primary data was obtained by way of a comprehensive survey. Secondary data on total land size in the study areas and

the number and sizes of registered lands were obtained from District and Regional land Commission offices.

3.5 Method of Data Analysis

Qualitative and qualitative research design methods were used with the aim of explaining the underlining issues this study sought to address. Qualitatively, tables and charts were used to compare the means and variations in access to livelihood assets as well as the socio-demographic characteristics of respondents. Factors that influence farmers' choice of livelihood strategy was also determined quantitatively by employing a multinomial logistic regression model.

3.5.1. Conceptual framework

Key themes of this study can be situated within the context of sustainable livelihood framework developed by the Institute of Development Studies (IDS's) (Scoones, 1998). The framework establishes the relationship between livelihood resources and livelihood strategies. It postulates that an individual's livelihood asset has a direct influence on his livelihood strategies through the aid of institutions and organisation. The context of this study operationalises land as a key livelihood asset capable of influencing household livelihood choice decisions. Commercial scale land deals in the study communities is postulated to affect the ability of households to acquire and deploy land as an asset. The framework is presented in figure 3.1.

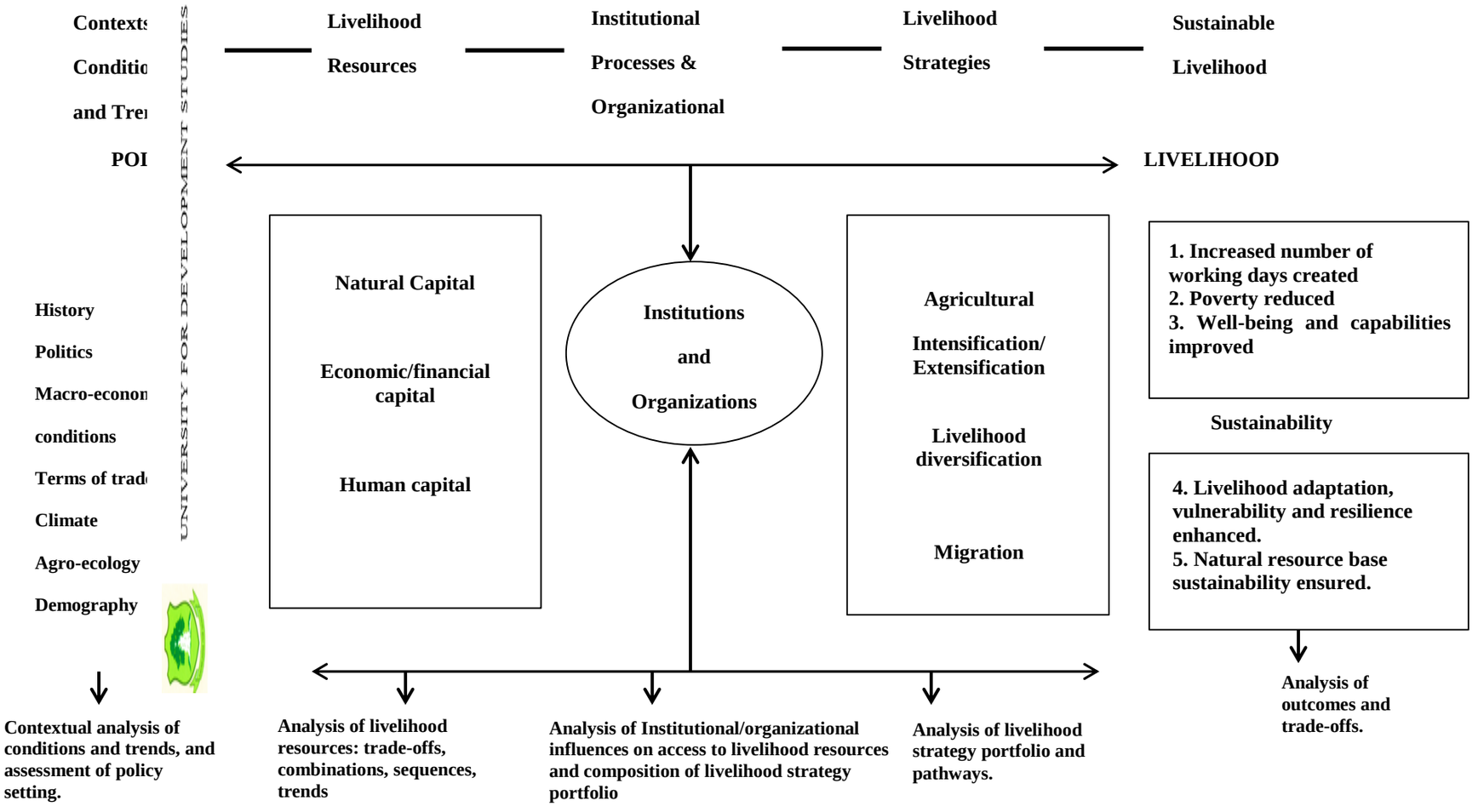

Figure 3. 1. The Sustainable Livelihood Framework
Source: Scoones, (1998)

3.5.2 Scale, actors and drivers of land deals

In order to gain insight into the scale, actors and drivers of grabbed lands, the study relied on survey data on land acquisitions in the communities, complemented by land registration data from the Town and Country Planning and the Lands Commission. The data include sizes of land acquired, registration status, sources and types of land acquired, the purpose for acquisition and the actors involved. The data was analysed and presented using bar charts and tables to give a simple view of the comparison between the two key categories of respondents considered in this study as well as the actors, drivers and scale of land deals.

3.5.3 Analysis of commercial scale land acquisition, land availability and land access

Goldstein and Udry (2008) reports that period of fallow is an important indicator of land tenure security. Goldstein and Udry argues that land holders who had secure ownership or exercised significant authority within communities fallowed their lands for longer period. In most parts of Ghana, lands that are actively cultivated are hardly lost. Land custodians and other customary authorities may appropriate and sell fallowed land. This framework implies that there will be reduction in fallow periods if farm households perceive large scale land acquisition as a threat to usufruct rights of land in the communities.

Respondents' fallow decision was used in this study to determine the extent to which medium and large scale land deals influence land availability and land access and use right holders' perception of tenure security. The study solicited for 'recent fallow' (i.e. the most recent fallow of farm land by farm household) and also 'fallow period' (i.e. number of years taken before re-cultivating farm land).

The recorded number of years in both periods were grouped into categories and then compared against each other to ascertain whether there exist any significant trend in the relationship between recent fallow and fallow periods. This comparison was carried out among the three category of respondents (i.e. affected, non-affected and DI).

Cross tabulation was used because it is the best suited for analyzing relationship between categories. Chi-square test was employed in the establishment of a hypothesis on the various ranges as;

Null hypothesis

There is no significant difference in the ranges of time recorded for recent fallow and fallow periods by the study.

Alternate hypothesis

There exist a significant difference in the ranges of time recorded for recent fallow and fallow periods by the study.

Reasons for variation in recent fallow decision and length of fallow period were solicited from respondents as well as the emerging trends of farm land arrangements arising from the difficulty in accessing farm lands.

3.5.4 Determining effect of land deals on land resources and services

Farm households in rural Ghana and the study area in particular have unflinching demand and use for naturally occurring livelihood assets. Given the event of loss of land resulting from the lease to commercial land users, farm households are in a better capacity to reveal

their extents of access to livelihood assets. Even though, Schoneveld *et al*. (2011) considered fuelwood access, this study extends the number of livelihood assets by including wild fruit and game accesses.

A likert scale was employed to help determine extent of access to livelihood assets. On the likert scale, a choice of very easy access, easy access, difficult access, very difficult access - represent respondents' perceived availability and accessibility of the naturally occurring livelihood assets. On the other hand, somehow easy access represents an indifferent position expressed by respondents.

Table 3. 1: Measurement of accessibility of livelihood asset

Extent of accessibility	**Very easy**	**Easy**	**Somehow easy**	**Difficult**	**Very difficult**
Access to firewood	1	2	3	4	5
Access to fruit	1	2	3	4	5
Access to game	1	2	3	4	5

$$Mean\ \ score\ \ for\ \ jth\ \ Ext = \frac{Total\ \ score\ \ for\ \ jth\ \ Ext}{Number\ \ of\ \ respondents} \quad (6)$$

Individual farm household heads were asked to indicate their extent of access to each of the following livelihood assets; wild fruit, fuel wood and game to which was easy. Table 3.1 shows the likert scale that was used to measure the degree of easy access. Farmers were asked to choose an extent of access which falls within the range of 1 to 5 (i.e very easy, easy, somehow easy, difficult and very difficult) depending on the peculiar household

capabilities and resources available to that household. Mean responses of access to each livelihood asset category would be estimated using the formula indicated on equation (6). The mean values would therefore represent respondents' extent of accessibility to livelihood assets.

In ensuring safeguarded livelihoods, the farm household relies on available natural assets. This dependence of farm households on natural asset to earn a livelihood can be described as a socially linked metabolism. The concept of social metabolism surfaces in most sustainability discussions in the literatures (Singh *et al*., 2001; Kuskova *et al*., 2008; Marull *et al*., 2010). Social metabolism basically refers to how humans create a chain of goods and services from the environment to make a living. Researchers are able to create metabolism profiles for different resources for better understanding and comparison (Siciliano, 2013). Scoones (1998) presents in his sustainable livelihood framework, a splendid emphasis of the fact that a sustainable livelihood is among other factors achieved by natural resource base sustainability. The total livelihood expectation of the rural farm household is therefore compromised to an extent with the advent of land grabs which deprives farmers of the natural fauna and flora. The extent of livelihood asset loss of farm households as well as coping strategy depends on the available land specific factors and institutional support structures available to the community as well as farmers' socio-economic characteristics.

As land grab induced risk pervades target communities, it eventually emerges into a territorial or district level problem due to the flexible nature of secondary land ownership

right transfers. This flexibility makes it possible for farm households to easily link up with nearby communities and negotiate for farm land. Farm households engage this form of livelihood adaptation strategy and therefore remain in farming for household food security and income securing purposes. This is mostly the case in typical rural settings of Ghana where opportunities for alternative livelihood barely exist.

An event of a land grab imposes limits to cultivable land size as well as access to naturally occurring assets of indigenes. Most of these assets are either cleared to give way for new investments or have their access blocked, hence, diminishing livelihoods assets available to the community dwellers.

3.5.4.1 Empirical determination of land grab effect on livelihood asset

The means of each category of livelihood asset would be subjected to a comparison test with each other in two distinct sections. This would be made across affected and non-affected respondents; then a pooled test of access across the two districts.

The hypotheses to be tested are given as:

i. Null Hypothesis: There is no difference in the mean value of extent of access to jth livelihood asset between affected and non-affected respondents.

   Alternate Hypothesis: The mean value of extent of access to jth livelihood asset of affected is greater than the non-affected respondents.

ii. Null Hypothesis: There is no difference in the mean value of extent of access to jth livelihood asset between affected and DI respondents.

Alternate Hypothesis: The mean value of extent of access to jth livelihood asset of DI is greater than the affected respondents.

iii. Null Hypothesis: There is no difference in the mean value of extent of access to jth livelihood asset between DI and non-affected respondents.

Alternate Hypothesis: The mean value of extent of access to jth livelihood asset of DI is greater than the non-affected respondents.

3.5.5 Effects of land deals on farm livelihood choice decisions

This segment examined farm household's choice decisions on farm livelihood within affected communities in the study area. The study employed multinomial logit regression analysis in identifying factors that influence farm households' decision to opt for either 'intensive', 'semi-intensive' or 'low intensification' farming regimes. The variable of interest has three categories which are mutually exclusive and had natural ordering. Thus, each alternative regime has an associated utility. Based on Pressman (2011) farm household were categorized as follows:

Intensive: If farm household engages in two or more of the following: mechanized land preparation; use of improved seed; application chemical fertilizer; use of weedicide and pesticides.

Semi-intensive: If farm household engages in two or more of the following: mechanized land preparation; use of improved or local seed; application of partial organic fertilizer as well as chemicals.

Low intensification: If farm household engages in two or more of the following: partial or no mechanized land preparation; use local seed; apply no chemical fertilizer and chemicals.

3.6 Multinomial Logit Model

The general model for examining the factors influencing a farm households' probability of choosing j^{th} farm livelihood strategy for i^{th} farmer (P_{ij}) is specified with reference to equation (2) from chapter two as;

$$P_{ij} = \frac{\exp(X_i^{'} \beta_j)}{\sum_{j=1}^{n} \exp(X_i^{'} \beta_j)} \qquad (2)$$

Where j = 1, 2, and 3 which represent outcomes for intensive, semi-intensive and low intensification; X = socio-economic characteristics of farm household; β = unknown parameter estimates of explanatory variables; P = probability of choosing a livelihood strategy.

Equation 3 specified above is not identified; it is only identified when one of the coefficients is arbitrarily set to zero; this study therefore equate the coefficient of semi-intensive to zero, hence becomes the base outcome of the probabilities corresponding to each outcome. The coefficients thus denote the marginal effect in the probability of engaging either high intensive or low intensive farming. The model fits well with the

estimation because it also allows for the investigation of explanatory variables for the chosen alternative over the other alternatives.

$$\Pr\ (Y_i = Semi - \text{int}\, ensive) = \frac{1}{1 + \exp W\delta(1) + \exp W\delta(2) + \exp W\delta(3)} \quad (7)$$

For the base outcome semi-intensive

$$\Pr\ (Y_i = Intensive\ ) = \frac{\exp W\delta(2)}{1 + \exp W\delta(1) + \exp W\delta(2) + \exp W\delta(3)} \quad (8)$$

$$\Pr\{Y_i = \{Low\ Intensific\ ation\} = \frac{\exp W\delta(3)}{1 + \exp W\delta(1) + \exp W\delta(2) + \exp W\delta(3)} \quad (9)$$

The dependent variable is expressed in a linearly explicit form as a function of socioeconomic variables of farm households and a stochastic term in the equation below;

$$\begin{aligned} Y_{ij} &= \delta_0 + \delta_1 W_{1i} + \delta_2 W_{2i} + \delta_3 W_{3i} + \delta_4 W_{4i} + \delta_5 W_{5i} + \delta_6 W_{6i} + \delta_7 W_{7i} \\ &+ \delta_8 W_{8i} + \delta_9 W_{9i} + \delta_{10} W_{10i} + \delta_{11} W_{11i} + \delta_{12} W_{12i} + \delta_{13} W_{13i} + \delta_{14} W_{14i} + \\ &\delta_{15} W_{15i} + \delta_{16} W_{16i} + \delta_{17} W_{17i} + \delta_{18} W_{18i} + e_i . \end{aligned} \quad (10)$$

Where δ = unknown parameter estimates; W = explanatory variables and 'e' represents the error term.

The exponent of coefficient in a multinomial logistic regression can be viewed as the probability of choosing alternative regime j of farm livelihood over the base category. This is known as the Relative-Risk Ratios (RRR). It is the measure of the probability of choosing an alternative over the base outcome.

$$RRR = \frac{\Pr\{Y_i = j\}}{\Pr\{Y_i = Semi - \text{int}ensive\}} = \exp W\delta \quad (11)$$

3.7 Description of Variables Used in the Multinomial Logit Model

In order to establish the relationship between land acquisitions and livelihood strategy of farm households in the study area, socio-economic characteristics and grab-specific variables were captured. The independent variables used in the multinomial logit model are explained as follows;

Age: This variable was measured as a continuous variable, thus the number of years of the farmer. Age of household head has been used in many livelihood studies but the direction of its effects on the dependent variables has been varying and this may depend on many factors. Yizengaw *et al*. (2015) found age to have no significant influence on choice of livelihood strategy. However, it is expected that older household heads would most likely choose intensive farm livelihood strategy ahead of their younger counterparts because older household heads have better access and control over economic resources.

Years in Education: This variable is measured as the number of years a household head has spent in school. Educated household heads are most likely to be engaged in other formal occupations as found out by Hatlebakk (2012); Gecho et al. (2014); Rahman and Akter (2014). This study hypothesises years in schooling to positively influence the decision of a farmer to choose non-intensive farming strategy because household heads with higher education are most likely to engage in a formal occupation.

Farm size: This is measured as the total land area under food crop cultivation of a given farmer. Farmers with larger farm sizes are usually wealthier as compared to their counterparts with smaller farm sizes and so there is the likelihood that they would readily choose intensive farming strategy. Rahut and Micevska (2012), and Gecho et al. (2014) found that farm size had positive influence on farmers' choice of non-farm livelihood; this notwithstanding it is expected that farm size will positively influence a farmers' choice of intensive farming strategy.

Knowledge on other grab lands: This variable is measured as a count variable, thus the number of commercial acquisitions a household head is aware of. The study expects that, the more commercial sites a farmer is aware of, the more his likelihood of choosing intensive farming strategy. This variable is therefore hypothesized to positively influence a farmer's choice of an intensive farming strategy.

Future intention: This is measured as a dummy, thus '1' if a farmer had a future intention of cultivating part of an acquired land prior to the take over and '0' if otherwise. A farmer who had a future intention of farming on an acquired land will most likely choose intensive farming strategy. As a result of this, the study expects this variable to have positive influence on intensive farming strategy.

Recent Fallow: This is measured as the most recent fallowing engaged by a farmer and it is recorded as number of years. The last time a farmer fallowed can either have a positive or negative influence on the type of farming strategy he chooses. Therefore it is postulated that recent fallow would have an indeterminate effect on the choice of farming strategy.

Fallow period: This variable is measured as the length of time (years) a farmer allowed fallowing before revisiting the farm land. The fallow period may either have a positive or negative influence on a farmer's choice of farming strategy. This therefore means that the study postulates this variable to be indeterminate.

Adults: This is measured as the number of people in the households who are 18 years and above. The study hypothesises that a farm household with more adults would most likely be positively influenced to engage in an intensive farming strategy.

Enough land: this is measured as a dummy. Thus '1' if a farmer concedes to having enough land for cultivation and '0' if otherwise. It is expected that a farmer who has enough land for cultivation and is therefore not affected by land grabs is expected to engage in a semi-intensive farming system ahead of an intensive farming strategy.

Amount spent on Education: This is measured as the total monthly expenditure spent on wards' education in Ghana Cedis (GH₵). The study assumes that the more a farm household spends on education, the less likely they would choose intensive farming strategy. The study therefore postulates this variable to have a negative relationship with the choice of intensive farming strategy.

Total monthly expenditure: This variable is measured as the amount of money a farm household spends on food, medical bills among others in a month. A farm household that has higher total monthly expenditure is most likely to engage an intensive farming strategy. Abimbola and Oluwakemi (2013), and Yizengaw *et al*. (2015) found total household income to have a positive influence on farmers' choice of livelihood strategy. As such the

study hypothesises total monthly expenditure to positively influence the choice of intensive farming strategy.

Remittance: This is a continuous variable measured as the total yearly amount of money received by the household head from relatives and well-wishers outside his community of residence. The influence of remitted amount in this study is indeterminate.

Location: This variable is measured as a dummy, thus '1' if the farmer is located in KNEM and '0' if the farmer is located in the Gushegu District. A farmer located in KNEM is assumed to have a positive and strong preference for intensive farming strategy than a farmer in Gushegu District. This is because it believed that there are larger lands acquired in KNEM than in Gushegu District. The study therefore hypothesizes location to positively influence a farmer's choice of intensive farming strategy.

Land type acquired: This is as an indicator variable which was censored as '1' if acquired land was a bush and'0' if not; '1' if acquired land was a fallowed land and'0' if not; '1' if acquired land was under cultivated and '0'if not. With cultivated land as reference category, the study expects that farmers within an area where fallowed lands were acquired would most likely choose intensive farming.

Grab investment: This variable is measured as dummy, thus '1' if a grab land is used for the cultivation of arable crop and '0' if the grab land is used for the establishment of a tree crop plantation. The *a priori* expectation of this variable on a farmer's choice of farming strategy is indeterminate.

Grab scale: Grab-scale is measured as dummy, thus '1' for large scale and '0' for medium scale. The assumption is that larger scale acquisitions have high potential of influencing farmer's farming strategy. This implies that the larger the grab land, the more likely farmers would want to intensify their farming. Therefore, Grab-scale is expected to have a positive influence on the choice of intensive farming strategy.

Grab years: This variable is measured as dummy, thus '1' if the land had been grabbed for a longer period and '0' for shorter period. Farmers who find themselves in communities that have been affected by longer years of grab lands may have a greater incentive to choose intensive farming strategy than their counterparts. The study therefore predicts Grab-years to have positive influence on a farmer's choice of intensive farming strategy.

Grab status: This variable is measured as dummy, thus '1' if a farmer's land has been lost to land acquisitions (DI) and '0' if a farmer has not lost land (NI). It is assumed that farmers whose land has been grabbed, are most likely to choose intensive farming strategy ahead of semi-intensive farming strategy. The study therefore hypothesises Victim to have a positive influence on a farmer's choice of intensive farming system.

Table 3. 2: Description of explanatory variables used in the multinomial logit regression model

Variable	Definition	Measurement	A priori
Age	Age of household head	Years	+
Edu_yrs	Number of years spent in school	Years	+
Farm_size	Farm size of household	Acres	+
knwlg_other_grabs	Number of grabs household head is aware of in the community.	Number o	+
Future_intent	If household head had intention of cultivating part of the area grabbed.	1 for yes; 0 for no	+
Adults	Number of adults in a household.	Number	+/-
Recent_fallow	Most recent year of fallowing farm land.	Years	+/-
Enough_land	If the household head is satisfied with current size of farm land.	1 for yes; 0 for no	+/-
Wish_size	Number of acres household head wishes to add to owned farm land.	Acres	+
Food_amt	Monthly amount spent on food	Cedis	-
Edu_amnt	Yearly amount spent on wards' education.	Cedis	-
Tt_Mexpend	Total monthly household expenditure.	Cedis	+
Location	Location of household.	1 for KNE; 0 for Gushiegu	+/-
Land_typ_acq	Type of land acquired by investors.	Indicator: Bush, Fallowed, Cultivated	+/-
Grab_invest	Agricultural investment that acquired land has been put into.	Dummy: 1 for arable crop; 0 tree crop	+/-
Grab_scale	Scale of land acquired.	Dummy: 1 for large; 0 for medium	+/-
Grab_years	Years of acquisition.	Dummy: 1 for longer; 0 for shorter	+/-
Grab_status	If household head has lost land to investors.	1 for DI; 0 for NI	+

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents results, interpretation and discussion of the research. The chapter starts with description of the demographic characteristics of respondents; scale, actors and drivers of medium and large scale land deals in northern Ghana; the extent to which medium scale land deals influence land availability and land access; effect of medium and large scale land deals on alternative land resources and services; and how land deals influence livelihood choice decisions of farm households. Both descriptive and quantitative analyses are employed in this chapter for clarity and to enhance understanding.

4.2 Demographic Characteristics of Respondents

This section presents demographic characteristics of the survey participants. Attributes such as sex, age, educational level and household size are described within the context of the study. These characteristics give a description of respondents and how their personal and household characteristics influence key parameters of the research. The frequency distributions of demographic characteristics of the respondents are presented in table 4.1 and 4.2.

The total number of farm households sampled by this research was three hundred and two (302) among which 6.0 % and 94.0 % are female and male headed households respectively. Eighty-nine percent (89.1 %) of the respondents were married and 2.0 % were divorced. Also widowed and unmarried household heads were 5.0 % and 3.0 % respectively (Table

4.1). In terms of educational attainment, the data shows 66.0 % of the respondents had no formal education. Out of the 34.0 % who have obtained formal education, 13.0 % attended school up to JHS level with only 5.0 % schooling up to tertiary level.

Table 4. 1: Summary statistics of discrete variables

Variable	Category	Frequency	Percentage
Sex of household head			
	Female	18	5.96
	Male	289	94.04
Total		**302**	**100**
Marital status			
	Married	269	89.07
	Never married	10	3.31
	Divorced	7	2.32
	Widowed	16	5.3
Total		**302**	**100**
Educational status			
	No education	199	65.89
	Pre school	3	0.99
	Primary	24	7.95
	JHS/Middle	39	12.91
	Secondary/SHS	20	6.62
	Tertiary	16	5.31
	Non formal	1	0.33
Total		**302**	**100**
Major occupation			
	Arable crop farming	265	87.75
	Vegetable farming	2	0.66
	Tree-crop farming	7	2.32
	Livestock farming	3	0.99
	Fishing	7	2.32
	Crop marketing	11	3.64
	Artisan	7	2.32
Total		**302**	**100**

SOURCE: Author's Field Survey (October 2016)

A distribution of major livelihood sources of households captured in this study shows that almost all respondents were engaged in agriculture related livelihood activities, with arable crop farming recording the highest percentage of 87.8 % (see table 4.1). This is in tandem with the 2010 population and housing census report by Ghana Statistical Service (GSS).

Table 4.2 presents statistics on household size and age of respondents. About 33.0 % of households are made up of 6 - 10 members. The largest households have membership of between 26 and 30 and constitute about 3.0 % of the households. The age distribution of the study area is an expansive one since larger percentages of the population are in the younger age groups as shown by GSS (2010). The study recorded most respondents (household heads) within the age bracket of 31 – 40 representing 31.0 % and the least occurring age range was those household heads who are less than 30 years of age representing 9.6 % of the entire sample. On the other hand, the highest occurring range of schooling years was 7 – 12 which had 58.0 % of respondents. From table 4.2, 34.0 % of farmers cultivated 0.5 – 5.5 acres of land but the least percentage recorded was 10.0 % of who cultivated 15.6 – 20.5 acres.

Table 4. 2: Summary statistics of continuous variables

Variable	Category	Frequency	Percentage
Household size			
	1 - 5	70	23.18
	6 – 10	98	32.45
	11 – 15	55	18.21
	16 – 20	42	13.91
	21 – 25	20	6.62
	26 – 30	8	2.65
	Above 31	9	2.98
Total		**302**	**100**
Mean			**11.91**
Age of household head			
	Less than 30	29	9.6
	31 - 40	93	30.79
	41 - 50	79	26.16
	51 - 60	55	18.22
	Above 61	46	15.23
Total		**302**	**100**
Mean			**46.29**
Years of schooling			
	1 - 6	27	26.73
	7 - 12	59	58.42
	13 - 18	13	12.87
	Above 19	2	1.98
Total		**101**	**100**
Mean			**3.13**
Farm size			
	0.5 – 5.5	104	34.44
	5.6 – 10.5	69	22.85
	10.6 – 15.5	48	15.89
	15.6 – 20.5	30	9.93
	Above 20.6	51	16.89
Total		**302**	**100**
Mean			**12.74**

SOURCE: Author's Field Survey (October 2016)

From the descriptive summary, it is evident that majority of household members (57.0 %) are in the middle age category. This age category is mostly referred to as the working age group, an indication that other things being equal the study area would have relatively

lower dependency ratios since more household members would be working and contributing to production. This age group comprises of able men and women who undertake various economic activities to support themselves and their families. The dominance of male headed households is a characteristic of socio-cultural relations present within the study areas and the country at large. Half of the households had membership ranging between 6 and 15 with an average of 12 members per household. This gives an indication that the respondents are predominantly dependent on agricultural based livelihoods which are also labour intensive; hence large family sizes were expected. About 57.0 % of respondents had farm sizes ranging from 0.5 – 10.5 acres which shows that majority of farm holdings in the study area were within the bracket of small farms. About 34.0 % of the entire sample had ever been to school, among which about 85.0 % had spent up to 12 years in school. This shows that farmers' formal educational level in the study area is low.

4.2.1 Distribution of respondents

Out of the 302 sampled respondents 67.0 % were from affected communities. In non-affected communities 100 respondents were sampled representing 33.0 %.

Table 4. 3: Distribution of respondents by affected and non-affected respondents

Respondents	Frequency	Percentage
Affected	202	66.9
Non-affected	100	33.1
Total	**302**	**100**

SOURCE: Author's Field Survey (October 2016)

4.3 Overview of Scale, Actors and Drivers of Agricultural Land Deals in Northern Ghana

The first objective of the study is to examine scale, actors and drivers of medium scale land deals in northern Ghana. The key questions in this context is what drives commercial agriculture land deals, who are the actors and what is the scale of lands acquired in the study area. The study answers these questions by describing the drivers and actors in land deals for commercial agriculture purposes, nature of investments driving commercial land acquisition in the study area and the extent of land grabs in the study area.

Table 4.3 shows how acquired lands were classified and the percentage of respondents within those acquired communities. This study takes a queue from the work of Deininger and Byerlee (2010) to categorise land sizes above 50 hectares as large scale acquisitions and those between 10 -50 hectares as medium scale acquisitions. On the other hand, lands that have been acquired beyond 10 years were also classified as longer years, whilst those acquired below 10 years are classified as shorter years.

Table 4. 4: Characteristics of Agricultural Land deals in the Study Area

Variable	Category	Frequency (Percentage)
Drivers	Arable crop	72 (35.64)
	Tree crop	130 (64.36)
Total		**202 (100)**
Scale of grab		
	Small-Medium	89 (44.06)
	Large	113 (55.94)
Total		**202 (100)**
Years of Acquisition		
	Shorter years	110 (54.46)
	Longer years	92 (45.54)
Total		**202 (100)**

SOURCE: Author's Field Survey (October 2016)

The distribution of respondents within communities affected by commercial land acquisition are presented in table 4.4. The number of household heads interviewed in communities with tree crops investments constituted 64.0 % as against 36.0 % of arable crops. Out of the 202 respondents, 56.0 % live in communities that have lost land to large scale commercial agriculture while 44.0 % live in communities that have leased land to agricultural investments. The finding suggests that there is intensive land acquisition for commercial agriculture purposes be it on the small, medium or large scale. In terms of years of investment, 54.0 % and 46.0 % of respondents were located in communities with shorter and longer years of land deals respectively.

Six out of the ten (10) affected communities had mango plantation being the main investment on acquired lands. Most of these mango plantations were being managed by

farmer groups and agro-entrepreneurs aided by different support agencies including Export Trade, Agriculture and Investment Fund (EDAIF) and Ghana Commercial Agriculture Project (GCAP) in the Kassena Nankana East municipality and also Ghana Social Opportunities Project (GSOP) in the Gushiegu district.

Cashew plantation was the main investment on acquired land found in Samanga; a community in the Gushiegu district. The cashew plantation is owned by a Medical Doctor based in Accra. The investment at Sampebga, also a community in the Gushiegu district was rice fields covering 130 hectares developed by the Ghana Rice Sector Support Project (GRSSP).

Three communities were sampled along the coverage area of the acquired land developed for irrigation in the Kassena Nankana East Municipality. Irrigation Company of the Upper Region (ICOUR) which manages the Dam is engaged in the production of arable crop which is mainly maize, millet and soya beans.

4.3.1 Crop Investments Driving Land Deals in the Study Area

In the 19th Century, the commodification of land in southern Ghana was triggered by development of export crop frontiers. Amonor (2010) suggests that land sales in Ghana and particularly in southern Ghana occurred within the context of frontier development of export crops such as cocoa for European markets and date back to the 19th century. The focus of the study under this section is to highlight the actors and drivers of commericalisation and commodification of land in the study area. Figure 4.1 presents the forms of investments for which lands are acquired in the study area. One key contrast with Amanor (2010) is the emergence of rice farming as a key driving force behind land deals

in the study area. More than half of the land acquired in the Kasena Nakana East Municipal (KNEM) was for the development of rice irrigation fields. There are also similarities in the sense that significant areas acquired by investors is for the development of mango and cashew plantations (Figure 4.1). Non-rice fields and cashew plantation in Gushiegu District covered 50 hectares and 20 hectares respectively but KNEM recorded no cashew plantation as well as non-irrigated rice fields.

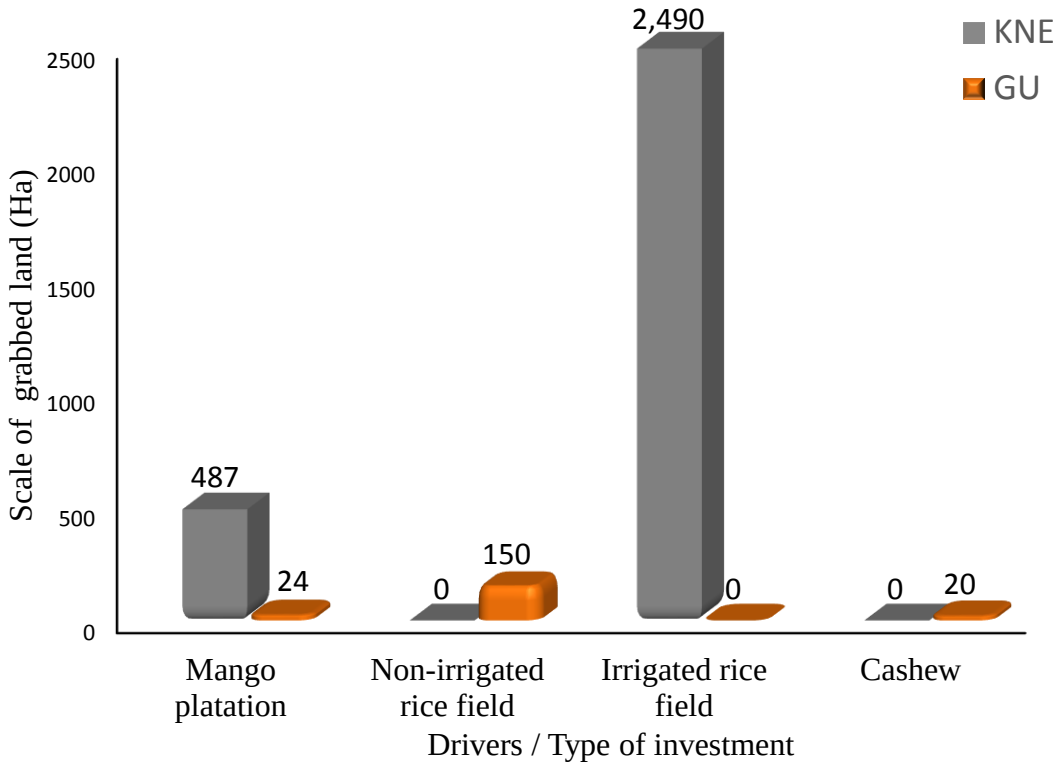

Figure 4. 1: Distribution of drivers and scale of acquired land

The post 2008 oil and food price hikes and the resultant rush for arable cropland in developing countries was led by transnational corporations who saw economic prospects in alternative energy and food crop production. A decade later and we are witnessing new dynamics in terms of the drivers of land deals in northern Ghana. Figure 4.2 presents a

distribution of the principal actors in land deals in the study areas. The data suggest that majority of land deals for commercial agriculture in the study areas are private-public partnerships and private domestic investors. In the KNEM, public private partnership agreement engaged by the Government of Ghana at the Tono irrigation dam covers a total land area of 2,490 hectares and is the highest acquisition recorded in this study. Privately owned acquisitions in KNE covers a total of 487 hectares compared to 44 hectares in Gushiegu. Government through the GRSSP has also developed 130 hectares of rice field which has been kept under the traditional authority at Sampebga a community in the Gushiegu district. Even though most actors engaged in land grabs within the study area are domestic, their influence does not differ from that of transnational investors because both entities contribute to land dispossession of small holders as well as significant alteration of customary land arrangements. The entry of domestic investors in land markets has resulted in the commodification of land. There are increasingly more cash-based transactions and formal documentation of land deals. The resulting increase in land prices and transaction costs required to protect land rights have combined to alienate peasants.

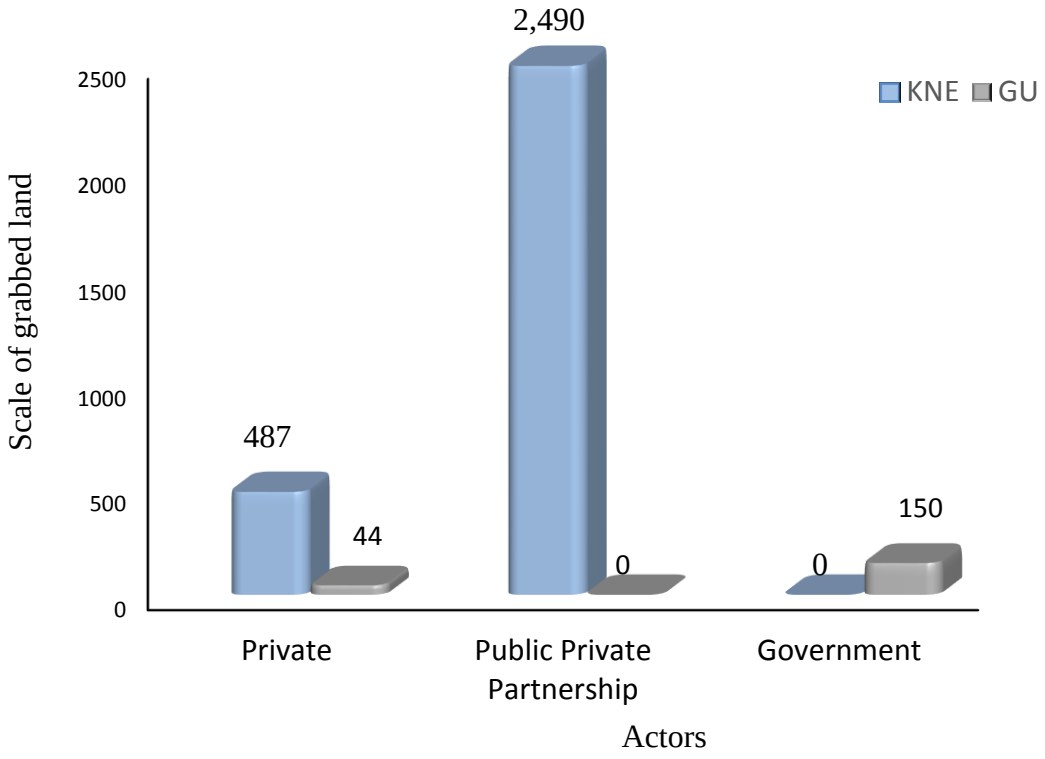

Figure 4. 2. Actors and scale of grabbed land

4.4 Impact of Commercial Land Acquisition on Land Availability and Land Access for Smallholders

The second objective of the study sought to examine the extent to which land deals affected land relations and influence land availability and land access for smallholders at the margins of the land tenure system. The key question was how land deals affected access to land and other land-based resources such as fruits and fuelwood. The study answers this question by examining the distribution of respondents in the study area in terms of how they are, affected or not affected by large and medium scale land acquisitions for agricultural purposes. The discussion further examines how farm land loss is distributed among those that have lost the avenue to acquire new farms to replace depleted farms.

Also, analysis on the fallow decisions of respondents and their coping strategies in the study areas have7 been presented. The study explores impact of land deals on access and use rights to land. The indirect impact category refers to those that face increasing risk of land appropriation because of land acquisitions in nearby communities.

4.4.1 Distribution of land sizes lost by farmers within affected communities

One key argument of multinational corporations engaged in land grabbing was that they operated in land abundant and sparsely populated areas (Yaro and Tsikata, 2014) and mostly acquired depleted and non-arable land. The observations and data from this study portray a different scenario. Actively cultivated lands have been acquired especially medium scale domestic investors for commercial agriculture. This means that contrary to claims that land grabs occurred on idle land, there is evidence of dispossessions and those who lost land in the process include smallholders cultivating less than 5 acres of farm land.

The study found that 37 respondents representing 18.0 % of affected respondents had lost land to land deals. These farm households had lost farmland to commercial agricultural investors in return for no compensation. Table 4.5 presents a distribution of directly affected households. A horizontal appraisal of the tabulated result shows that 51.0 % of the 37 respondents had lost 1 - 5 acres of land representing the highest occurrence of direct dispossession, followed by 27.0 % who lost 6 - 10 acres. About 16.0 % of respondents lost land above 20 acres whilst 6.0 % lost 11 - 15 acres. The maximum size of land lost to land deals was hundred (100) acres from three affected respondents within KNEM. Vertically,

it can be observed from the table that 24 respondents representing 65.0 % from KNE had lost land whilst the remaining 35.0 % of respondents had lost farm land in Gushiegu.

Yogbania, Bonia and Korania are communities that lie within the catchment area of the Tono Irrigation Dam. These three communities together had twenty-two respondents representing 59.0 % of the entire respondents who have lost land to commercial acquisitions. At the same time these three communities have individuals losing larger scales of land.

The result shown in Table 4.5 is similar to the finding of Schoneveld et al. (2011) where they also recorded that fewer households lost land to investors. According to the work of Schoneveld et al. (2011), a larger part of the acquired field was previously fallowed lands where everyone could engage in hunting and gathering of naturally occurring livelihood assets. Clearing acquired community lands for the purposes of commercial agricultural investment has direct effect on the availability of land for fallowing.

Table 4. 5: Distribution of land sizes lost within affected communities

Size o Land (Acre)	Kassena Nankana East Municipal					Gushiegu District					Total
	Naaga	Kologo	Yogbania	Bonia	Korania	Sampebga	Samanga	Gaa	Nayugu	Kpatinga	
1 -	0	0	4	2	6	3	1	1	2	0	**19**
6 -	1	0	1	3	2	1	0	1	0	0	**10**
11 -	0	0	0	0	1	0	1	0	0	0	**2**
Abov	0	1	0	1	1	0	1	2	0	0	**6**
Tot	**1**	**1**	**6**	**6**	**10**	**4**	**3**	**4**	**2**	**0**	**37**

CE: Author's Field Survey (October 2016)

4.4.2 Land acquisitions and Farmer Perception of Risk of Land Loss

As indicated from the Goldstein and Udry (2008) framework, farm fallowing decisions by households is an indicator of the perception of risk of land appropriation. Lands that are cultivated are rarely lost, especially within the context of usufructory rights in northern Ghana. Traditional custodians and clan heads would mostly appropriate lands that are idle or have been fallowed for considerably long periods of time. The study's *a priori* expectation is that communities with relatively higher commercial demand for land would have fewer number of households fallowing land and the durations would be shorter than communities not having commercial land investors or are further away from intensive land grabbing areas.

The distribution of fallow decision of households is shown in Table 4.6. Out of 163 respondents interviewed in Gushiegu District, 91.0 % indicated that they practice land fallowing. In KNEM, 72 respondents representing 52.0 % engaged continuous cropping on their land every year without allowing the land to fallow.

In the pooled result, 72.0 % of the respondents had engaged in fallowing as against 28.0 % who had not engaged in fallowing in recent times. The result clearly shows that there is an issue with agricultural land access and land use in KNEM relative to Gushiegu District.

Table 4. 6: Distribution of respondents' fallow decision by district

Respondents' fallow Decision	Gushiegu District	KNEM	Pooled
	Frequency (Percentage)	Frequency (Percentage)	Frequency (Percentage)
No fallow	14 (9.00 %)	72 (52.00 %)	86 (28.00 %)
Fallow	149 (91.00 %)	67 (48.00 %)	216 (72.00 %)
Total	**163**	**139**	**302**

SOURCE: Author's Field Survey (October 2016)576y7

Fallowing of farm land is an essential practice in crop production. It is an appropriate agronomical technique that allows farm lands to rejuvenate itself and it is keenly dependent on land availability to farm households. This study analysed the relationship between fallowing and land acquisitions. Table 4.7 shows the relationship between respondents 'recent fallow' (i.e. the most recent fallow of farm land by farm household) and 'fallow period' (i.e. number of years taken before re-cultivating farm land) decisions.

Three category of respondents were considered in the study including those living in communities affected by land grabbing, those in non-affected communities and household that lost farmland to large scale agricultural investors (DI's). The analysis of their stated fallowing schedule in recent times shows that 92.0 % of non-affected respondents who fallowed their land for 4 - 6 years could wait for less than 3 years to revisit their fallowed land. This was higher than 67 % and 50 % of affected and DI's respectively.

Tal : Relationship between recent fallow and fallow period as distributed across Affected, Non-Affected and DI's

	Fallow period										
	Affected				Non-affected				Direct Impact respondents		
Recen fallow	**– 3** (%)	**4 - 6** (%)	**>6** (%)	**Total** (%)	**1 – 3** (%)	**4 - 6** (%)	**>6** (%)	**Total** (%)	**1 – 3** (%)	**4 - 6** (%)	**Total** (%)
1 - 3	100	-	-	100	100	-	-	100	100	-	100
4 - 6	7.31	32.69	-	100	91.67	8.33	-	100	50	50	100
> 6	33.3	16.7	50.0	100	14.3	14.3	71.4	100	-	-	-
Total	**1.34**	**14.18**	**4.48**	**100**	**86.44**	**5.08**	**8.48**	**100**	**86.36**	**13.64**	**100**
	(12) = 118.6384; **Pr = 0.000*** **				χ^2 (16) = 105.2745; **Pr = 0.000*** **				χ^2 (1) = 9.2632 **Pr = 0.002*** **		

CE: Author's Field Survey (October 2016)

From table 4.7, the result shows that when fallow periods are shorter (between 1-3 years), there is no difference between affected and non-affected households responses. On the other hand, the differences emerge when fallow periods are relatively longer (6 years and above). Non-affected respondents who had fallowed their land above 6 years recorded 71.0 % of them returning to their fallowed lands after 6 years. Affected category also recorded 50.0 % of the respondents returning to their fallowed lands after 6 years. Victims did not record any recent fallow beyond six (6) years.

Statistically, the test of relationship between responses recorded for recent fallow were significantly different from those recorded for fallow period across the three categories of respondents. This is statistically significant at 1 % level of significance. From the results, farmers who live in affected communities or have lost land have a higher likelihood of fallowing lands for shorter periods. This may be due to the absence of land redistribution among direct impact (DI) category of respondents.

About 72.0 % and 28.0 % of respondents in affected communities in KNEM and Gushegu district, respectively indicated that acquired lands in their communities have affected their ability to allow their farm lands to fallow. The reasons they assigned for changes in fallow decisions are presented in figure 4.3. The result shows that 92.0 % of respondents from Gushiegu District stated they have inadequate farm land from which they could fallow as against 80.0 % response from KNEM. On the other hand, high cost of land and the fear of losing farm lands recorded 10 percent response each in KNEM. In the Gushiegu District, 8.0 % stated that they were non-native of the community in which they reside hence do not have enough land.

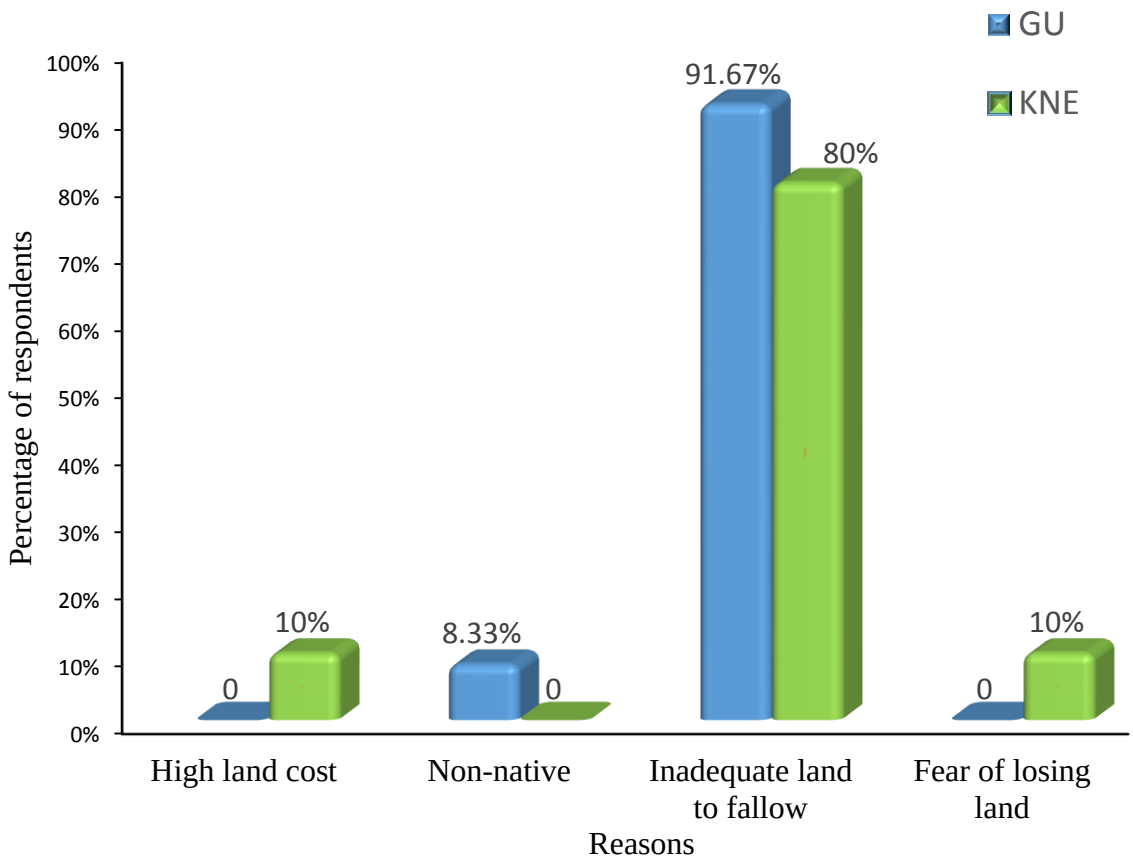

Figure 4. 3. Reasons for reduced fallow period

Analysis in this section also establishes the fact that commercial land deals have effect on farmers' ability to fallow for longer period, which is an indication of increased pressure on available farm lands. Fallow period has been extensively discussed by Ahn (1979), Amanor (1994), Nweke et al. (2002), Ajayi et al. (2007) and; Norgrove and Hauser (2016) as most appropriate way for natural rejuvenation of soil for cultivation especially when done for a period of 6-8 years. Commercial land acquisitions when not regulated is most likely to result in land degradation in the long term. As pressure on available land for cultivation increases, inorganic chemical application is also likely to increase. This would in turn affect soil organic matter sustainability and eventually soil fertility loss which is detrimental to agricultural development in the country.

4.4.3 Land Deals and Agrarian Change

Eighty-four (84) affected respondents were of the view that commercial scale of land deals in their communities had influenced their farming activities. This view is shared by; 63.0 % of respondents in the KNEM and 37.0 % in Gushiegu District. The result shows that, up to 94.0 % of the respondents from Gushiegu District revealed they had entered into 'agreement' (entering into negotiation with investors to rent portions of their developed lands for farming) relative to 56.0 % of the respondents who had entered into similar agreements in KNEM. This means that customary arrangements that existed in affected communities have given way to new negotiations for smallholder farmers in their quest to access farm land. The result presented in figure 4.4 shows that majority of the respondents across the two districts cited 'agreement' as the emerged way of accessing farm plots within affected communities. These agreements are arrived at on conditions of

compensation either in the form of token payment or in kind. Commoditisation of acquired land to rural farmers is therefore eminent and needs to be addressed by stakeholders in Ghana's agriculture.

Respondents stated sharecropping as another re-emergent phenomenon within affected communities. Share cropping was explained as negotiating for land in a different community in an arrangement of dividing total produce at the end of the farming season by an agreed fraction with the land owner. In KNEM the result shows that 40.3 % were also engaged in share-cropping likewise 3.1 % of respondents in Gushiegu District. Limited access to land was cited by respondents as the main reason for their movement to other communities to seek for farm land. The study acknowledges the difference in land tenure systems in the two districts but the resultant effect of land release to commercial invested is same. In the sense that farmers who held usufructory rights to use land had their right withdrawn, hence had to seek for other lands elsewhere.

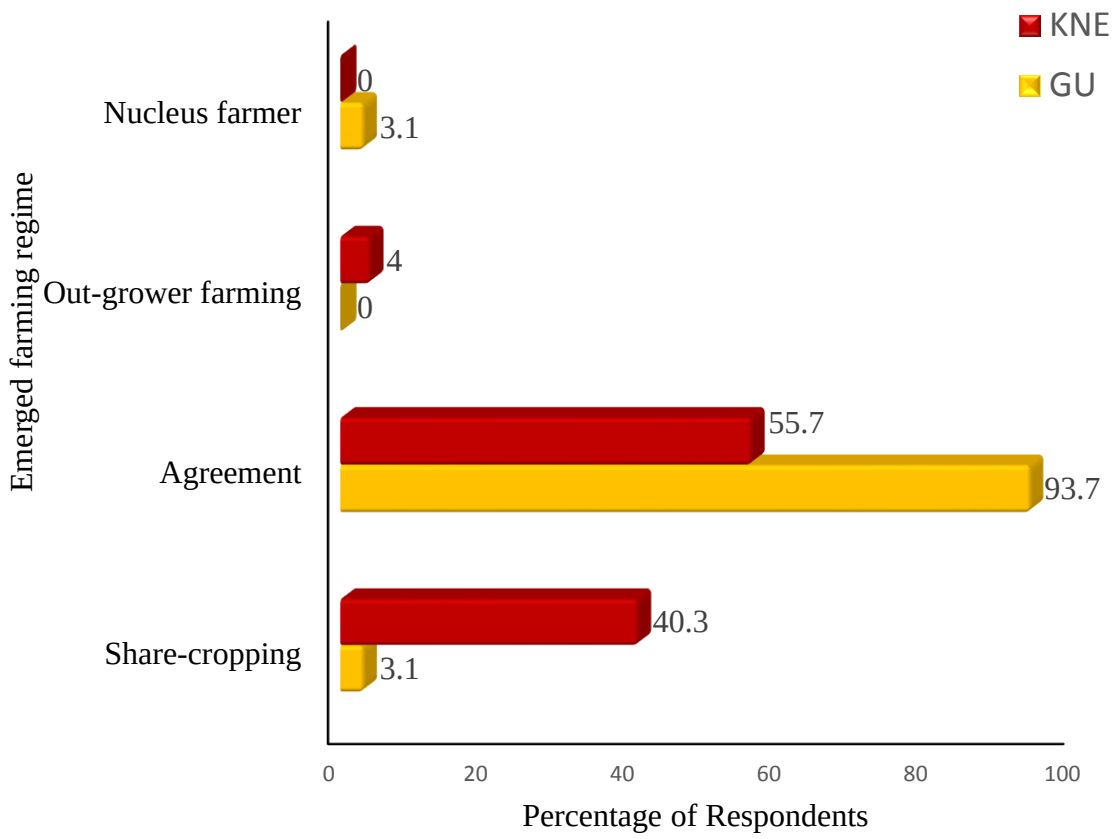

Figure 4. 4. Emerged faming regimes within affected communities

From the Gushiegu District 4.0 % indicated that commercial land acquisitions in their communities had influenced their engagement in out-grower farming regime which aims at maximizing farm proceeds. Nucleus farming also recorded 3.1 % response in KNEM.

4.5 Effect of Medium and Large Scale Land Deals on Alternative Land Resources and Services

The third objective of the study sought to explore the extent to which land deals serve as source of risk to farm households by adopting the extent of damage type of risk estimation as proxy. The basic question to answer here is, to what extent do medium and large scale land deals affect sources of livelihood among communities that have lost significant proportion of their forest cover within the study area. The study answers this question by determining access to alternative land resources and services like firewood, wild fruit and game. The analysis here centers on impact of land deals by comparing communities which have land acquisitions (affected) with communities which have no land acquisitions (non-affected).

The general response to the access of naturally occurring land resources is presented in Table 4.8. Access to firewood recorded a mean value of 3.47 which approximates 'easy' access. Also access to wild fruit and access to game had mean values of 2.64 and 3.92 approximately 'somehow easy' access and 'difficult' access respectively. The result shows a limited access to game across all respondents. This gives an indication that easy access to firewood directly reduces the habitat of wild animals such that wild animals have to move to places they can survive, hence the difficulty in accessing game.

Table 4. 8: Extent of accessibility to livelihood assets

Category of access	Mean response	Skewness	Kurtosis	Coefficient of variation (CV)	Indication
Access to firewood	**3.47**	-0.38	1.47	0.47	**Difficult**
Access to wild fruit	**2.64**	0.42	2.03	0.48	**Somehow**
Access to game	**3.92**	-0.71	2.31	0.30	**Difficult**

SOURCE: Author's Field Survey (October 2016)

Comparison of the accessibility to livelihood assets across affected and non-affected communities.is statistically determined using a t-test analysis. With reference to fuelwood access (Table 4.9), the pooled test result showed that non-affected respondents had a mean response of 3.82 which represents a 'difficult' access whilst affected respondents recorded a mean response of 3.29 representing 'somehow easy' access. The pairwise mean comparison of non-affected category with affected showed a statistical significance at 1 % but responses from Gushiegu District showed no statistically significant difference among affected and non-affected categories. KNEM exhibited similar outcome as that of the pooled results. Non-affected respondents are shown to have limited access to fuelwood than their affected counterparts.

Table 4. 9: Respondents' access to livelihood assets (non- affected and affected categories)

	Kasena-Nankana East Municipal					Gushiegu District					Pooled				
	No of responds	Mean	Std. Dev.	t	Prob > t	No of responds	Mean	Std. Dev.	t	Prob > t	No of responds	Mean	Std. Dev.	t	Prob > t
Fu access															
Nc ted	45	3.2	0.94	3.67	0.000	55	3.04	1.57	0.86	0.388	100	3.82	1.49	2.70	0.007
Af	94	2.96	1.52			96	2.30	1.69			165	3.29	1.64		
Di		0.24					0.74					0.53			
W access															
Nc ted	45	3.53	1.28	26.1	0.000	55	3.08	1.20	13.24	0.000	100	3.26	1.26	6.36	0.000
Af	94	2.35	1.13			108	2.30	1.20			202	2.32	1.16		
Di		1.18					0.78					0.94			
Ga ess															
Nc ted	44	4.45	1.22	1.03	0.30	55	3.78	1.21	1.59	0.113	99	4.08	1.25	1.66	0.096
Affected	94	4.23	1.13			107	3.49	1.01			201	3.84	1.12		
Difference		0.22					0.29					0.24			

SOURCE: Author's Field Survey (October 2016)

In table 4.9 a paired comparison of accesses to wild fruit also showed that non-affected respondents had a mean response of 3.26 which represents a 'somehow easy' access. On the other hand, affected respondents recorded a mean of 2.32 which represents 'easy' access. Differences in mean test showed a 1 % significance level in the comparison of responses between non-affected and affected households. The pooled result shows that access to wild fruit is generally easy across respondents. This notwithstanding, responses to wild fruit access among the two comparing categories were significantly different from each other statistically. The result is also similar across non-affected and affected respondents in KNEM and Gushiegu District.

Respondents' access to game, in comparison (table 4.9) showed that Non-affected had a mean response of 4.08 which represents a 'difficult' access whilst affected respondents recorded a response mean of 3.84 which also represents a 'difficult' access. The pairwise test of mean differences in the pooled results showed significance at 10 % between non-affected and affected households but no significant difference in the means compared across KNEM and Gushiegu District. This result shows a general difficulty in access to game across all categories of respondents and perhaps gives an indication of the extent of loss bedeviling hunting as a livelihood source.

From the results, non-affected respondents are shown to have better access to naturally occurring livelihood assets. This result does not meet *a priori* expectations set by this study and might be due to the fact that these land deals are occurring in forest zones as found in

the study of Schoneveld et al. (2011) such that their effects on open access livelihood assets are not significantly felt by rural households. Unlike farm lands that are individually owned and protected, common pool properties such as naturally occurring livelihood (fuelwood and game) assets are not. Wild fruits like Shea, Baobab and Dawadawa are communally protected for the benefit of society, hence it is not surprising to find access to wild fruit being easier across respondents.

4.6 Effect of Land Deals on Livelihood Choice Decisions of Farm Households

The key argument by governments in Sub-Saharan Africa in support of commercial acquisition of land for agriculture is economic development through positive agrarian change. The interface between the 'modern' investors acquiring land for commercial agriculture and rural peasants' improvement is that, the latter is expected to be achieved through the creation of jobs, improving incomes and by technology transfer that would improve indigenous farming systems. The effect of land grabbing on local farming systems has therefore become a key indicator in assessing the impact of commercial scale agricultural land deals. In this section, the study undertakes an econometric estimation of the effects of land deals on livelihood choice decisions of farm households and this answered the question of finding the relationship that exist between land deals and livelihood decisions, using a multinomial logit regression model.

From the results, the likelihood-ratio (LR) test of the joint hypothesis shows that the coefficients of all the explanatory variables are significantly different from zero as indicated by the LR Chi-squared = 119.15 with $p<0.01$, suggesting that the estimated model is highly significant. The Pseudo R^2 (0.4847) means that the model variables were able to predict at least 48.47% of the probability of farm households choice of intensive and low intensification farm livelihood regimes ahead of semi-intensive. The interpretation of all significant explanatory variables is based on ceteris paribus assumption.

Table 4. 10: Multinomial logistic estimation of factors influencing farm household's choice of farming strategies

	Intensive			Low intensification		
	RRR	**Std. Err.**	**P>z**	**RRR**	**Std. Err.**	**P>z**
HHSIZE	0.009	0.045	0.840	0.117	0.244	0.631
Age	0.014	0.021	0.509	0.193	0.112	0.087
Edu_yrs	0.034	0.060	0.570	0.376	0.255	0.139
Tt_plotsize	0.043	0.019	0.020	-0.103	0.123	0.400
knwlg_other_grabs	3.569	0.841	0.000	2.088	2.655	0.432
Future_intent	1.272	0.674	0.059	-13.56	146.932	0.926
Recent_fallow	0.237	0.200	0.237	1.556	0.786	0.048
Fallow_period	-0.285	0.231	0.219	-1.495	0.705	0.034
Adults	0.199	0.094	0.034	-0.019	0.339	0.955
Enough_land	-0.305	0.758	0.688	29.096	160.667	0.856
Edu_amnt	-0.002	0.0008	0.022	0.019	0.009	0.035
Tt_Mexpend	0.0012	0.0007	0.063	-0.015	0.008	0.055
Reimit_amt	-0.00016	0.0004	0.701	-0.009	0.005	0.098
Dist_name	7.165	2.199	0.001	4.959	776.201	0.995
Aq_bush land	-1.115	0.764	0.145	4.787	3.758	0.203
Aq_fallowed land	-14.971	630.389	0.981	0.817	7.312	0.911
inv_arable	3.538	1.871	0.059	2.558	244.798	0.992
sc_large	-4.216	2.589	0.103	-1.735	864.501	0.998
yr_longer	3.547	1.784	0.047	-9.132	206.166	0.965
Grab_status	-1.158	0.763	0.129	9.703	8.434	0.250
_cons	-11.270	2.757	0.000	-46.283	161.339	0.774

Pseudo R^2 (0.4847); Prob > chi2 = 0.01; Log likelihood = 119.15;
Number of obs = 202. Values in parenthesis represent respective standard errors.

Farm household's choice of intensive farming regime was positively influenced by farm size. The risk ratio of farm size is 0.043 ($p<0.05$) suggesting that, a marginal increase in farm size would result in a 0.043 probability of a household to choose an intensive farming system over semi-intensive. This contradict the work of Rahut and Micevska (2012), and Gecho et al. (2014) who found that farm size had positive influence on farmers' choice of non-farm livelihood. This result meets the *a priori* expectation in the sense that farm households with larger farm sizes are endowed with either social or financial capital and could intensify their faming activities within affected communities in the wake of commercial land deals.

Farm households having knowledge on more than one existing acquisitions within their community had a risk ratio of 3.569 at 1 % significant level and a positive relationship with choosing intensive farming strategy. This means that knowing other acquisitions increases the likelihood of a farm household choosing intensive over semi-intensive regime of farm work. A farm household's knowledge on more than one land acquisition has a direct correlation with reduced community lands. Therefore, respondents intend to make the best use of the available land at their disposal which accounts for their engagement in intensive farming.

Farm households with future intensions of cultivating part of grabbed lands had a positive and significant influence on choosing intensive farming strategy at a risk ratio of 1.272 and a 10 % significance level. This shows that farm households who had future intension are 1.272 times more likely to choose intensive over semi-intensive regime of farm work. This

result may be due to the fact that, individual farm households who had the intention of cultivating parts of acquired lands are having the capacity to extend their farming activities and have channeled those resources to intensification.

Total number of adults in a household was positive and significant at 5 % with the choice of intensive farming. Showing that at a 0.199 risk ratio, households with higher number of adults are more likely to choose intensive over semi-intensive regime of farm work. This result meets the *a priori* expectation due to the fact that, adults are of the working class and can contribute either labour or capital to intensive farming within the household.

Amount spent on ward's education influence the risk ratios of farm households engaging in the intensive and low intensification regimes of farm work. The risk ratio of intensive was -0.002 showing a negative relationship with education amount but for low intensification the risk ratio was 0.019. This result indicates that farm households with higher amounts spent on wards education are 0.002 times less likely engage intensive farming and are 0.019 more likely to choose low intensification ahead of semi-intensive farming. The cost of taking wards through school has direct influence on financial capability of a farm household, hence households with increasing bills on schooling are more likely not to engage in intensive farming. This is because intensive farming requires the purchase of agrochemicals, improved seeds, fertilizer and the use of farm machines. On the other hand, the reverse of this reason is valid in explaining the positive effect of amount spent on wards' education on low intensification.

Also, total monthly expenditure of farm household influences positively the risk ratio of engaging in intensive farming whilst negatively influencing the risk ratio of low intensification. This result indicates that farm households with higher monthly expenditures are 0.0012 times more likely to engage in intensive farming and are 0.015 less likely to choose low intensification ahead of semi-intensive farming. Total monthly expenditure encompasses all expenditures made by the household within a calendar month and reflects a good economic standing of such household. In light of this, it is not surprising that farm households with higher monthly expenditure do engage in intensive farming because they can afford. The result is consistent with the findings of Abimbola and Oluwakemi (2013), and Yizengaw *et al*. (2015) that total household income has positive influence on farmers' choice of livelihood strategy. This inversely explains the negative effect of higher monthly expenditure on low intensification.

Location of respondents on the other hand shows a positive and significant (1 %) relationship with the choice of intensive farming at a risk ratio of 7.165. This shows that, given the districts considered in this study, residing in KNEM increases the likelihood of choosing intensive farming ahead of semi-intensive farming, over residing in the Gushiegu District. This may be due to the fact that sizes of land that are grabbed in KNEM are larger in scale as compared to acquisitions in the Gushiegu District. This confirms the study by Yaro, (2006) in Kassena Nankana East as farmers engage intensive farming as a result of difficulty in accessing arable land in the area due to land grabbing.

At 10 % significance level, affected communities with acquired lands used for arable crop investments showed positive relationships with the choice of intensive farming. This means that at a risk ratio of 3.538 farm households within such communities are more likely to choose intensive farming ahead of affected communities with tree crop investments. This result may be due to the fact that acquired lands used for arable crop investments are most likely to have irrigation facility which can be taken advantage of by farmers within the catchment area therefore it is not surprising that these farmers engage in intensive farming.

Longer years of grabbing also, showed a positive and significant (5 %) relationship with the choice of intensive farming. This gives an indication that, at a risk ratio of 3.547 farm households residing in a community which has been affected for longer years are of higher likelihood of choosing intensive farming ahead communities with shorter years of acquisition. This result also may be due to the fact that longer years of acquisition has contributed to the reduction in farmers' per capita land access, hence the need to adopt intensive farming regime.

Age was positively significant with the choice of low intensification. The risk ratio of age is 0.193 which indicates that at 10 % significant level, farm household with older heads are about 0.193 times more likely to choose low intensification over semi-intensive regime of farm work. Increased age has direct correlation with strength reduction in humans, therefore it is expected that as farmers age increases they are more likely to engage in low intensified farming.

Recent fallow showed a positive relationship with choosing low intensification at 5 % significant level. The risk ratio of recent fallow is 0.237 which indicates that farm household with longer years of recent fallow are about 0.237 times more likely to choose low intensification over semi-intensive regime of farm work. This result is not consistent with the *a priori* expectation and may be due to the fact that, farmers who have not fallowed their farm lands for a longer period of time are not highly incentivised to farm, hence do not put much investment into farming. Land fallowing has been proven to improve soil fertility, therefore it is expected of motivated farmers to either engage in fallowing or intensify his/her farming routine.

The results also show a negative relationship between fallow period and the choice of low intensification at 5 % significance level. This means that, with a risk ratio of -1.495 farm households that experiences shorter fallow periods are more likely to choose semi-intensive over low intensification regime of farm work. Farmers with longer fallow period are most likely to sustain soil fertility. This result supports the fact that such farmers do engage in semi-intensive farming ahead of low intensification as they partly complement their farm work with farm inputs and machinery.

Remitted amount received by farm households showed a significant level of 10 % was found to have a negative relationship with the choice of low intensification. This shows that, at a risk ratio of -0.009 farm households that receive lower amounts of remittance are more likely to choose semi-intensive farming ahead of low intensification. The reasoning behind this could be that farm households with low income support from family and well-wishers do rely more on farming activities than their counterparts who receive support.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Introduction

This study focused on analysing the scale and dynamics of large and medium scale land deals and how these affect risk of land access and livelihood alternatives for smallholder farm households. This chapter presents the summary of key findings, conclusion and policy recommendations of the study.

5.2 Summary of Key Findings

The finding shows that commercialization of agriculture in rural frontiers has not in any way led to the diversification of livelihoods out of farming. Many rural communities still engage in agriculture despite new constraints introduced by land grabs. This outcome is consistent with the study conducted by Schoneveld et al. (2011) and also Magole and Thapelo (2005) who found out that in flood hit Tabu community in Botswana farmers had refused to stay away from farming in spite of recurrent floods.

Land acquisitions in the study area are shown to have directly affected individuals and has also led to dispossessions. Most acquired lands are community lands from which chiefs and family custodians had given out. The findings contradict assertions that investors mostly target uncultivated lands and operate mostly in land abundant areas.

The trajectory of commoditisation of land in the study area follow similar patterns to those that occurred in southern Ghana in the 19th Century. Like in southern Ghana where cocoa drove commercialization of land, most lands in the study area were acquired for large scale mango and cashew plantations for export. The distinguishing factor in the case of the study area is predominance of domestic investors seeking to benefit from government and donor funded incentives for commercialization of agriculture.

5.3 Conclusion

The study concludes that, since the main actors of medium and large scale land deals in the study area are private investors and the public private partnerships, land deals in the study area are mainly driven by domestic investors rather than transnationals. These acquired lands are mostly put into the cultivation of mango plantations, non-irrigated rice fields, cashew plantations and irrigated rice fields.

The study further establishes that there is limited land availability to farmers as cited by majority of respondents as the main factor influencing their inability to fallow their farm lands. Direct impact category of respondents were the most affected, followed by the affected category with regard to reduced fallow periods. This implies that victims within affected communities are most likely to have worsened livelihoods due to land acquisitions this confirms the postulation by Goldstein and Udry (2008) and also establishes that there is eminent risk associated increased land loss to commercial land deals.

Finally, the study identified that farmers in affected communities do engage actors of medium and large scale lands in an agreement for accessing farming plots within the

acquired area. Such circumstances further deepens unequal access to land than customary negotiations and nullifies arguments of better incentives provision by commercial investors. This situation translates into the payment of a token either in cash or in kind by farmers - this is an evidence of commoditization of land. The study can conclude that a time is coming where indigenes will become settlers on their motherland due to unregulated land acquisitions.

5.4 Policy Recommendations

Commercialisation of land must be accompanied by efforts to diversify livelihoods away from land-based systems. This would require skills training for rural peasants to enable them take up emerging livelihood opportunities. This is necessary because local peasants who are disposed by commercial land deals have limited options for livelihood.

Large to medium scale land acquisition policy should be developed and implemented. Such policy should have a clause that check the limits to which medium and large scale lands can be taken from a particular district in Ghana. This would ensure that biodiversity is protected and local people or indigenes also are given a significant quantum of naturally occurring asset (game, wild fruits, water and fuelwood) to support their livelihoods.

Regulation of commercial land deals is key. This regulation should include guidelines on acquisition of communally owned land and prescriptions for compensation for loss of livelihoods. Most medium scale investors in agriculture acquire land as means of gaining access to government and donor funds and not necessarily to develop commercial farms.

This is evident in large tracts of bush lands that have been cleared and abandoned. In order to safeguard the interests and livelihood of rural peasants, agricultural investment programmes must make community-investor partnerships a key condition for gaining access to government and donor incentives. Such policies would help reduce elite capture and ensure lands and funds acquired by urban elites translate into investments and livelihood opportunities.

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APPENDICES

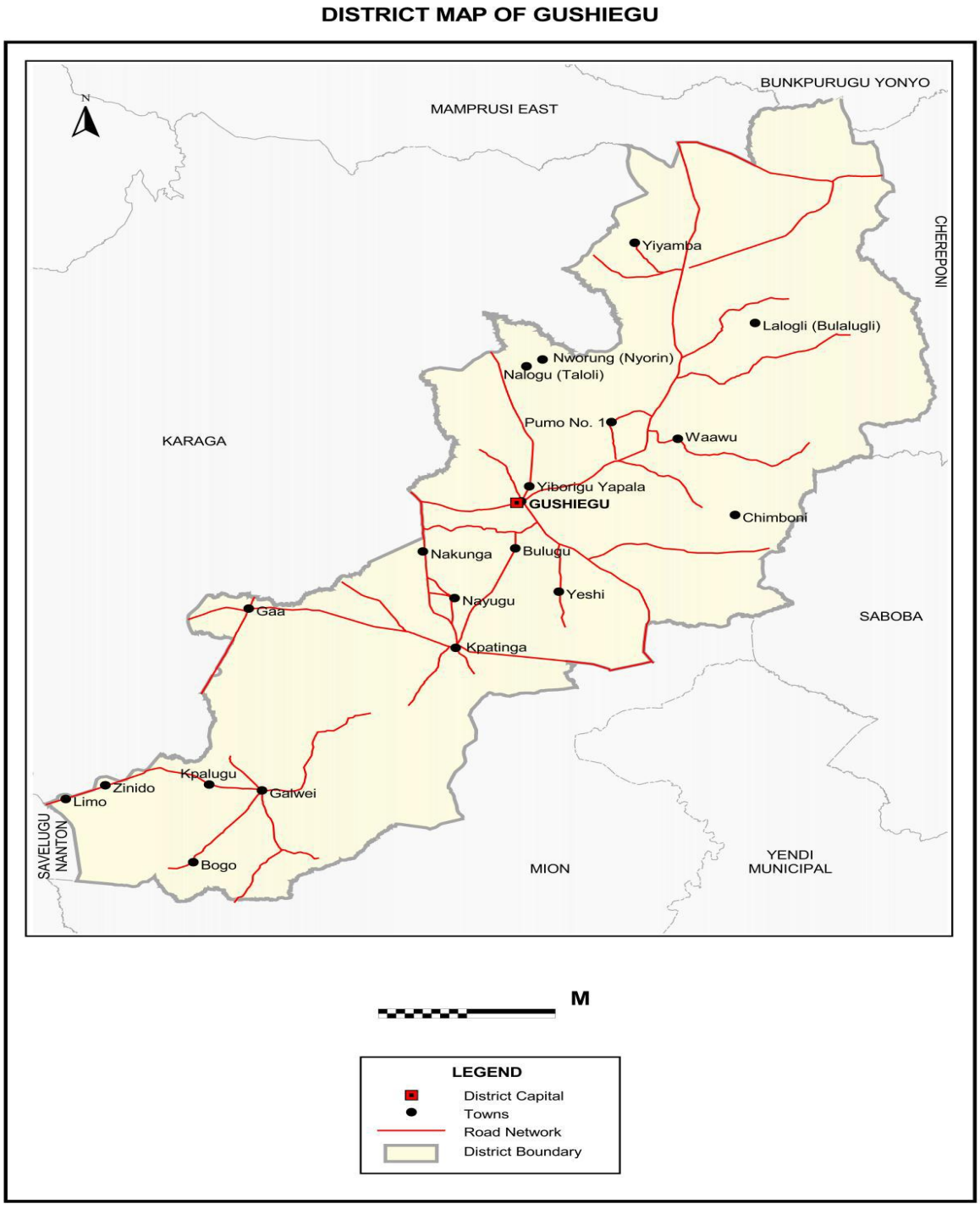
Appendix 1: Summary of Scale of Land Grabbed, Actors and Types of Investment

ɔf community	Type of investment	Land size (Ha)	Years of investment	Investor
	Mango plantation	81	4	Private
	Mango plantation	81	6	Farmer group
	Mango plantation	202	4	Private
ıia	Irrigation Dam (maize, millet, rice)	2,490	40	ICOUR
ı				
ɔga	Rice	130	20	Ghana Government
	Rice	20	4	Private
ga	Cashew	20	20	Private
	Mango plantation	8	4	GSOP
Kpatinga	Mango plantation	8	4	GSOP
Nayugu	Mango plantation	8	4	GSOP

Appendix 2: Matrix of Objective, Method, Key Finding, Conclusion and Policy Recommendation

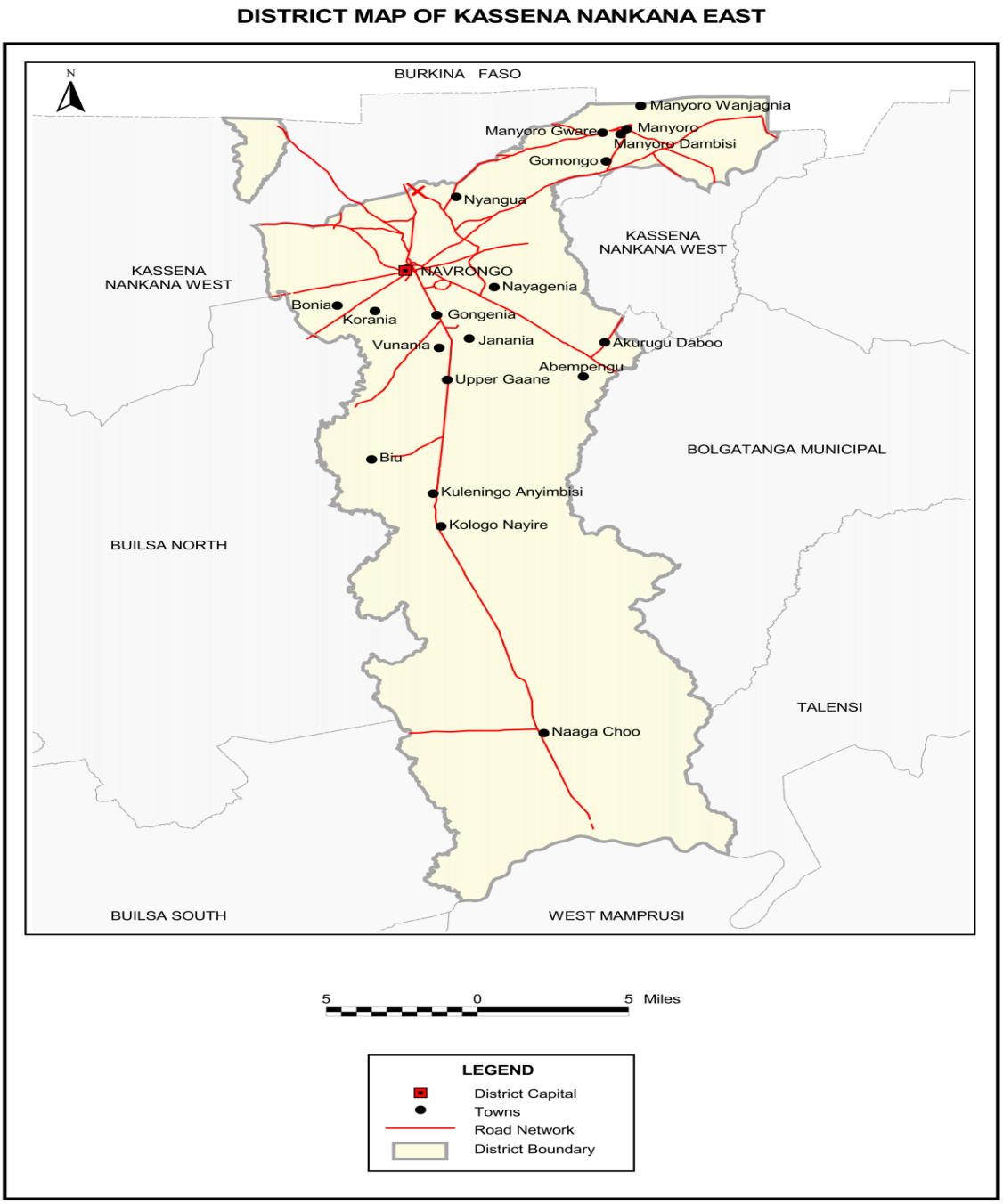
Objectiv		Method of analysis	Key findings	Conclusion	Policy recommendation
To exami and drive scale la Northern	, actors nedium als in	Chart and Tables	**Actors**: Private individuals and Government. **Drivers**: Irrigated and non-irrigated rice fields, Mango, Cashew plantation. **Scale:** Medium and large.	**Actors**: Private individuals and Government. **Drivers**: Irrigated and non-irrigated rice fields, Mango and Cashew plantation. **Scale:** Medium and large.	
To analy which land deal availabili access in	xtent to scale ıce land l land ly area.	Cross tabulation and Chi-square test	Diminished fallow period and increased recent fallow years.	There is limited land availability as cited by majority of respondents to be the main factor influencing their inability to fallow their farm lands.	Regulation must be put across to check the limits to which medium and large scale lands can be taken from a particular district in Ghana.
To deter of land resource the study	e effect ın land vices in	t-test analysis	Difficult accesses to naturally occurring livelihood assets (fuelwood and wild fruit).	There is evidence of livelihood asset loss but cannot be solely due to land grabs and the situation is most eminent in KNE than Gushiegu.	Regulation should include guidelines on acquisition of communally owned land and prescriptions for compensation for loss of livelihoods assets.
To examine how land deals influence the livelihood choice decisions of farm households.		Multinomial logit regression.	Longer years of grab and residing in KNE influences the choice of intensive farming strategy.	Land grabs has effect on livelihood strategy.	Local development authorities should enhance institutional support systems aimed at diversifying farmers' income sources.

Appendix 3: Map of Gushiegu District



Source: Ghana Statistical Service, GIS

Appendix 4: Map of Kassena Nankana East



Source: Ghana Statistical Service, GIS

Appendix 5: Land Acquisitions and Registration: Upper East

	Size of land (Ha)			
	Mean	**Maximum**	**Minimum**	**Count**
Upper East- Small-Medium				
Benkote-Zuarungu	50.00	50.00	50.00	1
BIU	13.21	16.19	10.24	2
ICOUR-TONO	10.76	12.14	10.24	11
Jentia	18.00	18.00	18.00	1
KOLOGO	13.75	24.28	10.24	4
KORANIA	10.24	10.24	10.24	2
NAAGA	10.24	10.24	10.24	4
NAMOLO	12.17	16.19	10.12	5
NAVRONGO	10.71	12.14	10.24	4
Upper East Medium				
Pusu-Namongo	76.18	156.63	45.06	4
Pwalugu	153.20	153.20	153.20	1

Source: Lands Commission, Ghana (October, 2016)

Appendix 6: Land Acquisition and Registration: Northern Region

	Size of land (Ha)			
	Mean	**Maximum**	**Minimum**	**Count**
Northern Medium-Large				
Bunkpurugu-Yunyoo	12.19	12.24	12.14	2
Chang naa yili	15.50	20.85	10.15	2
Golinga	20.00	20.00	20.00	1
Gushiegu	31.12	50.00	20.00	27
Mion District	33.19	75.04	12.26	3
West Gonja	613.07	2027.66	13.38	4
Nanumba	51.34	130.56	25.43	3
Northern Large				
Bole	34882.72	51798.00	10369.17	3
Bontanga	570.00	570.00	570.00	1
Damongo	22493.00	111600.00	43.00	5
Central Gonja	1124.03	6834.63	10.24	7
Savelegu/Nanton	157.76	210.36	40.80	5
Walewale	17349.80	31469.00	8806.00	5
Yendi	6340.75	16441.00	29.00	8

Source: Lands Commission, Ghana (October, 2016)

MEDIUM AND LARGE SCALE LAND DEALS SURVEY IN NORTHERN GHANA
FARM HOUSHOLDS QUESTIONNAIRE

Household Number **HHID**_____

House Name; **HNAME**_ _____

Respondent(s) Name l _____ **Tel No. of Respondent** _____

Household size of resp _____

Enumerator Name: _____ *ENNUM* _____

Name of District: _____ *DSTRT* _____

Name of Village: _____ VILGE _____

Time Interview Starte)_____ Time Interview Ended (hr:mn)_____

Date of Interview (dd.....,,,_____ Revisits: Date (dd.mm.yy)_____

Region codes: 1=Northern 2= Upper East

zzz1. DEM HIC CHARACTERISTICS OF HOUSEHOLD (TO ADMINISTER TO FARM OWNER/DECISION MAKER IN HOUSEHOLD)

1.1. How old _____years

1.2. Sex of re t _____ 1. Male 2. Female

1.3. Marital s respondent_____ (enter codes below)

1.4. What le ication did you attain?_____(use codes)

1.5. How ma did you spend in schooling? _____years

1.6. Can you ntence in English? _____ 1. yes 2. No

1.7. What is or occupation?_____(use codes)

1.8. What is or occupation? _____(use codes)

1.3 Marital S

_____ ___

1 = Married
2 = Never m
3 = divorced
4 = widowed
5 = separate
6 = other, sp

1.4 Education levels

1= No education
2`=pre school
3=primary
4= JHS/Middle
5=secondary/SHS
6=tertiary
7=non-formal

1.7 & 1.8 Major and Minor Occupation

1. Arable crop farming
2=Vegetable farming
3=tree crop farming
4=livestock farming
5=fishing (fish and seafood)
6= produce marketing (crop)
7=livestock marketing (incl. produce)
8=petty trading
9=salaried worker
10=tradesman (bricklayer, carpenter,
11= artisan(basket weaver, potter, etc)
12=schooling
13=unemployed
14=others (specify)

2. HOUSEHOLD CROP PRODUCTION INFORMATION FOR SEASON

Crop02.sav *Key Variables: ,hhid, season, pid, plot, crop*

Plot No.	2.1		2.2 Plot size in Acres	2.3 How is this plot watered? 1=Rain fed 2=Irrigation 4=other (specify)	2.4 What type of seed did you Plant? 1=Purchased / improved 2=Recycled improved 3=local 4= Purchased / improved + local	2.5 What quantity of seed did you use? And how much did it cost, if you purchased this season?			2.6. What quantity of fertilizer did you apply?				2.7. What quantity (value) of labour did you use?		
						Qty	Unit	Cost per unit	Type	Qty	Unit	Cost/per unit	Type	Qty (days)	Cost/per day
Plot			**Acres**	**Water**	**Sdtype 1**	**Sqt**	**sunit**	**Scost**	**Fert1**	**fqty1**	**unit1**	**Fertcost1**	**labtyp**	**labdays**	**Dailywage**
1															
2															
3															
4															
5															

Unit Codes			Crop Codes					Labour Codes
1=90 kg bag	hes	13=grams						
2=kgs	bag	14=wheelbarrow	Cereals	Legumes	Roots and Tubers	Vegetable Crops	Other Crops	Labour type
3=litre	bag	15=cart	1= Early millet	7= Groundnut	15= Yam	21= Leafy vegetables	29= Kenaf	1. family
4=crates	uring	16=canter	2= Late millet	8= Bambara groundnut	16= Cassava	22= Pepper	30= Cotton	2. Hired
5=numbers	g tin)	17=pickup	3= Sorghum	9= Beans	17= Sweet potato	23= Tomatoes	31= Tobacco	3. Group Farming
	es	18=2kg packet	4= Rice	10= Cowpea	18= Frafra potato	25= Okro	32= Mango	
	g bag	(seed)	5= Maize	11= Neri	19= other roots	26= Onions	33= Pawpaw	
	surin	19= Maxibag	6= other cereals	12= Soybeans	and	27= Garden eggs	34= Cashew	
	8kg	20= Basin	(specify)	13= Pigeon pea	20= Tubers	28= other vegetables	35= Sesame	
		21= Tubers		14= other legume (specify)	(specify)	(specify)		
		22= Yamset						

3. KNOWL ND EXPERIENCE (DISPLACEMENTS) OF MEDIUM AND LARGE LAND DEALS

3.1. Are you large or medium scale(above 10 hectares) acquisition of land in or near this community? 1. Yes 2. No

3.2. For how these land deals been in effect? _____ years

3.3 If yes (in ou have an idea of the number of people (acquisitions) who have acquired large farms in this community? 1. Yes 2. No

3.4. If yes (in our estimation, how much land has been acquired? _____Acres or _____ha

3.5. If yes (in far are these acquisitions from your community or farms? _____KM

3.6. Which t nd have been acquired 1. Bush(but arable) 2. Fallowed 3. Cultivated lands 4. degraded land

3.7. Have you or any member of your household personally lost land because of large and medium land deals? 1. yes 2. No

3.8. If yes (in 3.6) how much of your land has been lost to the deals? _____Acres or _____ha

3.9. If no (in he land acquisitions affected places you intended to use in the future when you fallow your land or when your household size has increased?
Yes 2. No

3.10. When ast time you fallowed your farms? _____ years ago

3.11. For ho fallow your farms? _____ years

3.12. Has me large land deals affected your ability to fallow your land? _____ 1. Yes 2. No

3.13. How ha uisition affected your ability to fallow your farms?

4. LAND D HOUSEHOLD LABOUR AND FARMING SYSTEMS

4.1. How ma e in your household are adults and capable of working? _____ people

4.2 How mar n currently are able to work? _____people

4.3 What wo ey doing_____(prompt) and how much do they earn monthly on average

1. F own farms) _____GHS estimated income
2. fa ur (work for other farmers) _____GHS estimated income
3. A essing/marketing _____GHS estimated income
4. Non farm employment by investors _____GHS estimated income
5. Other Specify_____ _____GHS estimated income

4.4. Has the activities of land investors in anyway affected your ability to find work? 1. yes 2. No

4.5. If yes (in v has if affected your prospect of finding other farm/off-farm work?

4.6 What otl s exist for you and working age members of your household to find work apart from what you are currently doing?

4.7. What w our preferred livelihood activity(ies)?

1. F
2. P rm labour
3. P arket farm produce
4. P e
5. N work in cities
6. C cify_____

4.8. Why are able to engage in your most preferred activity?

4.9. Do you have an idea of the purposes for which the lands were acquired? 1. Yes 2. No

4.10. If yes (i ndly indicate the purpose for which the land(s) has been acquired

4.11. Has the en used for the purpose for which it was acquired? 1. Yes 2. No

4.12. If no (ir indly indicate the different purpose to which the land has been put

4.13 Has the ny changes in crop production over the last 10 years? 1. Yes 2. No

4.14. If yes (a at are some of the changes in crop production systems

Prompt: for intensification: changes in pesticide and fertilizer patterns Prompt: for intensification: changes in pesticide and fertilizer patterns

4.15 Have yc d any changes in structure and fertility properties of your soils? 1. yes 2. No

4.16. If yes (a at changes have you experienced in your soils?

4.17. In whic e categories best describes the state of soils in your farm?

1. Not degraded (Fertility good and yields not declining)
2. Degraded but responsive to fertilizer (yields returns to normal when fertilizer is applied)
3. Degraded and non-responsive to fertilizer
4. Degraded, not responsive to fertilizer but can be rejuvenated by short fallowing (less than four years)
5. Degraded, not responsive to fertilizer but can be rejuvenated by long-term fallowing (more than five years)

4.18. How d dertake crop production in your farms

1. Ir **Prompt after first response**: mechanized land preparation/use improved seed/apply chemical fertilizer on all plots/use weedicide and pesticides)
2. S nsive (**Prompt after first response**: mechanized land preparation/use improved/local seed/ apply chemical fertilizer to part of land/partial application c micals)
3. L tensification (**Prompt after first response:** partial or no mechanized land preparation/mix improved and local seed/

4.19. Do you ess to enough land for farming? 1. Yes 2. No

4.20. If No, how much more land do you think you require? _____Acres

4.21. Do you pay for the land you farm on? 1. Yes 2. No

4.22. How much do you pay unit land? _____Amount (if monetary)

4.23. If payr kind, indicate the mode and monetary equivalent

1. C y _____ GHS equivalent

2. E labour _____ GHS equivalent

3. ir t _____ GHS equivalent

CO RS

1. Additior expenditure component to better check on incomes

1. Food, l es and tobacco	
2. Housel ns (soap, battery)	
3. Transp fuel	
4. Medica ses	
5. Educat oks, school fees)	
6. Comm n	
7. Celebr nd social events	
8. Cookir ghtning fuel (gas, firewood)	¢…….. Distance …… Time……..
9. Insurar lth insurance)	
10. Wate	¢…….. Distance …… Time……..
11. Other y)	

2. Kindly ra n item by the extent of difficulty: With 1= Very easy, 2= Easy, 3= somehow, 4= Not easy and 5= very difficult

	Very easy	Easy	Somehow	Not easy	Very difficult
Access to fuel wood					
Access to portable water					
Access to wild fruit (Shea, Dawada etc.)					
Access to game					

(For my fir tive)

3. Do you remittance from any relative outside your community? 1. Yes 2. No

If yes, how 1. Monthly 2. Quarterly 3. Semi-annually 4. Yearly

4. How mu ou averagely receive? GH¢ ……