

**COPING WITH HOUSEHOLD FOOD INSECURITY DURING THE LEAN SEASON;
STRATEGIES EMPLOYED BY SMALLHOLDER FARMERS IN NAVRONGO, GHANA.**



SAMUEL AMAKYE

Thesis for the Master of Philosophy in Development Geography

Spring, 2017



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DEDICATION

To my mum, Madam Grace Awuah, I say God bless you. To my sisters, Lydia, Gladys, Faustina, Janet and Rose, I love you all.

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ABSTRACT

In Ghana, smallholder farmer households are the most dominant food producers. Yet, they are the most vulnerable to food insecurity. Seasonal food production, climate change, coupled with other social factors further worsens the state of food insecurity among households. This study examines the food insecurity situation among smallholder farmer households and how households as a unit cope with during the lean season. The lean season in this context refer to the period between planting and just before harvesting. It is the time when most households' food stock reaches its minimum level. Food prices during this time also increase. With low purchasing power, farmers' households find it difficult to access foodstuff from the market to meet their consumption demands. Nevertheless, households' find a way to manoeuvre through such period. The study makes use of qualitative research techniques, thus, interviews, participant observation, photo elicitation, case study and informal conversation for data production. The study drew insight from the concept of food security, entitlement approach and the sustainable livelihood approach as a framework. The study found that most households experience food insecurity during the lean season. This is caused by many related factors ranging from the environment to anthropogenic. The study also found that different coping strategies, classified as food-based and non-food based strategies are employed as an immediate response to food insecurity. Further, the study revealed that the type of coping strategy use by households heavily depends on the resource entitlement available to the household.

Keywords: Smallholder farmers, Lean season, coping strategies, food insecurity, Vulnerability, sustainable livelihood.

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ABBREVIATIONS

ACDEP-	Association of Church-based Development Projects
AGRA-	Alliance for a Green Revolution Africa
AMSEC-	Agriculture Mechanization Services Directorate
CARE-	Cooperative for Assistance and Relief Everywhere
DFID-	Department for International Development
FAO-	Food and Agricultural Organization
GSS-	Ghana Statistical Service
ICOUR-	Irrigation Company of Upper Region
IDI-	In-depth Interview
IDS-	Institute of development Studies
IFAD-	International Fund for Agricultural Development
IPCC-	Intergovernmental Panel on Climate Change
MoFA-	Ministry of Food and Agriculture
NADMO-	National Disaster Management Organization
NGOs-	Non-Governmental Organizations
Oxfam-	Oxford Committee for Famine Relief
PNDC-	Provisional National Defense Council
SADA -	Savanna Accelerated Development Authority
SARI-	Savanna Agriculture Research Institute
SLA-	Sustainable Livelihood Approach
UK-	United Kingdom
UNDP-	United Nation Development Programme
WCED -	World Commission on Environment and Development

CHAPTER ONE

Introduction to the study

1.1 Introduction

Food insecurity is a major global issue as it affects people from all sort of life. Globally, it is estimated that about 870 million people are food insecure (FAO, 2011). Most of these people are the poor smallholder farmers who live in rural areas and depend on agriculture for their livelihood (IFAD, 2008). Smallholder farmers are the major food producers in the world, yet still, they are the most vulnerable to food insecurity (Nagayet, 2005; Lowder et al., 2014). Smallholder farmers' households worldwide face many challenges in their agriculture activities. The challenges face by smallholder farmers include land shortages because of increase in population as well as expansion of the biofuel, rising cost of food prices, lack of access to production facilities such as irrigation dams and financial credit, loss of soil fertility, rising cost of production inputs, climate variability and change and market shocks (IPCC, 2007; FAO, 2008; Ellis and Manda, 2012; Morten 2007; IFAD, 2008; Graeub et al., 2015, Harvey et al., 2014). Due to the high dependents on agriculture for food and income, poor performance in the sector has an adverse impact on smallholder farmer households (Harvey et al., 2014).

Agriculture plays a very important role in Ghana's economy. Aside, it been the major foreign exchange earner for the country, it also provides food and employment to most people. The country's agriculture sector is dominated by smallholder farmers. They accounted for about 88 percent of the entire farmers (GSS, 2013). In Ghana, smallholder farms are classified based on land size and input use. Accordingly, a smallholder household is the one that cultivates less than five hectors of land. Production is on subsistence basis; thus, it is aimed at feeding the household and if there are surplus, sold on the market to generate income to take care of other household needs. In their quest to meet this target, smallholder farmers' in Ghana face many challenges (GSS, 2013; WFP, 2012). The most significant of these challenges is climate variability and change (Antwi-Agyei et al., 2014). Climate variability and change has a significant impact on food production in the country. This is because; the farming system in the country is rain-fed (MoFA, 2015). Owing to this, poor climatic conditions in a farming season impact negatively on crop production among households. Poor crop outputs in the already vulnerable households contribute significantly to food insecurity among smallholder farmers. Generally, it is known that food insecurity is a

challenge to most household in Ghana, especially during the planting season. However, the severity and length of its experience is different from region to region, community to community and household to household. This disparity is as a result of the rainfall pattern in the country and access to resources. The regions in southern Ghana experience bimodal rainfall pattern, whereas those in the northern part experience unimodal rainfall pattern. The unimodal and bimodal rainfall pattern influences the length and severity of food shortages in smallholder households (Chambers et al., 1981). The bimodal rainfall pattern (April-July¹ and September-November²) experienced in the south support two planting seasons within a year. This makes it possible for double harvesting among smallholder farmers. Ultimately, the gap between harvesting periods reduces and therefore reduces the food shortage period in the household. This is not the case for smallholder farmers in the northern part where they experience unimodal rainfall. The unimodal rainfall pattern only supports single farming activities within the year (MoFA, 2008). The time periods between harvests are therefore wider. As a result, most households' food stock depleted long before the next harvest, hence making them vulnerable to food insecurity. However, regardless of the rainfall pattern, all smallholder farmers' households experience food shortages during the lean season, when food stocks from the previous harvest run out (Kigutha et al., 1995). Seasonal food availability is therefore a major challenge for most household in the country.

Upper East Region of Ghana is one of the most vulnerable regions when it comes to household food insecurity (Quaye, 2008; Yaro, 2013). Farming in the region is primarily rain-fed. This makes it vulnerable to the vagaries of climate variability and change. The region experiences seasonal food insecurity because of the unimodal rainfall pattern. Long dry period with few months of rainfall have adverse impact on household food security situation in the region. The increasing length of the dry season with its associated drought as well as the shortening length of the raining season with its associated floods and erratic nature, coupled with other social factors has further exposed smallholder farmers shock and risk (Hesselberg and Yaro, 2006; Akudugu and Alhassan, 2012). Due to this condition, most households have now become more vulnerable to food insecurity (WFP, 2012). Although, the problem of food insecurity might be felt in most smallholder farm households throughout the year, it however, reaches its peak during the lean period (WFP, 2012). The Lean period in the context of this study refers to months of inadequate food provision for households. It is the

¹ April to July is the major raining season. It is the time all farmers cultivate their crops

² September to November is the minor raining season. It also facilitates farming activities

time between planting and just before harvest (Quaye, 2008; Chambers et al., 1981). During this period, almost all household experience food shortages. This is because households must have to depend on production from one harvest until the next harvest (WFP, 2012; MoFA, 2008).

In Ghana, men and women play different but inclusive role to ensure food security in the household. However, the roles of women are sometimes undermined though they are significant and equally important to the role play by their male counterpart. Women in the rural areas get involved in all the activities that lead to food production. Women participate in food production by performing different task within the food production chain. They play a significant role in land clearing, cultivation and harvesting (Boakye-Acheampong et al., 2012). They are also responsible for processing food in the household for consumption. In addition, women are also involved in several activities that generate income outside the farm and use it to support their household (IFAD, 1998). The roles play by women show their importance when it comes to ensuring food security in the household.

1.2 Problem Statement

Access to sufficient food in a sustainable way is a fundamental human right that need to be enjoyed by everyone no matter the age, gender, nationality, or religion of the individual. However, it is the right that has constantly been violated (Clover, 2003). Individual right to food are sometimes curtailed by lack of availability, access and sustainable. This has been the situation for most smallholder farm households in Navrongo during the lean season. Availability to food becomes problematic for these households due to several factors with long drought season and crop failure attributed to climate change and loss of soil fertility as the main drive. Moreover, to access food from the open market seems not to be an option for many households' due to high food prices during the lean season. Navrongo is one of the poorest areas in Ghana. Studies have revealed that most households in the area fall under the poorest wealth quantile (WFP, 2012; GLSS6, 2013). Household in the poorest wealth quantile are the ones that experience food shortage as at certain point in time in the year (GLSS6). Moreover, the area is dominated by smallholder farmers with most farm size less than five hectors. Agriculture is the main livelihood activity; as a result, failure of crop output makes them vulnerable to food insecurity. The reason has been that more than three-quarters of household consumption comes from their own farms (WFP, 2012:23). The Government of Ghana with the help of international donors and Non-governmental organisations in a way to

reduce the level of poverty and to ensure food security in the area have established and initiated several projects and policies to help farmers to be able to cultivate throughout the year (MoFA, 2015). However, most of the initiatives have not yielded the expected results. Many research reports suggest that most smallholder farmers in the area are still vulnerable to food insecurity (GSS, 2013; FAO, 2012). The reports attributed the situation to many factors. Notable among is climate change, increase in population, poor infrastructure, and lack of irrigation facilities (Quaye, 2008; WFP, 2012; GLSS6, 2013; Kuuire et al.2013; Antwi-Agyei, 2014). Other factors include the insufficiency of households own production and seasonal fluctuation in food prices. Regardless of these challenges, studies have shown that smallholder farmers with minimal resources always manoeuvre their way through the difficult period. The question then is, how do they do it?

This study will therefore, investigate food security status of the smallholder farmer households. Also, to identify the coping strategies use by the smallholder households' when experience food shortages during the lean season.

1.3 Main Research Question

What are the food security coping strategies employed by households during the lean season? Specifically, the study will use these sub research questions as a clue.

1. What is the food security situation in smallholder farmers' households in Navrongo during the lean season?
2. What are the perceived causes of lean season food insecurity?
3. What are the food security coping strategies employed by smallholder farmers' households during the lean season?
4. What role does gender play in the household to ensure food security in the lean period?

1.4 Aim/Justification

Ensuring food security within the globe has become a concern for all global actors. As such emphasis has been placed on doubling global food through production by 2050 in order to be able to meet the consumption demand of the ever-increasing world population (Tomlinson, 2013). However, the complexity and the multifaceted nature of the issue have made it very difficult for clear policy to be implemented. Studies have shown that increasing yields of

food will address only one aspect of household food security because food security is not only about yield increase but the ability to access during the difficult periods (Poppy et al., 2014). In the case of Navrongo producing food in one season is not a guarantee for household food security throughout the year due to the longevity of the dry season (Drafor et al., 2013). Other factors like household assets and entitlements with the strategies that employ will determine how resilient a household will be during the lean season.

The complexity of the issue of food security makes it more imperative for such study as it will contribute academically to the already existing literature on food security from the study area. Focusing on the lean season with qualitative research methods will provide an in-depth understanding to the issue. Also, it will provide in-depth baseline information to policy makers, non-governmental agency, researchers, and other development partners who normally provide support for such households.

1.5 Organization of the study

The thesis is organized into seven chapters. Chapter one comprises introduction, problem statement, research question, aims and justification. Chapter two deals with the detail descriptions of the study area, looking at climatic conditions, agriculture production and policy interventions. Chapter three consists of theoretical frameworks that underpin the study. Chapter four explains the methodological approach and the ethical considerations used in data production. Chapter five presents the findings of the study while chapter six presents the discussion of the major findings within the theoretical framework of the study. Chapter seven and the concluding chapter present the summary of the study findings in relation to the research questions and conclusions.

CHAPTER TWO

The Study Area

2.1 Introduction

This chapter provides a description of the study area and the region in which it is located. It starts by providing the baseline information of the region based on the secondary information from many sources. The climatic and environmental conditions, economic activities and the food security situation in the study area are therefore outlined here. Policy interventions that seek to improve the wellbeing of the dwellers will also be looked at in this chapter.

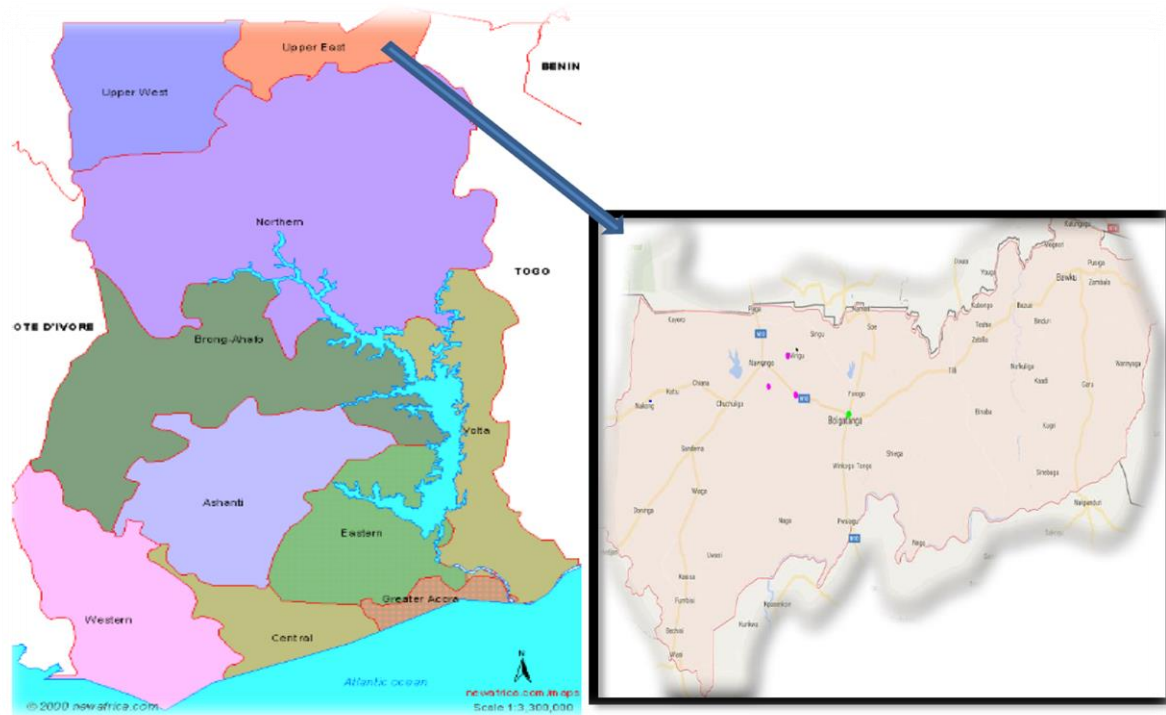
The Upper East region is one of the administrative regions in Ghana with Bolgatanga as its capital. Based on climate, the Upper East region is located within the Guinea Savanna agro-ecological zone (MoFA, 2015). The region was part of the Upper Region which was latter divided into two (*Upper West and Upper East*) in 1983 by the Military Government, thus PNDC (*Provisional National Defense Council*). The region is in the northeastern corner of the country. It lies in between longitude 00° and 10' west and latitudes 10° 30' and 11°. The region is bordered in the east by Togo, north by Burkina Faso, west by Upper West region and south by the Northern region. It has a total land area of 8,842, sq.km with a density of 118.4 persons per km². The region has a total population of 1,046,545 as at the time of the 2010 national population and housing Census (GSS, 2013). The main livelihood activities of the inhabitants in the region is farming which is primarily rain-fed (ibid). The region is covered with savannah woodland vegetation with short scattered drought-resistant trees and grass. Economic trees such as *dawadawa*, *baobab*, *acacia* and *shea nut* also form part of the vegetation. The soil in the region is made up of sandy and loamy soils with light textured surface horizons in the eastern part of the region whilst the western part of the region is made up of Savanna ochrosols and ground water laterite. The area experiences two climatic seasons; thus, the dry and the rain season. The dry season start from November and ends in April, while the raining season starts from May and ends in October (ibid).

Upper East region is part of the marginalized northern territory of the country in terms of development. Both colonial and post-colonial governmental policies have contributed to the under development of the region (Hesselberg & Yaro, 2006). Most of the colonial policies were focused on development of the resource southern part of the country. Mining areas and areas suitable for the cultivation of cash crops were the focused for colonial masters in terms of infrastructure development. These policies created a huge gap between the northern and

the southern part of the country. Thus, the developed south was served as a pulling factor that attract the energetic youth from the north (Bening, 1975). Moreover, the post-colonial policies were not able to change the trend as the infamous Ghana's structural adjustment policies further came to reduce the plight of the indigenes of the region (Songsore & Denkabe, 1995 in Hesselberg & Yaro, 2006). Currently, Upper East has thirteen Municipal/District assemblies; Bolgatanga, Bawku West, Bawku East, Bongo, Builsa south, Builsa north, Talensi, Garu Tempane, Nabdam, Pusiga, Binduri, Kassena-Nankana East and Kassena-Nankana West. The region is considered as one of the poorest regions in the country with majority of the population fall under the lowest wealth quintile of the country. Based on the education, an estimated 44.5 percent of its inhabitants are illiterate; most have not had primary education (GSS, 2014). Food insecurity situation in the region is worrying one, as 15 percent of the 1.2 million food insecure people in the country are believed to inhabit in the region (MoFA, 2015). Even though the region boasts of one of the largest irrigation dam (*Tono irrigation*) in the country, it still cannot provide the needed amount of food to feed its increasing population. Accordingly, an estimated 56 percent of food consumption in the region are imported (ibid). This make most household vulnerable to food insecurity lean season because of food shortages. Notwithstanding these challenges Upper East region has the potential to become one of most economic regions in the country. The region connects Ghana and Burkina Faso. As a result, some of its towns (Paga, Borgatanga, Navrongo) play significant role in the northern economy.

Economically, Upper East region is predominantly agriculture. Agriculture and its related activities (66%) are the main economic activities that most people in the region engages in. Other economic activities are professional, technical and related work (3.8%), Production and transport equipment (14.5%), Trading (9.5%) and services (4%). These activities form the basic economic structure of the region (GSS, 2012).

Map. 1 Map of Ghana showing the Upper East region



Source: Modified from google.

2.2 Kasenna-Nankana East (Navrongo)

Kasenna-Nankani East Municipality is one of the municipalities under the Upper East region. The Municipality has an estimated population of 109,944 during the 2010 population and housing census. This constitutes 10.5 percent of the entire regions population. Out of this number, 72.7 percent lived in the rural areas whiles only 27.3 percent lives in the urban areas of the municipality (GSS, 2012). The municipality is made up of 19,790 households with the average household size of 5.4 percent. Out of the total municipal population, 56.3 percent are literates whiles 43.7 percent are illiterates. The male literacy rate, stands at 64 percent, whereas the female literacy rate is 34 percent. The difference in the literacy rate could be attributed to the long-standing traditions whereby young females were kept in the house to take care of the household activities instead of attending school. However, recent studies are showing a progressive increment of the number of girl child enrolments in schools within municipality (GSS, 2014; GSS, 2012).

The dwellers in the municipality engaged in different livelihood activities, notable among are agriculture, fishery, forestry, trade and craftwork. Agriculture households dominate all others in this area. Thus, about 82.7 percent of all households engaged in

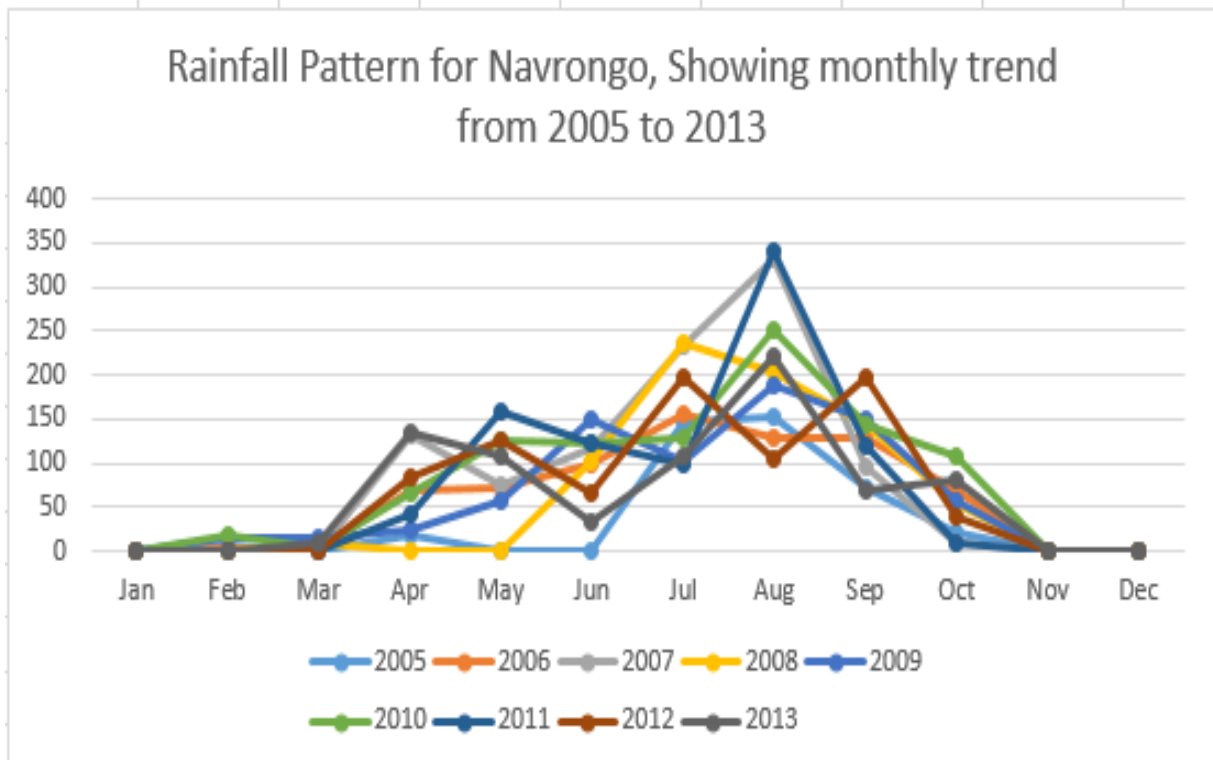
agriculture. This figure increases to 93.1 percent in the rural areas. Crop farming is the most dominant livelihood activity among households.

Government system in the area is the fusion of Traditional and modern governance. The Municipal chief executive represents the central government in the area. The Municipal chief is appointed by the president and approved by the assembly members in the municipality. The assembly members are elected representatives of the people in the various constituents in the municipality. The municipal executive oversees the day to day administration of the area. Traditional authority also plays a very significant role in the study area. Navrongo and its surroundings are ruled by chiefs (*Naabas*) and earth priest (*Tindanas*). The paramount chief of the entire area is the Navrongo Naaba. The Naaba is the overall traditional political head in the area. The Naaba is traditionally in charge of the people in the area. Moreover, each suburb also has its own chief who pays homage to the paramount chief. The Tindanas on the other hand are the custodians of the lands and hold it in trust for the people. The Tindanas' inherited the lands from their ancestors and some of these lands have been leased to other families.

2.3 Climatic conditions in Navrongo

Navrongo experiences only two climatic seasons, thus the dry and wet seasons. The South-West Monsoon and the Northeast trade winds influence these seasons. The South-West monsoon, popularly known as tropical maritime air mass blows moist air from Atlantic Ocean onto the main land. The tropical maritime air mass is experienced in Navrongo from April to October. The area during this time receives between 150-250 mm of rainfall per month. It is the time when farmers plough their lands and cultivate their crops. The dry season on the other hand, is influenced by the north east-trade winds. The northeast trade winds (*Harmattan*) blows from the Sahara Desert from November and April. It mostly comes with hot and dusty air with very low relative humidity. Temperatures range in between 42°C in the day and 18°C in the night during such period. Rainfall during this time is very rare to come by. As such, most rivers and small dams dry up in this period. The biggest Dam in the region, thus the Tono Dam also experience reduction in its water volume.

Figure 1. Rainfall pattern for Navrongo, from 2005 to 2013, monthly and annual distributions.



Source: Data from Navrongo District Assembly, figure constructed by the Author.

2.4 Agriculture in Navrongo

Agriculture is the major livelihood activity inhabitants of Navrongo depend on. Almost all households in the area engaged in agriculture activities. Crop farming and livestock rearing are the two major agriculture activities households engaged. Few households, however, practices fish farming and tree planting. Majority of farms in the area are small size farms with less than two hectares (MoFA, 2010). Family labour is the most dominant type of labour use when it comes to agriculture activities. Dominated by subsistence farmers, most of the products from the farms are mostly use for household consumption. However, in situation where there is surplus, household sell it to take care of other pressing household needs. Dry land crops such as millet, groundnut and sorghum are the common crops cultivated by households. Livestock rear includes chicken, goat, sheep and guinea fowl. Apart from the communities within reach of the channels of the Tono Dam irrigation project, most agriculture households are vulnerable to food insecurity due to the over-reliance on the rain. Those with dug out and small dams mostly benefit small number of households whose lands are located around. In some instances, the dugout only allowed to be used for livestock

production. As such, households without livestock do not benefit from it (MoFA, 2015). The communities that have access to the Tono Dam irrigation project, however, practice year-long farming. Dry season garden is very popular among households in the area, Crops cultivated include tomatoes, pepper, onion garden eggs. Aside the poor climatic conditions and the lack of irrigation facilities in most communities, farmers also face challenges such as poor soil fertility, shrinking of farm size due to population increase, lack of credit facilities, lack of improve seeds and poor extension services (ibid). Some communities with their own initiative and the help of NGOs have constructed small dams and dugout. These facilities are used by communities in diverse ways. Thus, it is either used for crop production or livestock usage or both.

Table.1. Dams and Dugout in some selected communities in Kassena Nankana East District

NO	Location of Dam/Dugout	Name of Dam/Dugout	Purpose / Usage
1	Nangalkinia West	Goo dam	Crops and Livestock
2	Gia West	Nangwao dam	Crops and Livestock
3	Gia West	Kasongo dam	Livestock
4	Nawognial West	Nawognia Dugout	Livestock
5	Bonia West	Bonia Dugout	Livestock
6	Tankuna East	Tankuna Dagout	Livestock
7	Nayagenia East	Nayagenia dam	Livestock
8	Pungu East	Telania dam	Crops and Livestock
9	Janania south	Navasco Dam	Livestock
10	Vunania	Vunania Dam	Livestock
11	Nogesnia	Yuusi Dam	Livestock
12	Nogesnia	Nangalkinia Dugout	Livestock
13	Pungu	Bavugnia Dam	Crops and livestock
14	Doba	Doba dam	livestock
15	Kologu South	Kologu forest Dam	livestock

Source: MoFA Kassena Nankana East, Fieldwork, 2016.

As the table shows, majority of the of these dugout and dams are mostly use for livestock production. This indicates the importance of livestock in the study area.

Table 2: Food production Estimate for some selected food crops (MT) in Kassena Nankana East District 2005 to 2015

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Millet	9806	6250	6250	10380	12016	10824	8800	5479	2976	1947	1669
Sorghum	1906 7	11561	3594	15436	16076	35626	21385	1574 6	7595	6832	4999
Rice	8282	15766	1045 1	16044	12633	39504	33152	2663 2	5331	1647 5	1340 1
Groundnut	1816 1	14526	7534	17728	12326	17083	7145	1174 3	5373	7191	9639
Maize	3050	836	919	5460	6494	5226	8032	3941	3825	4004	2032
Soya bean	-	120	463	124	-	1487	280	1228	797	326	1082
Sweet potato	1431	16256	2170	9784	-	1401	1320	1246	1128	800	-
Cowpea	-	-	-	-	-	-	1002	1861	783	977	1405

Source: Kassena Nankana MoFA office, Fieldwork, 2016

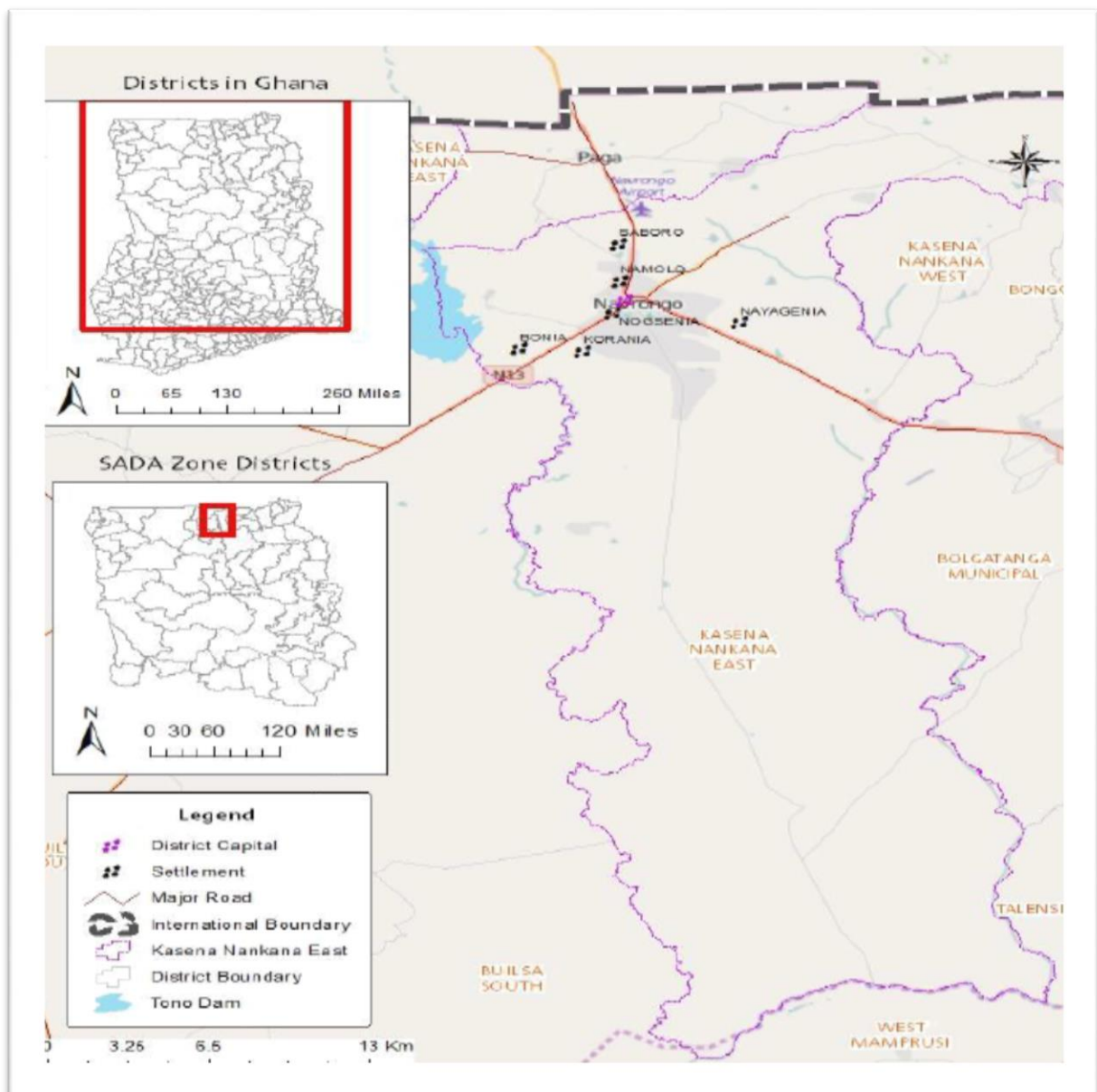
2.5 General Food Security Situation in Navrongo

Owing to the high dependency on agriculture by households in Navrongo and its suburbs, the declining nature of the sector has a significant impact on the food security situation in the area. As stated earlier the area has a food deficit of 56 percent. The implication is that majority of household who cannot produce enough to cover the year, therefore must buy from the market in order to be able to meet the households' food consumption needs. However, due to the level of poverty in the area, most households find it difficult to buy from the open market to meet the household consumption. A study conducted by World food programme

revealed that about 33.2 percent of households in the area are food insecure. This number increases during the lean season, which is preceded by the long dry season (WFP, 2012). Due to the unimodal rainfall pattern in the area, there is wider gap between harvesting, and as a result food stocks mostly get depleted before the next harvest. More so, the price of all food items increases in few months before harvest. All these contribute to the increasing number of food insecure household during the lean season.

Although reports from various state institutions and non-governmental organizations indicate general poverty reduction in the entire country, yet still, the situation has not change much in the northern part of the country. For instance, the level of poverty in the southern part of the country decreased from 48 percent in 1992 to 20% in 2006. At the same period, the northern territory just experienced marginal decrease from 69 percent to 63 percent. Only 6 percent decrease was observed as compared to 28 percent in the south (World Bank, 2011). Recent study by World food program revealed that poverty is still prevalence in many households in Navrongo. Indeed, the study revealed that majority of the people in the area is still falling below the poorest quintile of the country. Accordingly, most of the households could not invest in their basic livelihood activity or engage in higher return business to boost their wellbeing (WFP, 2012). Such a situation has a dire consequence on food security situation in the household. It is important to note that the most difficult period in terms of food availability for households in this area is April-July. As already stated, food stock within that time almost depleted and food prices are at its highest level. Besides it is time for higher energy burns as farming activities reaches its peak. More so, most wide foods are also out of season making it difficult for household to access.

Map 2.0 Map of Kassena Nankana District



Source: Kassena Nankana District Assembly, Fieldwork, 2016.

2.6 Policy interventions to combat food insecurity

Governments over the years have initiated several programs and projects to reduce poverty level and increase food production to improve the well-being of the people. As such, different agricultures based policies and social interventions have been embarked over the years to improve the household food security situation. The main goal of most of these policies was to improve the household income and crop yields in other to make them more resilient to the challenges they face. One of such noticeable projects is the Tono Dam irrigation project. Military government (People Defense Committee) in 1985 under the auspices of the

Irrigation Company of the Upper Region (ICOUR) constructed the Tono dam irrigation project. The idea behind the project was to facilitate dry season farming in the area and support the farmers with inputs to improve crop yields of households. This has improved the overall food production estimates in the area. In addition to the irrigation project, government through the Ministry of Food and Agriculture introduced a Block farm programme to help farmers access farm input such as improved seeds, fertilizer, weedicide and tractor services. The project was established to meet three broad but related objectives, that is to support farmers to increase production to ensure food security, generate employment in rural communities especially among the youth and increase incomes of small farm households (MoFA, 2015). Another policy intervention seeks to reduce food insecurity in the area is the creation of Agriculture Mechanization Service Centre (AMSEC). The center was to help farmers to access farming machinery and equipment to help improve farm yields with the use of mechanization methods (ibid). Furthermore, the Savanna Accelerated Development Authority (SADA) was instituted in 2009 to help strengthen the wellbeing of the people in the deprived areas in the northern part of the country. The Authority was to coordinate a comprehensive development agenda for the northern savanna ecological zone in Ghana with a specific aim to provide poor peasant, specifically women to sustain their food crop production and own assets (MoFA, 2015). The Savannah Agriculture Research Institute (SARI) established is also contributing to the food production in the area by introducing improved crop seeds to farmers to reduce crop failure. The government recently has initiated a programme called 'planting for food' with the main purpose of increasing food availability in their country to improve the food insecurity situation among the people in poverty-stricken areas.

Furthermore, non-governmental organizations are also contributing to help reduce poverty and improve food security situation among households. Among the NGO in the area is NEWCO AP. NEWCO AP is a Holland based NGO with the aim of training locals on fish production for both export and local consumption. Almost seventy households had the opportunity to benefit from their activities. Another NGO whose activities are impacting on the people, especially smallholder farmers is the Alliance for a Green Revolution in Africa (AGRA). AGRA is focused on improving the wellbeing of smallholder farmers through sustainable growth and development. Association of Church-based Development NGOs (ACDEP) is a network of Church sponsored development NGOs in northern part of the country with the aim of improving social-economic development of rural poor. Since its

establishment ACDEP has contributed to the improvement of agriculture development and hence food security. Currently ACDEP is operating in over 500 communities and engaging 30,000 rural small-scale farmers and women in agriculture production and other livelihood activities. The activities of the various NGOs and the Governments is contributing to the development and improving social-economic wellbeing of the northern dwellers.

CHAPTER THREE

Conceptual Framework

3.1. Introduction

To explain social phenomena, social scientists employ different theories and concept to help facilitate in analyzing experiences. The theories and concepts serve as the guide for conceptualizing social phenomena. This study therefore utilizes different theoretical approaches to understand the complexities of food insecurity and how smallholder households cope with it. Hence, the concept of food security, livelihood framework approach and Entitlement approach are the theories used in this study. The concept of food insecurity provides the framework for analyzing lean season food security situation in the study area. Like wisely, the livelihood sustainable approach addresses the livelihoods activities smallholder farmer household depend on broader perspective. The Entitlement approach is used as a supporting theory in discussion household resources in relation to food insecurity.

3.2. The Sustainable Livelihood Approach

The Livelihood thought, dated back has influenced rural development thinking and practiced. The concept was used in different studies by various scholars without labeling it as such (Scoones, 2009). Although there was widely usage, the concepts did not come to dominate development thinking as modernization theories came to influence development debate (ibid). However, the concept found its way back to the development discourse through the publication of the Brundlandt Commission Report by the World Commission on Environment and Development (WCED) in 1987. At this stage, sustainable livelihood became central policy concern with the UN conference on Environment and Development in Rio in 1992 (Scoones, 2007 cited in Scoones, 2009). Building on such break through, the term ‘sustainable livelihoods’ was related to a wide set of issues which encompass much broader debate about the relationships between poverty and environment. Advocates were more concern on how to tackle poverty and development with long term environmental shocks and stresses (ibid). As such, livelihood research became very dominant in the 1990s as internationally recognized bodies such as CARE, Oxfam, UNDP and DFID adopted and conceptualized it in their policy implementation (ibid). The new wave of sustainable livelihood developmental discourse has been attributed to Robert Chambers and Gordon Conway. Their work, ‘Sustainable Rural Livelihoods’ published in 1992 became very influential in the arena of livelihood studies (de Haan and Zoomers, 2005:30). Conway and

Chambers asserted that capabilities, equity and sustainability combine within the concept of sustainable livelihoods. To them ‘livelihood in its simplest sense is a means of gaining a living’ (Chambers and Conway, 1992:5). This scholarly work provided a platform for other scholars to build on the concept. Notably among the livelihood scholars who through their work have shaped the concept are De Haan and Zoomers (2005), Solesbury (2003), Scoones (1998, 2009). The sustainable livelihood approach reached an important milestone in 1997 when it was adopted by the UK Department for International Development (DFID) in policy implementation. The basis for its adoption was to help the international development effort on elimination of poverty and encouragement of economic growth which benefit the poor (Solesbury, 2003:1)

3.3 Definitions of Sustainable Livelihood Approach (SLA).

Sustainable livelihood approach has been defined by different scholars and institutions since its inception. Although the complexity of the term has been improved, yet in the existing literature, there is often little clarity about how contradictions are addressed and trade-offs are assessed. The definitions of sustainable livelihoods are often unclear, inconsistent and relatively narrow. Without clarification, there is a risk of simply adding to a conceptual muddle (Carswell, 1997). Among the different definition of sustainable livelihood approach is the one that was put forward by an Adversary Panel of the World Commission on Environment and Development. Viewing sustainable livelihood security as an integral concept, WCED proposed definition that factor in sustainable, livelihood and security. To WCED “livelihood is defined as adequate stocks and flows of food and cash to meet basic needs. Security refers to secure ownership of or access to resources and income-earning activities, including reserves and asserts to offset, ease shocks and meet contingencies. Sustainable refers to maintenance or enhancement of resource productivity on a long-term basis. A household may be enable to gain sustainable livelihood security in many ways-through ownership of land, livestock or trees; rights to grazing, fishing, hunting or gathering, through stable employment with adequate remuneration or through varied repertoires of activities” (WCED 1987a:2-5 cited in Chambers and Conway 1992:5). Sustainable livelihood from this perspective was a means of serving the objectives of both equity and sustainability (ibid:5). Chambers and Conway in an Institute of Development Studies discussion paper defined sustainable livelihood approach as “A livelihood comprises of the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or

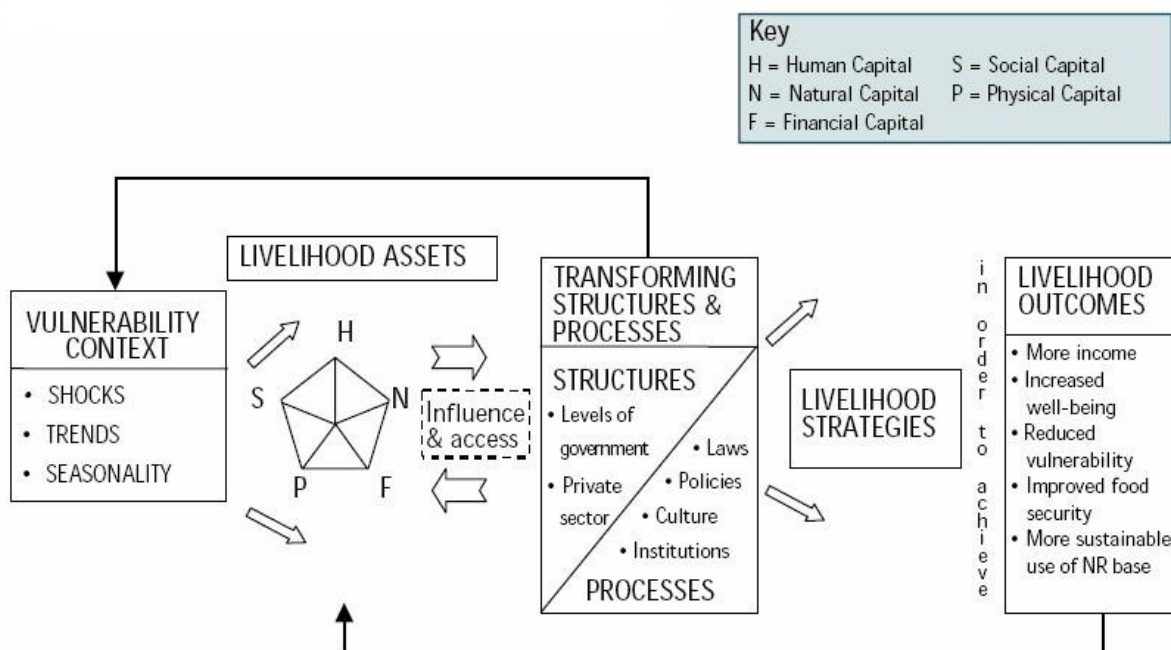
enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term”(chambers and Conway 1992:6; Solesbury, 2003:5). The salient point from this definition is that a livelihood should be sustainable and must be able to stand against stress and shock and at the same time must not compromise the future. Arce (2003:202) pointed out that, the focal point of chambers and Conway in the development discourse was not sustainability but on ‘income’ and ‘security’ however they delve into the environmental sustainability debate at the time and examine the trade-off for poor between ‘vulnerability’ and ‘poverty’. Despite this accusation, de Haan and Zoomers (2005:30), asserted that environmental issues were very imperative in livelihood debate in the 1990s than now. About this, the Institute of Development Studies (IDS) team defined sustainable livelihood as: “A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base” (Scoones, 1998:5). Per Scoones, this definition highlights five key elements with livelihood linking it with work and employment, poverty reduction, well-being and capabilities, livelihood adaptation, vulnerability and resistance and finally natural resource base sustainability (ibid). Ellis (2000:290-291, quoted in Allison and Ellis, 2001:379) defined sustainable livelihood as: “A livelihood comprises the assets (natural, physical, human, financial and social capital), the activities and access to these (mediated by institutions and social relations) that together determine the living gained by individual or household” This definition bring to forefront how individuals and perhaps households draw from the available resources and manoeuvre their way through difficult times such as food shortages. Moreover, the various definitions made emphasis on the need to ensure both livelihood and environmental sustainability.

3.4. The Sustainable Livelihood Framework

Different scholars and organizations have represented the sustainable livelihood framework in different diagrams. It must be emphasized that the entire sustainable livelihood framework is developed from the basic idea underpinning the sustainable livelihood approach (Solesbury, 2003:9). However, due to its robust nature, it has been adopted and modified by organizations, researchers, and institutions in trying to solve social problems. The framework could be used for different analysis of livelihood on different scales ranging from individual, household and even to national levels (Scoones 1998:5). This makes it preferable for studying

household food insecurity situation in a holistic perspective. Per this framework, there are five key questions that needed to be asked in analysing sustainable livelihood. It stressed that an analyst must look at the context, livelihood strategies, outcome of the strategies and institutional process which mediate the ability, in this context of the smallholder household to carry out the strategies and achieve a desirable outcome (ibid). Moreover, the various concepts (assets, institutions, organizations, shocks) make it efficient for the understanding of the phenomenon being studied.

Figure 2. DFID Sustainable rural livelihood



Source: DFID, 2000.

3.3.1 Livelihood Assets

According to Carney (1998), assets are more than material things; it also includes social resource stocks. Therefore, an effective combination of material assets and social resources at the disposal of a household provide the basics for more robust livelihood. Assets are key component within the sustainable livelihood framework. The framework displays five different assets also known as capitals. These are physical, social, natural, financial and human assets or capital (DFID, 2000). The natural capital of the individual, in this regard the household, encompasses all natural resources and environmental services which the household acquire to strengthen their livelihood. To Bebbington “a person’s assets, such as land, are not merely means with which he or she makes a living: they also give meaning to

that person's world (Bebbington 1999:2022). The financial capital comprises financial resources that household utilized to obtain their livelihood. This may come from two main sources; the available stock and regular inflow of money with the exclusion of income. Available stock attains from savings, which may be in the form of cash, bank savings, jewelry and livestock. Regular inflow of money may include pensions, state transfers and remittances in cash and kind (DFID, 2000). This capital is very important as it facilitates and shape food security strategies employ by households during the hunger period. Social capital comes in many forms and it includes social network, social relations, associations and affiliations. Human capital comprises individual's health, individual development, skills, Knowledge that the individual rely on when engaging in livelihood strategies. Physical capital comprises infrastructure, tools, in this regard productive tools and technology that are available to the individual. As such, technology may come in the form of innovative farming techniques and new crop variety. Moreover, it may be transportation or channel of information facilitate dissemination and adoption of modern technology by the household. These capitals work together as a whole for livelihood of the household to be effective. For instance, at the micro level, household access to land as a natural capital is not enough to ensure livelihood security, more importantly there is the need for financial capital and human capital to make the land productive (ibid). Regard to this study livelihood assets of the various smallholder household that are keen to the household, especially during the lean season was listed and map to access their importance during the hunger period.

3.3.2 Livelihood Strategies

Sustainable livelihood strategies explain many ways individuals, households or groups combine their assets to achieve livelihoods (DFID, 2000). Scoones (1998) adopted and modified the framework in his study of rural livelihoods. Accordingly, he layouts three broad livelihood strategies individual or farming households pursue to strengthened their livelihoods. These are agriculture intensification and intensification, livelihood diversification and migration. These three strategies provide different dimensions to rural people to be able to deal or manage with shocks and stress. During the first stage of agriculture intensification and extensification, farmers either embark on capital investment or increase labour input to ensure high yield per unit area or cultivating more land to increase output. Secondly, farmers may engage in livelihood diversity by pursuing off farm jobs that will earn them income. The last strategy is migration. At this stage, a household member move either temporary or

permanently to look for alternative livelihood elsewhere (Scoones, 1998). All these strategies are put forward in order to insure sustain livelihood.

Livelihood diversification aims at “coping with temporary adversity or more permanent adaptation of livelihood activities, when other options are failing to provide livelihood” (ibid). Coping strategy here refers to the method used by household to survive when confronted with unforeseen livelihood failure (Ellis, 2000:297). Coping involves using household savings, food stocks, rely on community transfers, sales of livestock and gift from relatives and close acquaintance to deal with disaster and seasonality (ibid). Livelihood adaptation on the other hand is view as a continuous process of “changes to livelihood which either enhance existing security and wealth or to reduce vulnerability and poverty” (Davies and Hossain, 1997:5 in Ellis, 2000). Strategy either coping or adaptive may either be ‘pervasive’ or ‘enduring’ in character (Ellis, 200:290). It is pervasive in the sense that Livelihood diversification is boundless as it cut across all farmers’ household. It is enduring in the sense that it is not just transitory experience caused by smooth adjustment of resources as many people are creating different strategies as a way of life (ibid:290). Haan and Zoomers, (2005:38) pointed out that people now rely on different strategies in order to better their incomes for survival. In respect to this, Ellis (2000) revealed that it is the poor that tend to be engaged in complex, multi-activity income generation for survival.

3.3.3 Vulnerability Context

The concept of vulnerability was incorporated in the framework to highlights challenges household face from the external source. It has been used in many studies by scholars to examine cases in different situations. Among these are climate impact analysis, disaster management and food security analysis (Timmerman, 1981; Chambers, 1989). According to Dilley and Boudreau (2001), “Vulnerability encapsulate a growing recognition that the extent to which people suffer from calamities of any kind depends on both their likelihood of being exposed to hazards or shocks and their capacity to withstand them”. Downing (1991: 5) in rationalizing vulnerability in relation to an outcome rather than hazards or shocks asserted that “Vulnerability refers to a consequence, rather than a cause. Using vulnerability in reference to a cause insinuates a negative consequence without completing the reference. For instance, to assert that nations are vulnerable to drought implies a causal linkage between drought and an unspecified negative impact”. In the context of food security, Chambers (1989:1) wrote that “Vulnerability refers to exposure to contingencies and stress, and difficulty in coping with them. Vulnerability thus has two sides: an external side of risks,

shocks and stress to which an individual or household is subject and an internal side which is defencelessness, meaning a lack of means to cope without damaging loss". Allison and Ellis (2001:378) also focusing on food security, defined vulnerability as "a high degree of exposure to risk, shocks and stress and proneness to food security" It constitute both external threats to livelihood security and internal coping capacity. The external threat is based on risk factors such as climate, markets, or sudden disaster whilst internal coping capabilities are determined by assets, food stores, support from kin or community, or government safety net (ibid:378). To Dercon (2001), vulnerability is determined by the option available to households and individuals to make a living, the risks they face and their ability to handle this risk. In conceptualizing livelihood vulnerability, Carney (1998) suggested three essential elements of vulnerability, thus seasonality, risk, and shock. Of the three, seasonality is the most important to this study. Different research studies have shown that seasonality have an impact on households making them vulnerable to food insecurity. For instance, Stevens et al., (2017), study of the role of seasonality on the diet and household food security among pregnant women living in rural Bangladesh found that both dietary diversity and food security deteriorate during the lean season among the study households. In similar vein, Patterson et al., (2017), investigate seasonal variation of food security among Batwa of Kanungu Uganda found that food insecurity among the Batwa people increases during the dry season. The study revealed that majority of the people find it difficult to acquire sufficient quantities and quality of food during the dry season. In studying seasonality, household food security and nutritional status in Dinajpur, Bangladesh, Hillbruner and Egan (2008) found out that seasonality have a significant effect on both food security and nutritional security in Dinajpur, indicating that households are worse off during the monsoon season. Kigutha (1995), in examining the effects of seasonality on food security and nutritional status of smallholder rural households in Nakuru District of Kenya found that most households are food insecure during the lean season because they do not produce enough to last throughout the year. The examples listed here indicate that most households, especially, in the rural areas are vulnerable to seasonality which affects their food security status.

3.3.4 Institutions

Institutions are very imperative when it comes to access to livelihood by local group. Usually, institutions shape access to entitlement and endowment. Both formal and informal institutions are important in mediating access to and control of certain resources (Yaro, 2008). Due to this, the framework emphasized the need of institutional control to be considered in

sustainable livelihood analysis. According to Scoones (1998), institutions are “regularised practices (or pattern of behaviour) structured by rules and norms of society which have persistent and widespread use”. To Yaro, Institution is the defining rules that legitimize peoples’ entitlements environmental resources (Yaro, 2008). To distinguish between institutions and organizations, North (1990, p.5 quoted in Leach et al., 1999:237) referred to institution as “the rules of the game in the society” and organizations as “groups of individuals bound together by some common purpose to achieve objectives”. Thus, institutions are social events which link stakeholders to access capital of various kinds to the means of exercising power and so define the gateways through which they pass on the route to positive or negative livelihood adaptation.

3.4 Criticisms of SLA

Notwithstanding the robust and all-inclusive nature of the SLA, it has been criticized by some scholars’ different grounds. The first critique of SLA is that it is more people centred. As a result, it fails to make room for other things like culture which are embedded in many communities. Culture was seen as a constraint to an understanding of opportunities and potential interventions (Morse and McNamara, 2013). Moreover, the approach was also criticised for underscoring importance of certain activities in human life. Among such activities is leisure. Leisure plays very significant role in the life of the people and must therefore be considered when studying the livelihood of the people (ibid). For instance, a study made by Brinson et al. (2009), revealed that there is a very significant impact of recreational fishing on fish stock and therefore suggested that leisure must be incorporated the SLA. Secondly, there is a concern of the measurability of some elements defined by the various capitals. For instance, Land is a productive asset for household which can be measured; however, the productivity level of the land could be difficult to measure. Moreover, the tenancy agreement could determine whether the land should be considered as assets or liability. This decision will be determined by the returns that accrue from the land after putting into use (Morse and McNamara, 2013). Moreover, there is also an issue of substituting one capital with the other and how sustainable it can be. For example, financial capital can replace natural capital, however the question is how sustainable could it be? Thirdly, SLA may also seek for detailed information from the people for its analysis. However, the trust and openness of such wide sorted information cannot be ascertained. Some household as a matter of fact may be considered certain information as very sensitive and therefore may not want to give out. This might have affected the outcome of in the SLA

(ibid). Moreover, the detail information the framework provides also make it difficult to analyse. Other critics are also of the view that SLA is not a theory but just a framework for livelihood studies.

3.5 The Concept of Food Security

Food security is a complex concept with environmental, social political and economic determinants (Erickson, 2008:234; Devereaux, 2000). Since meaning is nuanced by the discursive context in which it is situated, the same phrase (concept) can be used quite differently by various claim-makers (Mooney and Hunt, 2009:470). Likened the concept of food security to “sustainability,” Mooney and Hunt argued that “food security” has developed multiple meanings, and its achievement as a concept has laid down “to a resonance that does not immediately engender oppositional claims, making it difficult to mobilize opinion in favour of alternatives” (ibid:470). To Maxwell (1996), the whole concept of food security has been “evolved, developed, multiplied and diversified” after the 1974 Rome conference. In emphasizing the broad nature of the concepts and how it has been used, Smith et al., (1993), claimed that there are almost two hundred definitions of the concept of food security. Indeed, different scholars and agencies in various ways have used the concept of food security in many ways. The initial definitions of food security were focused on abundance of food supplies at the national and global levels. During this period, the focused was primarily on the balance between adequate global food supply and the demand by the global population. It was the period when the Neo-Malthusian theory was at the forefront of many developmental agendas. Food insecurity was then linked to food shortage, which was attributed to the increase of the world population.

Elsewhere, Sen (1980) raised the issue of access and entitlement to food as the main challenge to food security (Clover, 2003:7). Food insecurity was then, seen as the failure of livelihoods to guarantee access to sufficient food at the household level instead of failure of crop output (ibid). Sen’s work came to influence the concept as actors’ and stakeholders factor in both access and entitlement in their definition. Based on the work of Sen, World Bank (1986) defined food security as “access by all people at all times to enough food for an active, healthy life”. This definition highlights the shift from initial focus of the concept from national and local to household and individual. The discussion on the matter of what food security constitute came into conclusion in 1996, during the World food summit at Rome. Accordingly, food security was defined as “Food security exists when all people, at all times,

have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (WFP, 1996). On the other hand, food insecurity was defined as “A situation that exist when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life” (Hesselberg and Yaro, 2006). Indeed, availability, access and utility have been the core elements of food security. Availability refers to the amount, type and quality food a unit has at its disposal to consume. Availability is realised through production, distribution, and exchange (Erickson, 2008:238). Access on the other hand refers to the ability of an individual to attain access to type, quality and quantity of food needed. Access is described by food affordability, allocation and preference (ibid). The final core element from the definition is food utilization, which consist of nutritional and social values and food safety (Erickson, 2008). The last concept this definition highlight is the stability of the various concepts availability, access and utility at all times. The emphasis of stability indicates that in order for a household or an individual to be categories as food secure there must be a consistent pattern of availability and consumption.

Food insecurity may be transitory or chronic. It is transitory when the people involve experience temporal challenges in food consumption. It is chronic when the people involve experience a long-term food insecurity challenges. Chronic and transitory food situations overlap. Many people already on the edge find their ability to cope, compromised by small shocks and can become chronically food insecure. Conversely, chronic food insecurity is often the result of repeated shocks such as recurrent droughts (Devereux, 2006).

Food insecurity can be look at from different perspectives. It may be national, local, household and individual. The abundance of food at the national and local levels do not necessary means that the household and the individual levels have enough food (Maxwell, 2001). Food security can be measured in diverse ways. Noticeable among are Household Caloric acquisitions, individual food intakes, dietary diversity, and coping strategies (Hoddinott, 2002). This study is using coping strategy at the household level to measure food insecurity in the study area. Indeed, coping strategy as a measure is based on the perception, the experiences of the various households on what to them constitute food insecurity, and how well the household as unit manoeuvre through such period.

3.6 The Entitlement Approach

Access to food is one of the main pillars of the definition of food security. As stated earlier, this dimension was introduced or brought to the noticed of the decision makers by Amartya

Sen (1981). According to Sen, entitlement is “the set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces” (Devereux 2001:246). Per Devereux, the most valuable contribution of the entitlement approach to the understanding of famine is that, it “shifts the analytical focus away from a fixation on food supplies—the Malthusian logic of “too many people, too little food”—and on to the inability of groups of people to acquire food” (ibid). Therefore, people may be affected by food insecurity if they cannot access adequate food even in times of abundance under a well-functioning market. To Sen, there is no technical reason for markets to meet subsistence needs and no moral or legal reason why they should (ibid).

The entitlement approach highlight three conceptual categories, thus an endowment set, an entitlement set and entitlement mapping (Leach et al., 1999: Nayak, 2000). The endowment set refers to the combination of all those resources that are legally owned by a person conforming to established norms and practices. These include both tangible and intangible assets. Among these assets are lands, equipment, animals, knowledge and skills, labour power, or membership of a particular community (Nayak, 2000). The entitlement set constitute the possible combinations of goods and services that a person can legally obtain by using the resources of his endowment set. The use of the resources to get final goods and services may be either in the form of production, exchange or transfer (ibid). The entitlement mapping, also known as E-mapping, expresses the relationship between endowment set and entitlement set. It is the rate at which the resources of the endowment set can be converted into goods and services included in the entitlement set (ibid).

Sen (1981) using peasant as a case, contented that, the ability of a peasant to access food is determined by land, labour power and other resources owned, the person’s endowment is the combination of all these resources. This endowment can be used in the production of a bundle of food; alternatively, the labour skill can be sold to earn income, which can be used to purchased foodstuff and other commodities. More so, cash crops can be cultivated to generate income which can be used to buy the needed commodities (ibid).

The individual entitlement could be placed into one of these categories. Thus trade-based entitlement, production-based entitlement, own labour entitlement and inheritance and transfer entitlement (Sen, 1981:2; Devereux, 2001:19). The trade-based entitlement—here one is entitled to own what one obtains by trading something one owns with a willing party. In production-based entitlement, one is entitled to own what one produces using one’s own available resources, or resources hired from willing parties meeting the agreed conditions of trade. About own-labour entitlement, one is entitled to one’s own labour power. Regarding to

the inheritance and transfer entitlement, one is entitled to own what is willingly given to one by another who legitimately owns that thing (Sen, 1981:2).

3.6.1 Criticism of the entitlement approach

The entitlement approach has contributed significantly to the understanding of famine, food insecurity and poverty; however, many scholars (Devereux, 1988; De Wall, 1990; Maxwell and Frankenberger, 1992; Pattanaik, 1991 in Nayak, 2000) have subjected it to several criticisms. Among such criticism is the claim that Sen ignored the significance of non-legal transfer of resource which household may rely on but rather only emphasized on legal transfers. This is a limitation Sen himself identified and as quoted by Devereux (2001) “while entitlement relations concentrate on rights within the legal structure in that society, some transfers involve violation of these rights, such as looting or brigandage”. Devereux further opined that such statement indicates that what constitute peoples’ entitlement was not totally defined in the approach (ibid). In the study communities, the environmental conditions coupled with few or lack of formal employment opportunities influence people to engaged in some activities that are not defects from the normal acceptance of what ought to be done.

Furthermore, Sen was criticised for ignoring the fact that the causes of famine are far more than entitlement failure but however multifaceted phenomena that can be related to political conflict, tribal wars, and outbreak of diseases. Indeed, Devereux (2000) indicated that famine could also be caused by food availability decline, which is cause by drought and floods.

In addition, Devereux (2001), contended that the entitlement approach has four limitations. The idea that the people facing famine may trade-off their endowment is not always the case. Per Devereux, people may prefer to starve rather than selling or exchange their assets for food. Secondly, he argued based on De Wall’s health crises model that, mortality is not caused by entitlement failure, but the outcome of patterns of migration and exposure to new diseases. Thirdly, the critiques were of the view that the use of individual as a unit of analysis may not fit in all cases. They argued on what they considered as fuzzy entitlement; the issue of the ownership of assets was raised. In many communities’ ownership of assets are not in the hands of the individual but the community. The forth critique is focused on the extra- entitlement transfers. They argue that famine is not only experience by the individual at the household level, however, it transcends through to the community and national levels (Devereux, 2001).

3.7 The concept of household

The concept of a household has been central to the study of food security in recent years. Household got its prominence in the study of food security after the focus of food insecurity shifted from global and national level to household and individual levels. As such, household became the unit of analysis of food security among researchers. A household might be large or small (Niehof, 2010:25). Based on this assertion, a household was defined as “household comprises either one person living alone or a group of people, who may or may not be related, living or staying temporary at the same address with common housekeeping, who either share at least one meal a day or share common living accommodation” (Jenkinson, 1998 in Neihof, 2010). To Ellis, a household is “a single decision-making unit maximizing its welfare subject to the range of income-earning opportunities and a set of resource constraints” (Ellis,1998:12). A household is a “co-resident groups of persons who share the most aspect of consumption, drawing on the assets and allocating a common pool of resources (including labour) to ensure material reproductive. (Schmink,1984 in De Hand & Zoomers, 2005). In the 1980s household studies became popular among researchers. Thus, researchers were of the view that concentration on household could narrow the gap between micro-economics based on its focus on individuals rather than the community. More importantly, the household was seen as a convenient unit for data production (De Hand & Zoomers, 2005). Regarding this study, the household was used as the unit of analysis. Thus, household is considered as people bound together by close relations, live under one roof and pool resource together and eat from one pot.

CHAPTER FOUR

Research Methodology

4.1 Introduction

Methodology is a systematic way of solving a research problem. It involves the studying and understanding of the research methods adopted in solving the research questions and the motives behind the use of such methods (Kothari, 2004). The methodological chapter will therefore provide in detail the research methods, techniques and strategies used for the study; thus, coping with lean season food insecurity, strategies employ by smallholder households in the Guinea Savanna Zone of Ghana. In this study, the qualitative research method was adopted to answer the various research questions. Qualitative research provides understanding of how people make sense of the world they live and the experiences and the meanings they attached to it (Merriam, 2009). Qualitative research therefore assumes that, reality is constructed, it is multidimensional, not static as it keeps on changing and that there is no immutable reality waiting to be discovered and measured (Merriam, 1995:54). The intension of this study therefore, was to unravel the experiences, thoughts, perception, and the meanings attached to lean season food insecurity by smallholder farm households in order to get an in-depth understanding of the phenomenon been studied, hence the use of qualitative research method and techniques. The methods used include, In-depth interviews with semi-structured interview guide, participant observation, informal conversation, photo elicitation, data triangulation and case studies. In addition, the sampling technique, my status, and role play on the field, ethical consideration and limitation of the study are all captured in this chapter.

4.3 Selection of Study Area and Communities

The study area was selected after the decision to study on the lean season food insecurity and how smallholder households cope with it. Discussions with friends and my supervisor coupled with information from a review of literature made me to settle on Navrongo. Navrongo was selected on the basics that it is within the Guinea savannah zone of Ghana, where only two distinguish climatic conditions (*dry and wet seasons*) are experienced. More so, the main livelihood of the inhabitants is agriculture which is basically rain-fed. Therefore, the assumption was that smallholder farmers in the area who mostly depend on their farm products would have felt the impact of the lean season in terms feeding their households. The same assumption was used as a guide to select the suburb communities for my studies. Some

areas in the Navrongo municipality have access to the Tono Dam irrigation project. In view of this, I assumed that the lean season food shortages are minimal among households in those communities because of the possibility of dry season farming. Based on this assumption, communities, distant away from the Tono Dam area were selected for the study. In all, four different communities were selected for the study, thus Doba, Gognia, Nayagenia, and Mirigu. It must be emphasized that most of the informants however, were selected from Doba community.

4.4 Journey to the study area and Community Entry during the fieldwork

Community entry during fieldwork is a herculean task for researchers in many aspects. The travel, finding gate keeper(s), familiarizing with norms of the host community and establishing a rapport with informants' is difficult. Regarding this study, I had to travel all the way from the southern part of Ghana where I hail from to the extreme north of the country. After my arrival, I searched for a guest-house to rest until day break. During the day, I walked through the streets of Navrongo to familiarise myself and search for a permanent accommodation for the rest of my stay. It was through this exploration that I met my *interpreter/gatekeeper* who is a graduate from Bolgatanga Polytechnic and was waiting to be posted for national service. He is the one who helped me to find accommodation and with his knowledge of the customs of the area, he led me to buy *cola nut* which was presented to the chief when he led to the chief's palace. The intension was to introduce myself and seek for permission from him to undertake my studies. The ability of the gatekeeper/interpreter to speak different languages, especially, the *Kasen and Nankani* which is the most dominant language in the area became vital during my interviews. In the next day, I and my *interpreter/gate keeper* visited the suburb communities of Navrongo to observe what farmers where doing as they wait for rains to start their land preparation and planting. Many contacts were made at the community level and household level during the visits. At the community level I had conversation with some local champions, National Disaster Management Organisation officials (NADMO), Agriculture extension agents and some Non-governmental organisation officials who give relief items to households during the hunger period. Some household heads were also engaged at the same time. The interview guide was tested during the same period for adjustment. After two weeks of visiting, observation and engagement with all sorts of people in the areas, I then took a week off to strategies for the task ahead of me, thus the in-depth interviews (*IDI*).

4.5 My Status and role in the study area

According to Linton (1936), the status of an individual is the total sum of his rights and duties. This rights and duties are exercised by role playing. Thus, roles cannot be performed without statuses, in other words there are no statues without role attachment. As someone visiting the community for the first time, different statuses were attached to me during my stay. I was considered as the member of National Disaster Management Organization (NADMO) because of my participation in the meeting that was organised between the organisation and the community. It was the first time most of the community members noticed about my presents. Due to this, most of them thought I could be of help and hence sougheed to tell me what they think must be done in other to safe the community dam for which the meeting was organised. By Listening to them and sharing my thought on the issue and other social issue confronting the community created friendly relationship between me and most of the community members. Moreover, others also referred to me as the friend of the assemblyman who has come to visit him, a student from the southern Ghana, official from the Municipal Assembly and interestingly musician because of my surname (*Amakye*) which is similar to popular musician in the country. In view of this, I was preferably called '*Abranteε*' means the *gentleman* which is the nickname of the musician. This created an enabling environment for me to proceed with the interview in a very relaxed mood as the informant became cooperative. Further, I was considered as a Ghanaian student from abroad who has come into the community to do research. As a student doing research the community members were expected to see me concentrating on my work. Anything out of that was seen by some section of the host community as deviation from my core duty and the reason why I am in the community. For instance, I took part in plastering of a house by some women and anyone who passes by stopped, glanced at me and asked, '*are you now a mason?*'" The answers given to them make them laugh as they greet me "*ayikoo*³" means *well done*. By doing this I became friendlier to the community members.

4.6 Insider or outsider: creating of positional spaces in the study community

According to Mullings (1999:340), '*insiders*' are researchers who study a group to whom they relate. This give them an advantage to use the experience and knowledge of the group to get more insight onto the phenomenon been studied (ibid). However, critiques are of the view that been an insider will deny one from gaining access to some vital information with the

³ Ayikoo means well done

perception that the fellow is abreast with such information already (Mullings, 1999). On the other hand, “*outsiders*”-described as researchers who study a group to whom they are not related to and this provide them with a greater advantage of accessing certain information which might not have been given to insiders(ibid). To ‘*outsiders*’, not belonging to a group been studied is likely to provide more objectivity, unbiasedness and will be perceived as neutral hence given information that will not be easily disclosed to outsiders (Fonow and Cook, 1991 in: Mullings, 1999). Nevertheless, Mullings (1999) advised that, strictly adherence to ‘*insider/outsider*’ divides freeze positionalities in place and assumes that being an insider or outsider is a fixed attribute. She further asserted that “the ‘*insider/outsider*’ binary in reality is a boundary that is not only highly unstable but also one that ignores the dynamism of ‘*positionalities*’ in time through space. No individual can consistently remain an insider and few ever remain complete outsiders” (ibid). Mullings (1999), therefore advocates for what she refers to as *positional spaces*’-areas where the situated knowledge of both researcher and the informant encounter, engender a level of trust and co-operation. This ‘*positional spaces*’ however, are mostly transitory and thus, eclipse the familiar fixed boundaries of ‘*insider/outsider*’ privilege based on visible attributes such as gender, race, class or ethnicity (ibid).

With regard to this study, I and my interpreter assumed different statutes during the data collection process, bearing in mind the diverse background of the informants and been reflexive of the role we were playing during the interviews. As someone from the southern Ghana and a student from outside Ghana, my informants’(*farmers*) considered me as an outsider who has never experience the difficulties that is associated with the lean season in the northern part of the country. To them, southern Ghana is more developed in terms of infrastructure and very strong economically. Not only that, in climatic terms too, southern Ghana is also better off as it receives double maxima rainfall which supports two planting seasons within a year, hence, anyone from the southern part of the country is perceived to be economically strong and have not experienced lean season or the difficulty associate with it. The informants’ therefore, placed me into the same category and henceforth seen as an outsider. My outsider status in many ways gave me the chance to get more insight into issues as informants found it prudent to give me a detailed account of what exactly is the lean season, the period referred to as lean season, how it is changing, difficulties households encounter during the period and the tradition and contemporary coping/adaptive strategies pursue by households. As I nodded to the responds from my interpreter, the respondents look

excited and sometimes ask the interpreter to vividly tell me exactly what they have said. On the other hand, my interpreter was seen an insider because of his fluency in the local languages (*Nankani and kasem languages*) and his knowledge on the culture of the communities. His insider status had both positive and negative consequence for me during the interviews. On the positive side, he could establish rapport with most of the informants that makes them to participate in the study. On the negative side, some of the informants felt uncomfortable to reveal some vital household information to me in the present of their tribe man because of the fear of causing damage to the pride of the family and been tag as irresponsible household head. A household head who can express himself little in Twi⁴ language in the absent of my interpreter said to me *'we go through many challenges during this time of the year (lean season) but because of your friend(interpreter) I couldn't tell you all. This was to avoid putting my household into future a public ridicule'*. I however assured him of the confidentiality of the data given to me.

During my encounter with the Ministry of food and Agriculture officials at the area, I assumed the status of student who is just interested in food security issues in relation to seasons. At the initial stages of my engagement, the officials were very sceptical to give me any information for the fear that I might be an agent for the opposition political party or a media person seeking information that can be used to ridicule the government. This assertion prolonged my access to the information needed as I was always told that the Director is not around and that no one can give me the information needed in his absent. After few weeks, I met the director but to my surprised he was also sceptic to grant me the chance to interview him and other officers. However, after showing him the introductory letter from my supervisor, that I am a student from university of Bergen and doing research on lean season food insecurity and how households' cope with it, confidence was restored. My status as a Ghanaian student and my knowledge on the lean season and food insecurity in the country and in the north to be specific brought me to the level where officers were ready to give me their maximum cooperation and all the secondary data I needed was given to me.

4.7 My Interpreter

Due to the language difference between me (the researcher) and my informants, it was necessary for me to use an interpreter to help me in the data collection process. Based on the prior knowledge I have my preference of an interpreter was based on the language, cultural

⁴ Twi is a language for the Akan people in southern Ghana

competence, and familiarity to the area. Indeed, the interpreter I have was culturally competent as he orients me on traditions of the area. As already mentioned my interpreter is a graduate from Bolgatanga Polytechnic. As such, he was respected by both young and old in the community as one of the educated people. The influence of my interpreter in the community was vital to my work, especially during the initial contact with informants. Most informants were willing to engage with me in his presence than when he is not around in the initial stages. In order, not to allow the interpreter to have too much influence on the interviews and the answers given by informants, his role was clearly defined for him. He was to ask questions in a polite way and translate the answers to me as given by the informant. He was to seek my advice when he wants to ask a follow-up question to avoid asking sensitive questions. Such roles were vital to ensure he stick to his role and been reflective to avoid distorting the information given by the informant.

4.8 Sampling Strategies

According to Rice (2010), sampling entails gathering of information about a relatively small part of a larger group or population to make inferential generalization about the larger group. Sampling is important in research because it is often not possible to obtain information from an entire population or group under study (ibid). Sample in qualitative research is not intended to be representative since the emphasis is usually upon an analysis of meanings in specific context (Robinson 1998, p.409 cited in Hay, 2005:72). Regarding this study, purposive sampling was employed to select informants' and key informants'.

4.8.1 Purposive sampling

Purposive sampling technique was employed to select the specific informants needed to provide information that can be used to answer the research questions. Purposive sampling involves precisely selection of informants from cases that are judged to epitomize the views of the group they represent. The selection of informants mostly depends on experience and judgement of the research prior to the study (Rice, 2010). In order for me to be able to answer the research questions of this study, informants with less than *five acres* of farm size were purposively selected and interviewed to find out their experiences, thoughts and perceptions on lean season household food insecurity and to ascertain the coping strategies employ by households during such periods. Household heads were interviewed and in the unlikely event that the household head was absent the eldest person in the household were interviewed on his/her behalf.

In all, twenty-seven (27) household heads were interviewed to find out the household food insecurity situation during the lean season and how the household as a unit cope with. Out of the twenty-seven, nine (9) were female whose husbands have either migrated or died at the time of the interview. In addition to the household heads, six (8) key informants including a chief, an earth priest (Tindana), two (2) assemblymen, an agriculture extension agent and the director of Ministry of food and agriculture (MoFA) in the district office and (2) extension agents and a local champion. The key informants were interviewed based on the assumption that such people have enough experience and knowledge of the lean season and food insecurity in the study area.

Table 3. summary of informants interviewed in relation to their communities

<i>Community</i>	<i>Number of Households</i>	<i>Gender of household head</i>	
		<i>Male</i>	<i>female</i>
<i>Doba</i>	17	12	5
<i>Gognia</i>	4	3	1
<i>Nayagenia</i>	4	2	2
<i>Mirigu</i>	2	1	1
Total	27	18	9

Table 4. Summary Key informants interviewed

<i>Key Informant</i>	<i>Number</i>
<i>Chief of Doba</i>	1
<i>Earth priest</i>	1
<i>Assemblymen</i>	2
<i>Director of MoFA</i>	1
<i>Agric extension agents</i>	2
<i>A local champion</i>	1
Total	8

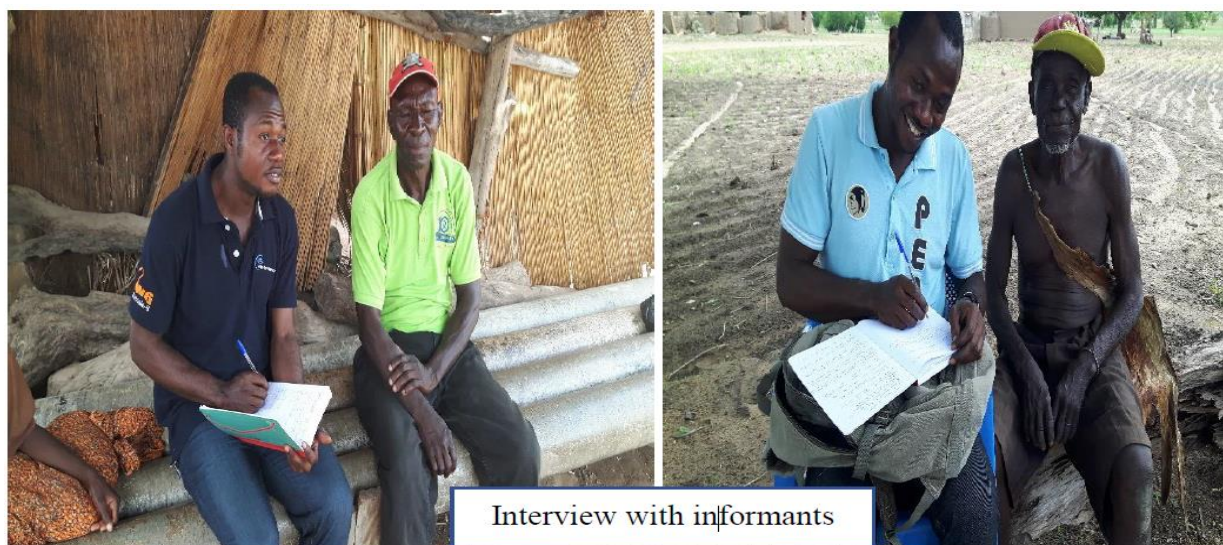
4.9 Data collection techniques

4.9.1 Interviews with informants

Interviews are verbal interchanges where one person, the interviewer, attempts to elicit information from another person, the interviewee (Dunn 2005:79, in French, Valentine and

Clifford, 2013). It is a perfect way of gaining access to information about individual's perception, experiences and opinions on the phenomenon under study (Hay, 2005). Interviews can be structured, semi-structured and or unstructured. One end of the continuum is structured interview which follows a predetermined and standardized list of questions which are asked in the same way and in the same order. The other end of the continuum is unstructured form of interview whereby the informant directs the interview instead of the questions (ibid). In the middle of the continuum is semi-structured interview. The semi-structured interview has some degree of predetermined order but still ensures flexibility in the way issues are addressed by the informant (Hay, 2005). During the fieldwork, semi-structured interviews were used to interview smallholder household heads on face-to-face basics. More so, unstructured interviews were used during the encounter with key informants to be able to probe vigorously into issues as the persons expresses his opinions, experiences and perceptions of food insecurity during the lean season and the noticeable coping strategies in the area. Indeed, the use of these two forms of interviewing gave me more options and flexibility to get insight into the phenomenon under study by constantly prompting the informants to clarify conflicting issues. In order, not to lose any information given to me by the informants', audio recorder was used in all the interviews. In each case, consent was sorted from the informant before I proceeded with the recordings. Moreover, note-taking were also used to record some salient points raised by the informants.

Plate 1. Interview with some household heads



Source: Fieldwork, 2016

4.9.2 Participant observation

Participant observation is one of the qualitative research methods I used effectively during my fieldwork. It involves strategically placing oneself in situations in which systematic understandings of place are most likely to arise (Hay, 2005). During the fieldwork, I participated and observed several social events and natural phenomena in the study area. One of such instances was my participation of a gathering that was organized between the National Disaster Management Organization (NADMO) and the *Doba* community. The purpose of the meeting was to sensitize the community members on how to protect a small dam in the area to prevent it from drying up during the dry season, thereby given them the opportunity to engage in dry season farming. Indeed, my relationship with the community members grew to the level where I could involve in their day to day activities, including planting and construction in the community. Aside the participation, I also observed some events during my stay in the community. Among other things I observed are how the planting season is changing because of the delays of rains, men involving in activities such as *shea nut* gathering which hitherto was believed to be women activity, household depending on wild foods, weak livestock due to lack of forage because of the long dry season and land preparation techniques with the use both tractor and oxen. In addition, I observed the celebration of married rites and some funeral activities. These two social events were later referred to by my informants as one of the many causes of food insecurity in the household. The participant observation technique that was used in the study gave me a good insight of the lean season and how the household as a unit sustain them in such period. Moreover, I got first-hand information on how the food production chain starts from the onset up to the mature stage. However, I did not witness the harvesting stages because of time constraint.

Plate 2: Participation in informants' activities



Source: Fieldwork, 2016

4.9.3 Photo Elicitation

Photo elicitation involved the use of virtual images to probe informants to discuss social relationships (Esptein et al., 2006). Photo elicitation has been used in various disciplines including geography (ibid). To delve into the food security issues confronting households in relation to the lean season it was important for me to use photos to help me clarify issues from the informants. As such, photographs of ploughed fields, crops cultivated, wild foods and storage facilities were taken before and during my interviews. In addition, food storage facilities (eg.barn) images were also taken. The informants interpreted and explained the images to me as I show it to them during my engagement with them. By doing so, I came to know the local names and different food crops that are grown. I also came to understand why different crops (millet, groundnut, maize) are cultivated on the same piece of land. In addition, difference between land plough with oxen and the one with tractors and why households prefers one to the other was revealed by informants through this process.

4.9.4 Informal Conversation

Complementary to other qualitative methods used during the fieldwork for data collection is informal conversation. Informal conversation was extensively used to engage the community members especially during the earlier stages of my stay in the community. The purpose was to familiarize myself in the area and to get insight on number of issues before the start of the interviews. Most of these conversations happened in the community *resting places*. The community resting places are places where the community members meet, especially the men and have drink (*pito, a local beer made from millet*) and engaged each other in personal conversations after the day's work. The conversation sometimes last as long as one-hour-thirty-minutes. Indeed, the informal conversation gave me a lot of insight even before the start of my interviews. People gave me vivid description of what the lean season is and the challenges that comes along with it after knowing that I am not a native of the northern part of the country. These conversations helped me during the main interviews as I already had information with some terms used locally to describe the phenomenon I was studying.

4.9.5 Case Studies

A case study is an empirical inquiry that investigates a contemporary phenomenon in a real-life context (Yin,2003). Case study as a qualitative research method helps one to explore and

reveal the essence of the phenomenon under study (Stark, 1995; Yin, 2003). Stark (1995) categorized case studies into three; *intrinsic, instrumental and collective*. An *intrinsic case study* used when the researcher is interested in the case been studied and intend to know more about it, *Instrumental case study* provides deep insights into a phenomenon been studied while a *collective case study* encompasses different cases. The instrumental case study was used for this study. The reason behind using the *instrumental case study* was to get deeper insight and understanding based on household experiences of lean season, food insecurity, the impact of lean season on household food security and the *coping/adaptive* strategies that are employed by each household. *Three different* cases were selected to be presented, and it was based on the detail description of the phenomenon and how household as unit reached a decision on the type of coping strategies to be used at any point in time to be maneuver their way through the lean season.

4.9.6 Data Triangulation

Triangulation refers to the combination of two or more methods, theories and data in the same study in order to get different perspectives on the phenomenon been studied (Thurmond, 2001:254). By using triangulation, the researcher increases confidence in data produced, reduce biases and provides comprehensive understanding of the phenomenon been studied, thereby strengthening the study outcomes (ibid). To Lincoln and Guba (1985, in Thurmond, 2001) “*Triangulation of data is crucially important in naturalistic studies...No single item of information (unless coming from an elite and unimpeachable source) should ever be given serious consideration unless it can be triangulated*”. Different types of data were used for this study. Primary data was generated from the interviews, observations, informal discussions and photo interpretation. This was complemented with secondary data from relevant documents, scientific journals and situational reports from the Ministry of food and Agriculture district office at the study area, *Navrongo*. Data produced from these sources include household livelihoods, major crops cultivated, farming system, land preparation techniques, months of land preparation and planting, lean season challenges, coping and adaptive strategies, food security situation at the study area and market prices of food stuff during the lean and peak seasons. Using diverse sources of data helped to enrich the information and hence enhanced the research study.

4.9.7 Data Analysis

Data collected during the fieldwork was analyzed in order to deduce the right information that can be used to answer the research questions from a pool of information given by the informant. The first phase of the analysis was to type the writing notes I took during the field interviews into a computer (*creating word document*). In similar vein, the audio recordings, translated from Nankam and Kassim languages to English by my interpreter were also transcribed to word document. Secondly, the various transcripts which were purely qualitative responses were coded. Demographic data of the household heads and household characteristics such as age, educational level, household size and gender were also analyzed to link to the other data to find relationships. Moreover, metaphors identified in the speeches of the informants were interpreted. This helped me to understand the meaning and context to which informants place their statements. For instance, an informant trying to explain the economic importance of *shea nut* to me referred to it as a cocoa. She said “the *shea nut* is our cocoa...it is very lucrative during this period”. Cocoa is the most important economic tree in Ghana and it only grows at the southern forest zone of Ghana.

4.10 Ethical Consideration

People have their own culture and believe that needed to be observed by researchers during their studies. Working ethically during fieldwork increases the people’s confidence and also brings respect to the researcher. Aside these, working ethically safely guides the rights of informants, the research community and the environment. This creates a friendly atmosphere for further research (Clifford, French and Nicholas, 2013). Regarding this study, strict ethical guidelines were followed in order to safely guide the data collected from the informants during the fieldwork. First, ethical approval was sought from the *data protection office of Norway* prior to the fieldwork. This was done to ensure that the required ethics needed to be followed in doing household research with the intention of collecting sensitive data such as household income, education, names, age etcetera are adhered to. With the help of my interpreter, verbal informed consent was obtained from the informants’ before I proceeded with the interviews. This was done by introducing the research topic and explaining to them the purpose of the study, the data that I will be needed and how such data is going to be protected from getting into the hands of any third party. It must be emphasized that most of the questions were asked in English, translated into Nankam and Kassim languages for the informants by my interpreter. Aside this, I also sought permission from the informants’ before using audio

recorder and taking photographs. Moreover, confidentiality and anonymity of the informants were upheld.

4.11 Validity and Reliability of Data (trustworthiness)

Validity of a study is concerned with the integrity of conclusions drawn from a research (Bryman, 2012). Validity comprises both external and internal validity. Internal validity deals with the extent to which the phenomena been studied are very much accurate to the group under study whilst the external validity is concerned with whether the study findings can be generalized to the entire population from which the study sample was taking and beyond (Bryman, 2012). Although, some scholars use validity and reliability in their studies, some qualitative researches are of the view that such concepts sound more quantitative hence conceptualized it into what is termed as '*trustworthiness*' which consist of *credibility*, *dependability* and *transferability* (Graneheim, 2004:100).

With this study, different procedures were used to make sure there is credibility of the study. According to (Graneheim, 2004:100), *credibility refers* to how well data and processes of analysis address the intended focus. The focus of the study includes selection of context, participants and the approach in gathering of data. Selection of participants with various experiences and from different background increases the possibility of casting light on the research questions from a variety of aspects (ibid). In this study, the informants selected for the interviews were smallholder farm households with two hectares or less farm lands. The interviews with key informants' (*chiefs, assemblyman, agriculture extension agent, Mofa Director*) contributed to the different experiences and perceptions of the smallholder farm households on lean season, food insecurity and strategies employ, thereby adding to credibility of the data. Moreover, the use of purposive sampling method also contributed to the credibility of the studies because informants were selected on the basis that they are smallholder farmers who have experience in food insecurity during the lean season and hence would provide the needed information that could help me answer the research questions. The use different qualitative methods and data sources through triangulation techniques also enhanced the credibility of the study as it provided the away to cross-check the data given by the household heads to that of other sources for consistency. For instance, household heads revealed that there was delay in rains during the 2015/2016 cropping season which eventually affected their crop yields and therefore worsening their vulnerability to the lean season food

insecurity. This situation was confirmed by a secondary data (*situational report on crop performance and food security in the study*) I obtained from the *Mofa* office at Navrongo.

Dependability is another aspect of trustworthiness. Dependability ‘seeks means for taking into the account both factors of instability and factors of phenomenal or design induced changes’ (Lincoln and Guba, 1985 cited in *Graneheim,2004*). That is, the degree to which data change over time and alterations made in the researcher’s decisions during the analysis process (Graneheim, 2004). In other to ensure dependability of this study, I engaged in informal discussion with the smallholder farm households on their experiences of lean season and the challenges the household face in relation to food availability during the period for two weeks before I started my interviews. Information I gathered during the informal discussions was used to shape the interview guide that was used during the interviews. Due to time constraints, I could not go back to my informants to validate the study outcomes of their information giving to me. However, during my interviews, I summarized all the salient points raised and asked informants through my interpreter to clarify and confirm if what has been captured is exactly what was said before I ended the interview.

Transferability is the final aspect of trustworthiness of data according Graneheim (2004). *Transferability refers* to the extent to which the findings of the study can be transferred to other settings or groups (ibid). The intension of this research was not to generalize the findings but to produce specific-based-knowledge on lean season food insecurity and how smallholder households cope with it. However, a detailed description of the study procedure, social settings, and characteristics of informants, data collection and analysis processes, data source and methods used during the study have been outlined. This might facilitate transferability of the study findings. The decision to transfer the findings to other culture settings however, lies with the reader (Graneheim, 2004).

Reliability on the other hand is defined as “the extent to which results are consistent over time and an accurate representation of the total population under study” (Joppe, 2000). To Long and Johnson (2000), reliability relates to dependability and confidence in the data been produced. In order to ensure reliability Brink (1991, in Long and Johnson, 2000:30) suggested three tests of reliability for qualitative studies; thus stability, consistency and equivalence. Stability is when asking identical questions of an informant at various times to ensure consistent answers. Consistency refers to integrity of issues within a single interview, so that a respondent’ answers on a given topic remain harmonious. Equivalence on the other hand is tested, using alternative forms of question with the same meaning during a single

interview (Long and Johnson, 2000:31). In this study, the question guide used for the interviews was pre-tested to standardize it before the main interviews started. Moreover, some questions were reframed to cross check the answers given by the informants. Further the same question guide was used throughout the data production process for all the categorized informants. By this way, I believed that the data produced for this study is highly reliable.

4.12 Challenges of the study

Many challenges came out during the fieldwork. However, swift decisions were taken to tackle it in order to reduce, if not to eliminate the impact that it could have on the study. The first of the challenges is the selection of informants. The informants needed for the study were smallholder farmers with less than two hectares of farms. Thus, prior to the fieldwork, the idea was that majority of the people in area are smallholders so it will be easy to recruit the informants. However, when I got to the field, I noticed that one household could have three or four farms with each less than two *hectares threshold* but when you add all it exceeds the two hectares. To tackle this challenge, I, with the help of my *gate keeper* (the assemblyman of the area) engaged in informal discussion with my perceived informants. During the informal discussion, I adopted what I called *listing*. During the *listing process* the farm size and number of farms own by each household was listed. Households whose farm sizes exceeded two hectares were eliminated from the remaining households for the in-depth interviews. Though the process was tedious, it was worth doing. It gave me a clearer population of smallholder farmers and therefore increases the credibility of the study as the right data were taken from the right informants.

Another difficulty encountered during the fieldwork was language differences. The language of my informants is different from me. Whereas I speak *twi* as my local language, my informants were fluent in the Kasem and Nankani languages. Few of them can speak the *twi* language but it was always difficult to express themselves well with it. Moreover, the English language that supposed to be a common language for communication was inadequate to be used as most of the informants cannot read or speak due to the high level of illiteracy in the study area and among the informants. To solve this problem, I engaged the services of an interpreter who speaks all the languages, thus, Nankani, Kasem and English. I asked the questions in English and the interpreter translate it to the Kasem and Nankani languages to the informants and vice versa.

During the initial stages of the fieldwork, my gatekeeper and interpreter was more dominant in most of the decisions we took. He was behaving like the leading researcher. This was because of his familiarity in the area and the relationship he had with the communities we went. Moreover, his motor cycle was used during our initial visits. As such, he was the one determining when we should go to the communities. However, after few weeks, I got someone who hired to me his motorcycle. As a result, I became the main man for all decision making regarding the time to visit the communities and when we must see our informants. Moreover, he became more cooperated after I told him that I will pay him for his service after the fieldwork. I also took care of his daily meals anytime we go to field. This helped me to have more influence on him during the interviews.

CHAPTER FIVE

Results of the study

5.1 Introduction

This chapter presents the findings of the study by looking at the experiences, opinions and perceptions of lean season food insecurity within the study households and examines the various strategies smallholder households adopt during such periods. The findings were generated from the data obtained from the informants through in-depth interviews with household heads and key informants during the fieldwork. Aside the main data that seek to answer the main research questions, other related information on livelihood activities are also presented in this chapter.

5.1.1 Livelihood activities of the study households

Agriculture is the main livelihood activity for the study households. It comprises crop farming, livestock rearing and poultry farming. The findings suggested that study households practice both compound and distance farming. The distance farms are located far away from the communities. The households with distance farms are the ones that have the capacity to acquire the necessary inputs needed for production. It involves the cultivation of large farm lands and dominated by high market value crops. Formally, the distance farms were mainly shifting. However, in recent times the increasing competition for land is limiting households to continue with the same practice. The compound farming on the other hand, is the dominance farming system practice among the informants. It is characterized by the use of traditional farming tools and application of manure. In all cases, the cropping system is mainly rain-fed. Aside crop farming, smallholder households also practice livestock rearing and poultry production in the study communities. Livestock rearing is based on the free-range system. However, during the interviews respondents revealed that there is a consensus in the community that all households should keep their livestock indoors during the planting season and release them later after all community members have finished harvesting their crops to avoid destruction of farms. Goat is the dominant livestock in most household. Like wisely, guinea fowl is the most popular poultry rear. Dry season farming is not popular among my informants' households because lack of irrigation dams.

The second livelihood activity among households is petty trading. Most households engaged in the trading of basic commodities and environmental products. Most of these trading picked

up during the dry season when there is no much on-farm work to be done. The third most reported livelihood activity is casual labour. Informants revealed that they engaged in both on-farm and off-farm activities during the dry and wet seasons. The fourth livelihood activity reported is livestock trading. Animals traders deal with includes pig, goat, sheep and cattle. The animals are bought and sold to other traders from the southern part of the country. This type of livelihood activity is practiced among a small number of households. Migration was also mentioned as an important livelihood activity among informant households. Both temporal and permanent migration was mentioned during the interviews.

5.1.2 Land Preparation Techniques

Three different land preparation techniques were observed during the fieldwork. That is Manual technique (*use of cutlasses and hoes*), Tractor technique/ mechanization and oxen-ploughing. The choice of land preparation technique used by a household is based on several factors; thus, availability and the cost of hiring, ownership, size of farm and location of the farm. For instance, in Doba community, *thirteen out of the seventeen* household heads interviewed indicated that they used the oxen drawn plough for land preparation. However, varied reasons were cited for its usage.

Informant 1: "... we use own oxen drawn plough to prepare our farm land".

Informant 2: "We use oxen for ploughing our land for cultivation because it is cost effective. Comparatively, the cost for hiring the bull is lower than the tractor in this place".

Informant 3: "...we cannot be chasing tractor for two to three weeks whiles our neighbours are planting their crops. We have only one tractor in this community and this tractor cannot serve all of us at once. We therefore use oxen which is easily accessible in this community"

As presented above, all the three respondents use the oxen for ploughing their land but however, cited several reasons for such decision. Ownership, availability and cost of it were their major reasons. Aside the reason given by the *informant 1*, the reason by both *informant 2* and *3* somehow suggested the cost of hiring tractor-*informant 2* and the availability of the tractor at the time of need-*informant 3* is a challenge in the community. My engagement with the Ministry of Food and Agriculture Director in the study area also confirmed. According to him, most smallholder farmers in the area still use the oxen drawn plough for land preparation. He attributed this to the inadequate tractors in the area and the astronomic hiring charges by the tractor owners. "*...the competition for tractors in recent times is the cause of*

its high charges by owners. Since farmers don't have the right standard measurement for their land size, any small piece of land is taking as one acre (0.4 ha) and hence charge as such'. He asserted. Smallholder farmers who use tractor are those who have a relation with the tractor owners, those engaging in crops like rice, those who could afford the cost of the tractor at any price, those with larger farms and those who have rapport with tractor owners. "...I have been using tractor for ploughing since 2009. My in-law is the owner of this tractor He always sends the driver operator to come and plough my land for me during the planting season" (Amina, 62-year-old, widow, 6HHM⁵). Like this informant, others also have different relationships with tractor owners that make them easily access the tractor service during the planting season.

Plate 3: Tractor and oxen ploughing farm land



Source: Fieldwork, 2016.

5.1.3 Types of Crops Cultivated

Navrongo, being located at the Guinea Savanna Zone of Ghana, experiences unimodal rainfall pattern. This makes it difficult for tuber crops (*cassava*, *yam*, *cocoyam*) to perform well when cultivated. As such, smallholder farmers in the area are limited and hence prioritize the cultivation of dry land crops because of its resilience to drought and climate

⁵ Household members

variability. Among such crops cultivated by smallholder farmers include the pearl millet, groundnut and sorghum and legume. These are the traditional crops smallholder households have been engaging in since time immemorial. However, some households are now adopting other crops such as rice, maize and cowpea due to its economic viability and because its long storage life span. The pearl millet popularly known in the local parlance as *Naara*, is an early maturing variety type of millet. It takes on three months to be matured. It is very important variety to households because of its early maturing nature. Respondents reported that this crop is important to them because of its timely matured nature. All households' heads revealed through the in-depth interview that they cultivate this millet variety (*Naara*). A household head expressed his impression of the pearl millet (*Naara*) noted *“The pearl millet is very important crop for my household because of its early-maturing nature. It mostly takes only three months to be matured. It is the first crop we harvest in our farm, and then followed with the groundnut, cowpea and the late millet (Zea). It comes at the right time to sustain the household until the major harvest”*. (Tia,36-year-old household head, 5HHM). Thus, for this household the timing of pear millet is very important because it comes to reduce the food scarcity in the household and sustain them until they harvest all the other crops. It is important to note that the late millet, the legumes and sorghums takes between six to seven months before maturing. The cultivation of maize was reported to have gained grounds in recent years.

Plate 4: Pearl millet display by the lady,



Source: Fieldwork, 2016

5.1.4 Good Agronomic Practices (GAP)

The performance of crops does not only depend on natural factors such as soil and climatic conditions, but also the farmers' ability to follow good agronomic practices. This starts right from land preparation, through to planting, weeding, harvesting and to some extent storage. In order to get more insight into this, informants were asked to describe how they plant and maintain their crops until harvest. Two different techniques classified in this study as traditional and modern techniques were identified. In traditional planting methods, farmers broadcast (*locally known as all die be die*) their seed in the farm land and later transplant clustered seedling after germination. Broadcasting is basically scattering of the seed on the prepared land without looking at where ever it will germinate. This method is preferably employed in the distance farms to the compound farms. Crops like rice and maize are the notable ones the technique is applied on during planting. Moreover, this technique is use by households with lower income to hire additional labour force to complement the household labour. "...*If you want to plant it one by one then you need more labour. And we don't have money for that*" an informant said. The modern planting technique reported includes row-planting. Farmers plant the seed on rows with and estimated distance interval. They refer to it as modern way because it was introduced to them by the agriculture officers. In the case of weed control, reported to weed under their crops for least three consecutive times before harvesting. The first weeding comes just after germination to prevent the weeds from mingling and over-shadow the crops. This is followed by second weeding at the mature stages of the plant growth. Then, the final weeding occurs just before harvest. Farmers either use traditional technique-cutlasses and hoes or modern technology-herbicides or a combination of both. Farmers mostly use hoes and cutlasses to weed under the crops during the first weeding whiles the weedicides are used at the later stages. On the application of fertilizer, it was reported that most households do not apply chemical fertilizers on their farms. This is due to the cost of fertilizer. As one respondent said, "...*we don't apply fertilizer in our farms because of its cost. The price of fertilizer can take care of me and my household for more than two months*". The cost of a bag of chemical fertilizer (NPK) at the time of my fieldwork was Gh¢110 (\$24) which according to informant was very high. Moreover, those who have the capacity to purchase the fertilizer also only apply it in the maize farms. The reason been that there is a higher income returns from the maize.

Application of organic fertilizer which was used by most farmers before is now been used by few households because of the declining state of household livestock.

5.1.5 Food storage techniques

Smallholder farmer households use many storage techniques to keep their products after harvest. In all, two food storage techniques were identified. It was observed that the barn storage is the most used storage facilities by households in the study communities. It is a cylinder-like shape structure build by males with the help of females. Millet, sorghum and maize is the main crop types kept in these barns. The second storage facility is the use of sack. Crops such as cowpea and beans are the main products store with sacks inside some part of the sleeping room. Some households treated their products before they are stored. Interviews with informants revealed that treating the crop products help to prolong its storage life span. “...we use ash to preserve our millet before keeping it in the barn to avoid weevils to pinch holes in them. This is to make sure that our meagre food is kept longer as we manage it through the year (Alifangsi, 56-year-old household head). Notwithstanding this, post-harvest loses is still a challenge for most of these households.

Plate 5. Barns use for food storage during harvest



Barns for food storage

Source: Fieldwork, 2016.

5.1.6 Household food production

As smallholder households, the level of food production is a determinant factor as to how long they can survive the food insecurity challenges. Food production at the household level is therefore very important contributor to food security. To find out the performance of crop output of households, informants were asked to describe how they see their crop output over a period of ten years. Most of the respondents indicated that their households' food production over the years has experienced constant decline throughout the period under consideration. Few others, however, indicated to have observed both increase and a decrease of the household production while some claimed to have experienced increasing crop production over the years. The households that claimed to have been experiencing a downward trend of production expressed fear of worsening state of affairs in the coming years if things continue as it is now. On the other hand, those with up and downs and increasing production expressed hope and projected a better state of affairs in the coming years if all things being equal. The reactions by the household heads have been expressed in the following accounts:

“We have experienced poor crop yields for our staple crops over the years. We have not changed our farming practices but there has been a continuous trend of crop yield reduction after the 2007 floods. After the floods, we have not been able to record any progress in what we do” (Ayaga, 50-year-old household head, 13HMM).

“...our crop yields over the years have not been stable. Some years have been good while others have been very bad. For instance, last two years (2014) we had a very good harvest. All our crop yields increased from the previous years. However, last year (2015) was very terrible as we recorded the poorest yields for our crops. We couldn't even have a half of the millet we had from the previous year” (Pelabia, 42-year-old household head, 8HMM).

“I cannot say we have experienced poor crop yields over the years. Even if we have it is not very significant for you to see. We always observed progress in our crop yields, especially the maize and the groundnut. For instance, from the last three years, we have had a very good crop yields. We got two bags of groundnut in 2013, 3 bags in 2014 and 2015. So, in general, I must be honest to say that our crop yields have not been decreasing just that the demand is rather increasing because of increased household size” (Abdul, 32-year-old household head, 7HMM). The three selected responses here suggested that households have different experiences when it comes to crop yields.

5.1.7 Labour use in farming activities

Household labour is the most dominant labour use by smallholder farmers for farm activities. The strength of labour in a household depends on the demographic composition of the household. Households with youthful population within the working age are more likely to use the household labour than the ageing household who find an alternative form of labour for their farm activities. More so, a household with a low educational background also depends on household labour for farm activities. Another type of labour use is the study community is the communal or shared labour. This type of labour is mostly used by the ageing households. Upon request by the household head, community members who could work come together to offer support. An informant said this “...my son who always prepares the land had a motor accident so I went to beg my neighbours to come and help me. Indeed, they came willingly to help me do what I wanted. I trust they will come and help me again during the harvest”. Some households also relied on hired labour for their farming activities. Households with the more robust diverse livelihood that earn them additional income were those noted to use hired labour for farming activities.

5.1.8 Access to credit

Access to credit for farming activities is very rare among study households. Almost all my informants reported not to have received credit facility from any of the banks and the microfinance companies in the area. They reported that the collateral demands from the banks and the microfinance companies are high for them. For instance, a household head interviewed reviewed that his attempt to acquire credit for the 2015 farming season proved futile because the microfinance company demanded from him a land papers as a collateral for the loan. This according to him was difficult because his farm land is not registered. However, two my informants reported to have received credit from a microfinance company. This was made possible because household members who work in the government sector were used as guarantors for the loan.

5.1.9 Access to extension services

The informants gave mixed reactions to the question of access to Agric extension officers. While some household heads reported having contacts with extension agents, others reported otherwise. Those who reported having contacts with extension agents further revealed that such contacts are made on a periodic basis. The information gathered suggested that the average contact with extension agents by farmer household is two times within a year. The

interview with the Director of the Ministry of food and Agriculture confirmed this. The Director indicated that the office is understaffed. Therefore, extension agents could not contact farmers on regular basis because of the number of communities under each agent.

5.2 Food production processes: gender roles

Gender plays different but inclusive roles in the food production chain in the smallholder farmers. Right from land preparation to harvesting different people in the household perform different tasks. From the study, informants revealed that male, both age and the young are mostly in charge of the land preparation. However, women in some households take the role of land preparation when there is no adult male in the household. Such households are headed by a female or the aged male who could not work. Sowing of seed is the task for women in the household. However, male members of the household in some instances work hand in hand with the female counterparts to make sure there is a proper planting of crops. In search instances, men create a hole with dibber⁶ while women sow the seed by putting seed in the hole and cover it. Households weed under their crops for at least three times before harvesting. In all instances, both the men and the women partake in this activity. The last stage is the harvesting. The role performs by either male or female members of the household is largely depended on the type of crop been harvested. Based on the data from the fieldwork, women are more dominant in the harvesting of groundnut. They uproot and remove the seed themselves. However, the roles play is different during the harvesting crops like pearl millet. Both men and women take part in its harvesting. The men are responsible for pulling the ear heads, while the female gather and convey it to the house. Aside this division of labour in the production processes, women contribute immensely in ensuring that there is food in the household for members to eat. The data gathered revealed that women are solely responsible for the preparation of food. Due to this, women in the households then become the managers of the barns after harvesting. Thus, women have the duty to manage whatever left in the barn to sustain the household until the next harvest. Moreover, they also engaged in other income generating activities to raise money to support the household. In the female-headed households' women oversee all the farming activities.

⁶ Dibber is a hole making tool made from either metal or stick with pointed edge

Table 3. The Summary of gender roles in households' food production.

<i>Farming activities</i>	<i>Who does what?</i>	
	<i>Male</i>	<i>Female</i>
Land Preparation	√	
Sowing	√	√
1 st weeding	√	√
2 nd weeding	√	√
3 rd weeding	√	√
Harvesting <i>groundnut</i>		√
Harvesting <i>millet, maize, sorghum</i>	√	√

Source: Fieldwork, 2016.

5.3. The main sources of food for smallholder households.

The information gathered suggests that households have four main sources of food. These are own production, purchases from the market, a gift from friends and close relatives, and through food aid. However, accessing food from own production and purchases from the market was reported to be the most reliable. The food aid and gift from close relatives were mentioned by few households. For instance, in the case of food aid, an informant narrated that he once worked for World vision international 7[1], and through that he created a network which has benefited his household. He claimed to have received a 50kg bag of rice and a bottle of oil from them in 2016. Aside from him, two female-headed households also reported that they received some food items from their church every year during the hunger period.

5.4 Food security situation in informants' household

The data gathered suggests that smallholder farmer households experience food insecurity at some point in the year. The most distinct food insecurity period according to the respondent is the lean season. Almost all household reported having experienced food insecurity during this period. However, the extent and the intensity of it vary from household to household

depending on the resource endowment available. The information gathered suggests that most households' food security status deteriorate just few months after harvest. This is an indication that the intensity and severity of food insecurity increases right after the harvest toward the hunger period. The reported months of food insecurity among households range from three to seven months. The data suggests that households that have smaller farm land size, with no livestock and mostly depend on their own farm production for food and income are the ones that experience long-term food shortages. Such households do not have any significant alternative livelihood activity to generate additional income. As a result, a proportion of whatever harvested is always sold to raise money to take care of other household needs. Such households are defined as acute⁸ food insecure households in this study. An informant belonging to this group gave this remark: *"...I can say without any reservation that the household start experiencing food insecurity just three months after harvest...that is right from January to the time of another harvest"* he asserted. Such a household only see themselves as food secure during the harvest and some few months after harvest. The second group of households reported experiencing food insecurity some five months before harvest. Most of these households have other sources of income aside farming activities with some livestock which they rely on during the peak of the lean season. However, the money from those sources was reported to be insufficient to sustain them throughout the year. Such households are being categorized as moderate⁹ food insecure households. The third group of households reported having experienced food insecurity three months before harvest. It was observed that such households have bigger farm size, livestock and have members who earn regular monthly income from the formal sector. *"...my household mostly experience food insecurity in three months before harvesting. Almost all the foodstuffs consume in this household at this period are purchased from the market"* (Adama, 60-year-old, household head, 13HMM). This group of households is also referred to as mildly¹⁰ food insecure household. Such households were found to be comfortable in most part of the year. However, their food security status worsens during the lean season. Thus, all the informants' households reported having experienced food insecurity during the lean

⁸ Acute food insecure households are the ones with small land size, heavily on their own production and lack financial resource such as livestock

⁹ Moderate food insecure households, other sources of income aside selling product from their farms. Most of these households have a sizeable livestock to rely on.

¹⁰ Mildly food insecure households. Have large land holding with regular income flow and livestock to depend on during the lean season.

season. However, households that experience long term food insecurity which is related to poor weak resource endowment are the most vulnerable during the lean season.

Table 6. Reported months of food insecurity for households, Fieldwork, 2016

<i>Households</i>	<i>No. months of food insecure</i>	<i>No. of households</i>	<i>Months of food Insecurity</i>
<i>First group of households</i>	7	18	January-July
<i>Second group of households</i>	5	6	Much-July
<i>Third group of households</i>	3	3	May-July

Source: Fieldwork, 2016

5.5 Climate seasonality: The wet and the dry season food variation

Smallholder farmers in the study communities revealed through the in-depth interviews their awareness of the seasonal variation of food availability in their households. According to the informants, there are two distinguish seasons in the calendar year; thus, the wet and dry seasons. The dry season is known as *Onne*¹¹ in the local language while the wet season is known as *yourbre*¹². The onset of the dry season coincides with the harvesting of crops. As a result, there is an abundance of food for most households during this period. Households eat what they like on a regular basis and feel secure during such period “...*there is always more food during the harvesting period. That is why we celebrate the Foa*¹³ *festival during that time. It is the happiest time for most households*” (interview with a chief, Doba Naaba). The relief the harvesting period brings to households are expressed during the celebration of this festival as both young and old, males and females partake actively. An informant echoing this point said: “...*the peak of the harvesting is our cocoa season. This is the time we get food and money to pay all our debt and buy whatever that we need*”. This statement is a structural metaphor that seeks to explain the importance of the peak season to the household in question. The cocoa season is the happiest time for cocoa farmers in the southern part of the

¹¹ Onne is a local language for harvesting time. It is this period that households have abundance of food in the stock

¹² Yourbre is the wet season and the time for active farming activities. It is the time food becomes scarce

¹³ Foa festival is celebrated by the people to commemorate the end of the farming season and thank the gods for protecting them throughout the season and making food available to them.

country. It is the time cocoa farmers harvest and sold their cocoa which earns them a lot of money. Respondents reviewed to have observed the longer dry season because of the shortened rainfall days. This was reported to have had a negative impact on crop yields among household.

The end of the dry season signifies the beginning of the wet season. The wet season is the time for farming activities. Most households now experience food scarce as food stock from the previous harvest get to its minimum level. This period is referred to in this study as a lean season. That is, the period in between planting and just before harvest. Locally, this period is known as hunger period (*Kombe*). Henceforth, these two terms will be used interchangeably. It is the time households prepare their lands for cultivation. Not only that, it is the time when food become scarce for most households interviewed. Informants' revealed that their food stock during this period depleted. In addition, respondents also reported of high food prices at the same time. Moreover, wild foods are rare to come by because most of them were reported to be out of season by then. More importantly, households reported having observed shifting in the start of rainfall. A key informant interviewed revealed that the start of the raining season which previously was April has shifted to May. In my fieldwork in 2016, I observed the delay in the rainfall as it started in the first week of June. In addition, farmers reported that the rainfall has become more erratic in recent years with poor distribution of rains during the wet season. The observed changes in the rainfall pattern affected the timing of planting and hence increase the period households experienced food insecurity. The length and the intensity of lean season in the study area is influence by the rainfall pattern. Thus, years with early rainfall reduce the extent of the lean season while years with the late rainfall increase the period of the lean season. Early rainfall facilitates the cultivation of pearl millet (*Naara*) which harvesting time shorting the hunger period among households. The respondents further revealed that the extent of the lean season could also depend on the harvest in the farming season prior to the hunger period. Years with good harvest shortened the lean period while years with poor harvest extend the lean season among households. An informant review that "...we had poor harvest last year and as a result, our food stock completely depleted as early as March this year (2016)...thus why hunger is in my household so early at this period" (Abubakar,60-year-old household head, 8HHM).

Table 7. Trends and Changes of Planting and harvesting months in the study area. Fieldwork, 2016.

Type of Crop	Months of cultivation		Months of Harvesting	
	Before	Now	Before	Now
Millet (early)	Apr-May	May-June	July-August	August-September
Groundnut	May-June	June-July	August- September	September-October
Millet (late)	Apr-May	May-June	September-October	October-November
Maize	Apr-May	May-June	August-September	September-October
Beans (cowpea)	May-June	June-July	August-September	September-October

Source: Fieldwork, 2016

5.6 Perceived causes of household food insecurity

According to the informants' food insecurity in the household can be attributed to numerous related factors. These factors are being categorized under two broad headings, thus, environmental induced factors and anthropogenic induced factors. Elements from these two broad categories work together to impact on food security issues. Therefore, preventing one from occurring does not automatically exonerate the household from experiencing food insecurity.

5.6.1 Environmental induced factors

Among the environmental induced factors that were mentioned by the household heads are climatic variability and change and loss of soil fertility. These two factors were commonly raised by household heads as the major environmental causes of food insecurity.

5.6.1.1 Climate variability and change

Climate variability and change is one of the many factors perceived by respondents as a cause of food insecurity in the study communities. Citing many instances where climate variability and change has affected the household food situation, households' heads were of the view that favourable climatic conditions could have averted the challenges that household face during the lean season. The informants further indicated their awareness on other related factors that might have contributed to the poor crop yield, but however, viewed climate variability and change as the bedrock against which all other factors rely on. They explained that farming in the study communities is rain-fed. Therefore, having a control over other related factors which are under the capacity of man does not prevent a household from the

vagaries of the climatic conditions and the impact it has on food production. “...without rains we cannot do anything, you can have all the required inputs but you can't plant” a female household head recounted. Informants reported that they have observed changes in climatic conditions over last ten years. This observed change is manifested in temperature rise, erratic rainfall pattern, and delay in onset of rainfall, periodic droughts and floods. This assertion was commonly raised by all my informants during the interviews. When asked about the causes of the changes in the climatic conditions, respondent attributed it to poor farming practices which perceived to have led to deforestation.

In addition, most informants were of the view that the change in climatic conditions has had an adverse impact on household livestock. Some of the informants perceived that the increasing outbreak of diseases, which is leading to the death of livestock is caused by the rise in temperature. During my fieldwork, I observed several instances of livestock and poultry deaths. However, I must clarify that I cannot link it to the increase in temperature because there is no confirmation from any veterinary officer in that aspect. In expressing his frustration on the situation, a 53-year-old household head narrated how his livestock size has reduced drastically in just three years. He said “Hmm...I used to have a very sizable number of livestock, specifically goats and sheep. Unfortunately, in later part of the dry season in 2013, they were attack by an unknown disease which killed a chunk of them. Some of them also went to eat far in bush and never come back. Look, I used to sell at least three livestock during this time in the year but now I cannot even get one to sell. These ones (pointing to some lying sheep) have reduced in size and weight because of inadequate fodder. I hope they will pick up when the rain begins and the leaves start coming”. The experience of this household was not peculiar to them as other households also reported facing similar challenges. Commenting on the same issue an informant recounted: “...we have only five poultry remained. Yesterday one died and as you can see today too another one has died. That is what the children are preparing over there to cook and eat. The temperature nowadays is too high for them. They cannot cope and are just dying. This has been the situation for some years now” (Nanwete, 35-year-old, household head, 5HHM). The perception of these two informants is that climate change is contributing to the decline of household livestock and poultry sizes. According to this informants' climate change has contributed to the decline of livestock in two ways; thus, increase in temperature which has increased livestock diseases and shortage of fodder because of the long dry season. The

perception of informants that climate variability and change have had adverse impact on household food security is demonstrated on the crops failure and decline in livestock.

Plate 6. *Ploughed land waiting for rains to start planting*



Source: Fieldwork, 2016. Photo Author

5.6.1.2 Reduction in soil fertility

Reduction in soil fertility is another environmental factor perceived by informants as a cause of food insecurity in their households. Most of the informants believed that, the continuous cultivation on the same piece of land has led to most lands losing its fertility. The perceived reduction in soil fertility was seen as one of the causes of poor crop yields experienced by some household. A household head stated: *“The decline of our crop yields is partly due to poor soil fertility of our farm land. This farm land was inherited from my father about 30 years ago and since then I have been cultivating on it every year. The land now has loose its strength and it is clearly manifesting in what we are getting from our farms. The result of it is what we are experiencing now, thus food insecurity”* (Gani, 55-year-old, household head,

10HHM). Soil fertility decline is perceived by some informants as a contributing factor to poor crop yield, hence making them vulnerable to food insecurity.

5.6.2 Anthropogenic factors

The human induced factors are the ones influence directly by the actions of individuals, the community, the state and to some extend the international bodies. Below are the anthropogenic factors reported by the informants.

5.6.2.1 Increase in household size

Increase in household members was reported to have contributed to food insecurity in the respondents' households. The perception of the increased in household size leading to food insecurity was narrated from two different perspectives; thus, increase in dependency ratio and shrinking of household farm lands. These two issues were raised by respondents during the fieldwork. Some of the informants reported that increase in household members is one of the direct causes of food insecurity their households. The increase in household members was reported to have increased in the demand for food. However, poor crop yields attributed to climate change and soil infertility coupled with other factors have made it impossible for most households to meet the consumption need of the members. Moreover, they reported that even if they produce enough, other needs (clothes, health care, school fees, and etcetera) of the household members could compel them to sell some of their crops to generate income to take care of such needs. In addition, the gap between harvests always makes it difficult for households with high dependency ratio to rely on their own production throughout the year. A 35-year-old Amidu, an eldest son of the household I interviewed recounted to me through the in-depth interview on how the increase in the household size coupled with the inability of his parents to work have increased the demand for food, hence making the entire household vulnerable to food insecurity during the lean season. He said: "...we were few (six in number) in this household before I got married...thus me, my parents, my sister and two brothers. But now we are eleven (including my wife and four children) and it's only me and my younger brother who are working. The rest are in school and age too has catch up with my parents so they cannot work as they used to. We should provide for all the household needs. It's not easy for us bro (referring to me) especially during this time in the year". For this respondent, high dependency ratio in the household has contributed to food insecurity in the household. The second link of increased in household size as a cause of food insecurity comes from the observed shrinking size of farm lands. According to the data gathered, the increased in

household size within smallholder households have led to the partition of farm lands. Conventionally, lands are divided and shared among male sons of the household who have reached the stage of raising their own household. The increasing number of household members has therefore become worrisome as the same piece of land used by the household are constantly been shrinking.

5.6.2.2 Reduction of wild foods and economic trees

In the study area, economic trees and wild foods play very significant role in the household food security situation. Among the economic trees identified in the area are *shea tree*, *dawadawa* and *Baobab* trees. The products from trees are either use directly or processed into finish goods to generate income to support the household. For instance, shea is processed into shea butter which is used as a substitute for cooking oil and pomade by the household. It also has very high economic values, that is it generates revenue for the household. *Dawadawa* on the other hand is used as a condiment by most household to add flavour to their food. However, respondents reported an observed reduction of some of these important trees within the vicinity of the households. This situation was attributed to many factors including long dry season with its associate hot temperature and the use of tractor during land preparation. Key informant interviewed also accused farmers for contributing to this situation. He explained that the cutting down of trees to ensure sufficient sunlight for farm crops has been a contributing factor to the current situation. He recounted that “*Now one cannot simply pick shea fruit from anywhere as it used to be ...every household is now entitled to pick shea from their own lands only*” (key informant interview). However, he was quick to add that those located in the bushes are free for all to pick. In addition, it was reported that Dawadawa fruit can now only be found in the bush. Women now have to cover a very long distance to get access to it. Respondents further, revealed that bush meats are mostly out of the season during the initial stages of the hunger period. They claimed that most of the animals move into the bushes where they could find foods and water during the dry season. Also, some informants reported that fishing and the search for crabs were not possible because of the long dry season that led to most rivers dry up. They claimed that this is also a contributing factor to food insecurity.

5.6.2.3 The declining state of agriculture input subsidies and reduction in organic manure

Despite the effort by governments to improve the household level food insecurity through food production, the cost of farm input keeps on rising. The respondents complained about

lack of subsidies on certain agriculture input. According to them, production inputs such as improved seeds, cutlasses, hoes and fertilizers have witnessed prices increases in recent years. As a result, access to these inputs has become difficult for most households. Most of the respondents asserted that they have used their farm tools for more than three years. *“I have not bought any farming implement for the last five four years”* an informant revealed. To them, the situation is a contributing factor for poor crop performance, which therefore makes them vulnerable to food insecurity. A situational report obtained from the ministry of food and agriculture office at the study area revealed that there have not been government subsidies on fertilizer since 2014. A key informant interviewed also confirmed this *“...No government subsidy fertilizer has been received since 2014. Fertilizer prices are very high now with NPK¹⁴ selling between GH¢85- GH¢100”*. The secondary data from Ministry of food and agriculture office revealed that, the fertilizer subsidy programme (FSP) was implemented in 2008 by the Government of Ghana to boost crop productivity to assist in the fight against food insecurity. It came at a time when average fertilizer usage by farmers had dropped from 21.9 kg per ha in 1978 to just 8 kg per ha in 2008 (MoFA, 2015). Inability of the households to access the non-subsidized fertilizers was a general concern raised by household heads that were interviewed. They claimed that the price of fertilizer is very high does why they are reluctant to buy. Household heads who managed to buy the non-subsidized fertilizers from the open market also complained about their inability to buy the required amount needed for their crops. Moreover, the use of organic fertilizer was also reported to have been limited because of the declining livestock among households. Those who have livestock further confirmed that, the quantity of manure they used to get has reduced. Therefore, it is very difficult for them share the little they get with their neighbours. The importance of livestock to households must therefore not be underestimated. This is because aside serving as food and income generating asset, it also provides livestock manure which is used to boost the fertility of soil.

¹⁴ NPK is an inorganic fertilizer made up of Nitrogen (N), Phosphate (P) and Potassium(K)

Plate. 7 heaped manure to be used as organic fertilizer



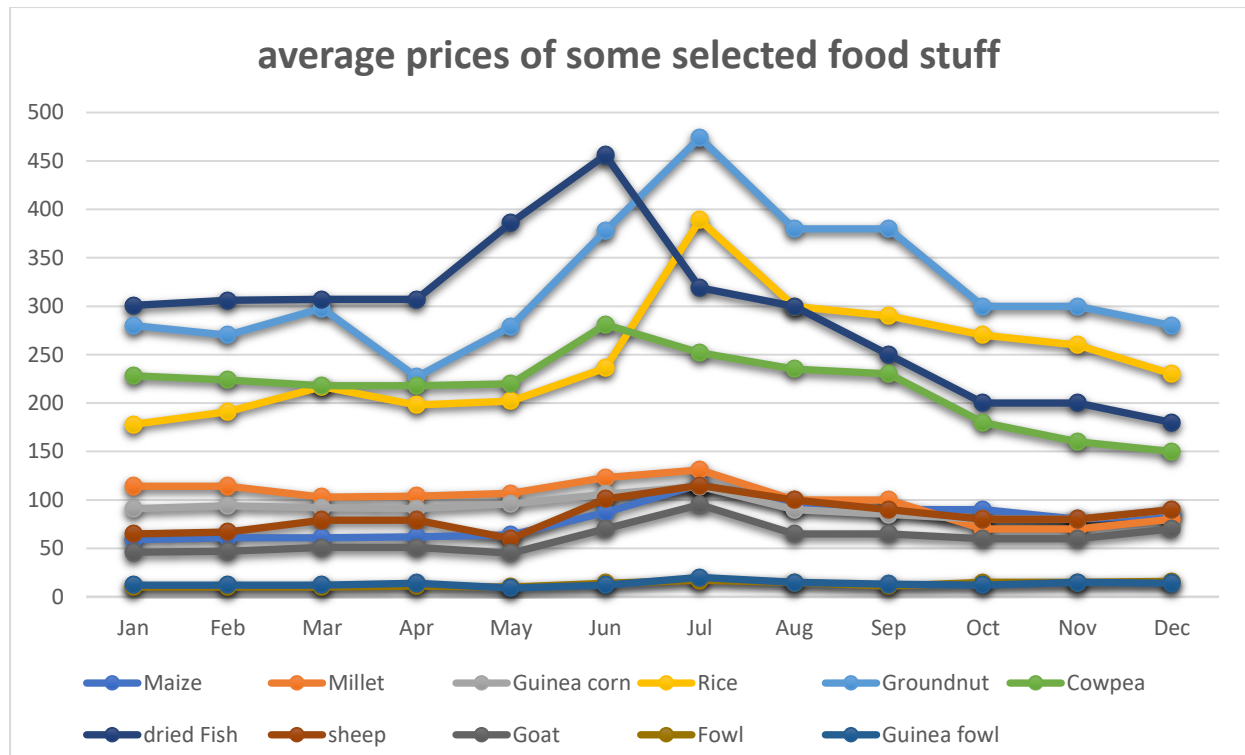
Source: Fieldwork, 2016.

5.6.2.4 Inflated cost of food prices during the lean season

Food prices hikes during the lean season was considered by smallholder household heads as one of the causes of food insecurity in their household. According to the data gathered, the prices of food grains (*millet, maize and sorghum*) mostly go up during the lean season. Thus, it coincided with the time when most farmers own food stock almost depleted and hence have no option than to purchase from the open market. However, most of the informants reported that they could not afford the prices of food in such period. As stated earlier, Upper East region is known for reliance on food import because of poor performance of crop output. As such, the respondents claimed that traders from the southern Ghana who apply their trade in the region hide behind the situation and increased their products. In echoing the challenges, the household face during the lean season, 45-year-old household head, Ezekiel, 7 HHM, noted “...our food stock mostly experience depletion just two months after harvest, so we start buying from the market to complement what is left. However, with the same amount of money, the quantum of the food stuff we buy reduces during the months of June and July

because of increase in prices”. This claim was raised by most informants during the interviews.

Figure 3: average monthly prices for some selected foods



Source: Data from MoFA. Constructed by the Author 2016.

As the figure depicts, the prices of traditional food crops vary from season to season. Food prices are relatively low at the last quarter of the year during harvesting. This is not the case in the second quarter of the year; the prices at the last quarter are very high, reaching its peak in July when food becomes scarce. Most households during this time purchase from the open market. Prices then increase because of the increases in demand for food stuff in the market.

5.6.2.5 Declining household labour

Household labour is undoubtedly the most dominant labour use by smallholder farmers for farming activities. However, globalization and the desire of the youth to earn an income for their own up-keep are deteriorating the one-time work force that serve as the backbone for a successful smallholder households. The study revealed that the youth in the various households now prefer to work for others to earn money other than to work for their own households. This, according to respondents has been a challenge especially in the aged smallholder households. To them there has been an increasing competition for the household

labour between the household that seek for the labour without pay and outsiders willing to pay for the labour services provided by these youths. “...now nothing is free, even my own children charge me when I want them to help me prepare the land for cultivation, even if they will do it free I have to wait for the them to finish with the one that earn them money”. (Tahiru, 68-year-old household head, 11HHM). With the current climatic challenges, the only hope for a good harvest is a timely planting of crops. Delay in planting as a result lack of labour increases the risk of crop failure. Respondents also attributed the decline in household labour to the emergence of formal education. They revealed that the declining nature of agriculture activities has necessitated the need to secure their children future through formal education. Owing to this, most households reported having sent their children who could support farming activities to school.

Closely related to this is migration. Migration of the energetic youth from a resource scarce area to other areas to seek for greener pasture is not new; however, the rate at which it is happening in recent times is very worrying. Before, migration in the study area was seasonal. People from the area migrate to the urban areas (Kumasi and Accra) in the southern part of the country during the off-farming season to seek for job and latter return during the farming season. However, the trend now is changing as permanent migration is now becoming more prevalence among the youth. This was attributed to the emerging small-scale mining communities in southern Ghana. Smalls-scale illegal mining, popularly known as *galamsey* in areas like *Tarkwa, Kyebi, Twakwa and Obuasi*, just to mention a few has been a pulling factor for most of this youth in the study area in recent times. The movement of these young men can either be positive depending on the remittances they send to their household or negative because of household labour lost. During the fieldwork a household head remarked, “...all my children are not here. The younger once recently moved to Takwa to join their elder brother who has stayed there for years now. He is a small-scale miner (*galamsey operator*) over there. They used to go there during the dry season and come back when is time for farming. They have however moved permanently last two years and are yet to even pay me a visit. Now I perform all the faming activities myself and as you can see I am not strong to cultivate on large space of land”. (Akaba,75-year-old, household head, 6HHM). Like this household there is a likelihood of food shortages because of household labour lost and lack of remittances to filled the gap behind. However, other households admitted having received remittances from their emigrated members which is used to hire labour and support the household.

5.6.2.6 Social events

Social events such as funeral and marriage were also mentioned as a cause of food insecurity in the household according to the informants. The respondents indicated that performing such rites required a lot of resources which mostly affect the household in both short run and the long run basics. They further narrated that a marriage rite in the study area demands a very good ransom from the bride's family in the form of bride price. This bride's prices come in many forms depending on the agreement between the families. It could be foodstuff such as yam, meat, cola, drinks, cows and sometimes money. The informants recognized the importance of such rites but were quick to add the negative impact it sometimes has on the food stock. More importantly, the informants also revealed that the death of a household member also brings a challenge to the household, especially when the person involved is a bread-winner. Aside from the challenges that the death brings to the household, the funeral rites performed further worsened the household food stock. Conventionally, a deceased household must feed all the mourners who come around to mourn with them. This according to households contributes to food insecurity especially when the death happened in the dry season. *"My father passed away six months ago, and as tradition demands, we performed his funeral rites. All the distant family members came around and we had to feed them throughout their stay. At the end of the day more than half of our last year's harvest was gone already"*. (Abdulai, 50-year-old, household head, 12HHM). Such a household lives on the meagre food left in the barn and possibly buy from the market.

Table 8. Summary of perceived causes of food insecurity

CAUSES OF FOOD INSECURITY

<i>ANTHROPOGENIC FACTORS</i>	<i>ENVIRONMENTAL FACTORS</i>
Increase in household size	Climate variability and change
Reduction of wild foods and economic trees	Reduction in soil infertility
The declining state of agriculture input subsidies	
Inflated cost of food prices during the lean season	
Declining household labour	
Social events	

5.7 Coping strategies of smallholder farmer households

The experiences of food insecurity by smallholder farmers have resulted in the application of different coping strategies. The informants revealed using several coping strategies when faced with food shortages. Regarding this study, the strategies identified by households have been categorized under two broad headings; thus food-based strategies and Non-food based strategies. It must be emphasized that these two classified strategies are not mutually exclusive.

5.7.1 Food-based coping strategies

Food-based strategies are traditional food insecurity coping strategy mostly used by household with food security challenges. Different research studies across the world revealed similar findings. This indicates that such strategies are not exclusively used by smallholder farmers in this study; however, the chronology of its application differs from household to household. Among such strategies identified in this study are presented below:

5.7.1.2 Reducing the size of food intake

Reducing the size of food intake for household members is one of the coping strategies that adopted by the study households. This strategy according to the informants has been practicing for ages. Almost all informants reported to have employed this strategy during the lean season. However different explanation was given as to while such strategy is adopted during the lean season. Some indicated that reducing food intake helped to sustain the household throughout the lean season without skipping meals at the peak of it. *"...we reduce the quantity of food cooked and the portion eating by household members in order to avoid total skipping of meals at peak of the season"*. (Awambo, 36-year-old, household head, 7HHM). Some also reported that reducing size of food intake is mostly employed in the initial stages of the lean season to prepare the minds of household members for more difficult strategies like skipping meals. Thus, some households employed this strategy to prepare for more challenging times while others use it as managerial process to maneuver through the difficult period.

5.7.1.3 Reliance on wild foods

The data gathered suggested that households mostly depend on less preferred and wild foods during the lean season. Respondents revealed through the interviews that households' members during the time of food shortages go and search for wild foods which are used as an

alternative to the regular food items used during the harvest period. The search for vegetables, fruits, and the bush meat becomes a vital daily activity for some household members. Whereas men in the household go and hunt for bush meat, women and children go and gather vegetables and fruits respectively. Wild foods such as baobab fruit and leaves, dawadawa, shea nut, beto leaves were most mentioned by the informants. The baobab leaves and the beto leaves are used by households to prepare soup. Moreover, the inner-most part of the baobab fruits are used as flour by some households. The dawadawa fruit are either eating in its raw state or refined and used as a condiment for preparing soup. It is important to note that because of the dry season that preceded the lean season most of these wild foods becomes difficult to access. Based on this, some households reported to keep some of the leaves (*Khenaf leaves*) during the harvesting period to be used in the lean season.

Plate 8. Fresh and dry khenaf leaf



Source: *fieldwork*, 2016

5.7.1.4 Eating less preferred foods

Most of the household heads revealed that their households eat less preferred foods during the period of food shortages. Less preferred foods in this case are the once a household would not have been eaten when there is enough food in stock. According some household heads eating less preferred foods is a way to ensure that household members get the three-square meals per

day even during the peak of the hunger period. “No one in the household complains about we are eating less preferred foods because we are all privy to the situation. We eat what we want during the harvest time, but this time what we want is to see food on our table, not a question of quality of food. If we want to eat the same as the harvest time then we probably have to skip one or two meals so that we can buy the quality that we want” (Alhassa, 40-year-old-househead, 11HMM). In such household, the question of quality food does not come in during the hunger period. To others, eating less preferred foods basically become the only option during the hunger period. Informants revealed that, eating less preferred foods does not exonerate them from skipping meals. “...we eat foods that can sustain us during the day...we don’t necessary look for quality or quantity”. One of such food reported by most informants is *Kamolega*¹⁵. This food is mostly taken as a lunch for most households.

Plate.9 Kamolega, a mixture of graded millet and shea butter



Source: fieldwork photo, 2016

5.7.1.4 Skipping meals

Skipping of meals is one of the food-based strategies revealed by the informants during the interviews. Unlike the first three strategies presented, this strategy is mostly employed by households at the peak of the lean season. The peak period is the time when most households’ food stock entered total depletion and food prices also reach its peak. It was reported as the

¹⁵ Kamolega is a local food make from a combination of millet flour and shea butter(*kaam*)

most severe food-based coping strategy employ. The data further revealed that households skip either the breakfast or the lunch or both. Supper then becomes the most important meal for them “...we normally skip lunch during this time in the year. This is to help us manage the meagre food left for us from the previous harvest” (Baba, 62-year-old household head). An important aspect of skipping meals is intra-household distribution of food. It was found that, children, breast-feeding mothers and the sick are given special preference. An informant recounted “...the children cannot sit down without food like the adults in the household. We mostly find something to give to the children” she said. The female-headed households are the most dominant in the application of skipping meals.

Plate 10. Case 1



Adugbire’s Household

Source: Fieldwork 2016, Photo published with the consent of the informant.

Adugbire is a 40-year-old man. He is the breadwinner for the household. His father and the mother are in their prime ages. The household comprises nine members. He and his wife and their three children (*the eldest is 10 years, followed by 8 and 6*), his parents (*above 70 years*) and his younger brothers (both in secondary school). The entire land area for the household is two acres¹⁶. The main livelihood of the household is farming. However, due to the poor climatic conditions and lack of money to buy the needed input for farming activities their yield has been always poor. This has put the household into a vicious cycle of food insecurity in most part of the year. The household have only three livestock and their priority is to see them reproduce and multiply in numbers.

¹⁶ Acre is a measurement mostly use by the local farmes. One acre is equivalent to 0.4 hectores. Thus, two acres is less than 1 hector

The household with prior knowledge of imminent food insecurity adopt food-based strategies to enable them to go through the lean season. Their first strategy is to reduce the amount of food cooked which directly impacts on food intake by the household members at the initial stages of the lean season. This serves as a psych up to all household members as they prepare for more intense strategy. *“With the consultation of my wife, the quantity of millet flour used to prepare Tuo Zaafi¹⁷ is reduced; hence the reductions of the food given to each member...at this point children are encouraged to drink more water when eating”*. During the lean season Adughire work as a casual labour for the well-off households to earn income or exchange for food. On-farm jobs become available in the lean season because it coincides with the farming period. While working outside the household own farm the wife then assumes the responsibility of working in the household farm. *“Anytime I go to another people’s farm, it is only the woman who works in our own farm. So, the work that we could have done in a day or two, she must take the whole week to do. It is a challenge...but if I don’t go, then we will all starve to death”* At the same time the household eat less preferred and heavily rely on wild foods. They also skip meals to increase the life span of the remaining foodstuff left in the barn. At this point, Adughire’s household only cook in the evenings with the leftover kept for children in the next morning.

5.7.1.5 Reflection on the case

The case above highlights the lean season food challenges and the strategies that are employed by this household. As the case depicts Food-based coping strategies are employed by the household as immediate responses to food shortages. This ensures that household could go through the lean season with at least a meal per day. More importantly, the case revealed that on-farm jobs during the farming season are very important for poor household. However, engaging in such activities could lead to long term food insecurity because one must leave his own farming task. In cases, where the household lack human capital, engaging in such task could further deteriorate the food insecurity situation in the household in the next hunger period. Working as a casual worker in neighbours farm earn him money to support the household. The application of food-based strategies and the off-farm income help the household to cope with the lean season.

¹⁷ Tuo Zaafi is a traditional food prepares from millet or maize and then serves with soup.

Plate 11. *Case: 2*



Source: Fieldwork, 2016 Photo published with the consent of the informant.

Tina is aged about 35. She is a left-behind wife, stays with her widow mother-in-law and her four children. She has now turned to be the breadwinner in the absent of her husband. The main livelihood of the household is farming. The farm size of the household is about two and a half acres. The lands they work on belong to her deceased father-in-law and were later inherited by her husband and it is the land the entire household feed from. Tina and her household engaged in mixed cropping with no application of either organic or inorganic fertilizer. The household grows early millet “*pearl millet*” (*Naara*) and the late millet “*sorghum*” (*Zea*) and groundnut. The crop yields from farm are divided into three groups. The first group is the quality seed selected and kept for planting in the next farming season. The second selection is sold to generate income to take care of the household whiles the remaining is kept by the household. This is what the household depend on until the next harvest. Tina observed that food insecurity situation in her household as cyclical, experienced in every lean season. The household therefore employs both food-based strategies and non-food based strategies as a surviving mechanism to maneuver their way through the lean

season. “Food *insecurity is something that we cannot do away with...it is always waiting on our doorsteps few months after harvest*”, she said. The situation has been the main reason for the early implementation of the coping strategies in the household. Among the coping strategies Tina and her household adopt are the sales of skills in other people’s farms at a nearby village Sandema. Based on what has been produced and how long it could sustain the household, she moves to a nearby village to work in maize farm in exchange for food to augment their own production “*I move to Sandema to work in the maize farm in exchange for food. This is what we use during the hunger period*”. The foodstuff acquired through exchange is the one that mostly sustain the household during the lean season. As a case for most women in the area, Tina also engaged in shea nut gathering and work on neighbours farms to raise income. This money is used to buy ingredients for food preparation. In addition, the Tina’s households also employ food-based strategies during the lean season. Skipping meals and relying on wild foods are the two most practiced food based strategies. Mostly the household eats breakfast and supper. The lunch is mainly eating of wild foods such as shea fruit. The household receives periodic remittances from the husband during such period.

5.7.1.6 Reflection on the case

The cases presented above indicate that household employs different strategy at certain period during the lean season. The Case 2, illustrates on how household gradually employ the various food based strategies throughout the year. The intensity of such strategies peak up during the latter stages of the hunger period. The importance of off-farm earnings, either in cash or kind also strengthened the household resistance during the lean season. It further revealed that the strategies employ by the households are not mutually exclusive, but however overlap in its application.

5.7.2 Non-food based food security strategies

Non-food based coping strategies are adopted to strengthen the household income. Most of these strategies earn the household some income which is used to purchase food from the open market at the point of depletion of household food stock, hence making them more resilient during the lean period. A well strategy in this sort serve as a facilitator to food based strategies discussed above.

5.7.2.1 *The Sale of livestock*

The sale of livestock is one of the reported non-food based coping strategy adopted by the household. According to the informants, the act of selling livestock during the hunger period is not new. To them, the awareness of eventual food shortages has been the motivation for keeping livestock in the household. In most of the smallholder households, the sales of livestock become the major income earner during the lean season. *“If you don’t earn any money from government work, or don’t have any off-farm jobs, the only hope for you during this time is your livestock...if you don’t have then you are doomed”* an informant revealed. Notwithstanding the importance of livestock and the investment household are making on them there was a general concern about the rate at which households livestock are declining. *“...we are facing double dilemma right now. Our crops have failed us and now we are losing grounds on our livestock too”* an informant said. The importance of livestock is not specific to certain households. All households, both the male and the female headed households confirmed this through the interviews. Those who don’t have livestock were seen as the most fragile to food insecurity.

5.7.2.2 *The Sale of skills (labour)*

According to the data gathered from the fieldwork, some households sought to depend on the sale of skills (labour) to generate income during the lean season. Households with youthful labour composition tend to work on neighbours farms for income. As agrarian community on-farm jobs are the most dominant economic activity. However, due to the unimodal rainfall pattern and lack of irrigation dams to facilitate dry season farming, this job has become a seasonal activity. As such, households with excess labour take the advantage and work for the well-off households for money. The decision to send some household members to work and earn income is a collective one by the entire household. An informant revealed that *“...division of labour becomes the order of the day in our household. The young male go for day labour to bring money whiles the women work on the family farm and also go and gather shea nut”*. Although, most households reported that engaging in such act affects their own farm work, however, they were quick to add that the returns from it is important during the lean season. Apart from working to earn cash, others also reported they work in exchange for food from the food secure households, schools and organizations *“...my dumb mother work as dish washer in Navrongo Senior Secondary school for in exchange for food”* (28-year old sit-in household head revealed, 8HHM). In addition, some household heads indicated that

members occasionally go and work at the rice farms around the Tono irrigation dam site in exchange for rice.

5.7.2.3 Hiring out household assets

The data gathered revealed that some households hired-out their assets to generate income. Households that have oxen plough reported having hired out to their neighbours. This according to informants earns them money that are used to purchased food during the hunger period. It was further revealed that the cost of hiring depends of the relationship between the households and the size of the land. The average reported cost for ploughing an acre of land is Gh¢ 50. The well-off households were noted for this type of coping strategy. The high competition for oxen ploughs during the farming season makes this activity more lucrative for households.

5.7.2.4 Petty trading and artisanal activities

Petty trading is one of the significant coping strategies adopted by the respondents' households during the field work. Trading commodities include shea fruits, shea butter, charcoal, firewood. Most households revealed that engaging in such businesses is easy since it does not need any financial commitment for its startup. As a result of this, both men and women, young and old in some households participate in the gathering of this fruit. *"We are all involved in gathering of shea nut during the lean season...that is our own cocoa"* an informant said. This statement is a structural metaphor that seeks to compare the economic importance of the shea nut in the northern part of the country to cocoa in the southern part. It generates revenue for northern households as cocoa also does for some southern households. Indeed, everyone in the household is involved in its gathering, however, it was observed that adult women are the ones who send the raw fruit or the processed finish product (*the shea butter*) to the market and sell. The sale of firewood and charcoal is also a very important business among households. Although, there was a reported restriction from the authorities on cutting down trees, informant still indicated that they maneuver their way and still produced. Aside this non-monetary start-up petty trading, other households also involved in trading that need some financial startup. Commodities such as dry fish, sugar, rice, groundnut paste and condiments are the major items these traders deal with. It was further observed that the money invested in such business is very small and therefore accrue small profit returns. This profit according to the informants is not reinvested in the business but use to buy food and other households' needs. *"...The profit from this business is what we depend on"* an informant said. Nevertheless, households are very keen to maintain such business to avoid total starving during the lean season.

Further analysis of the data indicated that female-headed households are the dominant in petty trading. Thus, women, especially widows, engaged in off-farm activities which could earn them income due to lack of access to productive assets like farm lands. The traditional paternal system practices by the people in the study area allow household heads to lease their lands to their male children. Women therefore are expected to get married and feed from their husbands' land. As a result, a death to a husband leads to a loss of productive resources by a widow. Depending on the relationship between the left-behind woman and her in-laws, one can partly or totally lose all the land the man left. In such instances, the only way for such household to survive is to engage in other revenue generating activities. In expressing her displeasure an informant, a 46-year-old widow with 8 household members stated “... *is very difficult to tell you this but I have to. Since the death of my husband, his family members have taking control of almost all the farm lands he left behind. This left me no option than to find an alternative livelihood to earn income in other to take care of my children, hence this business*”. In advancing this argument, a key informant revealed that even in the male headed households, whenever there is division of labour, especially, during the hunger period, it is the women who always get involved in petty trading.

Another activity households' members engaged in during the lean season is an artisanal works. Although, artisanal work is not new in the study area, however, it has become a very significant activity for smallholder households because of the failure of the main livelihood (*farming*) to support them. Cycle repairing (*motorcycle, bicycle, and tricycle*) construction works were the two main artisanal activities people engaged in. The artisanal work unlike the petty trading is dominated by men. Due to the importance of cycle as a means of transport in the study area, those involve in servicing them earn some reasonable income to support their households. “*This is what I do during times like this when we are waiting for our crops to be matured... at least I won't come here and leave with empty hand...yea, not my 10 or 15 cedis*”. (Akalinza, male, 35-year-old-household-head, 6HHM). Those involved in the construction works play the role of apprentice. These people travel around the surrounding communities with their masters to work. While learning such profession (*mason*) they also earn some money that is used to support their household.

Plate 12. Woman (left) working on fresh shea nut and dry shea nut (right).



Source: Fieldwork, 2016.

5.7.2.5. Migration

Migration is another coping strategy employed by households to manage their food security situation during the lean season. Migration of some household members during the peak hunger period was observed to have happened during the peak of the lean season. This is the time when there is no much work left to be done in the household farm. Accordingly, migration of household members helped to prolong the household resiliency to the hunger period. The informants reported that reduction in the number of household members because of migration in the hunger period help them to keep money and the food that would have been consumed by those members. A household head asserted that *“Two of my sons have travelled to Tamale to work recently because they were not doing anything here, just eating and sleeping”*. (Adagemura, 42-year-old-household head, 9HHM). As a temporal migration, the focus is not on the remittance that could be send back, however it is used to prolong the resiliency of the household in the lean season.

5.7.2.6 Reliance on Social Relation and Social Safety Net

The data from the study revealed the importance of social relations and safety net as a food security coping strategy. Some household heads revealed that asking support from their fellow friends, extended family members; local champions and other opinion leaders portray them as irresponsible. However, that does not stop them from seeking support from their relations, especially during the peak of the lean season. “...*We don't hesitate to ask for support from our family and friends when the need arises. Like this woman (pointing to a grocery store adjacent to where we were sitting), I can go and borrow rice and pay it later when I get money*” said an informant. Borrowing foodstuff on credit and money is the two main supports receive from their relations. According to the informants, some of these benefits are given to them for good whiles in some cases the household has to pay back after harvest. In instances where the support comes as a form of lending, household could pay back either in the form of money or food depending on the agreement between them.

Closely related to social relation is Social safety net is also another coping strategy some households rely on during the lean season. Although social safety net as coping strategy is not popular, however, the significant of it in the aged-smallholder households cannot be underestimated. Some households' heads through the interviews reported that they have received some support from the department of social welfare through the Livelihood Empowerment against Poverty (LEAP) programme. The programme was initiated in 2008 by the government of Ghana to provide support to most vulnerable and those living in extreme poverty. It is a cash transfer either through the mobile money system or Ghana Post System to qualified people in rural Communities. In 2016, the leap payment was structured based on the beneficiaries in the households. An eligible member in a household earns them GH¢ 48.00 (\$11), two get GH¢60.00, three and four people get GH¢ 72.00 (\$16) and GH¢90.00 (\$ 21) respectively. Smallholder households with members eligible for such interventions mentioned it as one of the coping strategies the household employ. The high dependency on the market for food by some of these households during the lean season makes the support necessary even though not enough for them.

Plate 13. Case three



Source: *Fieldwork*, 2016.

Gebuter is about 45 years old. He is the head of household with fifteen members comprises his two wives, children, parents, sisters and brothers. The main livelihood of the household is crop farming with livestock attached to it. The household has an estimated farmland of 3.5 acres cultivated at its full length. Crops cultivated by the household include millet (*both early and the late millet*), groundnut, maize and sorghum. Mixed cropping is the system of farming practiced by the household with the application of both organic and inorganic fertilizers. The household has a pool of livestock include cattle, goats and sheep with some poultry, chicken and guinea fowls. The size of the household makes it possible for it to rely on the household labour for all farming activities. Division of labour is one of the main characteristic of the household as men; women and the young members are assigned to specific work during the lean season as well as the peak season. Gebuter is also a bicycle repairer. This is his second livelihood activity. He worked both on the farm and his bicycle shop during the wet season. However, he fully concentrates on the bicycle repairs during the dry season when there are no

farming activities. The wives, on the other hand, engage in several businesses, shea-nut business and the sale of local beer known as *pito* which is made from millet. Food produced on their farms does not meet the consumption demand of the household due to household size. As a polygamous household with high dependency rate, producing more does not seem to be enough. He, therefore, takes the advantage of the low food prices during the peak season to accumulate more food for the lean season. *“What we produce is not enough for us... and as you have witnessed prices of the major traditional foods are very high now (referring to the hunger period), so we mostly buy some food stuff during the peak season to add to own harvest in preparation for the lean season”*. The accumulating of food during the harvest period, however, does not make them food secure during the lean season. They still run out of food in the last three months prior to harvest. As such, both food-based and non-food based strategies are employed in the household. Gebuter indicated that he sells most of his livestock during the lean season when the household run out of food they have accumulated. The money generated from the sale of the livestock is use for the upkeep of the household, more importantly, purchasing food from the market. He also works on part time bases at his bicycle repair shop because of farming activities. Not only that, additional income is accrued from the hiring out of the household oxen plough to neighbours. As stated earlier his wives also engaged in petty trading to generate money to support the household. The non-foods based strategies are accompanied by food-based strategies such as eating less preferred foods and reduction of the food portion of food cook and consumed. Both the non-food based and food-based strategies are practiced concurrently.

5.7.2.7 Reflections on case three.

The case of Gebuter household is different from the first two cases. In this case, the role of livestock is very important for his household. Some of the livestock are sold to generate income which is used to buy food when there is food shortage in the household. There are also some indications of long-term planning towards the lean season. There is an indication of insufficiency of the own production which could be related to the number of people in the household and the farming space own by the household. As an artisan, he could generate more income to support his household. Not only him, his wives involved in petty trading that also generate some income. A combination of different income generating strategies and food-based strategies strengthened resiliency of the household to the food insecurity.

Table 9 Summary of coping strategies

Coping strategies and some responses	
Coping Strategies	Example of Responses
<i>FOOD-BASED STRATEGIES</i>	
Reducing the size of food intake	“...we reduce the quantity of food cooked for the household during the lean season”
Eating less preferred foods	“We mostly eat kamolega during this period as our lunch instead of eating rice with tomatoes sauce”
Reliance on wild foods	“...we use baobab fruit as flour instead of millet when preparing Tuo Zafi”
Skipping meals	“When food becomes scarce in the house, we eat only two times in the day...we don’t eat launch”
<i>NON-FOOD BASED STRAGIES</i>	
Sales of livestock	“I sell some of my livestock to raise money for our upkeep at the peak of the lean season”
Sale of labour skills	“the active youth among us work on other people’s farms for money”
Petty trading and artisanal activities	“...I engage in shea nut trading to generate money to support my household” “As a mason, I engaged in construction work to raise money for my family after the main farming activities”
Hiring out of household asset	“...I give out the oxen plough for hiring”
Migration	“Some members in our household embark on temporal migration during this period”
Depend on social relations	“sometimes we go to my brothers store to borrow food stuff”
Social Safety net	“we rely on the monthly stipend given to our parents by the government”

CHAPTER SIX

Discussion of findings

7.0 Introduction

The chapter discusses the various findings of the study within the framework of sustainable livelihood approach and the concept of food security. Some terminologies in the entitlement approach will periodically be referred to for clarification and further explanation. Here, I will discuss household dynamics, socio-economic differences, Mapping of household productive resources and various strategies employ that determines the state of food insecurity. It must be emphasized that majority of the work would be discussed with the sustainable livelihood approach.

6.1 Vulnerability of smallholder farmer households to food insecurity

Vulnerability context is one of the components of sustainable livelihood approach framework. This concept is very important when looking at livelihood and food insecurity of smallholder farmers. This is because the vulnerability of households has an adverse effect on the type of livelihood strategies a household employ and the ability to provide the basic needs of members in a sustainable way. Within the food security discourse, “vulnerability is a function of how a particular population group’s options for obtaining access to food are affected by different shocks to which they are likely to be exposed and the characteristics of those shocks with respect to magnitude, duration, and timing (Dilley and Boudreau, 2001, p. 241). Vulnerability has both internal and external side. The internal side of vulnerability is the ability of a household to cope with stress and shocks without irreversible loss of capabilities and assets (Niehof, 2010). The external side of vulnerability comprises shocks, trend, stress and seasonality which households are exposed to (ibid). The internal side of vulnerability focused on resource endowments and capitals available to the household that determines the capacity of a household to respond to external vulnerability

In context, the smallholder farmer households in the study area live in houses built with mud. Most of these houses do not have toilet and kitchen facilities. Consequently, open defecation is practised among the community members. Further, most households experience destruction to their homes and must rebuild it every year, whenever there is a rainstorm. Most of the household heads are illiterates who cannot read or write the local language or English. Most households are characterised by high dependency ratio, which is expressed in high fertility rate and polygamous practices. The high dependency ratio in households contributes

to food insecurity during the lean season. Thus, households dominated by the aged, children and pregnant women were found to be more vulnerable to food insecurity than those whose productive members is higher than their dependants. Further, most households cultivate less than five acres of land. Cultivated crops are primary traditional grain crops which are specifically used for household consumption. However, there were some indications that some households are now embracing the cultivation of high market value crops such as rice and maize. Moreover, households use traditional storage facilities to store their harvested crops. The barn, constructed with mud in a cylinder-like shape is used for the storage of grains while the sack is used to store root crops, specifically groundnut. Some households reported that oftentimes they lose both their stored crops and the barn together. This is mostly caused by floods and heavy storms during the wet season. Such happenings were reported as a contributing factor to the food insecurity situation in most households.

Of the external vulnerability, it was observed that smallholder farmer households in Navrongo face several threats to their livelihoods. Among the challenges are rainfall variability and change, soil infertility, excessive cost of production inputs such as fertilizer, hoes and cutlasses, lack of access to loan facilities, poor extension services and seasonality. All, but climate variability and seasonality was reported to have had the most negative impact on the primary livelihood activity of households, thus farming, thereby leaving most households vulnerable to food insecurity. The smallholder farmers reported to have observed climatic changes in the form of increasing temperature and erratic rainfall pattern. As farming households, agriculture is the main source of food and income. As a result, any failure to the sector renders most household vulnerable and exposed them to further risk. To the farmers, the chances of having good crop yield do not only rely on good agronomic practices but also the timely planting of crops which is determined by the start of the raining season and its distribution. The observed changes in climate expressed in the changes of the rainfall distribution were therefore mentioned as a contributing factor to livelihood failures which resulted in severe food insecurity during the lean season. They explained that late cultivation because of delays in rains and sometimes the concentration of rainfall in a particular month, especially, at the latter stages of the crops affects crop yields; likewise, early ending of the rain also contributed to post-harvest losses as most of the root crops are left unharvested because of hard grounds. Consequently, most households become vulnerable to food insecurity. For instance, some households recounted how their livelihood was affected by the 2007 drought and flood and claimed that their households are now vulnerable because they

have not been able to recover from the shock that was experienced. Most households lost their seed stock, livestock, and farm lands through the floods and since then, have not been able to recover. This finding confirms Boko et al., (2007) assertion that climate variability and change have an adverse impact on farmers in West Africa, making them vulnerable to food insecurity.

Further, the data revealed that the observed climate change also have an adverse impact on livestock production. According to the informants, the increasing length of the dry season with its associated drought has had a negative impact on livestock. Two reasons were cited in support of this argument. First, they postulated that the increasing length of the dry season has intensified drought which has also have an adverse impact on livestock. The difficulty in feeding the livestock during the dry season as a result of fodder scarcity led to many households losing a chunk of their livestock. Loss of livestock through thievery was one factor mentioned. Although, this is not directly linked to climate, however, respondents were of the view that climate change menace which have had an adverse impact on livestock feed is an influential factor. Thus, households with less human capital tend to leave their livestock on a free range to find their own food, at the end most of this livestock may not return. On the other hand, those who are kept indoors also suffer from malnutrition that affects their size and therefore reduce their market value. This resulted in the loss of financial capital. The second reason linked to livestock loss is the sporadic outbreak of livestock disease which was perceived to have been caused by increasing in temperature because of climate change. Households were of the view that the outbreak of diseases which has led to the death of many livestock is caused by climate change manifested through the rise in temperature. Climate variability and change also affects dugouts and dams within some communities. These dams and dugout serve as a physical capital for various households. Most of these dugouts are used to store water for livestock during the dry season. However, due to the intensity of drought, most of these dugouts dry up and therefore fail to serve its intended purpose. This finding further supports the assertion by the Inter-Governmental Panel on Climate Change (IPCC, 2007) that increasing frequency of heat stress, drought and flood events will have an adverse effect on both crop and livestock production, thereby leaving most households vulnerable to food insecurity.

In addition, smallholder farmers' households are also vulnerable to seasonality. Seasonal climatic conditions influence the basic livelihood of the various households. That is, it

influences food production, which also determines the availability of food in most smallholder farmer households (Chambers, 1981). The findings presented revealed that seasonality affects the livelihood of the researched households, thereby exposing them to more risk. In the study area, a significant seasonal variation on peoples' livelihood activities was observed. Two distinct climatic seasons, the dry and the wet seasons are experienced in the study area. The wet season (starts from April and ends in September) is associated with intensive farming activities by households. This intensive cultivation calls for energy demand by household members because of intensive farming activities; however, it is the time when most households' food stocks are depleted. The dry season, however, is a good time for most of the households. Thus, there is an abundance of food because households may have harvested their crops. However, the longevity of the dry season was mentioned as a contributing factor to food insecurity. The explanation was that the extension of the dry season delays the cultivation of crops. As a result, the hunger period for most households extend thereby worsen the food security situation among households. The dry and the wet season is associated with drought and floods both of which impact negatively on the livelihood of the household which make them vulnerable to food insecurity in the lean season. In addition, on-farm jobs become available during the wet season, however, only households with active labour force benefit from such opportunity. However, the income earned is mostly invested in purchasing of food from the market. Further, seasonal food prices affect the already poor households making them vulnerable to food insecurity. The study found that the two most important source of food to the household is own production and purchase from the market. However, during the lean season food purchases from the market become the most reliable way through which household access food. This is because most households deplete their own production before the hunger period. Conversely, prices of various staple food crops increase during the lean season. This further exacerbates the vulnerability of the smallholder farmers' household, who earn less but are still required to meet all other household needs. Thus, seasonal food prices increase was found as a contributing factor to smallholder households' food insecurity in the study households. The insufficiency of the households' own food production and lack of money in most households to access food from the market during the lean season was found to have a dire consequence on household food security. This finding is in consonance with that of Hillbruner and Egan (2008) in Dinajpur, which found that seasons have significant effect on both food security and nutritional status of households.

Moreover, it was found that most wild foods are out of the season during the time of hunger. The seasonality of certain wild foods, such as mangoes, dawadawa fruit and bush meat, fish, and crabs which smallholder farmer households rely on to generate alternative income further increase their vulnerability of household to food insecurity. It must be emphasized that such natural capital is very important for most households in the study area because of lack of formal jobs. Apart from generating income, it also serves as a source of food for most households. However, those which are available during the lean season play a very significant role in the household food consumption pattern. For instances shea nut becomes important source of income during the lean season. Most households rely on the available wild foods as an alternative source of food. This finding agrees with some findings from Mali by Toulmin (1986) and Ghana by Dei (1989) who established that most households increase their consumption of wild foods during the lean season. It is also in consistent with de Merode et al., (2003), findings, that, wild foods as a source of income becomes more important during the lean season.

Women and children were identified as most vulnerable when the entire household is faced with seasonal food insecurity. During the months of drought, the routine work of women intensifies as they cover longer distances before accomplishing their daily activities. In the study area, women are responsible for the harvesting of firewood, water, and wild foods. Such resources are hard to come by within the vicinity of the households during drought months. As a result, women walk a longer distance to perform such task, this sometimes exposed to different attacks including snake bite. Children, on the other hand, must go far inside the bush to harvest fodder for livestock. Others also send livestock out to feed them, as such most children skip attending school to undertake such task. This also increased the vulnerability of children in the household.

Institutions-that is regular practices structured by rules and norms of society which have a persistent and widespread use have an impact on household livelihood (Scoones, 1998). Rules, norms and regulations instituted by Authorities in the study area were found to have a negative impact on some households in terms of access to some resources needed to improve their livelihoods and reduce their vulnerability to food security. The findings indicated that households have been restricted to cut down trees to produce charcoal which is an important source of livelihood. The main idea behind such rules was to protect the environment from ever increasing deforestation and land degradation in the area; however, it became a constrain

for households who rely on charcoal production as a source of income. This restriction instituted by the authorities was reported to have had negative impact on livelihood of the already vulnerable households. Moreover, there were also rules regarding the use of some physical assets specifically, irrigation dugouts and dams. Such rules prevent households from using the water in the dugout for crop production at some months in the year. According to the informants this makes them redundant during the dry season with the long-term impact of food insecurity. Women in the households are affected by norms and rules at the household level. Conventionally, women could not inherit farmlands from their fathers or personally access land from the community leaders without the support of men. Based on tradition, only male children were entitled to and could access the household land for farming. The female children could only work alongside their parents or other male relatives. Per the tradition, women were only entitled to share what their husbands have. Thus, women were expected to get married and therefore feed on their husbands' land. As a result, some women were made vulnerable because of lack of access to productive lands, which could be used to generate their own income (Maiga, 2010). Further, rules instituted in some households recognised the vulnerability of children, women and the sick. As such, this group of people were exempted or given some priority when it comes to implementing food insecurity strategies in the lean season. The argument here is that households' vulnerability to food insecurity is affected by climate change and seasonal variation of food prices, food production and also seasonal loss of wide foods with associated institutional challenges.

6.2 Mapping the available Assets and its impact on food security

The Sustainable Livelihood Approach (SLA) make emphases on the different assets a household could be entitled to and can bring them together to secure their livelihood. Five livelihood assets were listed within the framework, thus, human capital, financial capital, natural capital, physical capital and social capital (Scoones, 1998). These assets form the bedrock from which households initiate a coping strategy to managed food insecurity.

Among the assets at the informants' households is natural capital. Natural capital refers to natural resource stock from which resource flows and services useful for livelihoods are derived (DFID, 2000). The different natural capital was identified within the study households; however, farmland and soil fertility would be the focus of discussion. The land is a very important asset to smallholder farmer households in the study area. This is because the main livelihood (farming) of households is depended on this. It is assumed that the ability of

household to produce enough food is determined by the land size in possession of the household. The findings from the study suggested that every household owns a parcel of land in the study area. Household acquired these lands through inheritance from their fathers, as a reward from the earth priest (*Tindana*) and through purchase. There was a recognised social differentiation to the access of land. Women could not access farm land at the household level (Antwi-Agyei et al., 2014). However, at the community level, the introduction of the use of money to access land is empowering women to own land. This was revealed by the earth priest in the area (*Tindana*). According to the earth priest, access to land in the community is open to everybody only if the person can afford to pay for the price of the land, thus either hiring or outright purchasing. He further revealed that the increasing competition for lands with the use of money has made it easier for women also to acquire land without any hindrance. He said “...*now money is everything, even if you are not from this community and you want the land to farm and you can afford the price why not...it is given based on the highest bidder, so therefore if a woman outbid the man then she takes it*”. This has given many women who have the means to acquire land the chance to do so and engaged in farming to generate their own revenue. Households compound farm lands were observed to be shrinking because of increasing population which has resulted in the partition of most farm lands. Households with larger farm size were found to be less food insecure because of the ability to produce more food with their land holdings.

Soil fertility is an important aspect of natural resources. The fertility level of a soil is a determinant factor to good crop performance. Thus, the importance of land as productive assets depends on its ability to support crop growth. Most households were of the view that the fertility of the soil of their farm lands has reduced. They explained that the continuous cropping on the same piece of land (compound farm) has contributed to this situation. The distance farm lands were however, believed to have higher soil fertility. This is because most of the distance farm lands have not been used for a longer period as compared to the compound farm lands. The study found that natural capital is mostly affected by climate seasonality. It was observed that erratic rainfall and poor distribution of rains during the wet season and intensive drought during the dry season affects land as natural capital which impact negative on the crop yield. This contributes to the vulnerability of smallholder household to food insecurity (Yaro, 2006; Quaye, 2008; Hesselberg and Yaro, 2006).

Financial capital portrays financial resources that households use to meet their livelihood goals (DFID, 2000). Financial capital is expressed in household savings, credit accessibility, remittances, and institutional support. The findings from the study revealed that access to credit from formal institutions is rare to come by for most households. Most households could not access credit from the banks and the microfinance. They claimed that the demands of the banks and the microfinance companies before one can access credit are the main hindrance. The farmer households could not provide the collateral to secure loans. The most important asset (land) which could be used to secure the loan does not have proper documentation to back it. Notwithstanding this, some households reported having been able to access credit from some of the microfinance companies through their relations. Such households rely on their close relations who are employed by the government and ready to guarantee the loan with their salary. In addition, household also relies on their own savings. Household savings was reported to have accumulated through sales of crops, livestock, and trading. Few households reported accessing money through their own savings. Most the smallholder farmers do not earn enough for them to save some. Most of their earnings are used to purchase food within a short space of time. The lack of savings by most households was a contributing factor to their vulnerability to seasonal food prices increases. Moreover, remittance from relatives was identified as another financial capital for households. Most households reported that they received remittances in the form of cash and kind from other household members who have travelled to seek for greener pasture elsewhere. This, according to the households is one of the most important financial assets, especially during the lean season. The final financial asset reported to be available and accessible to some households is the institutional support. Some households claimed to have received some financial support from governmental and non-government institutions. However, such financial capital was only meant for households with aged people and does not come on regular basis. Access to financial capital was seen as very crucial for households during the lean season, however, seasonal food prices increases was noted to affect financial capital of most households leaving them vulnerable to food insecurity.

Different physical capital was observed in the study area. This capital includes roads, irrigation dams, dugouts and other productive assets use for farming activities. Generally, roads in the study area are very poor. The roads linking the various communities to the main market in the district was observed to be in a bad state. Most of them are untarred and the ones that have been tarred have also developed potholes due to lack of maintenance. This

makes it difficult for households to transport farm products to the main market especially during the wet season. Other available physical assets include the irrigation dams, dugouts, and boreholes. There is no pipe-born water in any of the study communities. All the households therefore rely on boreholes for water needs. Most of the dugout in the communities are filled with silt, hence making it dry-up during the dry season. It must be emphasized that, majority of the dugouts were noted to be used for livestock production. I argue that access to a well-functioning physical capital by smallholder farmers could reduce their vulnerability to food insecurity.

Human capital is an important capital that determines the usage of all other capitals. Without human capital, the other capitals cannot function to the benefit of the household. Human capital represents the skills, knowledge, the ability to labour and good health (DFID, 2000; Scoones, 1998). The household human capital is measured by the number and quality of labour availability; this varies according to household size, skill levels, leadership potential and health status (ibid). Human capital was observed as a major asset to the study households. The number of active members in each household differs. Some households have more active labour force than others. The well-off households with few active household members mostly rely on the labour force from the poor households to execute their farming activities. Households with active human capital rely on them for both household farming activities and income generating from on-farm and off-farm jobs. The low level of education among households could be a contributing factor to while most households couldn't improve their productivity and invest in businesses that could end them higher profit returns. Households with educated members that have been employed in the formal sector were more secure because of the regular in flow of income. Such households were found to be more resilient to the lean season food insecurity.

Social capital refers to the benefit a person or households received from their relations and network because of being part of such group (Scoones, 1998). It is based on reciprocity among households developed through trust. Findings from the study suggest that households make use of their social network to reach certain resources and support when the need arises. One important social capital identified is communal labour. Households members interviewed revealed that they sometimes depend on the social relations to execute some of their farming activities, especially during the harvesting period. A household with large farms reported to engage in shared labour during the years of good harvest. Others also revealed

that information from their social network was a motivation factor behind the decision to allow a household member to migrate. More importantly, some households reported that their ability to get access to government support was linked to their relationship with other people. In terms of working with others through networking, the interview revealed that the less endowed households mostly work with households with better off resources. Such networking is in the form of patron and client than different households that share the same interest. Other households reported to have benefited from their church, political parties, and social groups such as women in agriculture and many more. With respect to opportunities to get access to financial and food credit, it was revealed that those who have stronger social relations are the ones who easily access these benefits. At the macro scale, access to institutional support like agriculture extension agents whose activity influence food productivity was rare to come by for smallholder households. In ability of most households to access such network was seen as a contributing factor to household vulnerability to food insecurity.

6.3 Livelihood strategies of smallholder households

Livelihood is defined as the activities, the assets, and the access that jointly determine the living gained by an individual or household (Ellis, 2000). Smallholder farmer households depend on different livelihood strategies to insure the well-being of their members. The livelihood strategies identified will be discussed within the framework of livelihood strategies identified by Scoones (1998). That is agriculture intensification, extensification, livelihood diversity and migration. Crop farming was reported as the main livelihood activity for all the households interviewed. The perceived shrinking of farm lands because of households' population increases have resulted in intensification and extensification of farms. Depending on the resources endowment available to a household, one could pursue labour intensification or capital intensification. The study found some differences among female-headed and male-headed households in terms of investment in the farms. The male headed-households invest more money into their farming activities than the female-headed households. This resulted positively on their crop output and thereby strengthening the income of the entire household which further impact on their food security situation. Moreover, the ability to hire labour and tractor by the male-headed households has facilitated extensification system among such households. The female headed households on the other hand, tend to invest less due to lack of certain significant assets, especially financial assets, and natural assets like land. This situation affects their crop output in every season resulting in vicious cycle of food shortages.

In addition to crop farming is livestock farming. Livestock production is also very important livelihood activity. Every household have some livestock. However, livestock sizes differ from households. The sizes of livestock in possession of a household are used as a measure of wealth among households in the study area. Households with large size livestock holdings are perceived to be wealthier. The most well-off smallholder households can invest and accumulate livestock for longer period before selling them. This brings additional income to the households.

The information gathered during the interviews and my observations indicates that most of the households have diversified their livelihood to spread risk. The various livelihood diversification activities offer alternative source of income to household aside farming. Households have diversified their cropping system by engaging in more commercial crops such as maize, rice and groundnut. This shift may be as a result of the observed poor performance of the traditional crops. Secondly the market value of such crops may also be a determining factor for such diversification. This diversification has helped them to generate additional income to ensure the wellbeing of the households. Crop diversification was not popular among the female-headed households and the aged-headed households as most revealed that they stick to the traditional crops. An explanation to this was that most of this households could not afford the price of the improve seed varieties of this crops. Secondly, the additional agronomic practices attached to the cultivation of such crops for a successful yield was perceived as tedious and costly. For instance, the fertilizer requirement, and the application of it was reported to be a challenging task.

There was evidence of households engaging in petty trading. Petty trading includes trading with environmental goods which are freely gathered around the communities and within the bushes and does not need any financial for it start-up. Among such activities identified are shea nut and shea butter trading, charcoal productions, fire-wood trading, dawadawa production and trading, local beer production (pito¹⁸). Other petty trading which needed some financial start-up was also identified trading in basic household cooking ingredients (groundnut, condiments, pepper, salt, sugar) etcetera. Further observation was that the women among households and the female-headed households are the most dominant in this type of livelihood activities. More importantly, profit returns from this type of trade were reported to be very small.

¹⁸ Local beer made from fermented millet or sorghum

Further, the findings suggested that livestock trading is increasingly gaining prominence among households. The location of the district on the major international road that link Ghana and Burkina Faso has facilitated this business. Those involved in this business buy from their neighbours, communities around and sometimes go further to Burkina Faso to buy these livestock. The main customers are traders from southern part of the country who do business in the area. Some livestock traders also send their livestock to the urban centres themselves to sell. Good deal of funds is needed for the start-up of this business; it is therefore not surprising that most of this business is owned by well-off households. The high return from such business strengthened the purchasing power of such household. This makes them more resilient to food insecurity during the lean season. This finding is in connection with other studies (Antwi-Agyei et al., 2014; Guatam and Andersen, 2016) that the well-off households are able to invest in livelihood activities that earn them higher income thereby improving their well-being and food security situation.

Migration among the household members was seen as one of the livelihood strategies household rely on. Both temporal and permanent migration has become a very important livelihood strategy among smallholder farmer households. Migration among household members in the area to resource endowed areas has been in existence since time immemorial (van der Geest, 2011). However, the well-known dry seasonal migration was found to be taking new dimension. Informants revealed that migration during the wet season has become part of them as most household members migrate during the peak of the lean season. In all cases, the youth are the most dominant in this type of livelihood activity (Hesselberg and Yaro, 2006).

6.5 Food Security: availability and access to food during the lean season

Food security is defined as when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (World Food Summit, 1996). The major components of the definition, thus; availability, access and utilization of food were found to be affected by the lean season. As it has been discussed earlier, the most important source of food to smallholder farmer households is own production. However, the data gathered suggests that most households do not produce enough to take them throughout the year. This was found to have a negative impact on the household food security during the lean season. That is, households own production which is a determining factor of food availability becomes scarce during the lean

season. Secondly, access to food which is determined by affordability was also found to be affected by the lean season. That is, prices of the major staple foods were found to be expensive for most household to afford during the lean season. The reason has been that most households' income earnings fall short of the cost of quantity of food needed to buy to augment household food stock if there is any during the lean season. Thirdly, the utilization of food during the lean season was also found to be a challenge for most households. The observations and information gathered revealed a minor diversity of diet consume by households during the lean season. The reflection on the three case studies presented indeed indicates that smallholder households do not produce sufficient food that could take care of them throughout the year. Moreover, their income earn does not meet the prices of quantity of food stuff needed by their household. As a result, most households experienced food insecurity during the lean season.

6.6 Food security coping mechanisms in smallholder farmer households

The findings of the study suggest that food insecurity is prevalence in most households during the lean season (hunger period). However, the severity of it differs from household to household. As such, different strategies are employed by households to manoeuvre their way through the period. These strategies ranges from food based to non-food based. The application of any of the strategies is determined by many factors including households' composition and the resource endowment available to the households.

Of the food-based strategies, the findings revealed that the study households adopt strategies such as reduction in size of food intake, eating less preferred foods, reliance on wild foods and skipping meals. These findings are in consonance with those of many other studies that found that food based strategies are prominent among smallholder farmers' households at certain point in the year when food stock drop below its minimum level of expectation (see: Tam et al., 2014; Norhashmah et al., 2010; Quaye, 2008; Leonard, 1991). Thus, all households identified through the study employ at least one of the food based strategies at one point in time. However, it was observed that the less resourced households and female-headed households are more likely to engage in the most severe food-based strategy, thus skipping of meals. One reason for this observation may be that the food stock in such households mostly reaches its minimum level long before the lean season begins. Secondly such household could not buy enough food from the market because of higher food prices during the period. For instance, the case two presented is a typical food insecure

household that adopt skipping of meals after employing less severe food-based strategies to sustain the household until the peak of the lean season. At the peak of the lean season, the skipping of meals becomes the only option to sustain the household due to their inability to access enough food from the market. Within the well-resourced households, the dominant food based strategy employ is the reduction of the portion of food size consume by household members. This strategy is employed to avoid a total skipping of meals at the peak period. Households claimed that, such decision is influenced by the prices of foodstuff during the lean season. The explanation was that the value of the money allocated to food purchase depreciates as food prices increases. This impacts on the quantity of food access, hence impact on the portion cooked and consumed by household members.

An important characteristic found with the adoption of the food-based strategies is the intra-household distribution of food. Some members of the household were found to be given special preferences. In most households, pregnant and breastfeeding women, children and the sick were exempted from following the meal schedule use during the lean season. Informants reported that a portion of food serves in the household are kept for these people. For instance, most households indicated that they mostly leave some portion of the food served during supper to be used by children, breastfeeding women and sick people who must take medicine in the morning to as a breakfast. Children were seen as the most vulnerable and couldn't cope with skipping meals while breastfeeding women were to be fed because of their children. This finding contradicts a finding by Maxwell (1996) that during the period of food shortages, unproductive members of the households are the ones that suffer most in terms of food distribution.

Non-food based coping strategies identified include but not limited to the sale of livestock, petty trading, on-farm jobs, hiring out household asset, artisanal work, migration, and reliance on the social network. These findings are inconsistent with findings of many previous studies (Antwi-Agyei et al., 2014; Maxwell, 1996; Mardiharini, 2005). The resource endowment at the disposal for a household influence the type of non-food based strategy it pursues. In addition, a decision to pursue any of these strategies is negotiated among household members with the hope that the outcome of it could reduce the impact of food insecurity on the household. The sales of livestock were identified as the most dominant non-food based strategy used when household faced with food shortages and there is no money to buy from the market. Informants disclosed that the income from the sales of livestock is used

to buy food to augment their own production if there is any left in the barn. Most of these households claimed to have only two major sources of income; thus, income accrues from the sale of food crops during harvest and the sale of livestock. However, during the lean season, the livestock sales become the main source of income. Due to the reliance on livestock sales, most households invest well into livestock production. For instance, the case three presented revealed how households with sizeable livestock relied on to generate income during the peak of the lean season. Further, most households, especially those with very active human capital pursue on-farm jobs during the lean season. Others also engaged in petty trading that needed little or no financial commitment for its start-up. The income generated from such activities are mostly used for the purchased of food.

Further, social network and relation also play very important role during the period of food shortages. Those with stronger social ties within and outside the community rely on them for support. Such support may be in the form of cash or kind. Thus, households could borrow food on credit with the promise to pay back during harvest or borrow money to buy food. Others also reported having received support from their churches and some local non-governmental organisations. Although most households take the advantage of their social network, some informants reported not to have relied on such network. The explanation was that seeking support from other people sometimes portrays the household and for that the household head as been irresponsible, weak, and lazy. The second explanation was that such network mostly lead to exploitation, thus the well-off households exploit those with less resource endowment.

The experiences of households and the food insecurity coping strategies revealed by informants is an indication that lean season food insecurity is a manageable process. The differences in the management process are however; depend on the resource endowment at the disposal of the household. Contrary to the finding by Norhasmah et al., (2010), that non-food related coping strategies come first before food-rated coping strategies, the finding of this study revealed otherwise. The application of any strategy is not generic to households, but however based on household specific and it is determined by the available resource endowment a household possesses. For instance, a household may be skipping meals, at the same time eating less preferred foods and engaged in on-farm jobs to raise money or exchange their labour for food at the same period.

CHAPTER SEVEN

Summary of findings and Conclusion

7.1 Introduction

The core goal of this study was to find out the food security situation in smallholder farmer households in the study area and the coping strategies employ. Using the concept of food security, entitlement approach and sustainable livelihood approach, the study explored the food security strategy and the coping strategies employ by the household. The under listed research question were used to achieve the study objectives: What is the food security situation in smallholder farmer households during the lean season? What are the perceived causes of food insecurity? What are the food security strategies pursuing by smallholder farm households during the lean season? What are the gender roles in ensuring food in the household? The summary of the answers to these research questions is presented below.

7.1.1 What is the food security situation in smallholder farmer households during the lean season?

The study findings revealed that most smallholder farmers' households in the study communities experience food insecurity during the lean season. That is, most households do not produce enough food to sustain them throughout the year. As a result, household food stocks run out by the time the next harvest is due. Many factors, ranging from environment to socio-economic issues are accounted for this. The study found that all households experience food insecurity during the lean season, however, the degree and magnitude of this experience differ from household to household depending on the resource endowment available to the household. Households with more resource endowments are less vulnerable to food insecurity than those with less resources during the lean season. In addition, the study found that female-headed households are more vulnerable to food insecurity than the male headed-households. The existing social differentiation in the study area could be a reason for this situation. Most female-headed household were found to lack productive assets to improve their livelihood activities. The study also found that households that diversify their livelihood into higher return business are more resilient to food insecurity during the lean season. Further discussions with the sustainable livelihood approach (SLA), revealed that the ability of a household to invest in the higher return sectors to have positive impact on household

livelihood outcomes, in this context food security, is determined by the capital assets at the disposal of the households.

7.1.2 What are the perceived causes of food insecurity during the lean season?

The Lean season food insecurity among smallholder farmer households is caused by both environmental and anthropogenic factors. These include climate variability and change, reduction in soil fertility, increasing household size, reduction of wild foods, declining state of farm input subsidies, inflated cost of food prices, decline in household labour and social events. These factors were perceived to be the causes of food insecurity. Climate variability and change and reduction in soil fertility affect the basic livelihood of the people. Thus, it affects both crop production and livestock keeping. Reduction of wild foods, which serve as an alternative food during the lean season also affects household food security. Wild foods like bush meat, fish, mangoes which are both income earning as well as a source of food were reported to be out of season during the lean season. Moreover, the reduction in household labour and increase in dependency ratio also contribute to food insecurity among the studied households. The study found that social events are also contributing factors to food insecurity. The resources invested in the observation and celebrating of such events leaves many households vulnerable to food insecurity during the lean season.

7.1.3 What are the food security coping strategies employed by smallholder farmer households during the lean season?

To answer this question, smallholder farmer households were asked about how they manoeuvre their way through the lean season when the households experience food shortages and there is no money to buy from the market. Accordingly, households listed different food insecurity strategies they employ when faced with food insecurity. These strategies were grouped into two in this study, thus food-based coping strategies and non-food based coping strategies. Among these strategies are eating less preferred foods and wild foods, reducing size of food intake and skipping meals. These strategies are employed in different households depending on the remaining food stock and the ability to access food from the open market based on the resourced endowment at the disposal of the household. The female-headed households were the dominant households when it comes to the usage of these strategies. In addition, intra-households' distribution of food, relating to the application of these strategies were also observed in this study. Indeed, children, pregnant women and sick people in the

households were found to be given some exemptions when it comes to the application of food based strategies.

Apart from the food-based strategies, non-food based coping strategies were also found among smallholder households. These include the sale of livestock and trade, sale of skills, petty trading and artisanal activities, reliance on social relation and social safety net. These were the reported non-food based strategies by study households. Indeed, most of the non-food based strategies directly focus on income generating. Of course, the ability to get a higher income returns from any of these strategies depends on household resources endowment. The study found that the resource endowment households generate more income from these non-foods based strategies, hence better food security experiences than the less resourced households during the lean season. Migration is used as a strategy to prolong the household sustainability during food shortages. As such some household members migrate at the peak of the lean season when all farming activities has been done and the household is left with little foodstuff. Seeking help from relatives and other relations were also employed by smallholder farmers during the lean season. The study also food that some households with aged members benefit from social safety net in the form of monthly stiffen from the government.

7.1.4 What are the gender roles in ensuring food security in the household?

The study found that gender plays distinct roles in ensuring food security within the household during the lean season. The female and male household members perform different but inclusive activities to ensure that there is food on the table for household members each day. Conventionally, men in the study households are responsible for providing food in the households. Such responsibility is now shared between the women. The findings revealed that both men and women participated in farming activities to produced food for household consumption. Moreover, both men and women in the households also engage off-farm activities to generate income to support the family. The study further revealed, women in all the households' trades in either environmental resource goods or petty trading that needs some finance for its start-up. The income earn by the women in this business was used to purchase food. In addition, women go and gather wild foods to be used for cooking. Apart from women contribution to both farming and income generation activities, women are also responsible for daily food preparation in all the households participated in this study. Men on other hand, engages in both on-farm and off-

farm jobs to generate income. Working on other people's farms and engaging in an artisanal work was observed in this study. Men also involved in some activities of women by participating in shea nut gathering.

7.2 Conclusion

The study found that food insecurity is prevalence in most smallholder farmer households in the study area during the lean season. This is due to insufficiency of households own production and inadequacy of their income to support them to access food from the market during the lean season. As such, most households adopt strategies that help them to manoeuvre through the tough times. Depending on the resource endowment, a household may rely more on food-based or non-food strategies. In either way, these strategies do not improve the household food security situation during the period but just a way to survive until the next harvest. This therefore calls for the need of government and non-governmental organisations working in the area to scale up their operation activities relating to food production, food access and individual empowerment to improve the food security situation. The government should focus on developing the physical assets in the communities. Specifically, the roads linking the various communities to the main market in the area must be constructed to make it easier for farmers to transport their farm products to the market. Secondly, the government must invest in the construction of irrigation dams to support dry season farming. This could reduce the gap between harvesting and as well as improve the socio-economic wellbeing of the people. Policy interventions targeting household with the aged must be expanded to cover all households during the lean season. More importantly Prices of all farm inputs must be subsidies to make it affordable for farmers. Further, government and other developing partners should incorporate the creation of off-farm jobs in their developmental programmes for the area. This can curb regular migration of the energetic youth to the southern part of the country.

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Appendix 1

Interview guide

SECTION A. Background Information of Informant

- ✓ Age of respondent
- ✓ Gender of household head
- ✓ Marital status of respondent
- ✓ Number of people in the household
- ✓ Number of dependency in the household
- ✓ Higher level of education in the household
- ✓ livelihood activities of the household
- ✓ Number of women in the household
- ✓ Number of men in the household
- ✓ Number of children in the household

SECTION B: Household Food Production

- ✓ What is the size of the farm?
- ✓ What crops are cultivated?
- ✓ What month does the household start land preparation?
- ✓ What month does crop cultivation start?
- ✓ What month does the household start harvest?
- ✓ How are crops stored by the household? Do you treat the crops before storage? Any difference crop storage and crop type?
- ✓ What role do gender play from land preparation during the farming activities?
- ✓ What challenges do the household face in farming activities?
- ✓ Can you tell me about the conditions of your oxen's during the lean seasons? Are they strong enough for ploughing? Or not relevant due to tractor mechanization?
- ✓ what has been the trend of crop yield in the past 10 years?

SECTION C: Food Security during the lean season

How do you call this period in your language?

- ✓ Could you describe to me the food insecurity situation in your household during the lean season?
- ✓ What might be the cause of food shortage during the lean season?
- ✓ What is the main source of food for the household during the lean season?
- ✓ Type of food frequently consume during the leap and lean season?
- ✓ Can you please list available wild foods accessible in this community?
- ✓ Which of the available wild foods are available during the lean season?

SECTION D: Livelihood of the households

- What are the main livelihoods of the household members during the lean season?
- What other livelihoods do the household rely on during the dry season?
- Any Migration in the household? How does such migration impact on the household?

In terms of household production, strain on the remaining household members?

SECTION E: Household Assets

1. Do the household own land?
2. How was it acquired?
3. Is there any gender difference when it comes to access to family land in the household?

4. What other assets do the household have?
5. How important are they for you during the lean season?

SECTION G: Climate Change

- ✓ Have you experience changes in climatic conditions in last 10 years?
- ✓ In what form is this change?
- ✓ Do the changes affect the household food security in any way?

SECTION H: Household food security strategies during the lean season

- ✓ What food security strategies do the household pursue during the lean season?
- ✓ How does the household settle with a specific strategy during the lean season?
- ✓ Are there any specific food security strategies for women in Household?

Interview Guide for Key Informants

- ✓ How long have you live in this area?
- ✓ Have you observed any changes in climatic conditions?
- ✓ How is the land tenure system in the area?
- ✓ What is your perceptions and experiences of food insecurity in this community?
- ✓ General discussion on livelihood and food security situation in the area

Appendix 2.

Demographic characteristics of Respondents Households

<i>Smallholder household</i>	<i>Age of HH</i>	<i>Gender HH</i>	<i>Education level of HH</i>	<i>HH Size</i>	<i>HH Composition</i>			<i>Household Farm size (hectors)</i>
					<i><15</i>	<i>15-65</i>	<i>>65</i>	
<i>Household 1</i>	35	F	None	6	4	1	1	0.4
<i>Household 2</i>	40	M	Primary	5	3	2	-	0.8
<i>Household 3</i>	50	M	None	7	2	3	2	0.8
<i>Household 4</i>	32	M	None	6	3	2	1	1.0
<i>Household 5</i>	40	M	JHS/O level	9	3	4	2	0.6
<i>Household 6</i>	75	M	None	21	8	11	2	1.8
<i>Household 7</i>	40	F	Primary	6	2	4	1	0.4
<i>Household 8</i>	45	F	None	7	3	3	1	0.8
<i>Household 9</i>	38	F	Primary	8	4	2	2	0.8
<i>Household 10</i>	55	M	None	20	8	10	2	2.0

<i>Household 11</i>	38	M	Primary	19	9	7	3	1.6
<i>Household 12</i>	45	M	None	9	5	2	2	1.2
<i>Household 13</i>	42	M	None	11	4	6	1	0.8
<i>Household 14</i>	62	M	None	6	3	2	1	0.4
<i>Household 15</i>	46	F	Primary	8	3	5	-	0.4
<i>Household 16</i>	56	M	None	8	3	3	2	0.6
<i>Household 17</i>	50	M	None	13	7	3	3	0.4
<i>Household 18</i>	42	M	None	8	3	3	2	0.4
<i>Household 19</i>	32	F	None	7	4	1	2	0.6
<i>Household 20</i>	40	F	None	7	2	4	1	0.4
<i>Household 21</i>	68	M	None	11	5	5	1	0.8
<i>Household 22</i>	60	M	None	8	1	7	-	1.2
<i>Household 23</i>	53	F	None	6	4	1	1	0.4
<i>Household 24</i>	35	F	None	5	3	1	1	0.6
<i>Household 25</i>	55	M	None	10	4	4	2	1.0
<i>Household 26</i>	28	M	Secondary	8	2	4	2	0.8
<i>Household 27</i>	45	M	Primary	15	6	7	2	1.8