

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY  
KUMASI**

**COLLEGE OF AGRICULTURE AND NATURAL RESOURCES**

**FACULTY OF AGRICULTURE**

**DEPARTMENT OF AGRICULTURAL ECONOMICS, AGRIBUSINESS AND  
EXTENSION**

**ASSESSMENT OF LIVELIHOODS OF THREE ACTORS ALONG THE CASSAVA  
VALUE CHAIN IN MAMPONG AND TECHIMAN MUNICIPALITIES**

**BY**

**MARIAN GIFTY OSEI BOAMAH**

**2016**

**ASSESSMENT OF LIVELIHOODS OF THREE ACTORS ALONG THE CASSAVA VALUE  
CHAIN IN MAMPONG AND TECHIMAN MUNICIPALITIES**

KNUST

**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, KWAME  
NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI, IN  
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF  
MASTER OF PHILOSOPHY DEGREE IN SUSTAINABLE AND INTEGRATED  
RURAL DEVELOPMENT**

**BY**

**MARIAN GIFTY OSEI BOAMAH**

**2016**

**DECLARATION**

I, **Marian Gifty Osei Boamah**, author of this thesis do hereby declare that except for specific references which have been duly acknowledge, this project is the result of my own research and it has not been submitted either in part or whole for any other degree elsewhere.

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## ACKNOWLEDGEMENT

I am most grateful to the Almighty God for His guidance and protection throughout my education.

My gratitude goes to Nana Dr. Sampson Edusah for supervising this work.

I am also most grateful to Dr. Joe Manu-Aduening of Crop Research Institute (CSIR-CRI) for his support and advice.

I wish to render my sincere appreciation to Dr. Ben Banful and his wife Mrs. Esi Banful and their family for their love, care, financial support and pieces of advice.

My profound gratitude to my parents, Mr and Mrs Osei Boamah, my Aunty, Mrs. Lydia Konadu Codjoe my cousins Vivian, Anthony, Abigail, Emma and Rev. Fr. Emmanuel for their immense love and support.

I would also want to say a big thank you to all the farmers, processors and marketers of my study areas for their cooperation. To Mr. Noah Ameyaw the extension officer at Techiman Municipality and all workers at RTIMP main office, Kumasi, for their technical support and direction.

To my friends and colleagues at KNUST, especially the pioneering SIRD class, most especially Edward Yaw Kyere for the support and friendship, I say the sky is the limit. And to all those who urged me on in one way or the other, God richly bless you all.

## ABSTRACT

The study was conducted to assess the livelihoods of selected actors along the cassava value chain in Ghana. A total of 390 actors were sampled using a multi staged sampling technique from six communities in Techiman and Mampong Municipalities. Focus group discussions, interviews and questionnaires were used to gather data. The objectives of the study were to identify some major livelihood resources/assets of selected actors; identify the main vulnerability context of actors selected; identify key policies, institutions and processes and their effects on selected actors; and to identify livelihood sustainability strategies that affect the selected actors. From the results, actors identified within the communities were farmers, processors and marketers. The processors in the study areas were mostly gari, agbelima and kokonte processors. Actors had some form of human, social, physical, natural and financial assets but these were inadequate to meet their goals. The actors were affected directly and indirectly by local cultures and laws as well as national policies. One major constraint that affected all actors was financial problems. This greatly hampered both farmers and processors access of loans. To help make up their livelihoods most actors adopted various strategies such as farming other crops, processing other products, sale of other products, driving among many others. The research recommended that the actors should be encouraged to join work related societies that will help them pull resources. Also, the chain should be increased to bring on-board other actors such as brewery and textile companies. In addition, interventions should be geared at improving and enhancing actors' access of various resources most especially, financial and human since this would help them in achieving sustainable livelihoods.

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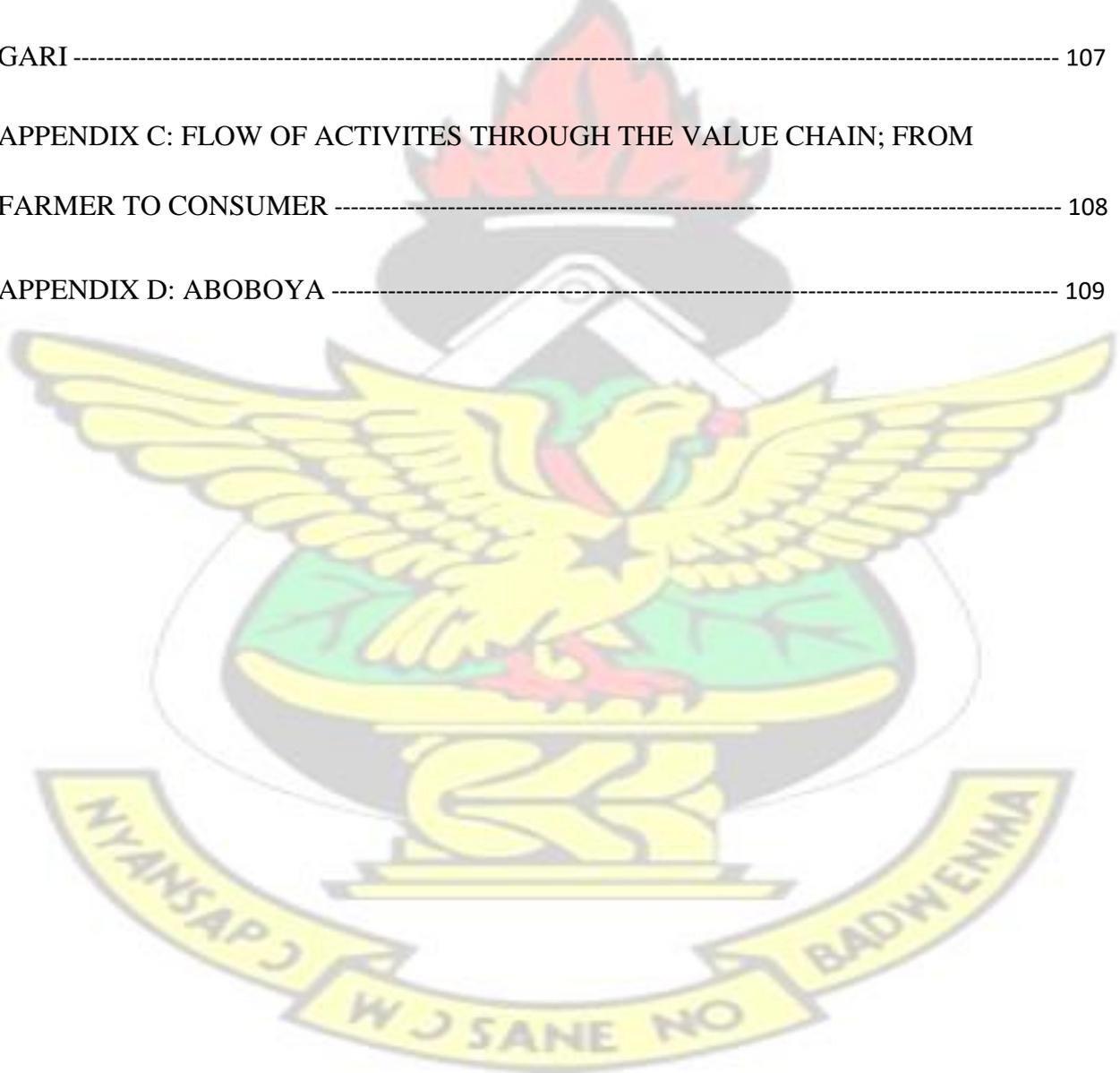
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### **ABBREVIATIONS**



AEA	Agriculture Extension Agents.
C:AVA	Cassava: Adding Value for Africa
COSCA	Collaborative Study of Cassava in Africa
CRI	Crop Research Institute
CSIR	Council for Scientific and Industrial Research
FAO	Food and Agriculture Organization of the United Nations
FFF	Farmer Field Fora
GDP	Gross Domestic Product
GGBL	Guinness Ghana Breweries Ltd
GPC	Good Practice Centres
HQCF	High Quality Cassava Flour
IFAD	International Fund for Agricultural Development
MDG	Millennium Development Goal
MOFA	Ministry of Food and Agriculture
MSLC	Middle School Leavers Certificate
NGO	Non-Governmental Organisation
PPD	Post-harvest Physiological Deterioration
R&D	Research and Development
R&T	Root and Tubers
RTIMP	Root and Tuber Improvement and Marketing Programme
RTIP	Root and Tuber Improvement Programme
SRID	Statistics, Research, and Information Directorate
SSA	Sub Saharan Africa
WAAPP	West African Agricultural Productivity Program

## DEDICATION

To the Glory of God Almighty

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# CHAPTER ONE

## INTRODUCTION

### 1.1 BACKGROUND

This study is to assess the livelihoods of three key actors (farmers, processors and marketers) along the cassava value chain. There are various actors in the cassava value chain; from producers through to the consumer and they all have livelihood outcomes to achieve.

Cassava (*Manihot esculenta* Crantz) is believed to have been domesticated by Amerindians in South and/or Central America (Oslen & Schaal, 1999). Cassava was introduced by the Portuguese to Africa in the 16<sup>th</sup> Century and has eventually become a major food crop (Manu-Aduening *et al.*, 2005). World production figures currently show that cassava is the fourth most important staple in the world after rice, wheat and maize, and ranks first in Africa followed by maize, plantain and rice. In Ghana, it ranks first followed by yam, plantain and maize (FAOSTAT, 2007).

The major reason assigned to cassava's importance in Africa is that it is a major food security crop. Rosenthal & Ort (2012) reported that cassava contributes vitally to global food security and is likely to play an even more significant role in the near future. Nweke (2004) also stated that after accounting for waste about 95% of total cassava produced is used as food in Africa. In other continents like South America about half of its production is used directly for food and the other part for animal feed and industrial use (Henry and Hershey, 2002). And in Asia, less than 40% is used for food by humans and the rest used in industries (FAOSTAT, 1997). Moreover, cassava provides the main source of carbohydrates which meets the dietary requirements of low income consumers in most parts of Africa (Nweke, 2004; Berry, 1993). According to FAOSTAT (2005) cassava supplies over 500 dietary calories per day to more than 500 million people who consume it. MOFA (2006) reported that estimated levels per capita consumption of cassava rose from 146kg/head/year in 1985 to 152 kg/head/year in 2005 in

Ghana. In addition, cassava provides employment and income to farmers, processors and marketers. MOFA (2006) estimated that 1,998,184 farming households were engaged in cassava cultivation in Ghana and this number has increased leading to about 90% of farmers cropping cassava either as a major crop or as a minor crop. Cassava also contributes 22% of the total agricultural GDP.

A large proportion of the population in Ghana are in rural areas and their livelihoods depend either directly or indirectly on agriculture and its associated activities. Cassava has become an important crop that has gained prominence in terms of rural development in recent times. Ghana was amongst the first African countries to receive the crop. Since then it has moved from being a poor man's crop to one of the most important staple food crops and is gradually gaining attention as a potential industrial crop. The cassava root apart from being consumed raw (boiled), can also be processed into gari, kokonte, agbelima; it can also be used in the brewery, textile, wood and the pharmaceutical industries. Most of these uses have been achieved through the introduction of improved cultivars over the years which have gone a long way to help farmers and by extension stakeholders/actors along the cassava value chain. These improved varieties have attributes such as; high yielding, resistant/tolerant to cassava mosaic disease, store longer in the soil and are suitable for industries Crop Research Institute (CRI) and the Root and Tuber Improvement and Marketing Programme (RTIMP) among many others have helped in this regard immensely.

Presently, Ghana is the fourth largest producer of cassava in Africa after Nigeria the Democratic Republic of Congo and Angola (FAOSTAT, 2013).

Cassava has a very short shelf life because of a process known as post-harvest physiological deterioration (PPD), this quickly renders the roots unpalatable and unmarketable (Reilly *et. al.*,

2003). Consequently, value is added to it by processing the roots. The common forms of processing in Ghana are into gari, kokonte and agbelima.

According to Kaplinsky and Morris (2000), „a value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use“.

And so by extension, actors along the cassava value chain are the „players“ who are engaged in the activities right from its conception to its delivery to final consumers.

Cassava farming, processing and marketing creates livelihood opportunities for various people, especially in the rural areas. According to Scoones (2009) livelihood comprises the „capabilities, assets (including both material and social resources) and activities for a means of living“. He further stated that 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“. An assessment of one“s livelihood, helps in creating a baseline for other projects to take effect.

This research therefore aims at assessing the livelihood of some selected cassava stakeholders along its value chain and the various strategies for their sustainability.

## **1.2 PROBLEM STATEMENT**

Since 1993, about 24 new cassava varieties have been released to farmers in addition to their landraces. These improved varieties are higher yielding and resistant/tolerant to Cassava Mosaic Disease (CMD). Some of these improved varieties were „client-oriented bred; with the participation of farmers (Manu-Aduening *et al.*, 2006). Farmers have also been taught good farming practices which help boost yields. Thus leading to higher cassava production and this

should lead to increase in income for farmers all other things being equal; it is also expected that this would have a trickle-down effect on other actors along the chain. Also, processors have been given various training through RTIMP and other NGOs; better technologies to make cassava processing less tedious have been developed and introduced into the system.

However, according to GSS report (2007), most Ghanaian farmers and for that matter cassava farmers still live in poverty. The Ghana Statistical Service (GSS) has national data in five rounds of Ghana Living Standards Survey (GLSS) disaggregated by ecological zones and by rural-urban communities. GSS (1995) studies showed that poverty is disproportionately concentrated among certain groups of the population and that geographically, rural areas are affected by higher levels of poverty than urban areas. Also, within socio-economic groups, farming households, especially food crop farmers, are most likely to be poorer and with poor access to social and economic amenities and other infrastructure (GSS, 2007). Cassava production has increased over the years with about 90% of farmers engaged in cassava farming either for subsistence or/and commercial purposes leading to an estimated 40% surplus each year. This has also led more people engaged in cassava processing and marketing. Yet, much is not seen in the improvement of livelihoods of these actors.

After, the work done on cassava production, processing and marketing, the question is whether this has translated into improvement of their livelihoods; is the cassava boom just a mirage? This research therefore, seeks to assess the cassava livelihoods of some actors along the value chain and hence, its sustainability.

### **1.3 JUSTIFICATION**

Apart from being a food security crop, cassava worldwide is seen as a cash-crop with much potential which can help in a country's economy. This is heightened by its drought resistant nature and ability to grow in most soils, even marginal soil. Importantly, most companies and

industries including pharmaceuticals are either using it as an additive or working on ways of using it in their products. Others are the breweries, livestock feed, ply wood and paper companies among many others. A research also conducted by the Food Research Institute (CSIR-FRI) on the value chain analysis and levels/under Work Page (WP) 7 of the Gratitude Project, noted that production and processing of cassava constitute a major source of income and rural livelihood which contributes about 22% of Ghana's agricultural GDP.

One cannot over-emphasise the fact that cassava has the potential to increase its present share in Ghana's agricultural GDP, thus by analysing the livelihoods of the actors along its value chain the following among many others can be achieved:

1. Know the current standing (livelihoods) of these actors.
2. The sustainability of their livelihoods and thus sustainability of cassava business.
3. Help target project interventions to help determine who will engage in and benefit from it.

#### **1.4 RESEARCH QUESTIONS**

Thus this research sort to answer the following questions

1. What are the major livelihood resources and assets of actors?
2. What are the main vulnerability contexts of actors?
3. What institutions and processes affect the actors?
4. What alternative livelihood strategies adopted by actors

#### **1.5 RESEARCH OBJECTIVE**

The main objective of this study is to assess the livelihoods of actors along the cassava value chain.

## **SPECIFIC OBJECTIVES**

The specific objectives of this study were

1. To identify the major livelihood resources and assets of selected actors.
2. To identify the main vulnerability context of actors.
3. To assess key institutions and processes and their effects on actors.
4. To identify alternative livelihood strategies adopted by actors.

### **1.6 SCOPE OF THE STUDY**

The study covered six (6) communities within Techiman and Mampong municipalities in the Brong Ahafo and Ashanti Regions respectively. Cassava farmers, selected processors (gari, kokonte and agbelima) and marketers were considered for the study. The emphasis of this study is on livelihoods of cassava actors and its sustainability.

### **1.7 ORGANIZATION OF THE STUDY**

This study is organized in five chapters. Chapter one opens with the background of the study which is followed with problem statement and research questions relevant to the study.

Chapter one also contains the objectives of the study followed by the need for undertaking the study.

In chapter two, relevant literature based on critical review and evaluation of the empirical and theoretical prepositions and generalization on the subject matter are the main focus. The third chapter contains the methodology employed in this study. Here, the choice of the study area and sampling procedure as well as the data collection method are elicited Chapter four deals with the analysis of data collected. Discussion of the outcome was carried out in chapter five. The study then concludes with chapter six, which is concerned with summary of the major findings of the study and the main recommendations.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

This chapter reviews literature on cassava, its origin and distribution; production, processing and marketing; its importance. It also, reviews literature on livelihoods as well as sustainable livelihoods and concludes with a review on value chain

#### 2.2 CASSAVA

##### 2.2.1 Cassava's Origin and Distribution

Cassava (*Manihot esculenta*, Crantz) was introduced by the Portuguese during the 16<sup>th</sup> and 17<sup>th</sup> centuries from Brazil as its country of origin to the Caribbean Islands, the Far East and the tropical areas of Africa (Manu-Aduening *et al.*, 2005). Ghana was amongst the first African countries to receive the crop. This was initially planted around the coastal trading castles and eaten as a major food by both the Portuguese and the slaves. The Akan name „Bankye“ could be a contraction of the Akan phrase, „Aban Kye“, meaning „gift from the castle“ (Korang-Amoakoh *et al.*, 1987). By the second half of the 18<sup>th</sup> century, it had become widely grown in the coastal plains (Adams, 1957). Adoption of cassava as a major food crop in other parts of Ghana was slow, with most people in the forest relying solely on plantain and cocoyam and in the savannah on sorghum and millet (MOFA, 1997). Failure of other crops other than cassava in the drought of 1982/1983, coupled with increase in population among other factors led to cassavas“ widespread cultivation in the country.

##### 2.2.2 Cassava Production

Cassava production has increased over the years both internationally and locally. African farmers in the early 1960s cultivated 5.6 million ha per year to cassava, some forty-five years down the line (early 2000s), that figure was nearly doubled to 10 million ha per year; Nigeria

and Ghana only increased almost four-fold (Nweke, 2004). Currently, Nigeria is the world's largest producer of cassava with a production of over 50 million tonnes/year and Ghana is the fourth largest with a production close to 16 million tonnes (FAOSTAT, 2013). FAO (2013) estimates the global harvest in 2012 at more than 280 million tonnes, a 60% increase since 2000. This expansion can be attributed to good farming practices, introduction of new varieties, improved processing and food preparation methods which reduce its weight and make it easier to transport at a reduced cost and also store for longer periods among many others.

Cassava, which can grow well on marginal lands, is one of the most important staple foods in Ghana (Kleih *et. al.*, 2013). It is the most important crop in Ghana followed by yam and cocoyam in terms of quantity produced while employing a large number of the rural population (MOFA, 2009). Due to its ability to withstand drought and thrive well on poor soils, it is considered as one of the strategic famine reserve crops in areas where rainfall is unreliable (Hendershot, 2004) and this gives it a higher pedestal over other root and tuber crops in Ghana and Africa as a whole.

Even though cassava production has increased steadily in Ghana, it has lost its position as the third largest producer of cassava in Africa to Angola (FAOSTAT, 2013) by about half a million tonnes, while Nigeria maintains and increases its production as the largest producer in the world. Productivity has increased, but there still remains a massive yield gap. This could be as a result of low adoption of improved technologies; Dankyi and Adjekum (2007) (cited in Owusu & Donkor, 2012) points out that the adoption rate and adoption intensity of the improved cassava varieties in the Southern part of Ghana as at 2007 were 9 and 37% respectively. Also, a report from Ragasa & Byerlee (2012) shows that Ghana's cassava adoption rate and variety turnover index still remains at 36% and 12 years respectively, similar to that of the whole Sub-Saharan Africa, whereas, Nigeria's is 46% and 19 years for adoption rate and variety turnover index

respectively. This suggests that Ghana's increase in productivity could just be in the expansion of production/cultivation area which is not sustainable, because land has competing uses.

### **2.2.3 Cassava Processing**

Cassava production and processing are major livelihood activities of most households in Ghana (Anaglo et al., 2009). Till recently, most cassava produced was consumed fresh as fufu but now there are many small-scale and a few medium to large scale enterprises in

Ghana processing cassava into diverse foods and starch for industrial uses. According to Manu-Aduening *et al.*, (2006), a greater portion of cassava produced in Ghana is consumed fresh as fufu but there are many small-scale and a few medium to large-scale enterprises in Ghana processing cassava into various foods and starch for industrial uses. Cassava is steadily being produced and processed as a cash crop for urban consumption in Nigeria and Ghana with the help of mechanical graters to prepare gari (Nweke, 2004).

In Dziedzoave et al., (2006), it was reported that processing of cassava was limited to traditional technologies like gari, kokonte, agbelima, tapioca, and minimal amounts of lowgrade starch and starch biscuits. Two decades down the line, the case remains almost the same. Most COSCA Countries still major in the dried roots, gari, a pasty product (agbelima) and fresh roots, with the highest being dried roots and gari (Nweke *et al.*, 2002).

Cassava processing is mostly associated with females. This could be due to their position in the labour market, women are typically found in low status work and mostly at the bottom of the value chain. Researches have shown that women are virtually exclusively responsible for the processing and marketing of cassava (Ezedinma *et al.*, 2007; PIND, 2011; MuhammadLawal *et al.*, 2013). Women are most often than not the ones found peeling, washing, drying/straining, roasting/frying while the men are usually found operating the mechanical grinder. Peeling, washing, drying and roasting are laborious and time-consuming and also not as well paid as

operating a mechanical grater. Men's participation on the other hand has been noted to increase as processing become more mechanized and commercialized (Martin *et al.*, 2008; Adebayo *et al.*, 2008)

### **2.2.3.1 Gari processing**

Gari is a granulated dry cereal common in both Ghana and Nigeria. The roots are peeled, washed and grated. The pulp is placed in a sack and a weight put on it for some hours to drain off effluent and kept for a day to ferment or used immediately. The semi-dried pulp is then sieved and roasted in a hot pan over fire till it becomes very dry and granulated. In Ghana, most processors hire labour to help in the production. Cassava in this form can be kept for longer periods if preserved well and not exposed to moisture. Gari can be considered a convenient food because it is stored and marketed in a form in which it is ready to eat either by soaking in hot or cold water. Thus making it very attractive to urban consumers and students as a fast food; giving it the name „students companion“. In Ghana and Nigeria, gari is the most common form in which cassava is marketed (Doku 1969; Ngoddy, 1977; Nweke, 2004).

### **2.2.3.2 Agbelima (Cassava dough) processing**

Peeled roots are soaked in water for some days, during which time the roots soften and ferment. The soaked roots are grated and put in a sack and weight placed on it (pressed) to drain. Salt is usually added to preserve it. It is usually retailed in urban markets in small plastic or propylene bags. This is mostly cooked with corn dough to make dishes such as banku, kenkey and akyeke. Its processing is usually done in the market unlike the other forms of processing which are done elsewhere (home) and brought to the market. This could be because it is weightier than the others.

### **2.2.3.3 Kokonte processing.**

Peeled roots are dried either directly under the sun or under shade. There are basically three types. The white one which is used for Tuo-zafi (TZ); the brown one, used for the main kokonte dish and the black ones which can be used for food and also in the plywood industry. Wholesalers and some retailers usually sell dried chips. Chips are milled at home for meal preparation.

#### **2.2.4 Cassava Marketing**

Cassava is marketed in various forms in Ghana. It is marketed for human consumption, industrial usage and feed for livestock. Fufu, gari, agbelima, kokonte and bakery products are some of the ways it is consumed by humans. As an industrial product it is used in adhesives, syrups and alcohol. The raw peels, it leaves and the roots are used as feed for livestock. Most of these uses have been achieved through the introduction of improved cultivars over the years which have gone a long way to help farmers and by extension stakeholders/actors along the cassava value chain.

#### **2.2.5 Importance of cassava**

According to FAOSTAT (2013), cassava is the most important source of calories in the tropics, followed by rice and maize. The nutritiondata.self.com summaries the caloric breakdown of cassava nutrients as Carbohydrates (97%), Fats (1%) and Proteins (2%) (For one cup of cassava).

According to Nweke *et al.*, (2002), cassava has and still is undergoing a major transformation. They outline four stages of this transformation; Famine Reserve, Rural Food Staple, Urban food Staple and Industrial Uses and Livestock Feed (ibid). They identify Ghana in the Urban Food Staple stage, where cassava is processed into gari for sale in urban centres and that government policies boost the replacement of imported rice and wheat with cassava food products.

Cassava has been a „controversial“ crop with usually two schools of thoughts. The first, praises cassava and campaigns for it to be produced on a large scale because it produces the largest number of calories per ha of any crop and has the ability to grow on poor soils, withstand attacks of drought, pests and diseases among many others (Jones, 1959; Nweke *et al.*, 2002; Nweke, 2004). But others are of the view that it is a subsistent crop that depletes soil nutrients, a women“s crop which is usually produced and consumed by impoverished household and thus not a keen interest of policy makers (White 1990). Nweke et al., (2002), states that these stigmas are half-truths and myths. The Collaborative Study of Cassava in Africa (COSCA) soil studies shows that fields for cassava cultivation, even those which have been under cultivation for at least ten years, are as fertile as soils of other crop.

Cassava has come a long way and is in no way a subsistent crop now. It is used in many ways now and is gradually gaining grounds in the industrial front. Recently, Guinness Ghana Breweries Ltd. (GGBL) launched a cassava beer called Ruut Extra Premium Beer. Cassava is used in many other ways showing its importance. Millions of people in Africa, Asia and Latin America depend on cassava for survival; for most of these families, cassava is necessary for both food security and income generation.

Cassava generates income for actors along its value chain (its producers, processors, transporters and marketers) and it serves as raw material in industries such as bakery, textile, paper, plywood and confectioneries (Babaleye, 2004; FAO, 2003).

### **2.3 LIVELIHOOD**

According to Chambers and Conway (1991;6) „a livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living“. The IDS team builds on this and defines a livelihood as „comprising the capabilities, assets (including

both material and social resources) and activities required for a means of living“ (Scoones, 2009).

A livelihood group is to some extent homogenous because the main livelihood strategies are usually similar amongst them.

In a livelihood analysis, indicators are used which cover most if not all aspects of livelihoods of the livelihood group. Some of them are livelihoods resources, vulnerability context, policies, institutions and processes, livelihood strategies and livelihood outcomes or goals.

### **2.3.1 SUSTAINABLE LIVELIHOOD**

Definitions of sustainable livelihood is mostly blurred, varying and relatively narrow (Carswell et al., 1997). Thus care must be taken, so as to bring out its clarification. 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“ (Chambers & Conway, 1991:6b).

DFID defines a sustainable livelihood as one which is resilient in the face of external shocks and stresses; not dependent upon external support (or if they are, this support itself should be economically and institutionally sustainable); maintain the long-term productivity of natural resources; and do not undermine the livelihoods of, or compromise the livelihood options open to, others.

Sustainability does not mean undermining one“s ability, but rather enjoying the resources available now to build one“s capability having in mind future generations.

Chambers and Conway (1991), puts sustainability of livelihood into two groups; environmental sustainability (external impact of livelihoods on other livelihoods) and social sustainability (internal capacity to withstand outside pressures). The environmental sustainability takes into consideration both local and global levels. Social sustainability on the other hand has both

negative and positive dimensions. Where the negative dimension is reactive while the positive is proactive.

DFID broadens this into four (4) components;

- a. Environmental sustainability; attained when the productivity of life-supporting natural capitals is preserved or improved for use by future generations.
- b. Economic sustainability; realized when a specified level of spending can be maintained over time. For livelihoods of the poor, economic sustainability is attained if a baseline level of economic welfare can be achieved and maintained.
- c. Social sustainability; achieved when social segregation is decreased and social equity increased.
- d. Institutional sustainability; realized when the main structures and processes have the ability to continue to perform their tasks over the long term.

Considering all these dimensions, very few livelihoods qualify as sustainable. However, DFID's definition of sustainability seems more exhaustive than Chambers and Conway (1992). Thus even though DFID's sustainability might seem impossible, it should influence development activities; consequently, making progress towards a sustainability even if „full“ sustainability is never achieved. Sustainability should be all-round; such that it is complete.

### **2.3.2 SUSTAINABLE LIVELIHOOD FRAMEWORK (SLF)**

The sustainable livelihoods framework is just one way of shaping complex issues surrounding poverty (IFAD, 2002). To use it, one needs to modify and adapt to it and make it appropriate to local circumstances and local priorities.

Usually, the livelihood assets of the group/individual are identified. This can be grouped into five capitals/assets; human, natural, financial, physical and social capital. This is by realising that the people have something to offer and not empty; as usually supposed looking from the

outside. Also, their vulnerability context (shocks, seasonality, trends and changes); policies, institutions and processes that affect them; livelihood strategies (how they combine their assets taking into account their vulnerability context with support or hindrances from policies, institutions and processes) are all considered and used as indicators in livelihood analysis.

Poorest households combine a variety of resources to which they have access in different ways to continue their livelihoods and these resources are called livelihood assets (Hossain *et al.*, 2010). There are basically five livelihood assets (DFID, 2001). They are:

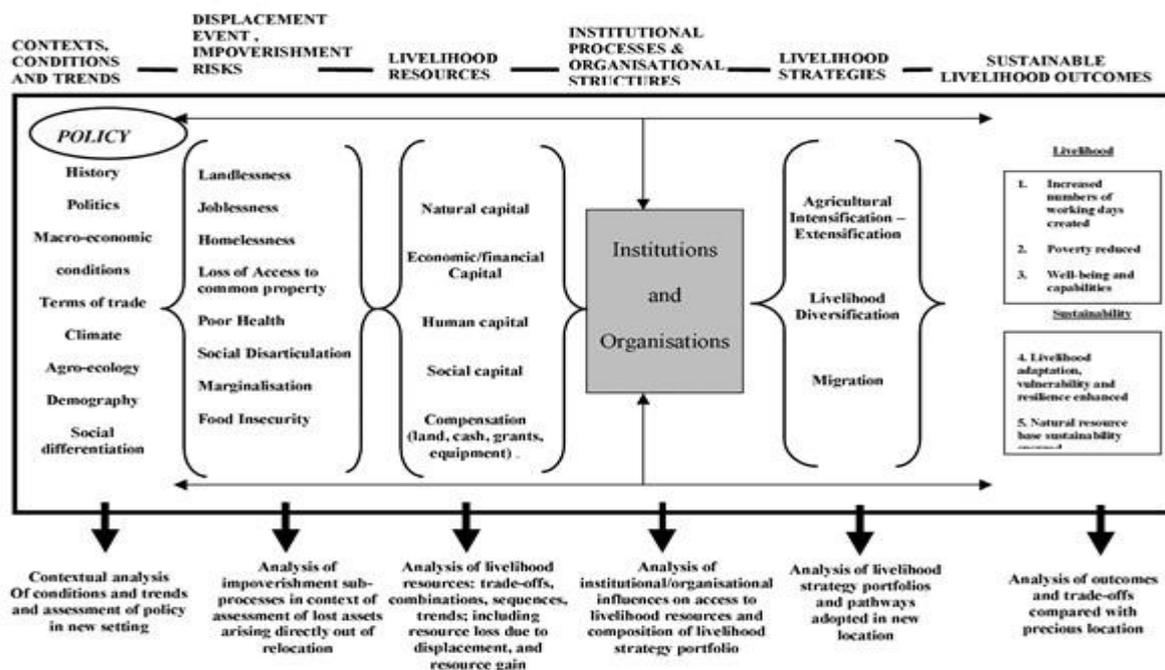
- Human capital which comprises of health; nutrition, education; knowledge and skills; capacity to work; capacity to adapt among many others
- Natural capital which comprises of land and produce; water and aquatic resources; trees and forest products; wildlife; wild foods and fibres; biodiversity; environmental services etc.
- Social capital also includes networks and connections (patronage neighbourhoods, kinship); relations of trust and mutual support; formal and informal groups; common rules and sanctions; collective representation; mechanisms for participation in decision-making; leadership etc.
- Physical capital consist of infrastructure (transport, secure shelter & buildings, water supply & sanitation, energy, communications); tools and technology (tools and equipment for production; seed, fertiliser, pesticides; traditional technology).
- Financial capital involves savings; credit/debit (formal, informal, NGOs), remittances, pensions, wages, etc.

These assets do not work in isolation; there are various assets which are usually combined in various ways, which help balance their livelihoods (Fig 2.1).

### 2.3.3 SUSTAINABLE LIVELIHOOD ANALYSIS (SLA)

SLA is to translate concepts of livelihoods and sustainability into fair and efficient policies. Sustainable Livelihood Analysis (SLA) has seven guiding principles (DFID, 2000; IFAD, 2002) that are malleable and adjustable to different local conditions. They in no way prescribe answers or dictate methods. The guiding principles are:





**Figure 2.1: The Sustainable Livelihood Framework Source: IFAD (2002) People-centred:**

People are the main concern and so everything revolves around them. The people themselves participate throughout the project cycle. People, rather than the resources they use or the governments that serve them are the major concern

**Holistic:** People adopt many strategies to support their livelihoods. The SLF is non-sectorial; it recognizes multiple influences, multiple actors, acknowledges that there are multiple livelihood structures and thus seeks to achieve multiple livelihood outcomes. It appreciates that various things shape one's livelihood and tries to understand them and how they can be harnessed to bring an expected outcome.

**Dynamic:** Livelihoods are dynamic and so is this approach. Even though dynamism cannot be presented in a framework, it can be reflected in process and modes of analysis. It also helps one to learn as one moves forward.

**Building on strengths:** SLA starts with the analysis of strengths, rather than needs and builds on these strengths and opportunities rather than focusing on their needs. Thus, people are helped to become more robust and better able to achieve their own objectives.

**Macro-micro links:** Macro policies are usually developed in isolation from the people it affects. But just as policies affect people, people also do affect policies. SLA focuses on both the macro and micro levels and tries to bridge the gap. It highlights the necessity for policies to be informed by insights from the local level and by the priorities of the poor.

**Encourage broad partnerships:** SLA draws on both public and private sectors; it is not biased to a sector. It helps public and private sectors to work together

**Sustainability:** For poverty reduction to be lasting, sustainability is very key.

## 2.4 VALUE CHAIN

According to Kaplinsky and Morris (2000), a value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use. A value chain is the full collection of actions/activities needed to bring a product right from its beginning, through various stages of production and transformation.

Value addition results from diverse activities including bulking, cleaning, grading, and packaging, transporting, storing and processing (Anandajayasekaram and Berhanu, 2009). The more value one adds/create, the more people are willing to pay a good price for the product or service. For instances raw cassava (cassava roots) sells at a lesser price than gari or agbelima.

Lawal and Jalyeola, (2007) opined that value addition improves the shelf life of agricultural products and generates income for participants. Adding value increases the chain thus providing

job avenues for many people. Gari, kokonte and agbelima can be stored for longer periods than raw cassava.

Kaplinsky and Morris (2001) stressed on the fact that there is “no correct” way to conduct a value chain analysis, but came up with four (4) aspects of value chain analysis that apply to agriculture.

1. Chain analysis systematically maps the actors participating in the production, distribution, marketing and sales of particular products.
2. Identifying the distribution of benefits among actors in the chain through the analysis of margins and profits.
3. Value chain analysis can be done to examine the role of upgrading within the chain.
4. Highlight the role of governance in the chain.

In any analysis, it is prudent to first identify the stakeholders involved, so as to work with them and not come up with something that cannot be used by the main stakeholders.

Bammann (2007) also identified three important levels of value chain. They are;

- **Value chain actors:** The chain of actors who directly deal with the products, i.e. produce, process, trade and own them.
- **Value chain supporters:** The services provided by various actors who never directly deal with the product, but whose services add value to the product.
- **Value chain influencers:** The regulatory framework, policies, infrastructures, etc.

This goes to show that value chain consists of actors or stakeholders who add/create value along the way. A value chain starts from a point till it ends usually with the consumer.

Depending on what one is working on various actors can be added or excluded to the chain.

#### 2.4.1 CASSAVA VALUE CHAIN

Although millions depend on cassava for their livelihood, it is a perishable crop and according to McForson (2014), about 50% of the cassava produced in Ghana is lost along the value chain despite an annual growth of 6% over recent years (FAO, 2005).

Essegbey (2008) proposed a cassava value chain (Fig 2.2). This identifies the stakeholders, and the relationships between them (how they affect each other)

This thesis looks at the livelihood of three of these groups involved along the cassava value chain:

**Farmers** are a very important group along the value chain. During the cultivation of cassava, Adebayo *et al.*, (2012) found that the various gender roles come into play; more women are involved in weeding, harvesting, transporting and processing whilst the men are more involved in land preparation and planting. Cassava production is mainly traditional with minimal use of any form of special inputs.

**Processors** are usually next in line to the farmers along the chain; some of the processors are farmers themselves. They add more value to the cassava by converting it into a temporarily imperishable state such as gari, agbelima, kokonte, pellets and chips among many others. Processing involves peeling, washing, milling/grating, sieving, roasting/frying, packaging among many others.

**Marketers** usually market cassava and its products with other produce/products. Example a cassava root seller usually sells plantain and cocoyam in addition.

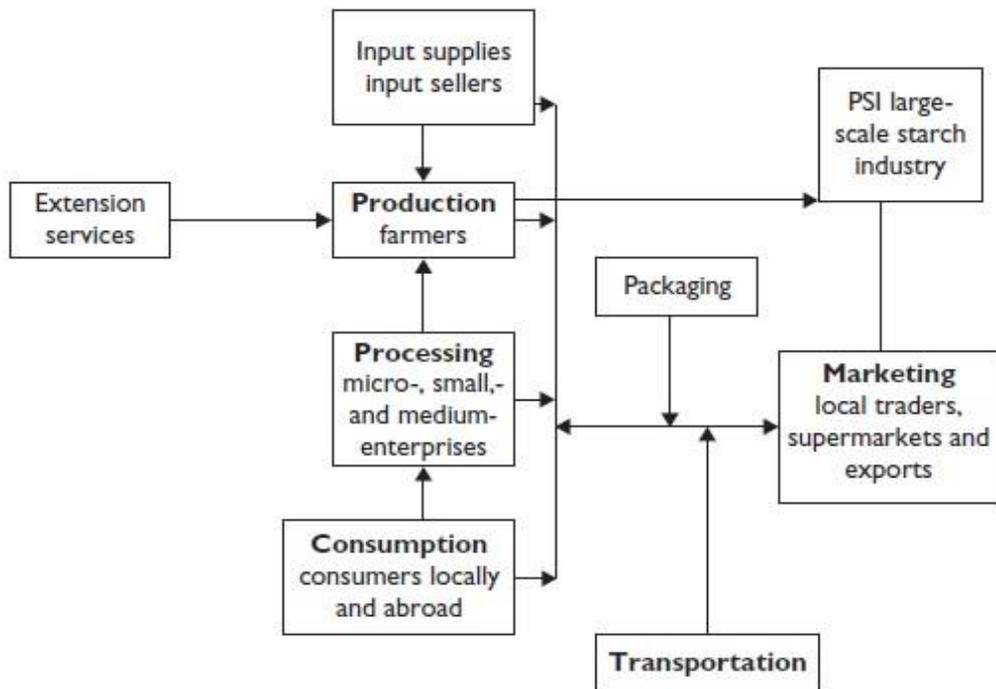


Figure 2.2: Cassava Value Chain in Ghana Source: Essegbey (2008)



## **2.5 SOME POLICIES AND INSTITUTIONS AFFECTING CASSAVA PRODUCTION, PROCESSING AND MARKETING**

### **2.5.1 ROOT AND TUBER IMPROVEMENT PROGRAMME (RTIP)**

The Root and Tuber Improvement Programme (RTIP) began in January 1999 and was planned to close by December 2004, which was extended to September 2005. The RTIP Project Appraisal Report (IFAD, 1997) cited four compelling reasons to develop this commodity sector:

- i. Root and tuber crops, because they can be grown all year round and grow well on poor soils, can mitigate the vulnerability of resource-poor communities to seasonal food scarcity;
- ii. As root and tuber crops are grown largely by the poorest segment of the rural population, improvements in root and tuber crop productivity will positively affect the incomes of those producers;
- iii. The development of the root and tuber sector is important to further diversify the agricultural sector; and,
- iv. Investments in the root and tuber sector would provide new opportunities to smallholders to increase incomes, thus favouring more equitable income distribution in the rural economy.

#### **Goals and Objectives**

The main objective of the project was to enhance food security and improve the incomes of resource-poor farmers by facilitating access to new but proven locally adapted technologies for root and tuber crops namely: cassava, cocoyam, yam and sweet potatoes. 720,000 resource poor farmers were targeted from all the ten regions of Ghana.

Five specific objectives were set to achieve the overall goal

- a. Develop a sustainable system for the multiplication and distribution of improved planting materials for root and tuber crops in order to increase their availability to smallholders;

- b. Develop an integrated pest management system including biological control, to reduce the incidence of diseases and pests and increase the productivity of smallholder root and tuber crop systems;
- c. Strengthen adaptive research for the root and tuber crops in order to increase the flow of new technologies available to farmers, including women;
- d. Collect, evaluate and conserve root and tuber germplasm in order to help conserve the rich plant biodiversity of Ghana;
- e. Empower resource-poor farmers, farmer groups and rural communities including women, to ensure unimpeded access to improved root and tuber technology and strengthen sector institutions to ensure effective programme management and sustainability.

More than 60 research projects by Ghanaian scientists were undertaken by the project. This led to the release of five new cassava varieties in 2002 by CRI with assistance from RTIP. The mid-term evaluation report also showed that almost 120,000 were reached with improved planting materials of cassava and sweet potatoes (IFAD, 2004).

The evaluation team observed that through various training sessions for Regional and District Agricultural Officers and production and processing groups, RTIP had an encouraging impact with respect to increased knowledge and skills at farmer level and among Agricultural Extensions Agents (AEAs). Knowledge and skills in production practices, pest management and to a lesser degree, on preservation, processing and utilisation of roots and tubers were acquired.

A total of 55% of beneficiaries had increased incomes due to participation in the project, out of this 44% attested to the fact that this additional income helped them to buy some household assets and pay their children's school fees.

## **2.5.2 ROOT AND TUBER IMPROVEMENT AND MARKETIG PROGRAMME (RTIMP)**

RTIMP was a continuation of RTIP, which was also funded by the International Fund for Agricultural Development (IFAD) and the Government of Ghana for a period of 8 years (2007-2014). Currently its activities have ended. The main aim of the programme was to enhance income and food security in order to improve livelihoods of the rural poor in Ghana. The programme sought to build a competitive market-based root and tuber commodity chain, which was supported by relevant, effective and sustainable services that were available to the rural poor. Its programme components included the following

- Support to increased commodity chain linkages;
- Support to root and tuber production;
- Upgrading of small-scale processing, business and marketing skills; □ Programme coordination, monitoring and evaluation.

This, the programme sought to achieve through the following key strategies

- District Stakeholder Fora (DSF)
- Commodity chain linkage activities through Initiative fund
- Linking up small-scale producers and processors with larger-scale users of R&T products
- Planting material multiplication and distribution
- Farmer Field Fora (FFF)
- Technology transfer for processors
- Establishment of Good Practices Centres (GPC)
- Exposure visits to Good Practices Centres
- Business development training

- Financial services through the micro enterprise fund.

(RTIMP, 2010; RTIMP, 2012; RTIMP, 2013)

### 2.5.3 Crops Research Institute

Council for Scientific and Industrial Research - Crops Research Institute (CSIR-CRI) is one of the 13 Institutes of CSIR of Ghana and was established in 1964. The Institutes mission is to develop and disseminate appropriate technologies for high and sustainable food and industrial crop production ([www.cropsresearch.org](http://www.cropsresearch.org)). The research mandate of CSIR-CRI covers the following food and industrial crops:

- Cereals (maize and rice)
- Legumes (cowpea, soybean, groundnut and Bambara groundnut)
- Roots and tubers (cassava, yam, sweet potato and cocoyam)
- Horticultural crops
- Plantain and banana
- Tropical fruits (citrus, mango, avocado, pineapple, cashew and pawpaw)
- Vegetables (pepper, garden eggs, tomato, onion and leafy vegetables)
- Industrial crops (rubber, sugar cane and tobacco).

CSIR-CRI goals are to;

- Develop and disseminate appropriate technologies that are demand driven and acceptable to end users.
- Promote and strengthen strategic partnerships with relevant stakeholders to enhance the generation of solutions to challenges in agricultural research technology development and transfer.
- Improve institutional capability to undertake effective research and service delivery to enhance agricultural productivity.

- Enhance research and technology delivery through efficient mobilization and management and operating procedures and systems as a means of ensuring efficiency in research delivery.

# KNUST



## CHAPTER THREE

### METHODOLOGY

#### 3.1 INTRODUCTION

In this chapter, the approaches that were used for the study is described in detail. It begins with the description of the study area, describes the actors considered, outlines the research approach used, explains how the sample size was determined; tools used for data collection and how the data was analysed. This section concludes with how field data was prepared and analysed and the tools used for data presentation.

#### 3.2 STUDY AREAS

The study was conducted in the Techiman and Mampong Municipalities of the Brong Ahafo and Ashanti Regions of Ghana respectively. The figure below shows the study communities.

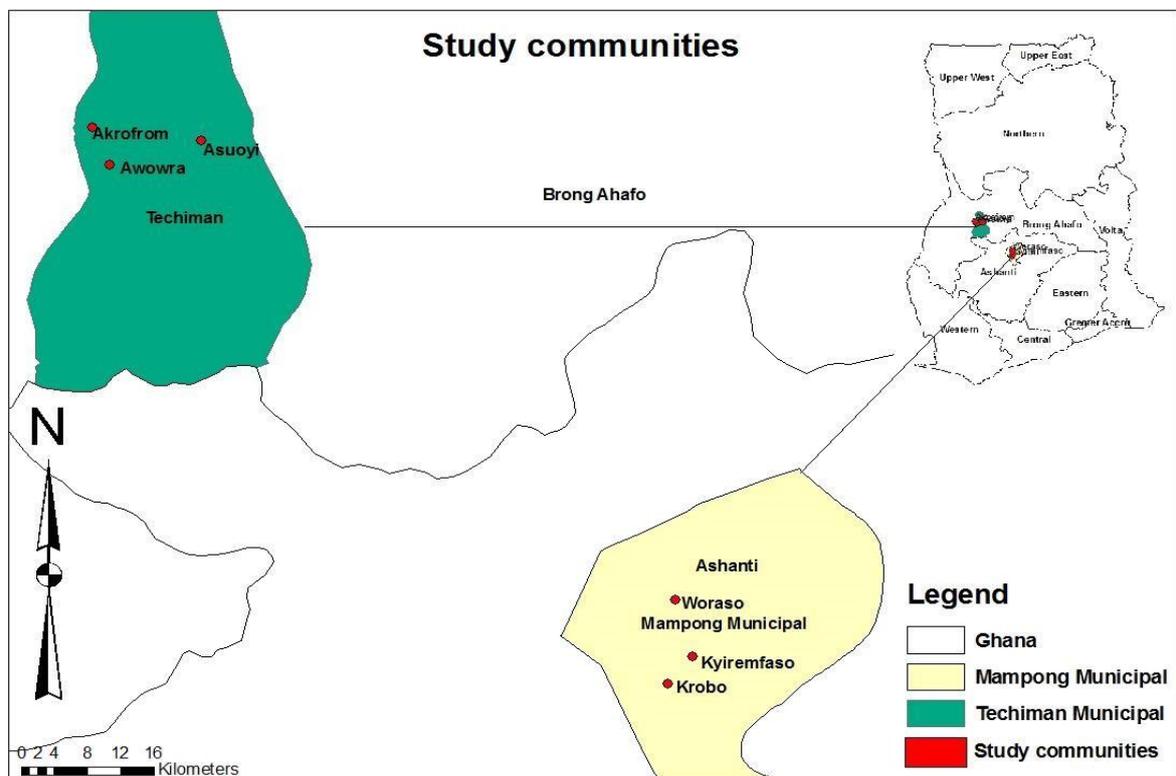


Figure 3.1: Map showing study areas

The two Municipalities were selected due to their importance in the production, processing and marketing of cassava and also for the unique difference in their topography, climatic condition, soil type and vegetation cover. Moreover, the differences in farming practices, processing techniques and marketing were also a major factor.

### **3.2.1 DESCRIPTION OF TECHIMAN MUNICIPALITY**

Techiman Municipality is one of the twenty-seven (27) Municipals/Districts in the Brong Ahafo Region of Ghana. The total land size of the Municipality is 669.7km<sup>2</sup>. It is situated in the central part of the Brong Ahafo Region and lies between longitudes 10°49" East and 20°30" West and Latitude 8°00" North and 7°35" South. The Municipality experiences both semi-equatorial and tropical conventional or savannah climates, characterized by moderate to heavy rainfall annually. Major rains start from April to July and the minor from September to October. The dry season which is highly pronounced in the savannah zone, starts in November and lasts until March. Techiman is characterized by three main vegetation zones; the Guinea-Savanna woodland, located in the north-west, the semi-deciduous zone in the south and the Transitional zone, which stretches from the south-east and west up to the north of the municipality.

According to the 2010 Population and Housing Census of Ghana, the population of Techiman was 206,856 comprising of 100,498 males and 106,358 females. The Municipality is the second largest urbanized in the region with about 60% of the total population living in urban areas. The major economic activity in the Municipality is Agriculture which accounts for about 55% of the economically active population. In addition, there are small-scale economic enterprises such as agro-processing (eg. gari processing), artisan workman auto repairs, tailoring/dressmaking and food processing among others. Trading is one of the major activities in the municipality and this is attributed to presents of the famous Techiman Market, one of the largest food crop

market in Ghana and a major commercial centre in the region; it hosts traders from Togo, Benin, Cote D'Ivoire, Burkina Fasso and Mali.

Some major crops grown in the Municipality are maize, cassava, yam, cocoyam, plantain, tomato, pepper, garden eggs, groundnuts and cowpea.

The research focused specifically on Awowra, Asueyi and Akrofrom communities all in the Techiman Municipality. These are towns noted for cassava production and processing.

### **3.2.2 DESCRIPTION OF MAMPONG MUNICIPALITY**

Mampong Municipality is one of the eight (8) Municipal Assemblies in the Ashanti Region. Mampong is bounded to the South by Sekyere South District, the East by Sekyere Central and the North by Ejura-Sekyeredumasi District. It is located between longitude 0°05" West and 1°30" East and latitudes 6°55" North and 7°30" South, covering a total land area of 449km<sup>2</sup>. It has about 79 settlements with about 61% being rural. The rural areas are mostly found in the Northern part of the Municipality where communities with less than fifty (50) people are dispersedly located. According to the 2010 population census, the population of the Municipality is currently 88,051.

The Municipality is partly situated on the Mampong scarp which runs eastwards. The highest point of the Municipality is 2,400m above sea level, while the lowest is about 135m. This makes the Municipality generally low lying which rises gradually through rolling hills stretching southwards. The major vegetation zone of the Municipality is the savannah transitional zone of Ghana, with the vegetation being savannah woodland, with patches of tall elephant grass to the north and mixed patches of dry forest and grassland to the South. 80% of land area is used for small-scale farming. There are 4 forest reserves covering an estimated area of 111.59km<sup>2</sup>.

Most lands are stool, family or clan controlled. Acquisition of land is normally done through the Chief. Majority of farmers are tenants who pay rent. Major staple crops in the municipality are maize, cassava, plantain, cocoyam and yam.

Communities used for the study were Woraso, Kyiremfaso and Krobo.

### **3.3 DESCRIPTION OF CASSAVA VALUE CHAIN ACTORS**

Stakeholders/actors along the cassava value chain selected for this study were farmers, processors and marketers

#### **3.3.1 Farmers**

Farmers who cultivated cassava were considered. Farmers could be engaged in other crops, be it cash or food crops.

#### **3.3.2 Processors**

Here particular attention was given to gari, kokonte and agbelima processors. Gari is the most processed form of cassava in most communities. Kokonte was not processed in large quantities as gari. Agbelima was processed mostly in the market place, where it was sold wholesale (by the processors). Questionnaire administration was done basically on the „owners“ of the gari sites, while one-on-one interviews were run on the workers/labourers in the gari site.

#### **3.3.3 Marketer**

Those who sold fresh cassava roots, gari, kokonte and agbelima were used.

### **3.4 METHODS**

#### **3.4.1 RESEARCH METHODOLOGY**

A mixed method design was used so as „to obtain different but complementary data on the same topic“ (Morse, 1991) to best understand the research problem. Thus to provide a „richer“ and more in-depth analysis; both quantitative and qualitative approach to research was used to

triangulate and complement each other (Greene, *et al.*, 1989). The mixed methods approach is a procedure for gathering and analysing both quantitative and qualitative data in a single study or in a series of studies, based on priority and sequence of information (Tashakkori and Teddlie, 1998; Creswell, 2004). The study employed the use of qualitative research because it wanted to reach into the thoughts of people; to create information with those involved. According to Bryman (2004), qualitative research emphasises on words rather than quantification in the collection and analysis of data.

Quantitative approach to research was also used to acquire data to buttress the information collected; it enabled sample segmentation for deeper appreciation of the underlying phenomenon and also yielded statistically significant results which can be generalized.

Specifically, the „Concurrent Triangulation Design“ (Creswell, *et al.*, 2003) was used to bring together the contrasting strengths and non-overlapping weaknesses of quantitative methods (large sample size, trends, generalization) with those of qualitative methods (small N, details, in depth) (Patton, 1990). This is a one-phase design in which researchers implement the quantitative and qualitative methods during the same period and with equal weight. This design is best suited for comparing results or to validate or confirm quantitative results with qualitative findings, hence it was used in this research to help best analyse the livelihood of selected actors.

### **3.4.2 SAMPLING TECHNIQUES**

Both probability and non-probability techniques were used.

With the aid of Agricultural Extension Agents (AEAs), a list of major producer and processor communities were prepared, after which a simple random technique was used to select three (3) communities in each municipality for primary data collection.

### **Mampong Municipality**

Apart from Woraso in Mampong municipality which had only one major gari processing factory (and so was considered as one processor), all the other communities had many gari processing sites scattered in the community. For the other two communities, the processors in each community were grouped into clusters of three (3) and ten (10) processors randomly selected from each cluster, making total of 30 processors. For the farmers purposive sampling was used to ensure that certain significant groups are represented and it also allows a range of rich information that provides insight into the issue at hand (Patton, 1990).

### **Techiman Municipality**

Here too, purposive sampling was used for the farmers“ whiles the cluster sampling was used for processors.

In all 180 farmers (90 from Techiman, and 90 from Mampong) were interviewed (Table 3.1) whiles 151 processors (90 from Techiman and 61 from Mampong) were also interviewed. 30 marketers were interviewed per municipality. This is because, it was realised that most farmers and processors sold their goods on wholesale to the marketers who were usually in the major markets.

**Table 3.1: Communities and sample size**

MUNICIPALITY	COMMUNITY	Sample size		
		FARMERS	PROCESSORS	MARKETERS
<b>Mampong</b>	Woraso	30	1	-
	Kyeremfaso	30	30	-
	Krobo	30	30	-
	Mampong market	-	-	30
<b>Techiman</b>	Awowra	30	30	-

	Krobo-Akrofom	30	30	-
	Asueyi	30	30	-
	Techiman market	-	-	30
<b>TOTAL</b>		<b>180</b>	<b>151</b>	<b>60</b>

Table 3.2 also shows the various processing and marketing actors interviewed, their frequencies and percentages.

**Table 3.2: Actors sampled.**

	MAMPONG		TECHIMAN		TOTAL No.	TOTAL %
	No.	%	No.	%		
<b>PROCESSOR</b>						
<b>Gari</b>	54	90.0%	83	92.2%	137	<b>91.3%</b>
<b>Kokonte</b>	3	5.0%	2	2.2%	5	<b>3.3%</b>
<b>Agbelima</b>	3	5.0%	5	5.6%	8	<b>5.3%</b>
<b>MARKETERS</b>						
<b>Storage roots</b>	4	13.3%	5	16.7%	9	<b>15.0%</b>
<b>Gari</b>	13	43.3%	16	53.3%	29	<b>48.3%</b>
<b>Kokonte</b>	5	16.7%	5	16.7%	10	<b>16.7%</b>
<b>Agbelima</b>	8	26.7%	4	13.3%	12	<b>20.0%</b>

Source: author, 2015

### 3.4.3 DATA TYPE AND SOURCES OF DATA

Both primary and secondary data was used in the research. The secondary data provided background information on the study areas as well as contextual background information of the

research. Secondary data such as baseline information of the selected Districts, programme/project documents and existing reports from Ministry of Food and Agriculture (MOFA), Crop Research Institute (CSIR-CRI), Root and Tuber Improvement Programme (RTIP) and Root and Tuber Improvement and Marketing Programme (RTIMP) among others were used. Other relevant secondary data were obtained from research articles, journals, books, news items and the internet. Primary data was sort through the use of questionnaires, focus group discussion and interviews.



**Plate 3.2: Plate showing data collection**

### **3.4.4 DATA COLLECTION INSTRUMENTS, PROCEDURE AND PRE-TESTING**

The research drew from both empirical research (data collection; formal and informal interviews) as well as non-empirical research (comprehensive literature review). Questionnaire in both opened and closed forms were administered to the selected actors; farmers, processors and marketers (gari, agbelima, kokonte). The questionnaire was administered with the aid of field assistants who were trained on how to administer the questionnaire. The preparation of the

questionnaire took into consideration factors that have been found to minimize non-sampling errors, namely, clarity of expression, potential for respondent recall, cultural specific conceptions, sensitive questions and the time required to complete an interview. Pre-testing was done with a few respondents; this was to test the clarity of questions and respondents' understanding of questions based on which further clarification was carried out on the questionnaires before administering to the stakeholders.

Questionnaires, interviews, observations, key informant discussion, field assessments and literature review were the tools used. To aid in triangulation thus strengthening the validity of the study, focus group discussions were carried out in the various communities.

A checklist of issues relating to the study was prepared to guide the researcher in conducting focus group discussion (FGD). The facilitator (researcher) led the discussion.

#### **3.4.5 DATA PROCESSING AND ANALYSIS**

The inductive approach which includes analysing data with little or no predetermined theory, structure or framework, but rather using the actual data itself to develop the structure of analysis was used in analysing the qualitative data. Specifically, the thematic content analysis (TCA) was used. This is one of the most common methods of data analysis used in qualitative research. The process involves analysing transcripts, identifying themes and categories within data and gathering together themes from the text (Burnard *et. al.*, 2008).

Quantitative data collected was analysed using Statistical Package for Social Science (SPSS) v 20.0 and Microsoft Excel. Descriptive statistical analysis factors like frequency tables, pie charts, bar graphs were generated from the data and their interpretations explained with other research work.

### **Objective 1**

Descriptive statistical tools such as frequencies and percentages were used to identify and examine the various livelihood assets. Also, observations and picture taking was used.

### **Objective 2**

Here, themes were generated from the focus group discussions and interviews to help explain their vulnerability context. This was supported with data from the questionnaires administered.

### **Objective 3**

Key policies, institutions and processes affecting them were obtained from the FGDs and interviews conducted. Data collected from the questionnaire administration was also used, using descriptive statistical tools like frequencies and percentages. Secondary data was also employed.

### **Objective 4**

Descriptive statistical tools were used in conjunction with data from FGDs and interviews.

## **CHAPTER FOUR**

### **RESULTS**

#### **4.1 INTRODUCTION**

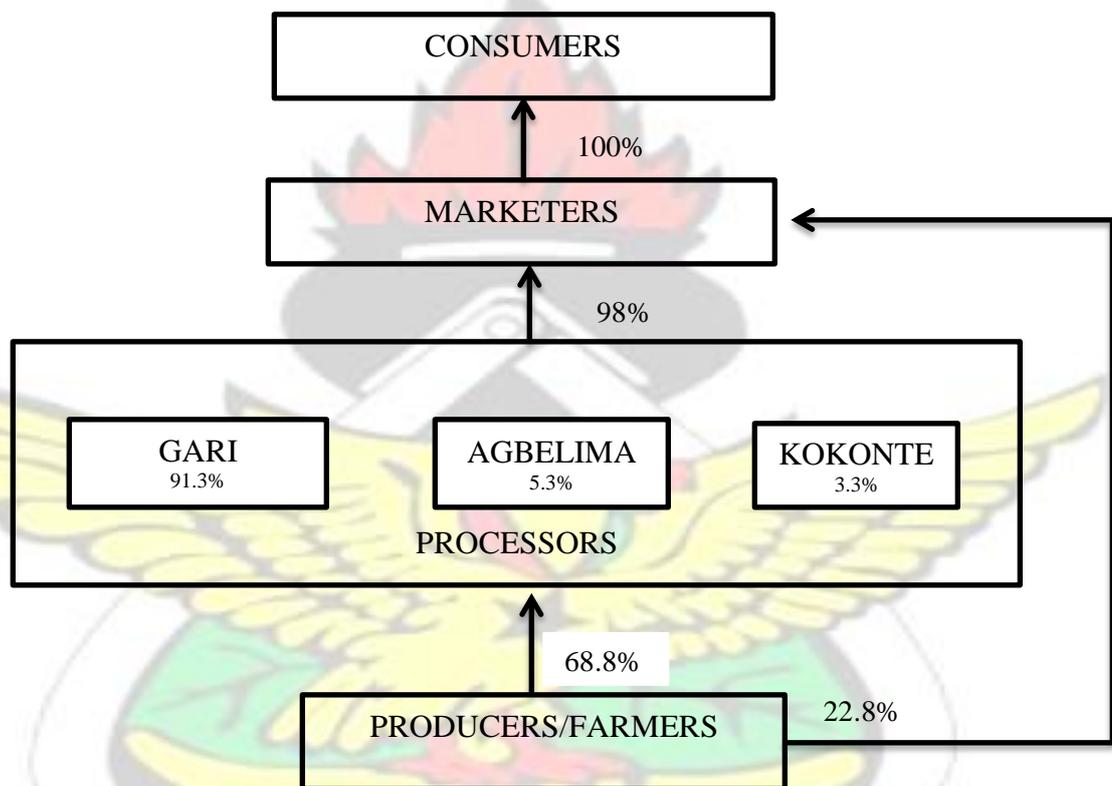
This chapter deals with the main results from the research work. Here, actors' livelihood assets and resources; their vulnerability context; key policies, institutions and processes that affects them; as well as some livelihood sustainable strategies they undertake are presented. They are presented in figures, tables and plates below.

Stakeholders/actors along the cassava value chain selected for this study were farmers, processors and marketers.

#### **4.2 IDENTIFIED ACTORS ALONG THE CASSAVA VALUE CHAIN**

To help the study, the actors along the value chain (Figure 4.1) were identified and the

„major“ actors selected for the study. The study showed that none of the farmers in the communities surveyed supplied to any cassava processing industry or company, even though a few had some sort of knowledge about them. The value chain started from the farmers and ended with the consumers as the Figure below shows. From the chain shows that flow to processors made-up the bulk of cassava flow from farmers.



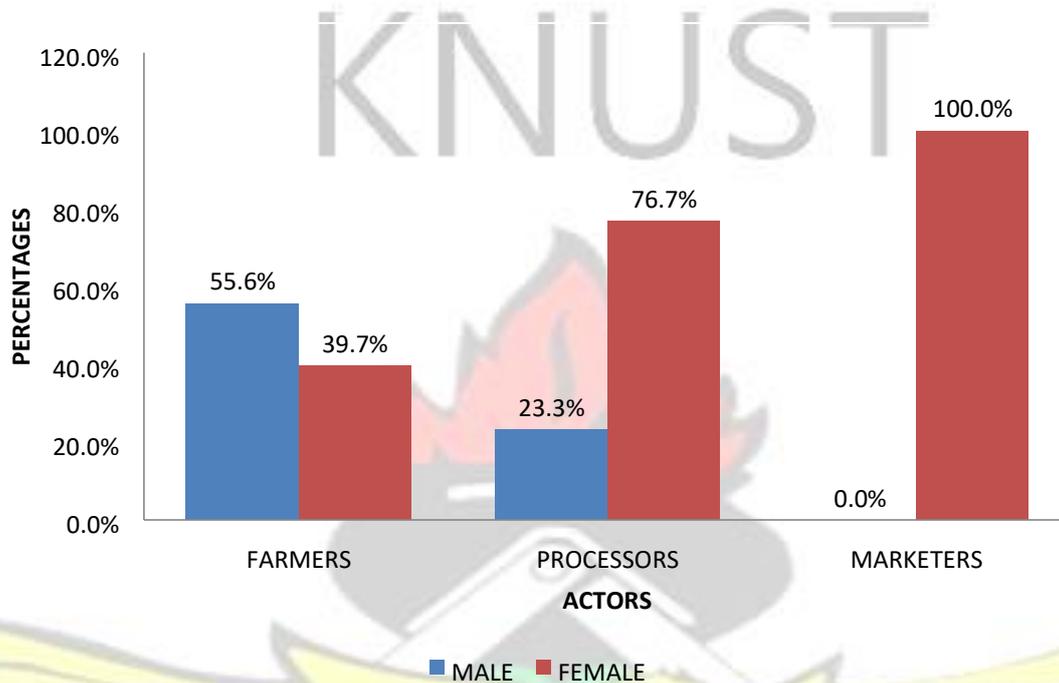
**Figure 4.1: Cassava value chain identified; flow of cassava from farmers, through processors and marketers to final consumers. Source: Field Survey, 2015**

### 4.3 LIVELIHOOD RESOURCES/ASSETS

Livelihood resources/assets are usually placed in five (5) categories. They are Human, Physical, Social, Natural and Financial. From the questionnaires and interviews conducted, some major resources were identified.

### 4.3.1 Human asset

The study indicated that all (100%) marketers were women. Also, for processors women were in the majority (76.7%) but were the minority (39.7%) as farmers (Fig 4.2).



**Figure 4.2: Sex of Actors Source: Field Survey, 2015**

The average age of farmers and processors was 43 and that of marketers was 44 (Table 4.1). Their least ages were 19 and 20 years, while the maximum were 71 and 78 years for farmers and processors respectively.

Table 4.2 (below) shows the educational background of farmers, processors and marketers in both Techiman and Mampong Municipalities. Generally, majority of farmers (44.4%) had the basic education, followed by farmers with no form of formal education. Most processors (66.7%) in also had the basic. Most processors in Mampong (48.3%) have no form of formal education. For marketers, basic education recorded the highest forms of education for both Techiman and Mampong.

**Table 4.1: Ages of Actors**

	<b>FARMERS/ Years</b>	<b>PROCESSORS/ Years</b>	<b>MARKETERS/ Years</b>
<b>Minimum</b>	20	20	19
<b>Maximum</b>	78	78	71
<b>Mean</b>	43.14	42.83	44.28
<b>Median</b>	42	43	45
<b>Mode</b>	45	45	51

Source: Field Survey, 2015

**Table 4.2: Educational background of Actors**

	<b>BASIC</b>		<b>SSCE/WASSCE</b>		<b>TERTIARY</b>		<b>NO FORMAL EDU.</b>	
	<b>NO.</b>	<b>%</b>	<b>NO.</b>	<b>%</b>	<b>NO.</b>	<b>%</b>	<b>NO.</b>	<b>%</b>
<b>FARMERS</b>								
Mampong	53	58.9	3	3.3	1	1.1	33	36.7
Techiman	67	74.4	4	4.4	3	3.3	16	17.8
<b>TOTAL</b>	<b>120</b>	<b>66.7%</b>	<b>7</b>	<b>3.9%</b>	<b>4</b>	<b>2.2%</b>	<b>49</b>	<b>27.2%</b>
<b>PROCESSORS</b>								
Mampong	29	48.3	1	1.7	1	1.7	29	48.3
Techiman	81	90	2	2.2	1	1.1	6	6.7
<b>TOTAL</b>	<b>110</b>	<b>73.3%</b>	<b>3</b>	<b>2.0%</b>	<b>2</b>	<b>1.3%</b>	<b>35</b>	<b>23.3%</b>
<b>MARKETERS</b>								
Mampong	19	63.3	7	23.3	1	3.3	3	10
Techiman	23	76.7	1	3.3	3	10	3	10
<b>TOTAL</b>	<b>42</b>	<b>70%</b>	<b>8</b>	<b>13.3%</b>	<b>4</b>	<b>6.7%</b>	<b>6</b>	<b>10%</b>

Source: Field Survey, 2015

Though most actors had weak formal education background, the study showed that most farmers and processors received various skills and training pertaining to their work from various

institutions and NGOs like RTIP/RTIMP and AEAs. These training and skills received are helping them immensely to keep abreast with current issues but were not as frequent as expected.

### 4.3.2 Financial asset

Famers in the study communities usually sold their produce to processors. Averagely 50kg of cassava is sold between GHC20.00 - GHC50.00 depending on the season. An „Aboboya-full“ (mini-kia - Appendix D) also sells between GHC120.00 - GHC200.00. Farmers also sometimes sold their whole farm produce to a buyer; the buyer then has a period of 1-4 weeks to harvest the produce on the farm. An acre of cassava usually sold between GHC 700.00 - GHC 1,500.00, and this depended on factors such as the season; previous year farm yield; the buyers“ relationship with the farmer; and his/her bargaining skills.

Processors usually had some costs they incurred in their work, Table 4.4 shows cost incurred by gari processors in Mampong and Techiman Municipalities. Gari processors usually roasted between 1-25 sacks of gari/week depending on their capacity, demand of their customers and the season. Averagely, a gari processor roasts four (4) 80kg sacks in a week.

Kokonte processors usually did not incur much cost apart from the price of the cassava roots and peeling of cassava. A processor averagely processed 2 sacks of kokonte per week

Agbelima processors had some cost which is shown in Table 4.5 (below). For large scale processors, processing was usually done in the marketplace. A 50kg sack usually sold between GHC40.00-50.00.

**Table 4.3: Item/activities of gari processing and their cost in Mampong and Techiman Municipalities**

ITEM / ACTIVITY	MAMPONG GHC	TECHIMAN GHC
-----------------	----------------	-----------------

Cassava	120.00-200.00/A	120.00-/150.00/A
Peeling of cassava	18.00/A	10.00/A
Grating/grinding	2.50/Kga	5.00/Kga
Fermentation	*N/A	0.40/Kga
De-watering	*N/A	0.70/Kga
Sifting & Roasting	6.00/Kgc	8.00-10.00/Kgc
Firewood	150.00/T	150.00-200.00/T
Transportation	2.00-4.00/Kgb	3.00-5.00/Kgb
<b>SELLING PRICE (*WS)</b>	<b>120.00-180.00/Kgc</b>	<b>110.00-180.00/Kgc</b>
<b>SELLING PRICE (*RP)</b>	<b>3.00-4.00/O</b>	<b>1.80-2.50/O</b>

\*N/A – Not applicable

\*Kga – 50 kilogram sack

\*Kgb – 80 kilogram sack

\*Kgc – 100 kilogram sack

\*T- Tractor

Source: Field Survey, 2015

\*O – Olonka

\*A – Aboboya

\*WS – Wholesale price

\*RP – Retail price

**Table 4.4 Item/activities of agbelima processing and their cost in Mampong and Techiman Municipalities**

ITEM/ACTIVITY	COST GHC
Cassava	120.00-200.00/A
Peeling	10.00-12.00/A
Grinding	5.00-7.00/Kga
Bagging	2.00/Kga
Transportation	2.00/Kga
<b>SELLING PRICE (WS)</b>	<b>40.00-60.00/Kga</b>
<b>SELLING PRICE (RP)</b>	<b>0.50/cup</b>

Source: Field Survey, 2015

**Table 4.5: Number of sacks of gari, kokonte and agbelima processed in a week**

Gari processed in a week	GARI (80kg sack)	KOKONTE (80kg sack)	AGBELIMA (50kg sack)
<b>MINIMUM</b>	1	1	1

<b>MAXIMUM</b>	25	5	20
<b>MEAN</b>	5	2	5
<b>MODE</b>	4	2	4

Source: Field Survey, 2015

Marketers usually re-bagged the processed products into smaller quantities to sell.

**Table 4.6: Marketed products and their wholesale and retail prices.**

<b>MARKETED PRODUCTS</b>	<b>WHOLESALE PRICE GHC</b>		<b>RETAIL PRICE</b>
	<b>Cost of 80kg sack/ GHC</b>	<b>Cost of 50kg sack/ GHC</b>	<b>GHC</b>
GARI	120.00 – 150.00	50.00 – 60.00	1.80 – 4.00
AGBELIMA	*NA	50.00-65.00	0.50 – 1.00
KOKONTE	70.00 – 140.00	40.00 – 45.00	1.50 – 6.00

\*NA – Not Applicable

Source: Field Survey, 2015

Actors were asked about their access and usage of loans or credits from various sources in the past 5 years. Table 4.7 shows the various loans or credits accessed and the number of people who did so. For all three actors, those who did not access or use any form of loan/credit were in the majority. No marketer accessed loans/credits from friends and family.

### 4.3.3 Social asset

Livelihood asset also looks at the social assets, where it considers the social support one receives or could fall on in times of stress and shocks. Figure 4.3 shows the number of farmers who join farming societies; 13% of farmers in both Municipalities join one farming group or the other, while 87% (157 farmers) do not join any farming society.

From the FGDs it was discovered that most of the actors had support from other groups and societies they joined which was not necessarily their „business/job“ group/society. Some examples were religious groups (eg. Christian Mothers“, Singing band), Youth societies („Jama“ group), football associations. Most importantly, actors also mentioned family and friends as social support they relied on in times of need.



**Table 4.7: Sources of loans/credit, their frequency and percentages for actors**

Sources of Loans/Credit	Frequency	Percentage
<b>FARMERS</b>		
Family & friends	5	2.8%
Banks	21	11.6%
Credit Union	9	5.0%
Microcredits	11	6.1%
Not applicable	134	74.5%
<b>Total</b>	<b>180</b>	<b>100.0%</b>
<b>PROCESSORS</b>		
Family & friends	5	3.3%
Banks	14	9.3%
Credit Union	20	13.3%
Microfinance	15	10.0%
Not applicable	96	64.0%
<b>Total</b>	<b>150</b>	<b>100.0%</b>
<b>MARKETERS</b>		
Banks	17	28.3%
Credit Union	24	40.0%
Microcredits	1	1.7%
Not applicable	18	30.0%
<b>Total</b>	<b>60</b>	<b>100.0%</b>

Source: Field Survey, 2015

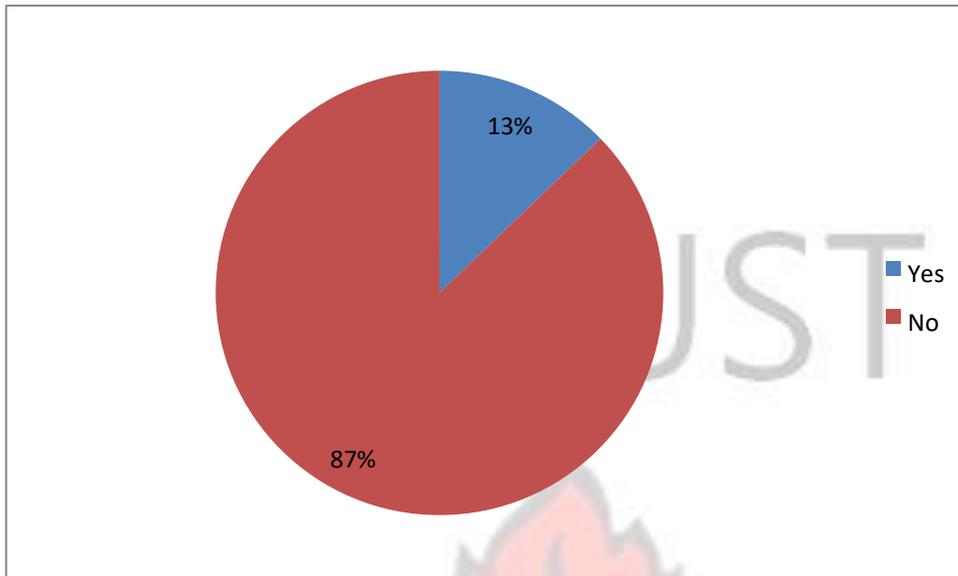


Fig 4.3: Farmers in farming societies  
Source: Field Survey, 2015

#### 4.3.4 Natural asset

One key natural asset available to farmers is land. From the study it was realised that most farmers cultivate about 3 acres of cassava (Table 4.8). The Minimum land under cassava cultivation is 0.5acre with the maximum being 25 acres.

Processors also use certain natural assets such as firewood and water. Firewood is usually purchased in tractor loads. Some processing centers were situated by water bodies to help in their work, while others had to travel over distances to fetch water and even sometimes employed labourers to fetch water for them.

**Table 4.8: Total land and land for cassava cultivation**

	Land size for cassava	
	Total Land size/acres	cultivation/acres
<b>Number of farmers</b>	180	180
<b>Mean</b>	5.84	3.96
<b>Median</b>	5.00	3.00
<b>Mode</b>	4	3

<b>Minimum</b>	1	0.5
<b>Maximum</b>	30	25

Source: Field Survey, 2015

#### 4.3.5 Physical asset

Structures (buildings and sheds) used by actors were considered here. In addition were some tools and equipment used by actors for production. Some of these structures are sheds constructed by NGOs or the Municipal assemblies and are used for a fee, while others are owned by the marketers themselves.



**Plate 4.1: Plate showing sheds used by marketers for trading (Source: Field Survey 2015)**

Some equipments (millers, pressors, roasters) are owned and operated by individuals and processors utilise their services at a fee. Some few centres on the other hand, were owned and operated by a group eg Christian Mothers' group at Asueyi.



**Plate 4.2: Plate showing some of the structures and equipment used by some cassava processors. (Source: Author)**

#### **4.4 INSTITUTIONS AND PROCESSES**

Here, the study identified some structures and processes that mediate the complex and highly differentiated process of achieving a sustainable livelihood. For example, laws/policies at different levels of government and of NGOs; language; social norms and customs among many others.

##### **4.4.1 INSTITUTIONS AND PROCESSES AFFECTING FARMERS**

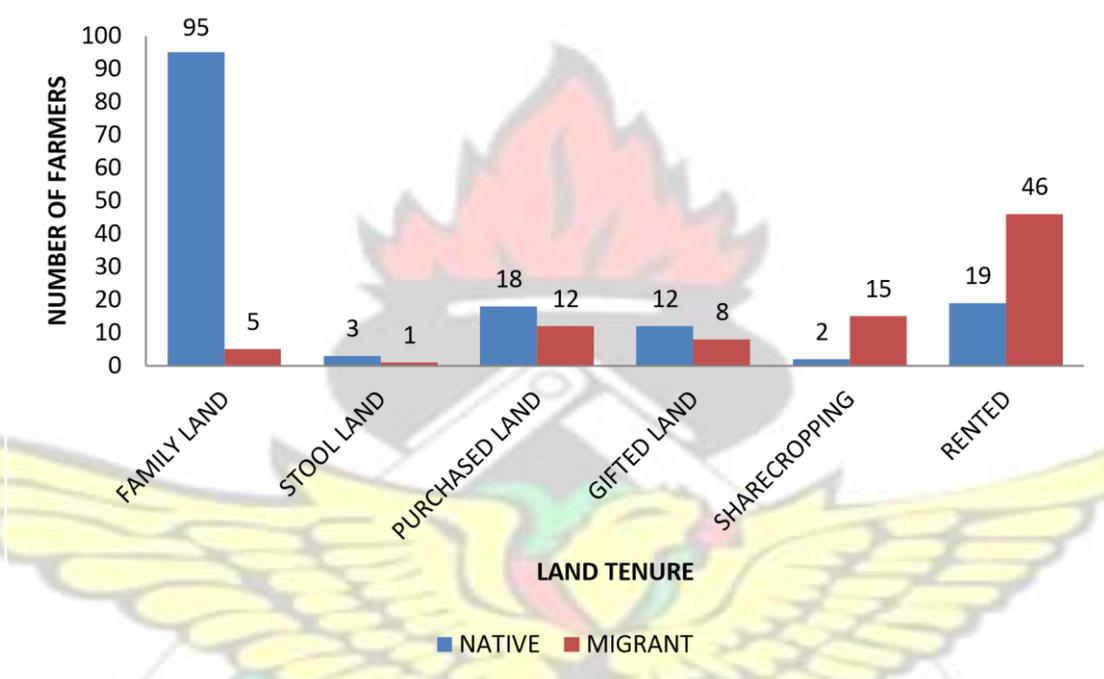
###### **A. Extension and education**

From the FGDs and one-one interviews with respondents, it was revealed that farmers occasionally benefit from the services of AEA, NGOs and MOFA (RTIMP). The training and skills received through these services are helping farmers to be abreast with trends in the farming business.

###### **B. Access and ownership of land**

Figure 4.4 shows the nativity of farmers and access to lands. Most of the lands in the study areas are owned by families. Individuals in the family are given portions to farm on based on their

strength, and finances and his/her standing in the family among other factors. It was therefore not surprising that natives had greater access to family lands than migrants. The second highest type of land tenure was rented land, and from the survey it was noticed that migrants were in the majority (46 farmers) as against natives (19 farmers). The land tenure system with the least number of farmers was Stool lands.



**Figure 4.4: Nativity of farmers and the various land tenure systems; Mampong and Techiman Municipalities Source: Field Survey, 2015**

### C. Cassava cultivars and Sources of planting

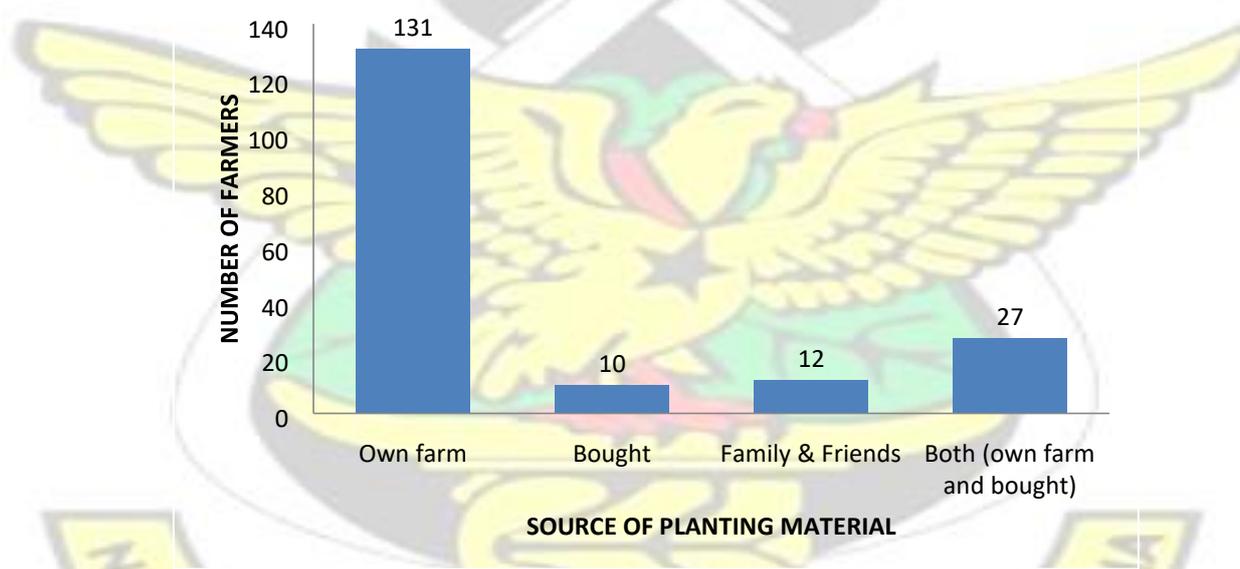
Farmers usually cultivate different varieties based on their purposes. From Table 4.9, most farmers cultivate 2 varieties (38.3%), followed by 1 variety (18.9%).

**Table 4.9: Number of cultivars grown by farmers, their frequency and percentages.**

<u>%</u>	<u>NUMBER OF CULTIVARS</u>	<u>FREQUENCY</u>	<u>PERCENTAGE</u>
	1	34	18.9
	2	69	38.3
	3	35	19.4
	4	14	7.8
	Have no idea	28	15.6
	<b>TOTAL</b>	<b>180</b>	<b>100</b>

Source: Field Survey, 2015

As many as 28 farmers (15.6%) from the 180 sampled farmers had no idea of the varieties they cultivate. From the study, it was realised that farmers usually resort to planting material from their own farms (131) and that only a few (10) usually bought planting materials (Fig 4.5).



**Figure 4.5 Sources of planting material used by farmers in Mampong and Techiman Municipalities. Source: Field Survey, 2015**

#### **D. Formation of societies**

The study further showed that 87% (Fig 4.3 above) of the farmers surveyed in both Mampong and Techiman did not join any farming society.

#### **4.4.2 INSTITUTIONS AND PROCESSES AFFECTING PROCESSORS**

Most processors when asked in the focus group discussion and interviews their knowledge of NGOs and new technologies in processing their products, mentioned RTIMP. According to processors, RTIMP occasionally run workshops for them to teach them new technologies. But this was concentrated on gari processors. Kokonte and Agbelima processors revealed that for the past 10 years and over no new technology had been introduced to them.

#### **4.4.3 INSTITUTION AND PROCESSES AFFECTING MARKETERS**

Most marketers had to pay either a daily or weekly toll in the market. Averagely they paid between GHC2.00-5.00 per week depending on the size of their business. This was different from the monies paid for rent of the shed or space for selling. Others too had to pay security services (watch-man) when they leave their goods in the market-place. Increment in fuel prices and tariffs usually cause marketers to increase their prices since the cost of transportation and storage of their goods also goes high.

#### **4.5 VULNERABILITY CONTEXT**

Vulnerability context strongly influences the extent to which people have access to their assets. This takes into account trends (economic, political and technological), shocks (epidemics, natural disasters) and seasonality (prices, production and employment opportunities).

##### **4.5.1 VULNERABILITY CONTEXT OF FARMERS**

Farmers identified the following as some of the problems that hinder their work.

##### **I. Financial constraints**

One key problem of most farmers is financial constraints. Farmers claimed that it was not easy to access loans to help in their farm work. They further explained that this hindered them in

their work because they could not hire enough labourers to help on their farm thus they are not able to expand their farming lands.

## **II. Pest and diseases attack**

Much work has been done by crop scientist to reduce the number of diseases and pests that attack cassava, yet a few still persist. Farmers made mention of rodents such as grass cutter, rats and insects as major animals who feed and destroy the crops. Occasionally, the crop is attacked by diseases; this usually happen in water-logged areas.

## **III. Inadequate planting materials**

Inadequate planting material (cassava sticks) especially when new varieties are introduced was another problem farmer's raised. Some farmers noted that when new varieties are introduced they do not get access to the planting material early enough for them to use when the planting season begins. They also added that new planting material was distributed in a biased manner thus most of them not using it.

## **IV. High perishability of roots after harvesting.**

Cassava root has a short shelf life of 2-3 days and so cannot be kept for long periods. Farmers lamented the fact that the crop had to stay in the ground (soil) for long periods till one finds a buyer. This ties the land down and prevents the farmer from doing any productive work on the farm till he/she has sold off the farm produce.

## **V. Untimely payment**

The farmers further stated that processors and marketers do not pay back in time for them to re-invest the returns into their farms. Mostly, they are paid in bits and pieces or instalments and so

they are not able to have substantial money for use on farming activities when the growing season begins.

## **VI. Influx in cassava farming**

Generally, cassava farmers have increased; cassava is either grown as the main crop or as a minor crop. This increase in cassava production, has greatly affected the pricing of cassava because production is exceeding demand thus creating surplus in the system. This has led to the process where buyers (processors & marketers) dictate prices for farmers, and farmers are forced to either accept the price offered or leave it unharvested till a good price is offered.

There are situations where market conditions change and farmers run totally at a loss.

### **4.5.2 VULNERABILITY CONTEXT OF PROCESSORS**

Cassava processing according to processors is gradually losing its profitability due to the following reasons;

#### **I. Financial constraints.**

Financial constraint is the major reason for the gradual unprofitability of the cassava processing business. This major factor of production prevents processors from expanding their businesses.

#### **II. Poor technology**

Processors made mention of the fact that the processing methods were very tedious, backbreaking and time consuming. This may include the many hours the processors mostly women spend by the fire roasting gari and peeling heaps of cassava.

#### **III. Marketing**

Some processors were of the view that, because many people process cassava products, they had lost their markets to processors who were stationed in the urban centres. They said

previously, people travelled from far and near to buy their products, but now processors can be found almost everywhere, so their „customers“ to save money rather purchased from those closer to them. They added that there were peak times in the year when their products were sought after, this is mostly in the dry season, when other food crops are not available and so during the other months, they had to sell at highly reduced prices to be able to offset cost and survive in the business.

#### **IV. Poor business environment:**

Some processors claimed that, they had tried to get standardization so as to export or even package into more attractive packages and sell in supermarkets, but the bureaucracy they faced with these institutions was too much and this had made them lose hope in their bid for certification. Their business is thus characterised with raw production and poor packaging. **V.**

#### **High cost of production:**

High cost of inputs was another problem identified by processors. Some of the inputs being, the raw material (cassava), water, fuel wood and labour. Due to the high cost of labour (because of the tediousness of the process). At Mampong, processors usually hire labour only for the peeling of cassava and sometimes for roasting during the peak seasons. Whiles at Techiman, the situation differs as processors hire labourers for almost all the processes. But Techiman, also experiences shortage of labourers during other farming seasons like cashew and cocoa harvesting periods.

### **4.5.3 VULNERABILITY CONTEXT OF MARKETERS**

Some issues raised by marketers were; **I.**

#### **Saturated local market:**

As cassava farming has increased and cassava processors are located almost everywhere, the obvious is the case. Most of the local markets are filled with marketers of cassava products, thus sales are low.

## **II. Poor pricing policy:**

. The sector is highly characterised by price instability. Due to lack of formal regulations the systems experiences lots of fluctuations in prices. Prices are seemingly high during the lean season but marketers are not able to capitalize on it and very low during the rainy seasons which affects them.

## **III. Credit worthiness of customers**

Most wholesalers sell on credit and sometimes they do not get their money back early enough to purchase more goods for sale and even at times the money never comes back (bad debt). This trend goes down along the chain to impact on all the identified stakeholders along the cassava value chain.

## **IV. Poor business environment**

The marketers also raised the issue of standardization and certification to help them export products. Some gari wholesale marketers at Techiman market claimed that previously traders from other countries (Burkina Faso) used to come and buy gari, but for some time now they had stopped coming because the levies they were charged was too high.

## **V. Financial constraints**

Access to and usage of loan facilities is another problem affecting the business. According to the marketers it prevents them from expanding their businesses.

## VI. Fuel prices

Increase in fuel prices, increases the cost of transporting goods into the market. This cannot always reflect in the pricing and so reduces their profits and causes loss.

### 4.6 ALTERNATIVE LIVELIHOOD STRATEGIES

Livelihood strategies look at combining the assets actors (farmers, processors and marketers) can access, taking into consideration their vulnerability context and being supported or obstructed by policies, institutions and processes.

#### 4.6.1 Alternative livelihood strategies of farmers

Table 4.10 indicates that about 78.4% of farmers grow maize, followed by yam (50%) in addition to cassava. The least crop cultivated is groundnut (1.1%) and this is solely in Mampong Municipality. Cashew is also grown solely in Techiman Municipality. It was also noted that about 38% of farmers also doubled up as gari processors (Table 4.11) and only 2% of farmers earned monthly salary. Five percent of farmers did not receive any other source of income and so relied only on income from their cassava farms.

**Table 4.10: Percentages and counts of other crops grown by farmers in Mampong and Techiman Municipality**

OTHER CROPS	MAMPONG UNICIPALITY			TECHIMAN			TOTAL	
	NO.	% within municipality	% of total	NO.	% within municipality	% of total	NO.	% of total
maize	77	85.6%	42.8 %	64	71.1%	35.6%	141	78.4%
Beans	7	7.8%	3.9%	1	1.1%	0.6%	8	4.5%
Yam	34	37.8%	18.9 %	56	62.2%	31.1%	90	50.0%
Plantain	47	52.2%	26.1 %	14	15.6%	7.8%	61	33.9%
Cocoa	10	11.1%	5.6%	17	18.9%	9.4%	27	15.0%

<b>Cocoyam</b>	18	20.0%		3	3.3%	1.7%	21	11.7%
			10.0 %					
<b>Groundnut</b>	2	2.2%	1.1%	0	0.0%	0.0%	2	1.1%
<b>Rice</b>	5	5.6%	2.8%	1	1.1%	0.1%	6	3.4%
<b>Vegetable</b>	11	12.2%	6.1%	15	16.7%	8.3%	26	14.4%
<b>Cashew</b>	0	0.0%	0.0%	12	13.3%	6.7%	12	6.7%

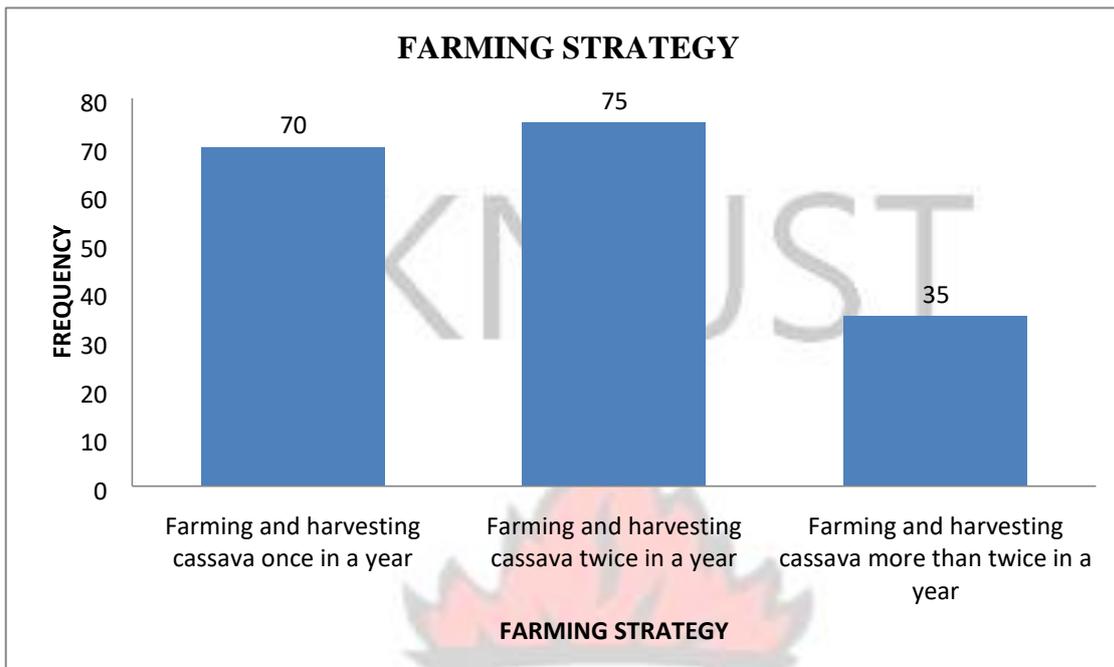
Source: Field Survey, 2015

**Table 4.11. Percentages and counts of other sources of income for farmers in Mampong and Techiman**

Other Municipality sources of income	Mampong			Techiman			Total	
	No.	% within municipality	% of total	No.	% within municipality	% of total	No.	% of total
<b>Remittances</b>	7	7.8%	3.9%	7	7.8%	3.9%	14	7.8%
<b>Trade</b>	14	15.6%	7.8%	9	10.0%	5.0%	23	12.8%
<b>Other crops</b>	60	66.7%	33.3%	80	88.9%	44.4%	140	77.7%
<b>Salary</b>	4	4.4%	2.2%	0	0.0	0.0	4	2.2%
<b>Rearing of livestock</b>	12	13.3%	6.7%	6	6.7%	3.3%	18	10.0%
<b>Processing of gari</b>	48	53.3%	26.7%	20	22.2%	11.1%	68	37.8
<b>Processing of detergents</b>	0	0.0	0.0	5	5.6%	2.8%	5	2.8%
<b>Driver</b>	12	13.3%	6.7%	8	8.9%	4.4%	20	11.1%
<b>Masonry</b>	3	3.3%	1.7%	0	0.0	0.0	3	1.7%
<b>Saw-mill operation</b>	5	5.6%	2.8%	0	0.0	0.0	5	2.8%
<b>None</b>	5	5.6%	2.8%	4	4.4%	2.2%	9	5.0%
<b>Total</b>	<b>90</b>		<b>50%</b>	<b>90</b>		<b>50%</b>	<b>180</b>	<b>100%</b>

Source: Field Survey, 2015

Farmers as a way of ensuring food for their household year round and also to make some income the whole year stagger their planting and harvesting periods. Fig 4.7 indicates that 75 farmers farm and harvest cassava twice in a year, while 70 farmers plant and harvest once in a year and 35 farmers farm and harvest cassava more than twice in a year.



**Figure 4.7: Farmers farming strategies (Source: Field Survey, 2015)**

#### 4.6.2 Alternative livelihood strategies of processors

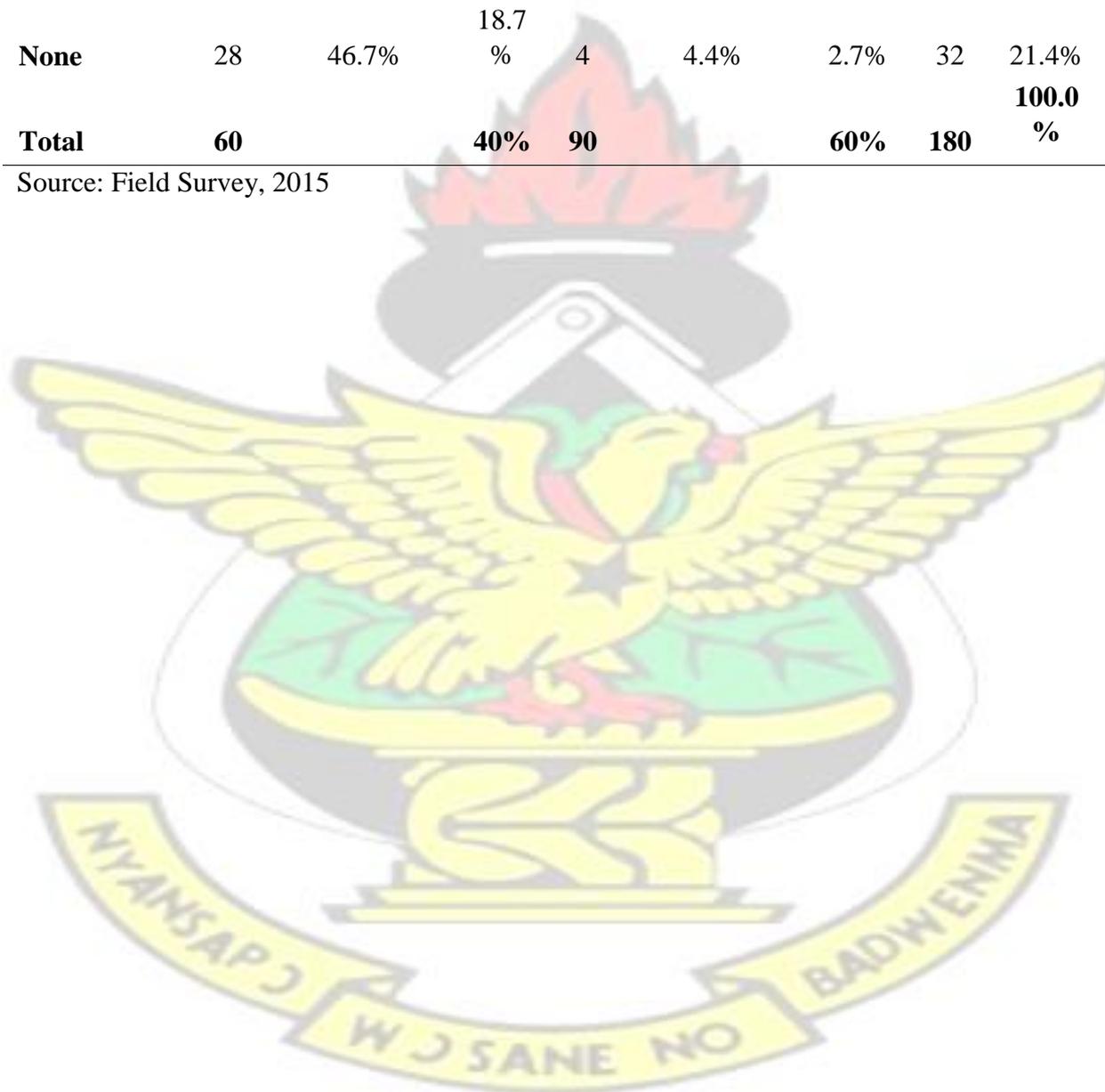
The study also identified various sources of income that supports processors in both municipalities. From Table 4.12, processors in Techiman are in the majority (60%) when it comes to other sources of income. Other sources of income with the highest percentage of processors was trading, with a total of 59.3% of the total processors population engaged in it, while chain-saw was the least with a percentage of 2%.

**Table 4.12: Other sources of income for processors; Mampong and Techiman Municipalities**

Other sources of income	Municipality							
	Mampong			Techiman			Total	
	No.	% within municipality	% of total	No.	% within municipality	% of total	No.	% of total
Remittances	6	10.0%	4.0%	24	26.7%	16.0%	30	20.0%
Trade	12	20.0%	8.0%	77	85.6%	51.3%	89	59.3%

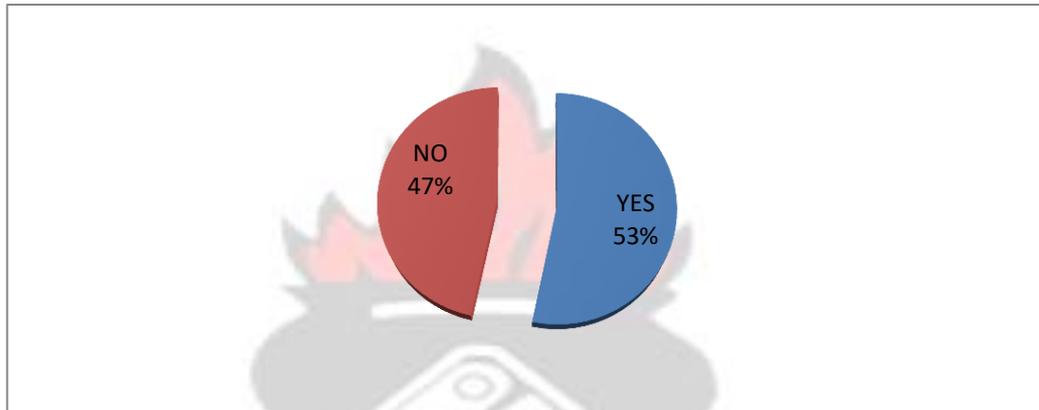
<b>Monthly salary</b>	2	3.3%	1.3%	8	8.9%	5.3%	10	6.6%
<b>Processing of other farm products</b>	1	1.7%	0.7%	59	65.9%	39.3%	60	40.0%
<b>Farming</b>	28	46.7%	18.7	60	66.7%	40.0%	88	58.7%
<b>Driving</b>	4	6.7%	2.7%	3	3.3%	2.0%	7	4.7%
<b>Chain-saw worker</b>	3	5.0%	2.0%	0	0.0%	0.0%	3	2.0%
<b>None</b>	28	46.7%	18.7%	4	4.4%	2.7%	32	21.4%
<b>Total</b>	<b>60</b>		<b>40%</b>	<b>90</b>		<b>60%</b>	<b>180</b>	<b>100.0%</b>

Source: Field Survey, 2015

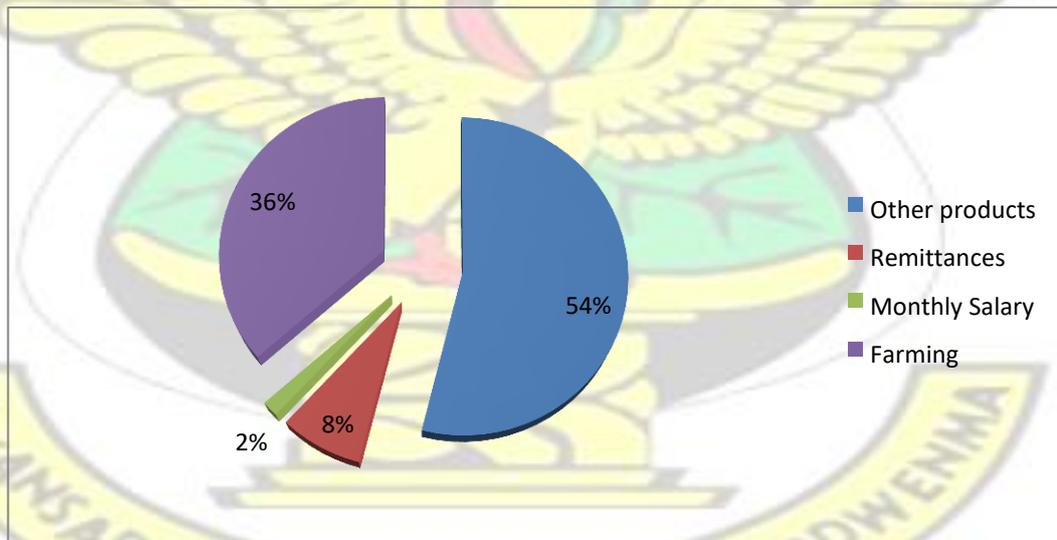


### 4.6.3 ALTERNATIVE LIVELIHOOD STRATEGIES OF MARKETERS

Marketers were asked whether they sold other products or not; figure 4.8 shows that 53% of marketers sold other products apart from their cassava products. Respondents were further asked their other sources of income; figure 4.9 indicates that 36% of marketers farmed one crop or the other, 8% received some form of remittances and only 2% earned monthly salaries.



**Figure 4.8: Percentage of marketers in who sell other products. (Source: Field Survey, 2015)**



**Figure 4.9: Different sources of income of marketers and their percentages. (Source: Field Survey, 2015)**

## CHAPTER FIVE

### DISCUSSION

## **5.1 INTRODUCTION**

This chapter provides detailed discussion of the results obtained from the studies. It further explains the results, its implications and relates it to other studies to explain the cassava value chain identified by the actors, their livelihood assets, key policies, institutions and processes affecting them, the vulnerability context they find themselves and the livelihood sustainable strategies they have adopted.

## **5.2. ACTORS ALONG THE CASSAVA VALUE CHAIN**

According to the Cassava Value Chain Overview (2005), cassava holds the position as a primary food security crop in Africa due to its resistance to drought and disease, flexible planting and harvest cycle, and tolerance of low-quality soils. The report indicated that cassava could remain in the ground for up to 18 months after reaching maturity (or more depending on the variety) and so, is well suited for a region that suffers both environmental and political hardships. These reasons may not differ so much as in the study areas cassava was a major crop cultivated by most farmers. There are various stakeholders in the cassava value chain and these stakeholders belong to either one sub-sector use of cassava or a combination of sub-sector uses. Westby (2008) reported that 88% of cassava produced in sub-Saharan Africa was consumed by humans with 50% of it being processed. Likewise in the study areas, almost all cassava produced was consumed by humans with about 69% being processed into gari, agbelima or kokonte. Cassava peels was used in feeding livestock. Farmers, processors as well as marketers in the cassava business have seen a major twist over the years which perhaps encourage their continuous interest in the cassava business. Actors unanimously, attested to the fact that processed cassava had more monetary value than sale of raw roots. Nweke (2004) reported that four major factors have driven cassava's transformation from a lowyielding, famine-reserve crop to a high-yielding cash crop. Chief amongst them was the IITA's new high-yielding Tropical Manioc Series (TMS) cultivars which increased cassava yield by 40% without

fertilizer application. This was however a minor contributor in the study areas as it was discovered from the study that even though yields had increased over the years, it was more associated to the fact that the number of cassava farmers had increased over time and thus land under cultivation had also increased consequently increasing yields.

This rather confirming Ragas & Byerlee (2012) report that agriculture output in Ghana for that matter cassava output growth was more of expansion of cultivated areas. Generally, farmers accepted Nweke's (2004) fourth reason that solving the cassava mealy-bug epidemic had rather increased the crops attraction and thus its production. Actors also added the longevity of processed cassava as another reason for processing. Though the fresh cassava has a short shelf-life, actors attributed its ability to stay for longer periods after processing as a factor „pulling“ people into the business. This factor made some farmers“ double as processors, because in extreme situations the storage root could be processed especially into gari and sold for a higher price or even stored for longer periods to feed the household. Pa

Mike, echoed the point by saying *“Now there are no jobs, but at least when I farm the cassava I can sell some, use some to feed my family and with the help of my wife process some into gari for sale.”*

Cassava production in the study areas is characterised by small-large scale farmers. Farm size under cultivation ranges from 0.5 to 25ha. The small-scale subsistence farms (0.5-1ha) are not many in these areas and their farming practices are the typical mixed farming, strategically a good livelihood option. They usually intercrop with maize, yam, plantain, vegetables among others. The farmers who plant for commercial purposes (large scale) usually have between 1-25ha. Though farmers are aware of new cultivars, only a few adopt the use of improved high yielding varieties like Tek bankye, Afisafi, Agric bankye, Bankye hema and Essam bankye among many others. Nepotism in the distribution of new cultivars to farmers coupled with delay in releasing cultivars to farmers according to farmers accounted for them not cultivating

most of the new cultivars. Another cause was that most farmers did not join any farming association, were they could share and exchange ideas and have assistance from extension officers also confirming the low adoption rate by Owusu & Donkor (2012). None of the farmers supplied to any of the processing companies even though they had heard about some of them. This was because they claimed they had not been approached.

In the study areas and thus Ghana in general, cassava is mostly processed into traditional food products (fufu, gari, kokonte, agbelema) at household and micro processing centres. While agro-based industries also processed cassava into improved food products like Gari, the industrial products at the SMEs and large scale centres are mostly industrial starch used by food processing companies, textiles and brewery companies. In both Municipalities, the main processing product from cassava was gari. This was because consumer demand for gari had increased not only by rural households but also by urban households and even international markets (Burkina Faso and Benin). Also, the use of mechanical grater which had reduced labour especially for the female had made the business attractive. Other reasons were that gari could be kept for longer periods when stored well. Furthermore, and most importantly, returns from gari processing were higher than other forms. Vanhuysse (2012) reported that processors can make approximately 50% profit from producing and selling gari and this is also re-iterated in Kleih *et al.*, (2013) where it was reported that processors preferred producing gari because the profit margins were better than other forms of processing. It was realised that most people in the communities processed their own kokonte and agbelima for family use, thus those who processed it usually targeted people from outside the communities" most especially urban dwellers who usually do not own farms. There are only a few people actively involved in kokonte processing; this is because some see it as an additional benefit along the processing chain. Usually, farmers and/or gari processors used the cassava pieces after selecting the good ones for the market or left-overs after sieving for processing kokonte for family usage. Most

agblelima processors processed their products in the markets. This was because it was easier and better to process in the market because of its bulkiness and also it reduces cost. These turned out to be the wholesalers, who then sell to other marketers in the market who retail.

Processing of cassava took place either in the household, micro processing centres, smallmedium and large scale processing centres. Gari processing happened to be the most tedious among the three types of processing. In Mampong, the gari processors mostly performed all the processes on their own (with occasional help from family and friends), this could account for the low productivity of the people compared to Techiman. Labour is hired to help in the peeling of the root so as to finish on time. The roots are grated mechanically and the processor sieves and roasts the grits by him/herself. Labour is hired for roasting during the peak season and when the processor has a lot to roast. On the other hand, in Techiman, almost all the gari processes are hired out with the processor playing a supervisory role and helping out occasionally. This could be as a result of a high variety of livelihood options in Techiman, thus most of processors have other jobs to fall unto (discussed further in Livelihood assets).

Storage root marketers usually turned the roots into kokonte after a few days on the market due to its perishability. Kokonte marketers sometimes supplied to some wood companies who used it as a binder. Gari was the most marketed cassava product. Both locals and foreigners (Burkina Faso, Benin) bought on wholesale to sell in other places. Most wholesalers now said business had decreased. Aunty Abena stated that: *“Previously people used to come from all over to buy from us. Those from Burkina Faso used to come and load their trucks to the brim, but now they no longer come. My customers claim that they’ve been asked to only buy to some level and not to over-flowing levels as they used to and that was not profitable for them because they had to pay a lot of duties on the road.”* Maame Konadu also added that *“Now everyone is*

*processing gari. Initially, only a few towns used to process and sell gari, but now everyone is doing it so our market has really gone down.”*

In the various processing of cassava products (Appendix C), labour is sort for each of the activities. This has created a chain of various actors along the cassava business including transporters, mechanical operators, peelers washers, roasters among others.

Among other things the actors in the value chain face constraints including: underutilization of cassava roots in the improved food channel because of weak linkages between actors in the chain to deliver cassava within 24 hours, lack of industrial production channels to use up the many raw materials produced, inadequate input supply, weak extension services, lack of access to credit for operating and expanding enterprises, low efficiency of processing enterprises, and the non-commercial orientation of many farmers and processors in the study areas.

### **5.3 LIVELIHOOD RESOURCES/ASSETS**

#### **5.3.1 Human asset**

Traditionally, cassava was considered a “women’s crop and so left in the care of women to grow and supplement the households” food or process for commercialization. However, COSCA studies showed that both men and women now cultivate cassava, and that the population of men have even increased in cassava production, processing and marketing due to the transformation on-going in Africa. This study showed that women were in the majority for both processing and marketing with them even being the sole actors in marketing emphasising works done by Ezedinma *et al.*, 2007; PIND, 2011 and Muhammad-Lawal *et al.*, 2013. This shows that there is still a bit of tagging cassava as a “women’s crop” most especially in its marketing. Lewis (1995), described women in under-developed countries as “beasts of burden” because they were used to execute tasks which in more advanced societies are done by mechanical power. But gradually there is being a break-through especially in cassava

processing. This could also support the fact raised by Nweke (2004) that men come in when the business (activity) is highly profitable. Men tend to capture benefits of mechanization as also stated by Martin *et al.*, (2008) and Adebayo *et al.*, 2008, and this usually underscores the need to empower women to acquire machinery and also train women in use of machinery.

The study also showed that averagely, actors were about 43-44 years of age. This shows that most actors are still vibrant (active working age) and have more years to work before retiring if they want to at the age of 65 years (since there is basically no retirement age in farming). But this also shows that most of those engaged in cassava production, processing and marketing are in the middle aged group (the mode also confirms it; 45 for farmers and processors, and 51 for marketers). It was realised that benefits from cassava business may not be enough for the active youth therefore it was left for the middle age. Most people interviewed also added that working with cassava was very tedious and back-breaking, this could be a major factor deterring the youth from engaging in it. Aunty Frema stated that, *“I used to farm cassava and process it into gari and kokonte but it has been more than 6 years now since I did that. My back used to ache a lot, the smoke from the fire too kept hurting my back, I just couldn’t stand it any longer so after my last born finished Senior High I have stopped and now I sell a few items, even though it is not as lucrative as the cassava business.”*

Also, quite a number of actors had no form of formal education. This number was quite high in farmers and low for marketers. However, farmers and processors received occasional training from AEAs and NGOs to help boost their work. Actors also learned new techniques amongst themselves and sometimes tried new ways of doing business.

### **5.3.2 Financial asset**

Most farmers sold their cassava to processors or processed them themselves. Averagely, a farmer made between GHC700.00-1,500.00 from an acre of cassava crop. This price hugely

depended on the season (dry or wet), which also showed whether other food crops were in abundance or not. The price also depended on the farmers own estimation from previous harvest on that same piece of land; the farmer usually harvested a few to check the size and quantity per stand. This to a large extent showed the farmer what is to be expected from the harvest. This method could sometimes be a disadvantage to the farmer since the buyer on harvest might make a much bigger harvest than what the farmer expected, but since the price has already been agreed on, nothing can be done. Papa Ato *“Some seasons the prices are good, but most times I just sell off to make an income. Even then I am not paid ready cash (full price); it is mostly paid in instalments,”*

The price for a sack or a bowl of processed cassava usually depended on the size, the quality of and the season. In general prices of processed cassava are usually high during the dry season when other crops are scarce. For instance, a bowl of kokonte sold for GHC1.50 could go as high as GHC3.00 during the dry season. Also, when schools most especially Senior High Schools re-open (August-September), prices of gari shoots up because a lot of students purchase it.

From the study it was realized that for all the actors more than half of them did not access/use any form of loans/credit. They stated high interests as a factor that prevented them from taking loans. Marketers were most likely to access or use loans from banks or/and Credit Unions. This is because the seasonality in marketing is not as high as the other actors.

Processors were most likely to access loans from Credit Union. They made „susu“ (a form of daily/weekly saving) with these credit unions and so it was easier for them to access loans from them and this also applied to marketers. The farmers“ usage of loans/credits was somewhat linked to their association with a farming society or not. Mr. Agyapong a cassava farmer said that, *“We used to have a farming association and that allowed us to access loans together, but*

*when some members defaulted in the payment and thus made the payment of the loan very tedious I vowed not to join such associations. But on my own I am not able to meet the requirements for accessing loans.”*

### **5.3.3 Social asset**

These are most often intangible assets, but go a long way to help one achieve or obtain other assets (both tangible and intangible).

Most farmers preferred not to join any farming society because they claimed it was a waste of their time and resources since other previous associations with other farming societies had not yielded the expected results. On the other hand, those who joined one farming society or the other said among the benefits they received were technical knowledge; education on issues such as savings and educating their wards; planting materials of new varieties and common access to loans. Those who did not join any farming society argued that there were usually defaulters in a group loan and thus the committed members were left to pay those debts. Farmers’ low participation in farming society could also be a major reason for their low adoption of new varieties. Ragas & Byerlee (2012) reported that Ghana’s adoption rate and variety turnover index were 36% and 12 years respectively and this comes after much effort has been put in by both government and non-governmental agencies.

Processors also sometimes joined agro-processing societies that helped them learn new technologies that could help them in their work.

Even though actors did not actively participate in the „work-oriented“ groups or societies, most actors stated that they joined other societies or groups which also rendered one form of help or the other. Aunty Ekua attested to this fact by saying that *„When I lost my husband the church, most especially the singing band was there to support me. They even helped me start my*

*business*'. Mr. Amponsah added his voice, by saying that „*When I had an accident and couldn't go to my farm, the Susu (Small savings) group I joined helped raise funds for me to hire labourers to weed my farm for that season*“.

Another most important association actors identified with was family and friends. This they mostly confirmed was one, none could live without. Even though some had bad experiences with family due to land issues, they still accepted the fact that family was an important social support. This also emphasises Nicholls *et al.*, (2013) report that healthy communities were crucial to sustainable agricultural systems.

#### **5.3.4 Natural asset**

The minimum land size for cassava cultivation is 0.5acre. This shows that there are some who are still indulged in subsistence farming. Also, because most of the lands are family lands and not easily sold out this makes it difficult for farmers to own and farm a lot of lands. Some farmers also cultivated on commercial basis with some farming 8, 10, 12 and 25 acres of cassava. Such farms are usually owned by gari processors who farmed to feed their factories. Examples are Asuogya agro-processing at Asueyi in Techiman Municipality and Josma Agro-industries at Woraso in Mampong Municipality. Most farmers also farmed about 3 acres of cassava to feed medium-small factories.

Processors use water and firewood (gari) in their work. Most processing sites are set besides a water body to make it easier to access water. Water is used to wash the peeled cassava roots and equipment used. Processors who process from home and are not situated near a water body have to fetch water from other places. This compels some processors not to wash the peeled roots before grinding. The commonest form of fuel used by processors (gari) is usually fuel wood (firewood). Most of them purchase from wood mills or chainsaw operators. Increasingly, firewood cost has gone up because of gradual deforestation in most of these areas.

### 5.3.5 Physical asset

Most farmers usually use planting material from the previous harvest or source some from family and friends. This has greatly led to the low adoption of new and higher yielding varieties (Dankyi & Adjekum, 2007). Most farmers in the study supply to the processing (gari) sites in the area and so they cultivate varieties that are suitable for processing. From the study it was gathered that most common varieties grown in Mampong were Esaam bankye, Dabour and Afisiafi. Others were Tech bankye, Nkabom and Bankye hema among many others. In Techiman the most common varieties were Benserem and Wenchi bankye. Others were Bankye korkor, Esaam bankye, Tech bankye and bankye pona among many others.

Most of the processing factories have sheds under which they roast the gari. With the aid of RTIMP some of the gari processing sites have been improved on with better sheds and frying pans for roasting the gari. Most of these are used as Good Practice Centres (GPCs) where other processors go occasionally to learn new technologies. In this regard much can be done since there are still many gari processing sites which need improvement. For kokonte, most processors dry them on mats in their compounds or on raised structures. Others also dry them besides the road and this also serves as a form of advertising and marketing. Agbelima processors as explained earlier usually process in the market and they usually have sheds they keep them under.

Most marketers have sheds under which they sell their produce. These sheds are usually rented and paid for daily, weekly, monthly or on yearly basis. At Techiman market, the marketers/traders are grouped based on their products/wares thus making it easy to locate them, while in Mampong market the marketers are scattered in the market.

#### 5.4. KEY INSTITUTIONS & PROCESSES

Functional institutional processes help promote businesses; primarily they are to build competitive, market-driven and inclusive service delivery supported by relevant, effective and sustainable delivery mechanisms of services easily accessible by the various actors especially the rural poor.

MOFA (RTIMP) for instance over the years has been implementing various policy frameworks. Some of the activities it has undertaken include; Information, Education and Communication; linking small producers to larger scale market and promoting new uses of R&T growers, processors and traders; strengthening of formal and informal organizations of farmers, processors and traders; support to R&T commodity chain partnership; and policy dialogue. Whereas these frameworks exist in the institutional body, the supposed beneficiaries find it difficult to carry out activities. They are confronted with series of issues now and then. It was no wonder various actors along the cassava value chain in the study areas identified some structures and processes which to them should mediate the complex and highly differentiated process of achieving a sustainable livelihood, but was not matching up to its potentials. It seems policies exist in isolation from the people they are meant to affect, this WAT (2013) explains as having a good policy is not enough because policy consistency is critical since once investments are made, there are sunk costs. The report further explained that no country in the African Region has yet demonstrated the ability to develop and consistently implement a strong industrial policy. Unless this capacity to formulate and implement policy and a political will to see it through is developed, a cassava-based industrialization dream will remain just that; a dream.

However, there are some institutions such as, MOFA (RTIMP) and CSIR-CRI trying to offer their professional touch to the cassava businesses.

Extension and education are occasionally given to stakeholders to improve on their production capacities. This was evident from the research as respondents explained some benefits from the services of AEA, RTIMP and some NGOs. These benefits include education on book keeping, account operations, learning new technologies and marketing among many others. Most processors revealed during the FGD and interviews that RTIMP occasionally runs workshops for them on new technologies but the concentration was mostly on gari processors and even there some communities did not benefit as others did. Agya Appiah said that, *“In this community we do not have any Good Practice Centre (GPC), so occasionally we are taken to Woraso to learn new techniques. I have gone just once because it means no gari production for that day and I just cannot afford not to produce a day because then I would not be able to cater for my family”*. Kokonte and Agbelima processors revealed that for the past 10 years and over no new technology had been introduced to them. The frequency with which the services are delivered stand to be the problem. For instance, the Farmer Field Fora (FFF) instituted by RTIMP as a platform for innovation and sharing of knowledge and experience by farmers, researchers and extension workers, may need some reviewing. This is because farmers’ rate of adoption of technology and new cultivars are very low to the point some farmers do not even know the cultivars they cultivate. Nevertheless, farmers involved in the FFF are learning to improve the productivity of their farms. Another problem could also be that farmers are stuck to their old ways of doing things that it will take a lot more time to get them to adopt new technologies supporting Owusu & Donkor (2012)

report.

Land as a factor of production plays a major role in the development of cassava business. The tenure system governing access and ownership of land in the study areas are simple; these communities are traditional communities with lineage, it was no news natives tend to have access and own land than migrant farmers. Most migrants had lands based on the rented system

or sharecropping. Just a few migrant had family, gifted or stool lands. For sharecropping and rented lands the farmer did not have much right over the land. The land owners usually dictated what could be grown on the land, thus one could not grow any perennial crop on the land unless granted to do so. Also, since they had to account for the land each year, crops could not be left on the land for a protracted time, thus they were forced to sell their crops yearly even if the price was not good. Whereas, those who had gifted, family or stool lands could leave their crop (cassava) on the farm for months till the price was good enough. Kwaku Musah said *“The land I farm on is not mine, each year I have to pay a minimum of GHC 100.00 to the land owner. I just cannot afford to let my crops be on the farm for a long period.”*

Since its general acceptance as one of the staple crops cultivated in most parts of Ghana and Africa, different varieties of the crop have been developed for different uses. The introduction of improved varieties has really improved the cassava business. IFAD has instituted cassava programs in Benin, Ghana and Sierra Leone which seek to improve yields. In Ghana it has established farmer schools focused on teaching groups of farmers (mainly women) how to plant new varieties and at the same time getting commitment to the participants that they will pass on their knowledge to other farmers in the community (IFAD, 2004). Most of the farmers in the study areas cultivate not less than two cultivars though due to low extension services some farmers are not able to adopt new cultivars. Information dissemination when it comes to new varieties of cassava is not encouraging as farmers reported the process is highly distorted by politics, nepotism and high cost of planting materials. This according to farmers account for them using planting materials from their own farms, family members and or purchasing from colleague farmers rather than from the breeders’/extension officers. With the introduction of high yielding varieties, it is expected that farmer income may also increase but this is dependent on the availability of market. This actually was one issue the cassava+ programme sort to

implement. Cassava+ a public-private partnership financed by the Netherlands government and implemented by the Dutch Agricultural Development and Trading Corporation (DADTCO), IFDC aimed at shifting cassava from its current status to a cash crop by creating stable markets to reduce uncertainty and thus induce farmers to produce more cassava for processors and the larger market. But unfortunately, most of the farmers in the study areas had not heard about them.

With all these efforts by various stakeholders toward the development of the cassava business, one issue that came out during the research was the stance vehemently taken by farmers, processors and particularly marketers not to commit themselves to associations/groups. The benefits attained from belonging to societies are more and very helpful especially in our local setting where formal education is low and sourcing funds from financial institutions and information on individual basis very difficult. That notwithstanding, some respondents shared their bitter experiences of belonging to societies. One common theme running through was issues to do with loan repayment. It was revealed that most often than not there were defaulters from group loans and the defaulters' share of the monies are shared among the other members to pay. This situation deemed unfair has been one major reason people shy away from societies. This has become a challenge for extension officers and researchers to discharge their duties, especially when it would require gathering and disseminating information.

## **5.5 VULNERABILITY CONTEXT**

Poor people generally live in conditions that are vulnerable within this epoch of trade and globalization shocks from the social and cultural network as well as unstable market prices, depleting natural resources and climate change issues. An ideal situation for the poor is to be able to access the livelihood assets they require. And these assets being adequately supported by good institutions and enabling agencies, accessibility to markets and funds as well as rules and norms that work to their advantage. This would go a long way to help them cope with those

elements of their vulnerability context which they have minimal or no control over. Strongly, their vulnerability context influences the extent to which the poor have access to their assets. This takes into account trends (economic, political and technological), shocks (epidemics, natural disasters) and seasonality (prices, production and employment opportunities).

Understanding the vulnerability context as all-inclusive for the poor, but mediated by the interaction of the other elements in their livelihoods, emphasizes the responsibility of development interventions to help the poor to cope with vulnerability factors.

To a large extent, the indigens of the study areas have access to land for cultivation but this does not put them in any different category from the migrant farmers who sometimes congregate at the marginal lands. For better lands to farm as a migrant, one must rent or buy. The poor conditions existing outside the farm land affects all manner of persons. Human development skills or societal infrastructures within the communities need to reduce the level of risk; include development of institutional, financial, political and other resources such as technology at different levels and sectors of the society which are woefully inadequate. For development to reflect in the real life of the people, access to basic infrastructures must exist as these facilities propel many human developments.

Within the vulnerability concerns are: shocks, adverse trends and unfavorable seasonal patterns affecting livelihood of farmers, processors, marketers and all the identified actors along the cassava value chain. All these concerns have major impacts on capital assets of stakeholders and consequently on their abilities to generate incomes. With all these factors at work, their key attribute is that they are not inclined to the control by the stakeholders themselves. Therefore, much must be done to improve the facilities. Mondal *et al.*, (2012) points out that it is important to identify means by which negative effects of the vulnerability context can be minimized including building greater resilience and improving overall livelihood security. All

the actors' vulnerability contexts are grouped under shocks, trends, seasonality and changes to make discussion better.

**Shocks:** Shocks in the form of extreme climatic events e.g. floods or droughts in cassava farming communities are destroying assets. Other disasters (bushfires) can also have significant impacts on natural resources or environmental sustainability on which a farmer's livelihood heavily relies. Sometimes, the crops are attacked by pest and diseases, causing a fall in yield and thus income. Sudden illness of a farmer or a processor, diseases in cassava farm all shock and make the cassava business tedious. Poor farmers are especially vulnerable as shocks can force them to liquidate assets. Processors and marketers for now are not that heavily burdened with climatic shocks it might seem. But they are affected by physical shocks such as the death of a relative or the burning down of a processing site or market. Some processors and marketers had shared how the death of a relative could bring their businesses down because they had to sometimes take loans to perform a befitting burial ceremony for them. These loans usually weighed them down and could even lead to the collapse of their businesses.

**Trends:** Actors in the cassava value chains' (farmers, processors, marketers) livelihoods can be made more or less vulnerable depending on long-term trends. Climate change is impacting on agriculture in general and with the current trend of changes in climate conditions, farmers especially are going through series of adaptations. This situation is reducing the arable land available for farmers and increasing farmers cost. As poor farmers' access to local natural resources declines, they are forced to use more less sustainable measures. But this does not really affect cassava farmers, since the crop is a hardy crop and can resist „tough times“.

However, financial constraint was one major issue that affected all actors (farmers, processors and marketers). This ranged from low access to loans through high cost of production to poor pricing policy and late payment or/and non-payment of goods. Most actors complained that finance was an issue that prevented them from attaining their full potential, since their

businesses was also hinged on the credit and the credit-worthiness of the client. But often than not clients/customers default and they (actors) are left in the red.

Others also, complained about the way their goods/products are priced. There is usually no policy or rule guarding the pricing of products and since the customer usually goes for the cheapest they are always indirectly forced to beat down their prices to be able to compete on the market.

Most processors especially gari processors explained that the processing methods were very tedious, back-breaking and time consuming. Serwaa said *“To make a bag of gari, one has to stand on her feet from morning to dusk. I am so tired that I do not even have the energy to cook to eat when I get home. And I even come here on weekends to roast gari.”* Akosua also said that *“The smoke from the stove really affects our eyesight. With time, we are not able to see clearly.”*

**Seasonality:** Various types of seasonality stress emerge in the cassava business. Seasonal shifts in cassava farming for that matter the whole cassava value chain are one of the greatest and more enduring sources of hardship for poor actors. The livelihoods of the study communities are predominantly natural resource-based livelihoods as such subject to seasonal cyclones of stress. These people rarely have protection against seasonal stress. For instance, cassava is under no price regulatory body as such prices are basically in the hands of the traders. From farmers account, they sometimes would have to leave the cassava on the field for almost a year and over, not because they do not want to harvest, but they realize they cannot even break even with the price being offered. Nevertheless, it is during the lean season that price of cassava is good. If this is the issue with farmers who own their land, what would the story be for the other farmers who rent land.

For processors, there are seasons when getting raw materials is difficult, this is especially in the lean season when harvesting cassava is very difficult. This causes cassava price to rise

benefiting farmers. According to processors, market is still good during this period because other staple crops are scarce and very expensive on the market favoring cassava products especially gari.

Another issue is that of certification and standardization to be able to directly export goods/products or sell in more prominent markets like the supermarkets.

**Changes:** Cassava over the years have received a lot of good publicity especially in rural areas thus prompting most people to join in. Actors along the value chain have greatly increased over the years not only in the study communities but across Ghana. These influxes of farmers, processors and marketers have saturated the cassava market making sales low.

## **5.6 ALTERNATIVE LIVELIHOOD STRATEGIES**

### **5.6.1 ALTERNATIVE LIVELIHOOD STRATEGIES OF FARMERS**

Farmers usually apart from growing for the market (money) also grow crops that supplement the household food (nutrition) and this was not so different in the study areas. These crops are either intercropped or solely cropped. Some crops grown in the study areas are maize, beans, yam, plantain, some vegetables, cocoa, groundnut, rice and cashew. The maize crop was one of the crops grown in large quantity by farmers; more than half the farmers in the study areas cultivated it. Some grew it as an inter-crop; the maize crop is grown and the cassava grown in-between them. After the maize has been harvested (3 months) the cassava continues to grow till its maturity. The maize crop (a sack of maize) is sometimes used by farmers who rented their land used as payment. Beans and groundnut were crops cultivated mostly by farmers in Mampong Municipality. Cashew was one crop grown mostly in Techiman, but not grown at all in Mampong. There is even a big market in Techiman for cashew, with Ghana Nut Company situated in the Municipality. Both cocoa and cashew sell at GHC 350.00 per 50kg bag. Also, farmers strategized by engaging in other economic activities or sourcing income from other avenues. Some felt that they had much time on their hands after their farm

work which was only involving during planting and harvesting seasons and so they could do other jobs to supplement their incomes. From the study it was realized that more than a third of the farmers interviewed doubled up as gari processors. This was because most farmers attested to the fact that sale of raw materials (roots) did not earn as much as sale of processed goods. In Techiman, some of the women had been taught how to make detergents by some NGOs. Others also stated that unlike the farming that gave them money during harvest or certain times in the year, cassava processing provided them with money the whole year round. This was to help alleviate them from poverty. These women processed detergents from palm oil and this also supplemented their livelihood. Other sources of income were remittances from family and friends, trading, cultivation of other crops, monthly salary, rearing of livestock, commercial driving, masonry and saw-mill operation. About 5% of farmers interviewed did not have any other source of income. Some farmers also adopt the trend of “staggering” the growing and harvesting of cassava, such that they grow at different times on their lands to ensure an all-year round harvest. For instance, Agya Bonsu says *“I have 3 acres of land for cultivating cassava. I first grow on 1 acre and then after 6 months grow on another 1 acre and then grow on the last acre in the following year. This way when I start harvesting I can harvest the whole year and then as I harvest I re-plant the land. Thus, I always have cassava.”* Cassava can be left in the ground for two to three years without harvesting (WAT, 2013), this, most farmers take advantage of and leave their roots in the ground till the prices are good. This however sometimes have detrimental effects on the root as it becomes fibrous and sometimes even begin to grow again. Also, the land which is a key asset to farmers cannot be left fallow for long periods of time since the longer it is left fallow, the more money is lost.

### **5.6.2 ALTERNATIVE LIVELIHOOD STRATEGIES OF PROCESSORS**

As many as 21% of the processors interviewed did not have other sources of income. This, some claimed was because processing of cassava product (mostly gari) was very tedious and time consuming and so did not afford them the time and energy to engage in other economic activities. Others also claimed that they did not have any other skill, while others said the job opportunities in their communities were very limited. Rose in Kyirefamso said *“In this community if you do not have money to process gari, you then either hire out your services for peeling the root or you sell at the toll booth.”* Others processed other farm produce such as palm oil and detergents. About 20% of processors received remittances from family and friends. Most of them due to economic hardships have spouses who are in other communities who send them money on monthly basis. Others received money from their children who were now older and working in other communities. About 87% of processors in Techiman were involved in trading activities compared to 20% in Mampong. This could be because Techiman has a big market, which most processors take advantage of especially during market days on Wednesday and Thursday. This market attracts people from both within and outside the Municipality and region and even international market. Mampong market on the other hand by virtue of its position does not have such an advantage. Other economic activities engaged in by processors are driving and chainsaw operation.

### **5.6.3 ALTERNATIVE LIVELIHOOD STRATEGIES OF MARKETERS**

More than half of the marketers sampled sold other products apart from their main cassava product. Some of these were complementary products; for instance, agbelima sellers usually sell corn dough, okro and palm oil. Storage root sellers sometimes sell plantain and cocoyam. Some other products are vegetables, groundnut paste, yam, charcoal and salted fish. Some marketers also engage in jobs that earn them monthly salaries, while majority engage in

farming activities. Figure 5.1 summarises the livelihood analysis of the actors studied into a livelihood framework.

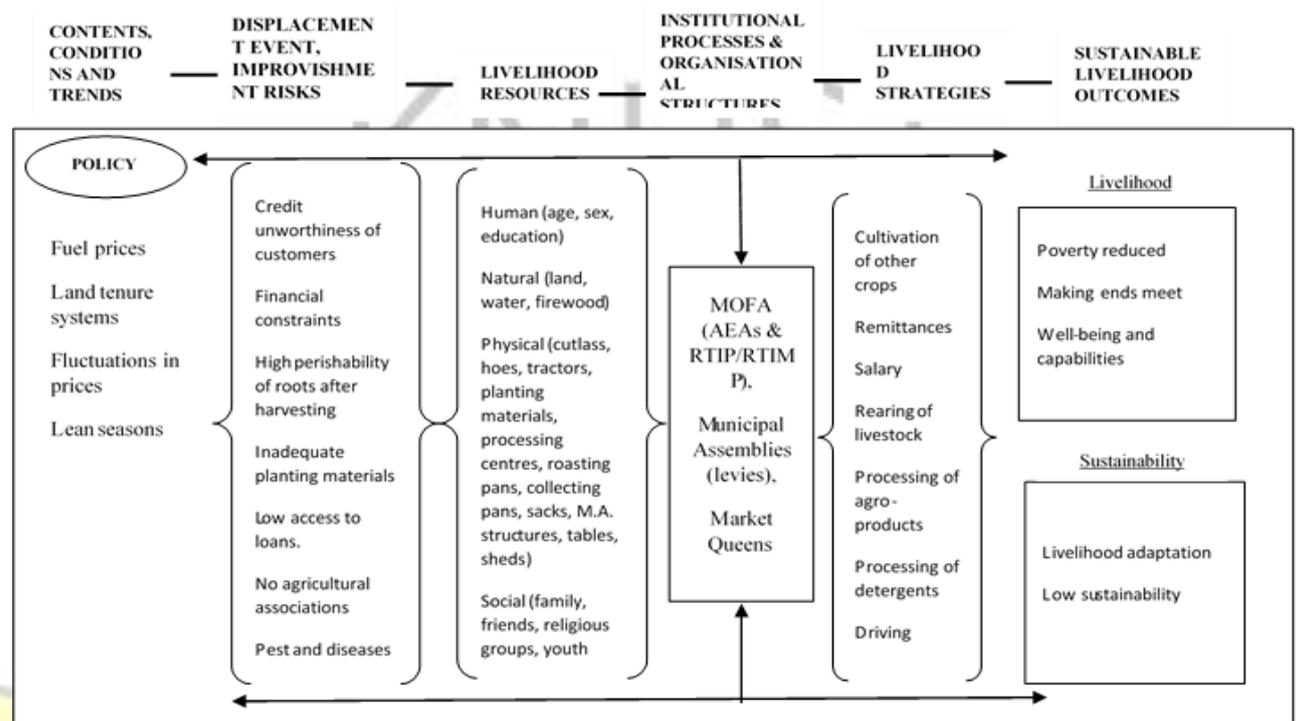


Figure 5.1: A Sustainable Livelihood framework of the actors studied  
Source: Adopted from IFAD (2002) livelihood framework

## CHAPTER SIX

### CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 CONCLUSION

The main objective of the research was to assess the livelihoods of some actors in the cassava value chain. Both quantitative and qualitative data was collected from three main actors of the chain as follows 180 farmers, 151 processors and 60 marketers.

One important aspect of a livelihood analysis is not to see the participants/actors as empty. Thus it was prudent to first identify what they have and how best it can be harnessed to help them. The study showed that the various actors had some levels of assets but these were found to be highly inadequate to help them achieve their goals.

In addition, actors were faced with many issues that undermined the attainment of a sustainable livelihood. Major among them financial constraints, credit unworthiness of customers (at various level), poor pricing policy and saturated markets. The study also showed that the actors were both directly or/and indirectly affected by the work of some institutions (MOFA, CSIR-CRI); local cultures (land tenure systems); laws (levies); as well as national policies (increment in fuel prices).

In a quest for a sustainable livelihood, actors engaged in combination of activities. Activities such as farming, trading, processing of agro-products and detergents amongst many others are some ways actors diversify their livelihood. These alternative activities helped them have some safety nets and able to fulfil some of their needs and attain some of their goals such as educating their wards and catering for their family's needs.

Even though the cassava business helps contribute to the upkeep of actors in one way or the other, there is still more potential for the actors, the community and the nation at large. To achieve these potentials, both internal (farmers, processors and marketers) and external (government, NGOs, extension agents etc) actors need to be involved. Thus the following are recommended

## **6.2 RECOMMENDATION**

1. Farmers agitated that planting materials were given out late in the planting season, and even then they were not sufficient. Thus, improved planting material (cassava sticks) should be made available to farmers as early as possible so that they can use it as expected. Also, improved varieties should be more tailored towards the attributes farmers and processors desire.
2. It is evident from the study that cassava is not being utilized to its maximum. Potential uses of cassava include food for livestock; starch production (which is an input in

industries like textiles, pharmaceuticals, adhesives etc.); and also used to produce alcohol and fructose among many others. There is also the channel of export which could bring in more income. Thus the current value chain can be worked on and increased to bring on-board various actors.

3. Farmers, processors (gari, kokonte, agbelima) and marketers should be encouraged to form and join work related societies. The leaders of the societies should be trained to harness their different abilities to help in the growth of these societies. This would go a long way to help them in furthering some of their agenda such as certification for branding for export and sales in supermarkets.
4. A further study on the economics of cassava production in Ghana should be done to quantify the contribution of cassava to the livelihood of actors along the value chain.

## REFERENCES

- Adams, C.D., (1957). Activities of Danish Bontanists in Guinea by R. Addo-Fening (Ed.), 17381850. Transactions of the Historical Society of Ghana III. Part 1.
- Adebayo, K., Lamboll, R., & Westby, A. (2008). Social Implications of the Development of Cassava Postharvest Systems in Africa. Expert Consultation Meeting at the Natural Resources Institute, ([http://www.nri.org/projects/GCPMD/files/2\\_Adebayo\\_paper.pdf](http://www.nri.org/projects/GCPMD/files/2_Adebayo_paper.pdf)). University of Greenwich, United Kingdom
- Anaglo, J.N., Westby, A., Morton, J.F., Atengdem, P.B. and Adebayo, K. (2009). Assessment of Farmers' Decision to Add Value to Cassava Roots in the Greater Accra Region, Ghana. *Journal of Sustainable Development* 1(6): 12- 16
- Anandajayasekeram, P. and Berhanu Gebremedhin, (2009). Integrating innovation systems perspective and value chain analysis in agricultural research for development: implications and challenges. Improving Productivity and Market Success (IPMS) of Ethiopian farmer's project working paper 16. ILRI (International Livestock Research Institute), Nairobi, Kenya.

- Babaleye, T. (2004). Cassava: a crop for hard times and modern times: The importance of cassava.
- Bammann, H., (2007). Participatory value chain analysis for improved farmer incomes, employment opportunities and food security. *Pacific Economic Bulletin*, 22(3):125.
- Berry, S. S. (1993). Socio-economic aspects of cassava cultivation and use in Africa: Implication for the development of appropriate technology. COSCA Working Paper No. 8. Collaborative Study of Cassava in Africa. Ibadan, Nigeria: IITA.
- Bryman, A. (2004). *Social research methods*. 2<sup>nd</sup> Edition. Oxford: Oxford University Press.
- Burnard, P., Gill, P., Stewart, K., Treasure, E. & Chadwick, B. (2008). Analysing and presenting qualitative data. *British Dental Journal*. Vol. 204. No.8: 429-432
- Carswell, G., Hussein, K., McDowell and Wolmer, W., (1997). „Sustainable livelihoods: a conceptual approach“, mimeo, Brighton: IDS
- Cassava Value Chain Overview. (2005). *Innovations for agricultural value chains in Africa: Applying science and technology to enhance cassava, dairy and maize value chains*. Meridian Institute.
- Chambers, R. & Conway, G.R. (1991). *Sustainable Rural Livelihoods: Practical Concepts for the 21<sup>st</sup> Century*. Institute of Development Studies DP 296
- Chambers, R.,and Conway, G., (1992). „Sustainable rural livelihoods: practical concepts for the 21<sup>st</sup> century“, IDS Discussion Paper 296, Brighton: IDS.
- Creswell, J. W., Plano Clark, V. L., Gutmann, M., & Hanson, W. (2003). Advanced mixed methods research designs. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (pp. 209–240). Thousand Oaks, CA: Sage
- Creswell, J.W. (2004). *Educational research: Planning, conducting and evaluating quantitative and qualitative research*. 2<sup>nd</sup> Edition. ISBN-10: 013112790X
- Dankyi, A.A & Adjekum, A.A. (2007). Determinants of the adoption of improved cassava varieties in Southern Ghana-logistic regression analysis. *Proceedings of the 13<sup>th</sup> International Society for Tropical Root Crops Symposium, (ISTRC'07)*, Ghana, West Africa, pp.641-647.
- DFID (2000): *Sustainable Livelihoods Guidance Sheets*. Department for International Development. [http://www.livelihoods.org/info/info\\_guidancesheets.html](http://www.livelihoods.org/info/info_guidancesheets.html)

Department for International Development (DFID). (2001). Sustainable livelihoods guidance sheets. Sheet 1

Doku, E.V. (1969). Cassava in Ghana. Ghana University Press, Accra, Ghana. Dziedzoave, N.T., Abass, A. B., Amoa\_Awua, W.K.A. and Sablah, M. (2006). Quality

management manual for production of high quality cassava flour. (Adegoke, G.O. and Brimer, L. Eds). International Institute of Tropical Agriculture (IITA).

Essegbey, G. O. (2008). Agribusiness Innovation Study: The Ghana Experience. Science and Technology Policy Research Institute (STEPRI-CSIR).

Ezedinma, C, Ojiako, I.A., Okechukwu, J., Lemehi, A.M., Umar, L., Sanni, M., Akoroda, F. Ogbe, E., Okoro, G., Tamwali, Dixon, A. (2007). "The cassava food commodity market and trade network in Nigeria". IITA, Ibadan. Nigeria.

Food and Agriculture Organization (FAO). (2003). website. [www.fao.org](http://www.fao.org)

Food and Agricultural Organisation Statistics (FAOSTAT) (1997) <http://www.faostat.fao.org>

Food and Agricultural Organisation Statistics (FAOSTAT), (2005). FAOSTAT database <http://apps.fao.org/fapstat>.

Food and Agricultural Organisation Statistics (FAOSTAT), (2007). FAOSTAT database <http://apps.fao.org/fapstat>.

FAO, (2013). Save and grow: Cassava A guide to sustainable production intensification. [www.fai.org/ag/save-and-grow/](http://www.fai.org/ag/save-and-grow/)

FAOSTAT. (2013). Food and Agriculture Organisation of the United Nations, Statistics Division. Retrieved from [http://faostat3.fao.org/browse/rankings/countries\\_by\\_commodity/E](http://faostat3.fao.org/browse/rankings/countries_by_commodity/E) on Thursday, 11<sup>th</sup> June, 2015

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed method evaluation designs. Educational Evaluation and Policy Analysis, 11(3), 255–274.

Ghana Statistical Service (GSS) (1995). [http://www.statsghana.gov.gh/socio\\_demo.html](http://www.statsghana.gov.gh/socio_demo.html) Ghana Statistical Service (GSS), (2007). [http://www.statsghana.gov.gh/socio\\_demo.html](http://www.statsghana.gov.gh/socio_demo.html)

- Hendershot, C.H., (2004). A literature review and research recommendations on cassava (*Manihot esculenta*, Crantz). University of Georgia, Athens, Georgia, USA.
- Henry, G and Hershey, C. (2002). Cassava in South America and the Caribbean. In: Hillocks, R. J., Thresh, J. M. and Bellotti, A.C. (eds). *Cassava: Biology, Production and Utilization*. CABI
- Hossain, A., M. and Rezaul, K., (2010). Impact of microfinance operations on the livelihood of the clients: A review of the existing literature. *Digital Bus.*, 21: 166-174. DOI: 10.1007/978-3642-11532-5\_19
- IFAD (1997). Ghana root and tuber improvement programme. Appraisal Report. Report No. 0829GH.
- IFAD. (2002). A workshop on the sustainable livelihoods framework for IFAD staff and Europe-based consultants. 2-6 December, 2002. Retrieved from <http://www.ifad.org/events/livelihood/december.htm> on 20th January, 2015
- IFAD, 2004. IFAD Annual report 2004. <http://ifad.org/pub/ar/2004/e/index.htm> retrieved on 23rd March, 2015
- Jones, W.O. (1959). *Manioc in Africa*. Food Research Institute. Standford CA,USA:Stanford University Press.
- Kaplinsky, R. & Morris, M. (2000). *A handbook for value chain research*. IDRC.Ottawa, Canada.Kleih, U., Phillips, D., Wordey, M.T., Komlaga, G., (2013). *Cassava market and value chain analysis (C:AVA)*. Natural Resources Inst., Uni of Greenwich, UK. Food Research Inst., Accra, Ghana.
- Korang-Amoakoh, S. Cudjoe, R A. and Adams, E. (1987). Biological control of cassava pest in Ghana. Prospect for the integration of cassava pest strategies. In: S.K. Hahn & F.E. Caveness (Eds), *Integrated pest management for tropical root and tuber crops: Proceedings of the workshop on the global status and prospects for integrated pest management of root and tuber crops in the tropics, 25-30 October, 1987, Ibadan, Nigeria*. International Institute of Tropical Agriculture, Ibadan, Nigeria, xii + 235 .pp.
- Lawal, J.O. and Jalyeola, C.O. (2007). "Economic analysis of cocoa wine produced from cocoa powder". [www.world-food.net](http://www.world-food.net). *Journal of Agriculture, Food and Environment* 5(2): 76-79
- Lewis, W. Arthur. (1995). *The theory of economic growth*. Richard D. Irwin, Inc. Homewood, Illinois.

- Manu-Aduening, J.A., Lamboll, R.I., Dankyi, A.A. & Gibson, R.W. (2005). Cassava diversity in Ghanaian farming systems. *Euphytica* 144: 331–340.
- Manu-Aduening, J.A., Lamboll, R.I., Among Mensah, G., Lamptey, J.N., Moses, E., Dankyi, A.A. & Gibson, R.W., (2006). Development of superior cassava cultivars in Ghana by farmers and scientist: The process adopted, outcomes and contributions and changed roles of different stakeholders. *Euphytica* (2006). DOI: 10.1007/s10681-006-9091-x.
- Martin, A., Forsythes, L., & Butterworth, R. (2008). Gender implications of developing cassava postharvest systems. Expert Consultation on Cassava Processing, Utilization, and Marketing, ([http://www.nri.org/projects/GCPMD/files/7\\_Martin\\_presentation.pdf](http://www.nri.org/projects/GCPMD/files/7_Martin_presentation.pdf)).
- McForson, K. (2014). Using Local Raw Materials- How Ghanaian Cassava Farmers Are Saved by a Beer. *The Chronicle Newspaper*- On December 23, 2014
- MOFA (1997). Agriculture in Ghana: facts and figures, SRID. MoFA, Accra MOFA (2003). Agricultural extension policy, DAES, Accra, Ghana.
- MOFA (2006). Agriculture in Ghana: facts and figures, SRID. MoFA, Accra
- MOFA (2009). Agriculture in Ghana: facts and figures, SRID. MoFA, Accra
- Mondal, M. A. H. Ali, M. M. Sarma P. K. and Alam M.K. (2012); Assessment of aquaculture as a means of sustainable livelihood development in Fulpur upazila under Mymensingh district
- Muhammad-Lawal, A., Omotesho, O.A. and Oyedemi, F.A. (2013). An assessment of the economics of cassava processing in Kwara State, Nigeria. 4<sup>th</sup> International Conference of the African Association of Agricultural Economists. Hammamet, Tunisia. September 22-25, 2013
- Ngoddy, P.O. (1977). Determinants of the development of technology for processing of roots and tubers in Nigeria. Proceedings of the First National Seminar on Root and Tuber Crops. National Root Crops Research Institute, Umudike, Umahia, Nigeria.
- Nicholls, T., Elouafi, I., Borgemeister, C., Campos-Arce, J.J., Hermann, M., Hoogendoorn, J., Keatinge, J.D.H., Kelemu, S., Molden, D.J. and Roy, A. (2013). Transforming rural livelihoods and landscapes: sustainable improvements to incomes, food security and the environment. Association of International Research and Development Centers for Agriculture (AIRCA).
- Nweke, F.I., Spencer, D. S. C., Lynam, J.K., (2002). The cassava transformation: Africa's best kept secret. Lansing, Mich., USA: Michigan State University Press.

- Nweke, F.I. (2004). New challenges in the cassava transformation in Nigeria and Ghana. Environmental and Production Technology Division. International Food Policy Research Institute. 2033 K street, NW. Washington, D.C. 20006 USA. www.ifpri.org. June, 2004.
- Oslen, K.M. & Schaal, B.A., (1999). Evidence on the origin of cassava: Phlogeography of *Manihot esculenta*. *Proceeding of the National Academy of Sciences USA* 96: pp. 5586-5591
- Owusu, V. & Donkor, E. (2012). Adoption of improved cassava varieties in Ghana. *Agricultural Journal* 7 (2): 146-151, 2012. ISSN: 1816-9155
- Patton, M.Q. (1990). *Qualitative evaluation and research methods*. Sage publications, Beverly Hills, California.
- PIND, (2011). *Cassava value chain analysis in the Niger Delta*. Foundation for Partnership initiatives in the Niger Delta (PIND). Wuse II, Abuja, Nigeria.
- Ragasa, C. & Byerlee, D. (2012). New directions for revitalizing the national agricultural research system in the context of growing private sector R&D. Ghana Strategy Support Program. Transforming Agriculture Conference. 8-9 November, 2012. International Food Policy Research Institute (IFPRI). Discussion note #017
- Reilly, K., Gomez-Vasquez, R., Buschman, H., Tohme, J., Beeching, J.R. (2003). 667 Oxidative stress responses during cassava post-harvest physiological deterioration. 668 *Plant Molecular Biology* 53, 669-685.
- Root and Tuber Improvement and Marketing Programme (RTIMP). (2010)). Ministry of Food and Agriculture (MOFA). 2010 Annual Report. Programme Coordinating Office. Kumasi-Ghana. March, 2011.
- Root and Tuber Improvement and Marketing Programme (RTIMP). (2012). Ministry of Food and Agriculture (MOFA). Status report. programme Coordination Office. Kumasi. July, 2012.
- Root and Tuber Improvement and Marketing Programme (RTIMP). (2013). Ministry of Food and Agriculture (MOFA). Supervision report. July, 2013.
- Rosenthal D.M. & Ort D.R. (2012). Examining cassava's potential to enhance food security under climate change. Springer Science+Business Media, LLC. *Tropical Plant Biol.* DOI 10.1007/s12042-011-9086-1

Scoones, I. (2009). Livelihoods perspectives and rural development. *Journal of peasant studies* Vol. 36, No. 1, January 2009.

Tashakkori, A. & Teddlie, C. (Eds) (1998). *Handbook of mixed methods in the social and behavioural sciences*. Thousand Oaks. CA: Sage.

Vanhuyse, F. (2012). Draft: Monitoring visit to CAVA Ghana.

Westby, A. (2008). Cassava Utilization, Storage and Small-scale Processing. In R. Hillock, J. Thresh, & A. C. Bellotti, eds., *Cassava Biology, Production and Utilization*. CABI Publishing.

West Africa Trends (WAT). (2013). The hidden potential of cassava: The future of West Africa's most undervalued crop. African Centre for Economic Transformation

(ACET). Issue 2

White, L. (1990). *Magomero: Portrait of an African village*. Cambridge University Press, Cambridge, England.



## APPENDIX

### APPENDIX A: QUESTIONNAIRE FOR DATA COLLECTION ASSESSMENT OF LIVELIHOODS OF THREE ACTORS ALONG THE CASSAVA VALUE CHAIN IN MAMPONG AND TECHIMAN MUNICIPALITIES – FARMERS

#### INTRODUCTORY DATA

1. Sex

- a) Male [ ]                      b) Female [ ]

2. How old are you? .....

3. Community .....

4. Educational background

- a) MSLC [ ]   b) BECE [ ]   c) SSCE/WASSCE [ ]   d) Tertiary [ ]   e) Other [ ]

Specify .....

5. Are you a native of the town? a) Yes [ ]   b) No [ ]

6. What is your family size? .....

7. What are the major foods eaten in the family? .....

8. Are you the major income earner of the family?

- a) Yes [ ]   b) No [ ]

If no specify .....

9. How many dependents do you have?   a) None [ ]   b) 1 [ ]   c) 2 [ ]   d) 3 [ ]   e)

4 [ ]   f) 5 [ ]   g) Above 5 [ ] .....

10. Of your dependents how many are;

11.

Dependent	Number
Below school-going age	
KG – Primary 6	
JHS - SHS	

Tertiary	
Out of school but unemployed	
Aged (not working)	

12. Would you consider yourself a major cassava farmer? a) Yes [ ] b) No [ ]

13. What is your land size under cultivation? .....acres

14. What is your land size for cassava cultivation? .....acres

15. Land tenure of current farm(s)

a) Family land [ ] b) Stool land [ ] c) Purchased land [ ] d) Gifted land [ ]

e) Caretaking [ ] Shared farming; f) Abunu [ ] g) Abusa [ ] h) Rented land [ ] i)

Other [ ] .....

16. How many years have you been in active cassava farming? .....years

#### FARM MANAGEMENT/ INPUT

17. How do you prepare your land? a) slash & burn [ ] b) Tractor [ ] c) Both [ ]

18. How much goes into land preparation?

Source of land preparation	Cost GHC
Hired labour	
Tractor use	

19. Source of planting material. a) Own farm [ ] b) Bought [ ] c) Other [ ] .....

20. If bought, how much? GHC.....

21. How many times do you weed before harvest? a) 1 [ ] b) 2 [ ] c) 3 [ ] d) 4 [ ] e)

Above 4 [ ] .....

22. How much do you spend per weeding? GHC.....

23. Labour for harvesting roots. a) Family & friends [ ] b) Hired labour [ ]

24. If hired labour, how much is spent GH¢ .....

25. How are the roots transported? a) In head pans by friends & family [ ] b) Hired hands [ ] c) Tractor [ ]

26. How much is spent in transporting roots? GH¢.....

27. How many cultivars are grown? a) 1 [ ] b) 2 [ ] c) 3 [ ] d) 4 [ ] e) 5 [ ]  
f) Above 5 [ ]

28. Name of cultivar, age at harvest and yield.

Name of cultivar	Age at harvest	Yield/bags harvested

29. What are the attributes of cassava you desire as a farmer?

Attributes	Very	Somewhat	Not	Can't tell
High yield				
Large storage root size				
Marketable				
Early maturity				
Post-harvest storage of fresh storage roots				
Prolonged in-soil storage				
Good taste				
Do not lodge				
Suitable for industrial processing				
Branching				
Appropriate plant height				
Other :				

**SUPPLEMENTARY DATA**

30. Other crops cultivated

a) Maize [ ] b) Beans [ ] c) Yam [ ] d) Plantain [ ] e) Cocoa [ ] f)  
Others [ ] Specify.....

31. What type of farming system is practiced?

a) Sole cropping [ ] b)  
mixed/intercropping [ ]

32. What crops are intercropped? a) Maize [ ] b) pepper [ ] c) other [ ]

specify.....

33. What other economic activity are you involved in? a) Trading [ ] b) Rearing of

livestock (poultry, goat, sheep, cattle, pig) [ ] c) Other [ ]

specify.....

34. Do you have any access to loans or credits? a) Yes [ ] b) No [ ]

35. Sources of loan/credit. a) Family & Friends [ ] b) Banks [ ] c) Credit Union [ ]

d) Microcredits [ ]

36. Do you join any farming society? a) Yes [ ] b) No [ ]

37. Farming society and benefits

Name of farming society	Benefits

38. What is the selling price per bag? .....

39. What is the income generated from cassava cultivation per year? .....

40. Income generated from other sources.

Sources	Income (GHC)
Remittances	
Trade	
Other crops	
Monthly salary	

41. What farming strategy do you engage in .....

a) Farming and harvesting cassava once in a year [ ]

b) Farming and harvesting cassava twice in a year [ ]



5. Are you the major income earner of the family?

b) Yes [ ] b) No [ ]

If no specify .....

6. How many dependents do you have? a) None [ ] b) 1 [ ] c) 2 [ ] d) 3 [ ] e) 4 [ ] f) 5 [ ] g) Above 5 [ ] .....

7. Of your dependents how many are;

Dependent	Number
Below school-going age	
KG – Primary 6	
JHS – SHS	
Tertiary	
Out of school but unemployed	
Aged (not working)	

### PROCESSING INPUTS

8. What cassava products do you process?

a) Kokonte [ ] b) Gari processors [ ] c) Agbelima [ ]

9. Where are cassava roots sourced from? a) Own farm [ ] b) Bought [ ]

10. If bought, how much does it cost per basket/sack GHC ..... 11. Cost involved in processing

Kokonte	Gari processing	Agbelima processing
Peeling -	Peeling -	Peeling -
Drying -	Washing	Grating -
Pounding -	Grating -	Draining -
Sifting -	Fermentation -	Packaging -
Packaging -	De-watering -	Transportation -

Transportation -	Sifting -	
	Roasting -	
	Bagging/Packaging -	
	Transportation -	
Selling price per bag/sack -	Selling price per bag/sack -	Selling price per bag/sack -

**SUPPLEMENTARY DATA**

12. Do you have access to loans/credits? a) Yes [ ] b) No [ ]

13. Sources of loan/credit. a) Family & Friends [ ] b) Banks [ ] c) Credit Union [ ] d)

Microcredits [ ] d) Other [ ] .....

14. How much do you gain from the cassava business

a) Daily GHC .....

b) Weekly GHC .....

c) Monthly GHC .....

15. Are you in any other economic activities?

a) Yes [ ] b) No [ ]

16. If yes, what activities are they?

List: a) b)

c) d)

17. What is the income generated from other sources? Where applicable

Item	Amount per month GhC
Remittances	
Trade	

Monthly salary	
Processing of other farm produce	

18. How do you sell your processed products?

Activity	All processed products	Most of the produce (more than half)	Less than half of the produce
f) Sell directly to market women			
g) Sell to middle men			
h) Sell at market (self)			

19. When are the peak times for processing your cassava product and why?

.....

20. What are the major challenges/constraints associated with your work? Please list

.....

### QUESTIONNAIRE FOR DATA COLLECTION

#### **ASSESSMENT OF LIVELIHOODS OF THREE ACTORS ALONG THE CASSAVA VALUE CHAIN IN MAMPONG AND TECHIMAN MUNICIPALITIES – MARKETERS**

#### **INTRODUCTORY DATA**

1. Gender

- a) Male [ ]                      b) Female [ ]

2. How old are you? .....

3. Community .....

4. Educational background

- a) MSLC [ ]   b) BECE [ ]   c) SSCE/WASSCE [ ]   d) Tertiary [ ]   e) Other [ ]

Specify .....

5. What is your family size? .....

6. What are the major foods eaten in the family? .....

7. Are you the major income earner of the family?

a) Yes [ ] b) No [ ]

If no specify .....

8. How many dependents do you have? a) None [ ] b) 1 [ ] c) 2 [ ] d) 3 [ ] e) 4

[ ] f) 5 [ ] g) Above 5 [ ] .....

9. Of your dependents how many are;

Dependent	Number
Below school-going age	
KG – Primary 6	
JHS - SHS	
Tertiary	
Out of school but unemployed	
Aged (not working)	

### MARKETING INPUTS

10. What cassava products do you sell?

a) Storage roots [ ] b) Agbelima [ ] c) Gari [ ] e) Kokonte [ ] d) Others [ ]

.....

11. How do you transport your cassava products to the market? a) By self [ ] b) In head

pans by friends & family [ ] c) Hired hands [ ] d) Tractor [ ]

12. How much does it cost you to transport cassava products to the market? GHC.....

13. Do you incur any other cost before sales (eg storage)? a) Yes [ ] b) No [ ]

14. What are they?

List	Cost GHC

**OTHER INPUTS**

15. Do you have any access to loans/credits? a) Yes [ ] b) No [ ]

16. Sources of loan/credit. a) Family & Friends [ ] b) Banks [ ] c) Credit Union [ ] d) Microcredits [ ] d) Other [ ] .....

17. Do you sell anything else?

a) Yes [ ] b) No [ ]

18. What other products do you sell?

List: a) b) c) d)

19. Are you engaged in any other economic activities?

a) Yes [ ] b) No [ ]

20. What activities are they?

List: a) b) c) d)

21. How much do you buy

a) Gari (specify measurement) .....

b) Kokonte (specify measurement) .....

- c) Agbelima (specify measurement) .....
- d) Cassava roots (specify measurement) .....

22. How much do you sell

- a) Gari (specify measurement) .....
- b) Kokonte (specify measurement) .....
- c) Agbelima (specify measurement) .....
- d) Cassava roots (specify measurement) .....

23. How much do you gain from the cassava business

- a) Daily GHC .....
- b) Weekly GHC .....
- c) Monthly GHC .....

24. What is the income generated from other sources?

Item	Sale per month GhC
Sale of other produce:	
Sale of other produce:	
Sale of other produce	
Remittances	
Monthly salary	

25. What are the major challenges associated with your work?

.....

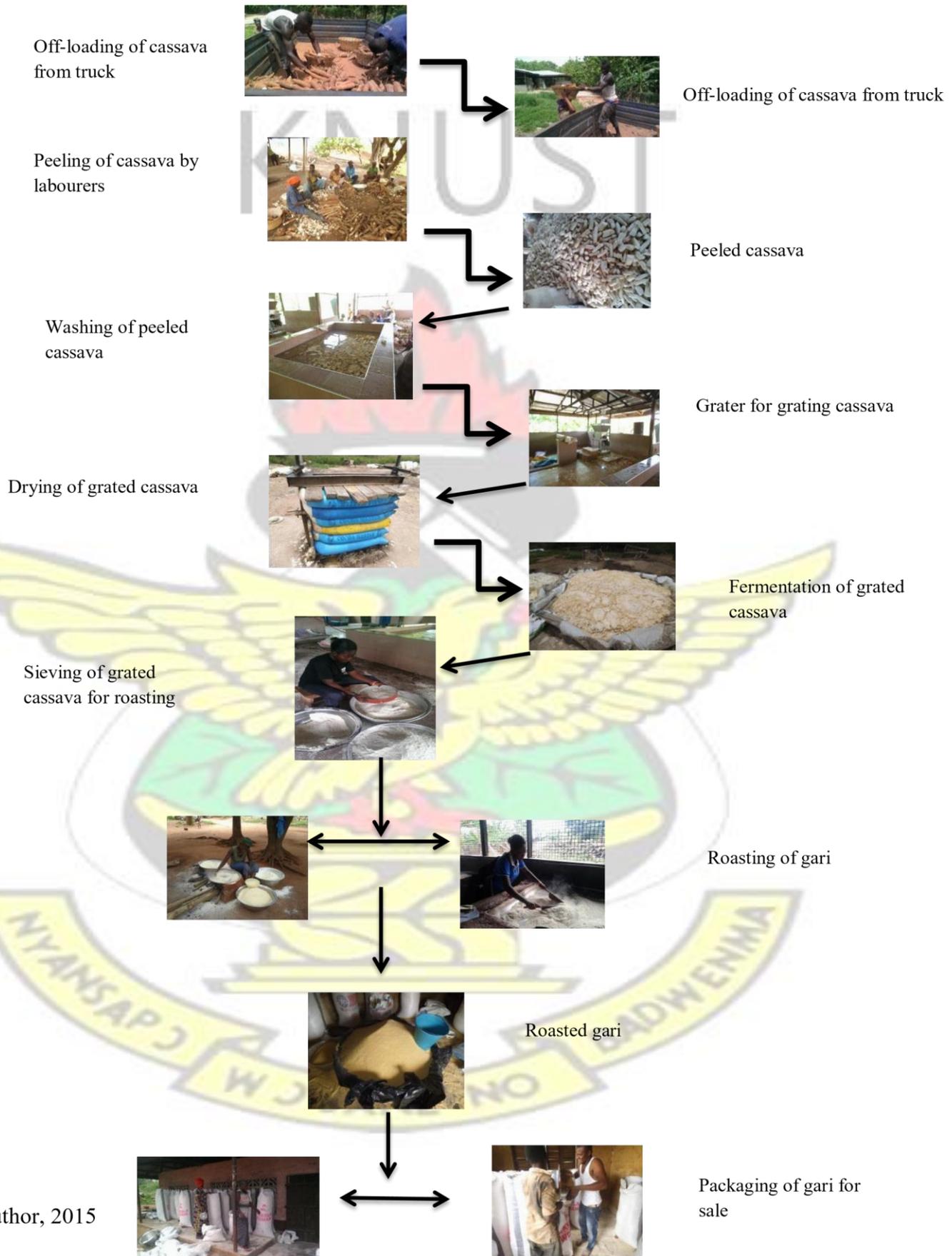
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# KNUST

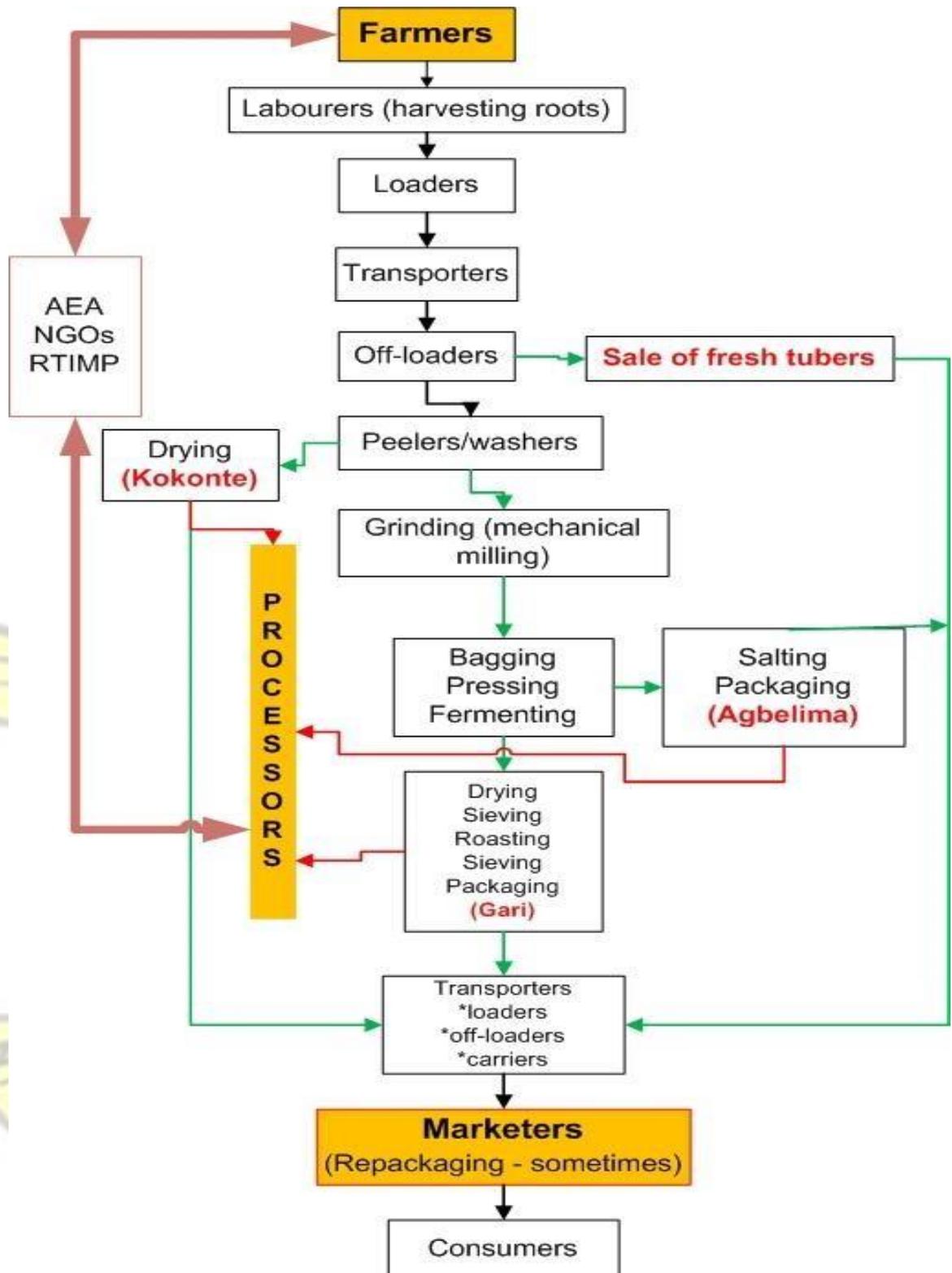


**APPENDIX B: RICH PICTURE DEPICTING THE PROCEDURE FOR PROCESSING GARI**



Source: Author, 2015

**APPENDIX C: FLOW OF ACTIVITES THROUGH THE VALUE CHAIN; FROM FARMER TO CONSUMER**



Source: Author, 2015

**APPENDIX D: ABOBOYA**



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