

**ASSESSING RICE VALUE CHAIN FINANCING:
A CASE OF SMALLHOLDER RICE FARMERS AT THE KPONG IRRIGATION SCHEME, GHANA**



A Research Thesis Submitted to the Van Hall Larenstein University of Applied Sciences in Partial Fulfilment of the Requirements for the Master of Science Degree in Agriculture Production Chain Management – Horticulture Chains

By

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ACRONYMS

ADB	Agriculture Development Bank
AfDB	AfDB Development Bank
BoG	Bank of Ghana
FAO	Food and Agriculture Organisation
GIDA	Ghana Irrigation Development Authority
GRIB	Ghana Rice Inter-Professional Body
IFAD	International Fund for Agriculture Development
IFC	International Finance Corporation
IFPRI	International Food Policy Research Institute
IISD	International Institute for Sustainable Development
JICA	Japan International Cooperation Agency
KIS	Kpong Irrigation Scheme
MoFA	Ministry of Food and Agriculture
NDPC	National Development Planning Commission
OECD	Organisation for Economic Development and Cooperation

ABSTRACT

Agriculture drives the economy of Ghana, but the sector is plagued with several challenges of which agriculture financing is no exception. The research was therefore conducted to assess the rice value chain financing within the Kpong Irrigation Scheme which is one of the major rice producing areas of the country. The research adopted a study design which employs the use of desk and field studies. The target population was smallholder rice farmers within the Kpong Irrigation Scheme. Both descriptive and analytical data were collected. By the use of a simple random sampling method, thirty (30) smallholder rice farmers from four (4) major producing branch canals in the Scheme and eighteen (18) value chain actors and supporters were selected for interviews. A semi-structured questionnaire was used for the interviews. Descriptive results show that more males (73%) than females (27%) are engaged in rice farming, and the sizes of their farms range between 1Ha and 3Ha. Contractual agreements are not common, with only 27% of farmers having contracts with their buyers, and this is mostly verbal. Interviews show the existence of both direct and indirect value chain financing schemes within the Kpong Irrigation Scheme. Results also show that rice farmers are aware of the formal financial institutions like banks (97%) and microfinance (83%). But only a few utilise the services they provide. They are also aware of some informal financial institutions like trader credit (70%), extension and mechanisation service (67%) and services from NGOs (37%). They use more of mechanisation services (73%). The research further shows that rice farmers face challenges in accessing financing. These are high-interest rates (80%), asymmetry of information (63%), inadequate assistance from Producer Organisation (63%), high risk of default (40%), high transaction costs (37%) and inadequate collateral (27%). Results further show the challenges financial institutions face in meeting the demands of rice farmers. These are high default rates, the inability of farmers to meet requirements, poor uptake of technology by farmers, funds for conducting field trials and the over-reliance of farmers on government services. Rice farmers indicated that to improve value chain financing there must be good government policies (77%), affordable financial institutions (67%), stronger Producer Organisations (50%), capacity building (37%) and adequate infrastructure (30%). The study recommends that for value chain financing to be effective there should be the formation of a producer organisation for the rice farmers. This will better link farmers to the right value chain financing scheme. Policies on agriculture financing reviewed and the capacities of farmers built to meet the demands of the sector. Promotions of linkages are also paramount to build trust among various actors and supporters within the value chain.

CHAPTER ONE: INTRODUCTION

1.1 Background

The demand for agricultural products worldwide is increasing fast, and the cravings for food commodities is anticipated to continue growing for several years. This trend is due to some factors like rising per capita incomes, population growth, and urbanisation (OECD/FAO, 2015). Nearly 60% of overall calories consumed is derived directly from cereals in developing countries with figures surpassing 80% in the poorest countries (Nasrin et al., 2015). Rice is a relevant source of calories for humans among the cereals. Whereas per capita intake is decreasing in parts of Asia, the demand for rice has improved considerably in Sub-Saharan Africa (SSA) (Mahanty, 2013). The increase rice consumption is as a result of population growth, urbanisation, changing consumer preferences and economic development (Nasrin et al., 2015).

The Ministry responsible for Food and Agriculture (MoFA) in Ghana identified urbanisation, change in consumer habits coupled with high population growth as placing a higher demand on the consumption of rice in recent times (MoFA, 2015). Local Paddy production surged from between 302,000 and 436,000 tonnes during 2008 and 2009 seasons to 688,000 metric tonnes in 2016 (Ghana News Agency (GNA), 2017). According to Food and Agriculture Organisation (FAO) report, by the value of production, it was considered the 10th agricultural product in the country, Ghana and ranked 8th during the period 2005 – 2010 regarding the quantity produced. Total area harvested is about 4% accounting for approximately 45% of the area planted for cereals (FAO, 2013).

Rice is grown in the country, Ghana as a cash crop as well as for food. The production of rice in Ghana is in the range of 30 -40% constituting an import bill of US\$450,000,000 per year (FAO, 2013). The overall consumption of rice during MY2014/15 is projected to be 950,000 metric tonnes from 850,000 metric tonnes during MY2013/14 which is equal to per capita consumption of 32 to 35 kilogrammes per year (United States Department of Agriculture (USDA), 2014). Other food crops which are relevant regarding domestic production are maize, cocoyam, cassava, and also plantain. Rice accounted for 9 percent of total caloric intake and considered as the fifth most significant energy source (FAOSTAT, 2012).

According to the Food and Agriculture Organisation (FAO), in 2013, Rice accounted for 58% of cereal imports and considered as the most imported food crop in the country. According to a Ghana News Agency report, Ghana imported about 680,000 MT of rice annually, and that cost approximately US\$300 -500 million (Business and Financial Times (BFT), 2017).

A National Rice Development Strategy (NRDS) for Ghana was launched for the years 2009-2018. The main aim NRDS is to double local production by 2018, suggesting a yearly production of 10% growth rate, and boost quality to trigger demand for locally produced rice (import substitution). It focusses on integrating long – grain and aromatic varieties into urban and peri-urban market channels. To achieve this, domestic rice production and onward processing have to match the quality requirements of imported rice. As the importation of rice increase, the growth in national output and productivity is now becoming a priority. The Head of State of Ghana, as at 2014 (John Dramani Mahama) apprehensive with growing import costs, proposed the production of rice domestically (Asare-Boadu and Syme, 2014). While the trading of rice worldwide represents 5%; domestic production would safeguard consumers in the rice market from price shocks (World Bank, 2013). The country has made some considerable investments in rice production, but local production is still not keeping up with growing demand for rice in Ghana (IFPRI, 2014). Even though domestic production of milled rice has increased by 10.5% yearly, most of this growth in output has come from area expansion (7.5 percent), with the remaining 3.0 percent coming from productivity improvements (BFT,2017).

1.2 Problem statement

The use of traditional technologies like hoes and cutlasses dominates the agricultural sector in Ghana with little or no irrigation and processing of farm products. Most producers are involved in subsistence farming and having meagre incomes from their farms. Some factors are contributing to this pitiable state of affairs ensuring the agri-business sector not realising its full potential. Quartey et al. (2012) identified weak infrastructure (e.g., roads, storage facilities), poor market accessibility, limited ability to influence government policy and limited financing as some of the problems affecting the agriculture sector in Ghana. The issue of agriculture finance is one such problem that is usually mentioned and yet not adequately addressed. The reason is that financial service providers consider rural areas and specifically the agricultural sector too risky and the transaction costs are high (KIT & KIRR, 2010). Also, asymmetric information, unfavourable economic policies, lack of collateral and poor capacities of smallholder farmers to obtain credit are some of the causes of this problem. These potentially thwarts the efforts of smallholder farmers in adopting new technologies resulting in low productivity and low income. The ability of farmers to have access to credit helps in ensuring the adoption of improved technology, increased output and enhances food security. These serve as mechanisms for increased agricultural production. ***Therefore, the relevance of credit in the agricultural sector in Ghana cannot be exaggerated. Value chain financing is in its infancy in Ghana, it is, therefore, imperative to assess value chain financing in the Kpong Irrigation Scheme within the Shai Osudoku District of Ghana to improve productivity and profitability in the domestic and international market.***

1.3 Commissioner

The Ministry of Food and Agriculture (MoFA), Ghana is my commissioner in this research. Discussion on the research topic commenced in December 2016, and the Head of my Department suggested that the Government of Ghana is intending to boost production of rice in the country, but efforts to do it was hampered by several challenges of which rice value chain financing is a part. MoFA is in charge of the development and growth of agriculture in the country except for the Cocoa-Coffee and Forestry sector. Its primary roles are the formulation of appropriate agricultural policies, planning & coordination, monitoring, and evaluation of the overall national economic development.

1.4 Objectives of the research

1.4.1 Main Objective

The main objective of the research is to assess the rice value chain financing in the Kpong Irrigation Scheme

1.4.2 Specific Objectives

The specific objectives are to:

1. develop business models for the Ministry of Food and Agriculture for implementation and
2. help various stakeholders access value chain finance in an efficient, effective and sustainable way.

1.5 Main Research Question

Question: What strategies can be used to improve the usage of value chain financing by small-scale farmers in Asutsuare?

Sub-Questions

- a) What is the current situation of Value Chain Financing (VCF) in the rice value chain?
- b) What are the various value chain financing schemes and models services within the area?
- c) What is the awareness level of farmers of value chain financing?
- d) What are the related problems rice farmers face in accessing value chain finance?
- e) What are challenges of financial institutions to satisfy the demand of smallholder farmers and towards the development of rice value chain?
- f) What are ways to improve Value Chain Financing in the area?

1.6 Limitations of the research

The major limitations of the research are:

1. The unavailability of some of the respondents especially from the formal financial Institutions for interviews.
2. The sample size for the research is too small to make generalisations for whole groups of rice farmers in the country.
3. There is not enough literature on value chain financing in the Kpong Irrigation Scheme. It was very difficult comparing findings with existing literature.
4. Some of the respondents like the aggregators were unwilling to give information on their activities especially when questions of how much is made on the sales of produce is asked.

1.7 Organisation of the thesis

The research is organised into six (6) chapters. Chapter 1 gives a brief about the rice sector in Ghana and the objectives of the research. Chapter 2 talks about the literature review where relevance relevant literature on the rice value chain, the financial sector and agriculture finance is reviewed. In the third chapter, the methodology is described and the various strategies used. Chapter 4 presents the findings and discussions was done in chapter 5. Conclusions and recommendations are presented in chapter 6.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section will be made up of the theoretical and empirical review of studies focusing on rice value chains and value chain financing in Ghana.

2.2 Definition of terms

2.2.1 Value chain: it is a sequence of value adding activities that start with production, processing and ends with marketing and sales to the end user (Kaplinsky *et al.*, 2001)

2.2.1 Value chain financing: Is the financial relationship between two or more actors within the value chain (Casuga *et al.*, 2008).

2.2.3 Smallholder farmer: This is a farmer who has two hectares or less than two hectares.

2.2.4 Financial Institution: Refers to formal, semi-informal and informal financial institutions.

2.3 Global Value Chain (GVC) Theory

The concept of the Global Value Chain presents an overview of the analysis of the relationships that exist within global production systems. Global Value Chain analysis focuses on the association between global and economic consumptions and also the distribution of gains among actors along the value chain (Gerreffi and Memedovic, 2003).

Humphrey and Schmitz (2001) asserts that a very relevant concept when discussing Global Value Chain is value chain governance. Chain governance denotes the relationships among various actors that either function within or affect activities of other players within a value added chain. Key areas to look out for in governance are what is to be produced, how it is to be produced, how much is to be produced, and when is it to be produced.

The GVC governance theory takes into account the empirical evidence on global consolidation and changes in the global integration process. The theory stresses the importance of governance as an important driver of the value chain, and not just buyers and producers. As such, it focuses on transaction cost analysis, production networks, and technological ability and firm-level learning. According to Gerreffi *et al.*, 2005, the primary premise of the theory is that chain governance is located on a continuum amongst a markets and a hierarchy status. There are three variables which influence that location: the complexity of inter-firm transactions, the power to systemize these transactions, and the abilities of suppliers to satisfy needs of buyer.

Buyer-driven governance is different from producer-driven governance. Buyer-driven chains tend to have few barriers to entry and are usually commanded by big retailers, brand-name companies and merchandisers who primarily are involved in the coordination and outsourcing of labour-intensive production (Thun, 2008). On the other hand, multinational manufacturers who own capital and technology-intensive industries like aeroplanes and cars dominate producer-driven chains.

2.4 Value Chain Business Strategies

According to Vorley *et al.* (2008), four value chain business strategies or models exist. These are producer driven, buyer-driven, facilitator driven and integrated value chain models.

2.4.1 Producer – Driven Model

This model begins as a consequence of small or large scale farmers coming together to form cooperatives, groups or associations. It enables them to enter into new and attractive markets, thus getting competitive prices for their produce. By coming into groups, members get technical advice, sell their products, provided with inputs and can also access financial services. This type of model which is called credit linking is common among cacao producers in Peru (Miller & Jones, 2010).

2.4.2 Buyer-Driven Model

The primary drivers of this model are processors retailers and exporters. In this case, buyers of agricultural produce trade the products in their raw states or as a processed product. The main emphasis here is the assurance of continuous supply of the produce. The value chain type exhibited in this model is best for value chain financing. This is because, to facilitate the flow of products, buyers can use finance as a means. Contract farming is the best buyer-driven model. In this way, the financier is the determiner of what inputs to be used, how production is done, quality and quantity of produce to be delivered and the time of delivery and realise payments as agreed. Due to the existing contracts, credits are provided by financiers as the risks associated with production are reduced from the buyer quality monitoring (Miller & Jones, 2010). Contracts can make with a farmers or producer organisations. The description of obligations may remain quite vague or be reasonably specific; contracts may be renewed each season or cover long-term agreements; specifications are based on case-by-case negotiations or a subsector code of practice (GIZ, 2013).

2.4.3 Facilitator Driven Model

Musuva (2015) asserts that in the facilitator driven model, Non-Governmental Organisations (NGOs) and government agencies serves as drivers of the model. In this situation, the Non-Governmental Organisations and the government agencies assist poor and marginalised producers in the area of marketing of their produce leading to the upgrading of areas of interest within the chain. Farmers who live on subsistence farming and have little to sell depends much on this model. Therefore, NGOs can assist this kind of farmers to maximise their profits through providing finances and training (Miller & Jones, 2010)

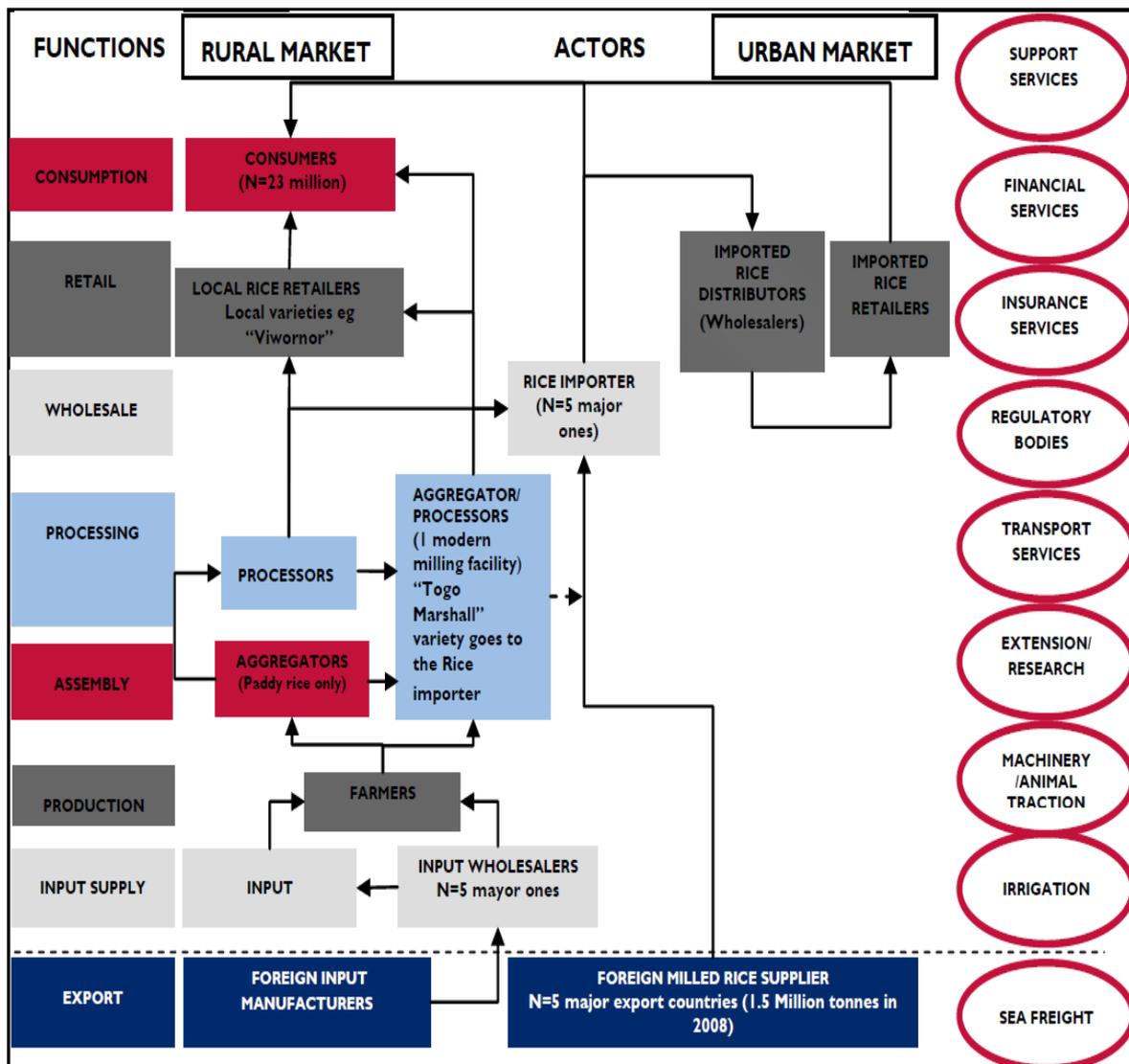
2.4.4 Integrated Value Chain Model

According to Miller and Jones (2010), this model is a distinct type of vertical integration that incorporates several stakeholders into the value chain through the ownership and contractual relationships. It integrates value chain actors through ownership and formal contracts. The drivers of the organisation are lead firms, supermarkets or multinational companies. Their goals refer to new and higher market values, low prices for high quality or market monopoly (Sjauw-Koem-Fa, 2012).

2.5 Rice Value Chain in Ghana

The Ghanaian rice value chain is made up of several actors. They include input suppliers, producers, aggregators processors, wholesalers(importers and local distributors) retailers and consumers. There are also organisations that provide support services to the actors within the chain. The chain is made up of two channels: the local and the imported channel. The figure below shows the value chain map for the rice sector in Ghana.

Figure 1: Rice Value Chain Map of Ghana



Source: USAID, 2009

2.5.1 Input suppliers:

Inputs used for the cultivation of local rice by farmers are mostly imported into Ghana. These are pesticides and fertilizers marketed by distributors such as Dizengoff Ltd., Wienco Ghana Ltd, Yara and Agrimat Ltd. These enterprises supply the inputs to other wholesale and retail shops. These inputs are then sold to smallholder farmers and a few commercial producers for the production of rice. These shops do not have certified seed most of the time. Therefore farmers tend to use their seed, which results in low productivity (USAID,2009).

2.5.2 Producers

MoFA (2015) grouped rice farmers into agro-ecologies. They are:

1. Irrigated (10% of arable area)
2. Rain-fed lowland (covers 78% of arable area)

3. Rain-fed upland (12 % of arable area)

On average, 118,000 hectares of agricultural land is cropped yearly. The cultivation of rice across in Ghana is done by smallholder farmers (280,0000). There are conventional rain-fed farmers in the northern regions producing between 2.33 and 2.79 hectares of rice which are relatively larger than those in the southern regions (0.87 – 0.9 hectares) (USAID, 2009). The majority of these producers sell at least a portion of their crop for cash.

2.5.3 Aggregators:

These group of people collect paddy rice after harvest from smallholder farmers and sell to rice processors. The local rice aggregators have no contract with farmers. Therefore they often secure the paddy rice by providing seeds and credit to farmers. They usually do not have challenges with side-selling than industrial importers or buyers due to the closeness to producers or personal knowledge. (USAID, 2009).

2.5.4 Processors:

The processors buy paddy rice from either aggregators or farmers and parboil and mill it manually. Some processors send the paddy rice to commercial milling places to have it milled. There are other players called the aggregator-processors (about 8) who does the dual role of aggregating and milling the paddy rice, after which it is packaged for sale on the local market. They have written contracts with rice importers to supply local rice to them. These importing companies re-bag the local rice under various brand names. Togo Marshall is the most popular local variety that rice importers sell.

2.5.5 Millers

They form part of the processor group and may buy paddy rice from some farmers for milling. The southern producers process their rice at a milling facility at Aveyime (10 MT/hr) in the Volta Region of Ghana, where the bulk of high-value rice is produced. The largest mill is in the northern part of the country at Nasia with a capability of 4 MT/hr and is very old (it was installed in 1977). Other mills across the country have capacities of between 0.3 and 1 MT/hr and are mostly inefficient and are all privately owned.

2.5.6 Rice Importers:

The five leading importers are Royal Bow, CCTC, Cereal Investments Limited, Olam Ghana and Ezaal Trading Ghana Limited. They sell to local wholesalers. The rice importer conveys the imported rice from the harbour to a warehouse where it is distributed. The company then sell the rice in wholesale quantities to the distributors (at least 100 MT a week). These distributors then sell to rice retailers. The rice is sold to the consumer in 1kg, 2kg, 5kg, 10kg, 25kg and 50kg bags. Some large importers also sell from their facilities directly to urban consumers.

2.5.7 Wholesalers:

They focus on selling both domestic and imported to a network of retailers.

2.5.8 Retailers

They also sell both imported and domestic rice. Some of the domestic rice is sold in the local open markets in Ghana.

2.6 Financial Sector in Ghana

Ghana's financial sector is comparatively advanced having an ever increasing competitive and well-managed banking system, a highly developed insurance market, and a small but functional stock market (GIZ, 2011). This report supports that of WorldBank (2012) which states that Ghana is experiencing a growth in the financial market with an increase in the number of banks, non-bank financial institutions, and microfinance institutions. According to PwC (2014), the current banking industry is inundated with banking and non-banking financial institutions. The banking institutions comprise 27 commercial banks and 137 rural and community banks. The non-banking agencies are 58 comprising finance houses, savings and loans, leasing, and mortgage firms. As at 2007, the number Non-Banking Financial Institutions (NBFIs) and Rural banks had increased to 41 and 126 respectively. The major players in the financial sector in Ghana are these financial institutions. The financial institutions are essential to the development of every economy. The financial institutions reappportion resources which are scarce and coming from members of society in surplus (depositors) to those in deficit (borrowers) through an intermediation process (Ackah and Asiamah, 2014). They do this by changing small liquid deposits into larger illiquid loans. According to Griffith-Jones and Karwowski (2013), the financial sectors in Africa can be an anchor for growth by mobilising enough savings and intermediating savings at low cost and long maturity to investors and also consumers thus helping companies and individuals manage risks. Efficient banking systems expand financing opportunities for both large and micro-enterprises, while also supporting financial sector development. The effectiveness and efficiency with which the financial sector in Ghana is playing these roles is limited but improving. The number of people who borrow from these financial institutions has increased also. Financial products access by companies in remote areas is increasingly challenging and costly. Though nominal rates have come down, depreciation and inflation of Ghana's currency have resulted in an increased interest rates.

2.6.1 Policy and Legal Environment for the Financial Sector in Ghana

For over two decades now, the Ghana Shared Growth and Development Agenda (GSGDA) II, 2014-2017, the fifth in the series serves as the policy framework for the financial sector in Ghana. It is the operational instrument that gives the broad policy parameters for economic growth and development in Ghana (National Development Planning Commission (NDPC), 2014). Ghana's medium-term Private Sector Development Strategy (PSDS II) policy is established on building a booming industry that generates jobs and enhances livelihoods for all. Thus the improvement of a robust financial system to serve a major purpose to offer payments, savings, credit, and risk management services to individuals and organisations are critical to the development agendas of the country (Ackah and Asiamah, 2014).

According to the World Bank (2012) agribusiness report, Ghana's financial sector has been transformed tremendously since the 1980s due to some reforms. It has shifted from an area that was mainly made up of state-owned banks to a mixed market of private commercial banks, non-bank financial institutions, and microfinance institutions (MFIs). These include domestic, regional, and international organisations. Even though there are changes, the principal shareholder in some of these banks is the Government. The Bank of Ghana serves as the central bank, and the primary regulator within the country supervises various commercial banks and savings and loan companies in Ghana while ARB Apex Bank directs the activities of the rural and community banks. Through associations, credit unions in Ghana are monitored independently and NGOs serving as financial institutions, adopt the same method in their dealings.

Agri-business Commercial Legal and Institutional Reform Assessment (AgCLIR) (2008) report stated that Ghana's general legal framework for finance sector is flexible, and the laws give permission to banks and non-bank financial institutions to:

- a) receive collaterals in the form of livestock
- b) agree buying on credit equipment and livestock.
- c) Use crops in good standing as collateral
- d) use the credit card as means of lending

2.6.2 Agriculture Financing in Ghana

Private sector financial institutions are doing well regarding finance and have seen some expansion over the periods. But most of the formal financial institutions do not pay adequate attention to agriculture investment (IFPRI, 2010). This assertion supports Bank of Ghana (BoG) (2011) report that most commercial banks in Ghana lack sufficient interest in the agriculture sector as compared to other areas. They account for only 6% of loans given commercially. From 26 banks, only three banks do not provide loans to farmers. Some banks are offering loans between GH¢1-20 million.

The reason for the reluctance of these financial institutions to lend money for the development of agriculture is due to a consistent attitude of not paying for loans disbursed by the banks and the consideration that agriculture companies which depend on rain such as in the case of rice are risky. Issues concerning land are also the primary factor considered by financial institutions and insufficient awareness how to make programmes solely for financing agriculture. As a consequence of these problems, the financial institutions have come up with some innovations such as the Index-based insurance schemes, microfinance, community banking, the use of modern communication technology to enhance payment system and bundling financial services with non-financial services in agricultural financing (IFPRI, 2011).

According to Worldbank (2012) report, apart from the commercial banks in Ghana, the Government of Ghana in the 1960s formed the ADB to provide financial assistance to the agriculture sector. The performance of the Bank after its establishment has been mixed. The banks offer lowest interest rates, that is 22 percent for other agricultural sectors and 19 percent for maize. The banks have of late shifted from agricultural investment to other investment though it maintains its name as ADB. The report reiterates that the agriculture sector got 25% of its lending facility which rose steadily to 29%. 75% of its loan facility was invested into services, construction, manufacturing and mining.

In 2012, Ghanaian government reorganised the defunct Export Development Investment Fund (EDIF) which was not taking care of investments in the agriculture sector. The reorganisation of EDIF led to a change of name to Export Development and Agriculture Investment Fund (EDAIF) which now takes care of agriculture-related activities (World Bank 2012). In 2015, EDAIF sanctioned an amount of GH¢ 28.5 million to 135 beneficiaries in the public and private sectors. Specific areas that received funding include poultry, agricultural production including the rice industry, agro-processing, and manufacturing (Joy Business News, 2015).

The most prominent bank that serves the rural folks in Ghana is the Rural and Community Banks. BoG (2016) reported that 140 Rural and Community Banks scattered all over the ten regions of the country had been licensed to operate. They lend to several sectors within the country, that is, salary workers (42%), traders (41%), agricultural sector (9%), cottage industries (6%) and transportation (3%) (Nair and Fissha, 2010).

Apart from the banks, there are also Non-Bank Financial Institutions (NBFIs) which also contribute to the agricultural sector. Currently, there are about 70 of the NBFIs. The table below shows a summary of NBFIs.

Table 1: Non-Bank Financial Institutions

No.	NBFI	Number
1.	Finance houses	22
2.	Credit Reference Bureau	3
3.	Remittance Companies	2
4.	Savings and Loans	37
5.	Leasing companies	2
6.	Finance and leasing	3
7.	Mortgage finance	1

Source: BoG, 2017

2.6.2.1 Access and cost of agricultural credit

It cannot be written off that, finance is key to the development of agriculture industry in Ghana. But financial access to agriculture is a bane to the growth of agriculture in the country. The outcome of a Ghana Living Standards Measurement Survey (GLSMS6, 2014) noted that 80.7% of loans received by households living in remote areas are for agricultural inputs. The loans were gotten from savings and loans schemes which accounted for 19.6%, friends and relatives are 22% and private banks also accounted is 18.6%.

2.6.2.2 Credits costs and Periods of loans

An article by the Agriculture Finance Support Facility (AgriFin, 2012) stated that other agricultural enterprises like traders, aggregators, and processors also have difficulty in accessing finance. The article noted that costs incurred in obtaining credit are high and falls in the range of 25 and 40%. Importers always have the lowest interest rates. Small-scale farmers have the highest interest rates, that is, between 35 and 40%. They even come with conditions of paying in a short time. This makes going for the credits not attractive.

2.7 Sources of Financing and support systems for Agriculture Value Chain Financing

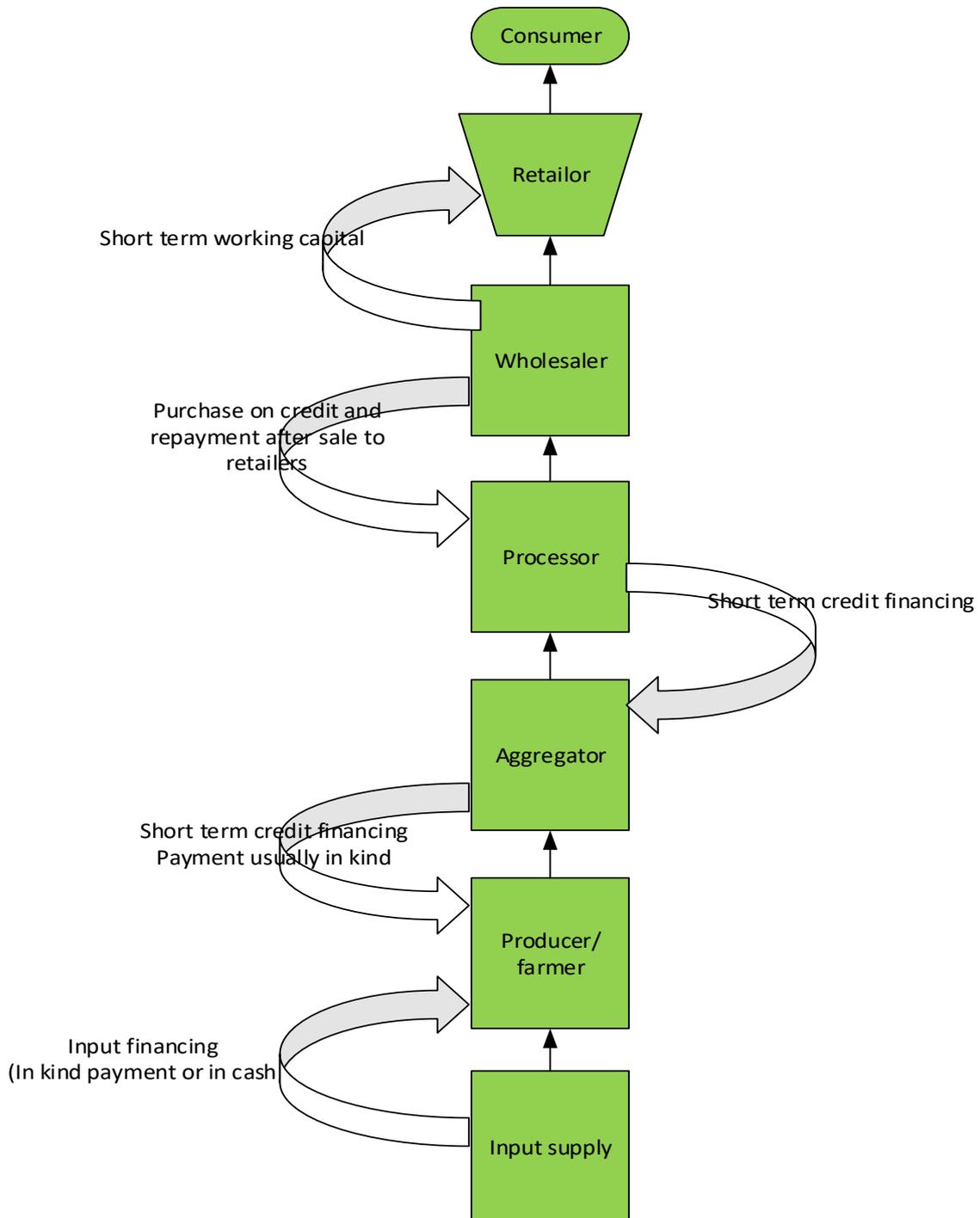
A typical Agricultural Value Chain (Figure 1) is made up of input suppliers, producers, traders or aggregators, processors, wholesalers, retailers and consumers. All of these value chain actors have their different characteristics and financing requirements. The producers need financing for inputs while a processor will require the same financing for upgrading processing activities like buying equipment and building.

2.7.1 Direct Value Chain Financing

Direct Value Chain Financing (within the chain finance) is a situation where value chain actors finance the activities of the chain. In such cases, input suppliers give credit support to farmers in kind like seeds, fertilizers, equipment. The farmer or producer, in turn, pay back the credit either in kind (agriculture produce) or cash after the sale of produce. In other situations, aggregators or processors can also extend credit support to input suppliers who in turn also support the producers with the

credit. This kind of financing consists of short term loans to ensure the free flow of products and keeping activities running within the value chain. These financing activities are based on trust and more actors may join in the financing depending on the market (African Development Bank (AfDB), 2013). It is an informal type of value chain financing. The figure below illustrates the direct value chain financing.

Figure 2: Illustration of Direct (Within the Chain) Finance



Source: AfDB, 2013

2.7.1.1 Aggregator or Trade Credit

This is where the traders provide advance payments for the farmer's produce, and the farmer repays the at harvest time. It can also help the traders to buy produce, and the farmer also receives the needed cash and an assured sale of outputs. In trade credit, dealers can deliver products to third buyers with delayed payments, and this happens downward in the chain (Miller and Jones, 2010). This kind of financing is usually short-term and on a seasonal basis. The advantage of this system is that it easy, flexible and timely access to credit. The traders are also assured of their produce, requirements are low, and the processing of loans is very efficient.

2.7.1.2 Input Supplier Credit

This is where a farmer takes inputs from its supplier and pays after harvest. Interest on credit is embedded into the price. This type of credit enables the producer to get the necessary inputs while increasing sales of suppliers (Miller and Jones, 2010).

2.7.1.3 Marketing Company Credit

This is where a lead firm or marketing company gives finance to its suppliers like farmers, aggregators or other value chain enterprise to increase production and supply. This mechanism is used to finance most cash crops. The marketing company usually establishes trust with its suppliers. The type of finance is generally in cash or kind, and mode of repayment is mostly in kind. The lead firm makes use of a bank or other financial institution to manage disbursements and collections are managed through the receipt of the product. According to Miller and Jones (2010), downstream buyers purchase outputs and lock in purchase prices and producers, and other value chain actors obtain credit access and supplies and secure market for selling their products.

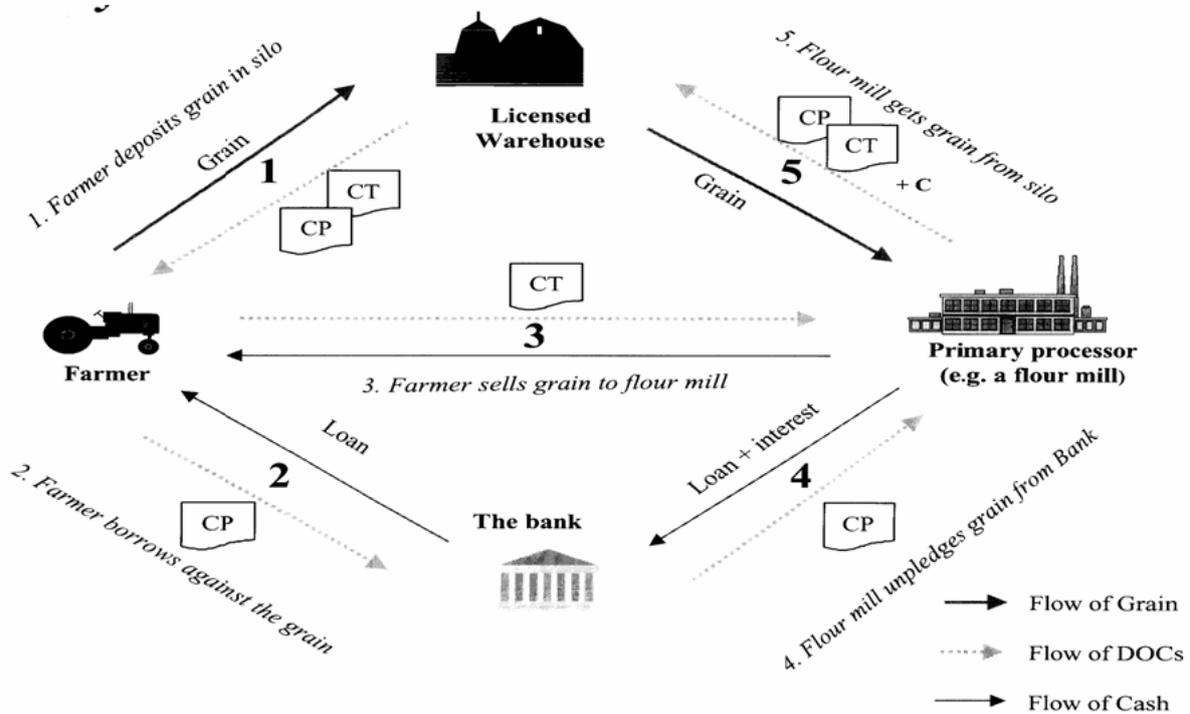
2.7.1.4 Lead firm financing

In the lead firm financing mechanism, there is the provision of direct financing to value chain enterprises including producers or guaranteed sales agreements that enable access to financing from third party institutions. In this case, a farmer produces crops under a buy-back clause, and the lead company finances all requirements at the production stage. The lead firm provides technical and advisory services to farmers (AfDB,2013). It is also known as contract farming or out-grower schemes.

2.7.1.5 Warehouse Receipt System

This is where farmers provided some proof in the form of a document which shows the storage of produce in a warehouse. The stored products serve as collateral. It can be traded or "sued for " delivery against financial instruments (IISD, 2015). The warehouse is certified. Certificates allow farmers and other value chain actors to access loan from third part financial institutions. In this arrangement, producers have the assurance of the ownership of the product unless they default on loans. This mechanism can be used to sell products to buyers at competitive prices by transferring receipts to the buyer, thus the farmer can pay for the loan. The customer then takes delivery of the produce at the warehouse. Warehouses are also insured against disasters and criminal activities and therefore protecting the depositor. The figure below shows how the warehouse system works (AfDB, 2013).

Figure 3: Warehouse Receipt System

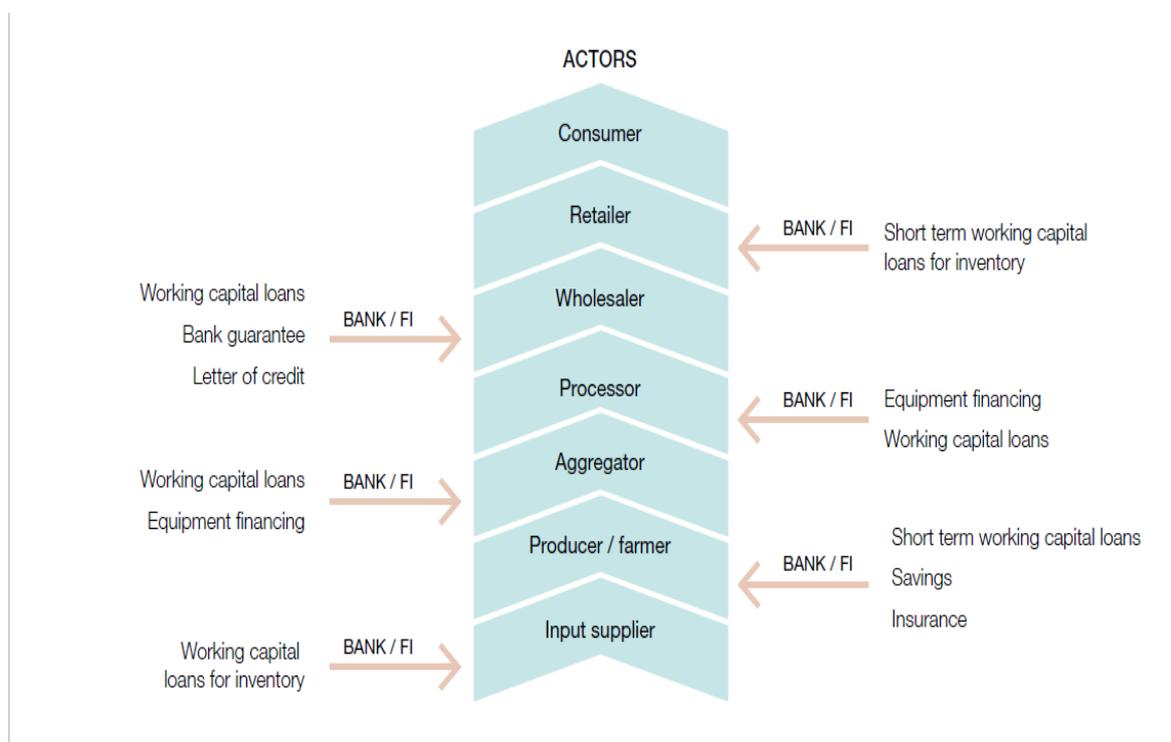


Source: Tridos Facet

2.7.2 Indirect (from outside the chain) Value Chain Financing

Indirect value chain financing occurs when financial institutions, non-actors in the value chain finance the chain. The type of financing is formal and financial institution serves as supporters of the value chain. They have one-to-one relationships with various actors in the chain. It may take the form of loans, savings, insurance and/or remittances. It requires longer term financing and a significant amount of money is involved as compared to direct financing. The scheme is considered transparent and exploitative risk is less. High transaction costs limit the indirect mechanism together with inadequate information of credit worthiness of different actors, poor flexibility in designing tailor-made solutions, and inadequacy of formal financial institution (AFDB, 2013).

Figure 4: Indirect Value Chain Financing



Source: AfDB, 2013

2.7.2.1 Regular Finance

It's the most common form of indirect finance. Financial institutions and government help in the delivery of this mechanism. The services offered under regular finance include loans (long and short term), farmers finance cards, overdrafts, credit line, equipment, assets and vehicle finance. Banks and microfinance institutions provide these services.

2.7.2.1.1 Microfinance

This product aims to make financing more accessible to rural and vulnerable populations especially farmers. The microfinance companies offer savings, loans, insurance, and remittances. Some even offer payments and guarantees for accessing finance. It is now common in most developing countries.

2.7.2.1.2 Traditional finance

This type of financing comes from Agricultural Development Banks, commercial banks, NGOs, investors or cooperatives. Organisations that receive this kind of funding also qualify for support from government or International Development Banks (e.g. Worldbank and IFAD).

2.7.2.2 Receivable Financing

2.7.2.2.1 Trade – Receivable Financing

This is where a financial organisation purchase accounts receivables or orders confirmed from an agribusiness to (or "intending to") advance its capital (IFAD, 2012)

2.7.2.2.2 Factoring

This is where a financial company called the factor purchases invoices from a business at a discount and making advance payments to the organisation or person (IISD, 2015).

2.7.2.2.3 Forfeiting

It is commonly used during exports. In this process, the financial company acting as a forfeiter buys the amount owed to exporters by importers in negotiable terms. The company then discounts commissions and fees and then pay in cash. (AfDB, 2013).

2.7.2.3 Physical Assets Collateralisation

2.5.2.3.1 Repurchase Agreements (Repos)

This occurs when a farmer wants to borrow for the short-term. The buyer of the farm produce gets securities in the form of a collateral and reach an understanding to purchase them again at a later date. The produce is put under storage with accredited collated managers who give receipts with the condition of repurchase agreements and also makes it obligatory to buy back the produce when it is in sales. These Repos are used by trading organisations that want access to a more and low-cost funds based on security (IFAD, 2012).

2.7.2.3.2 Leasing

The lease is employed to obtain financing for equipment in agriculture. A down payment is made by the lessee and then makes use of the asset while making periodic payments. When the term of leasing expires, the asset may be purchased by the lessee.

2.7.2.4 Risk Mitigation Products

2.7.2.4.1 Insurance

In this case, consistent payments are made to an insurance company by agricultural organisations to wholly or partially take care of losses to an unfavourable condition.

2.7.2.4.2 Forward Contracts

Agreements are made to purchase or sell an asset at a price between two parties at a particular time. Forward contracts lessen the risks associated with price fluctuations and mostly employed as a form of collateral (IFAD, 2012).

2.7.2.4.3 Futures

These are forward contracts which are standardised and are mainly trade in particular future exchanges.

2.7.2.5 Financial Enhancement Instruments

2.7.2.5.1 Securitisation Instruments

Securitisation Instruments (SI) is where the cash flow of receivables, that is illiquid assets are pooled together, repackaged into securities and sold to investors. The money from these securities finances the business.

2.7.2.5.2 Loan Guarantee

Loan Guarantee (LG) is where a guarantee to a loan is provided by a third party to reduce risks of repayment.

2.8 Special Mechanisms for Agriculture financing in Ghana

2.8.1 Stanbic/ AGRA Loan Guarantee Program

The Stanbic/AGRA Loan Guarantee Program is a joint loan facility between Stanbic Bank in Ghana and AGRA. The credit facility implemented under this programme is the "first loss Guarantee. According to World Bank (2012) agribusiness report, Stanbic which is the primary facilitator gives its funds to farmers, and if the bank invests US\$10, AGRA offers a first loss guarantee of US\$1. The programme is for about 5000 small scale farmers covering a lending volume US\$25,000,000.00.

2.8.2 Warehouse Receipt System

The Ghana Grains Council (GCC) which is a membership-based organisation representing the grain sector in Ghana at large is a lead agency in implementing this system. It has trained storage centre owners and certified five warehouses for storage of cereals.

2.9 Value Chain Models Available in Kpong Irrigation Scheme (KIS)

Some value chain business models have been identified in Asutsuare from literature. These are the buyer-driven and facilitator driven models. The models are described below.

2.9.1 Buyer-Driven Models

According to Asuming-Brempong et al., (2016), WIENCO (Ghana) Limited acquired the Global Agri-Development Company (GADCO) which is a commercial rice producer and processor with a focus on linking out-grower farmers to markets. GADCO connected farmers to markets through an out-grower scheme under its Copa Connect Initiative. The initiative allows small rice farmers to be given rice seed, fertilizer, pesticide, herbicide, and other inputs including technical support. The smallholder farmers were assured of a ready market since GADCO bought the entire rice paddy on a contract basis from them and subsequently sold to its clients after milling. USAID (2009) report identifies aggregator-processors which collect, mill and package paddy rice from farmers and sell it to importers on a contractual basis.

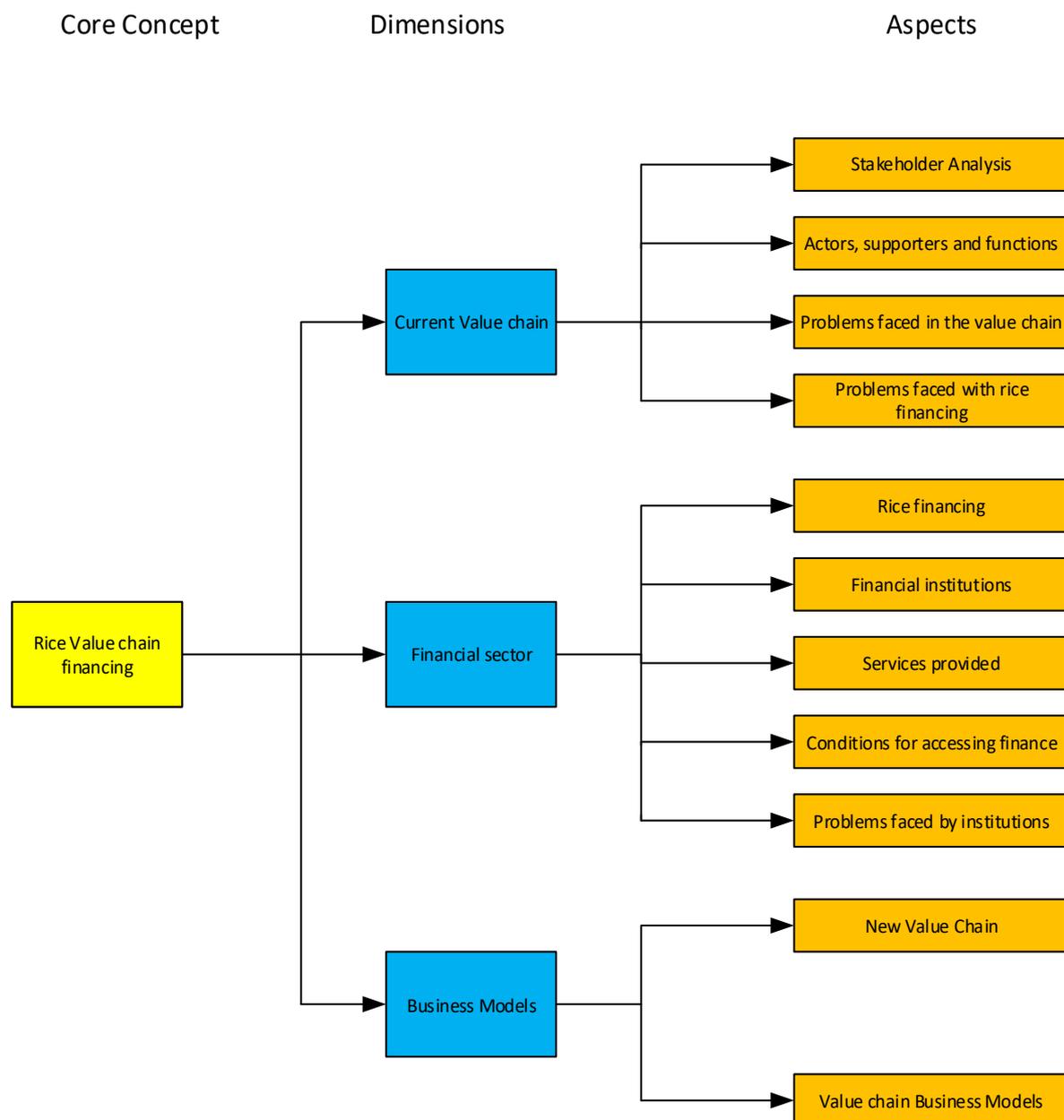
2.9.2 Facilitator Driven Model

In 2016, an NGO known as Hope-line Institute gave financial assistance to smallholder rice farmers in Asutsuare. The Institute mobilised them into savings and loans associations referred to as the Village Savings and Loans Associations (VSLA). This initiative is aimed at making available credit readily to farmers without any collateral requirement. The VSLA programme will also give insurance, technical support, extension services, health education and basic training in business operation to rice farmers to enable them to leap escaping poverty (Ghanaian Times, 2016). There is also the Ghana Rice Inter – Professional Body (GRIB) made up of over 15,000 stakeholders in the rice industry. The Government of Ghana through research-extension linkage had provided improved rice production inputs to the producers. Its FASDEP II identifies the relevance of supporting agricultural growth through value chain development. Although the initiative is a relatively new approach to supporting domestic rice sector, it is fast becoming prominent and serving as the centrepiece of development strategies in the rice industry (Addison et al., 2015). There are other donor agencies such as JICA, USAID, etc. which are giving a lot of support to the rice industry

2.10 Financial Institutions in Kpong Irrigation Scheme

Some banks exist in the Shai Osudoku District under which Asutsuare fall. They include the Shai Rural Bank, GN Bank, Ghana Commercial Bank, Agriculture Development Bank (ADB). Konu (2013) opined that ADB in conjunction with Kpong Irrigation Project provides loans to smallholder rice farmers at an interest rate of 26% per year.

Figure 5: Conceptual Framework



Source: Researcher's own construction

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The research methodology was made up of the description of the study area, research design, method of data collection, sources of data, target population and sampling techniques, sampling size, data analysis and reporting adopted by the study.

3.2 Study Area

The site for the research was at the Kpong Irrigation Scheme in Asutsuare in the Shai Osudoku District located in the Greater Accra Region of Ghana. The land is flat with a surface area of about 1,102 square kilometres which is the biggest (41.5 percent) in the Region. The District is constrained on the North by the Akuapim Ranges; to the South by Tema; to the East by River Volta and the West by Ga District. The district is in the southern part of Ghana and therefore has two rainy seasons in the year that is from April to July and October to December. Average annual rainfall increases from 762.5 millilitres on the coast to 1220 millilitres in the north and north-east close to the Akwapim Range (Ghana Statistical Service, 2014). The district forms part of the hot and dry south-eastern coastal plain of Ghana. Yearly temperatures are high in most parts, with the maximum being 40°C during the main dry season (November – March) and minimum during the short dry season (July – August).

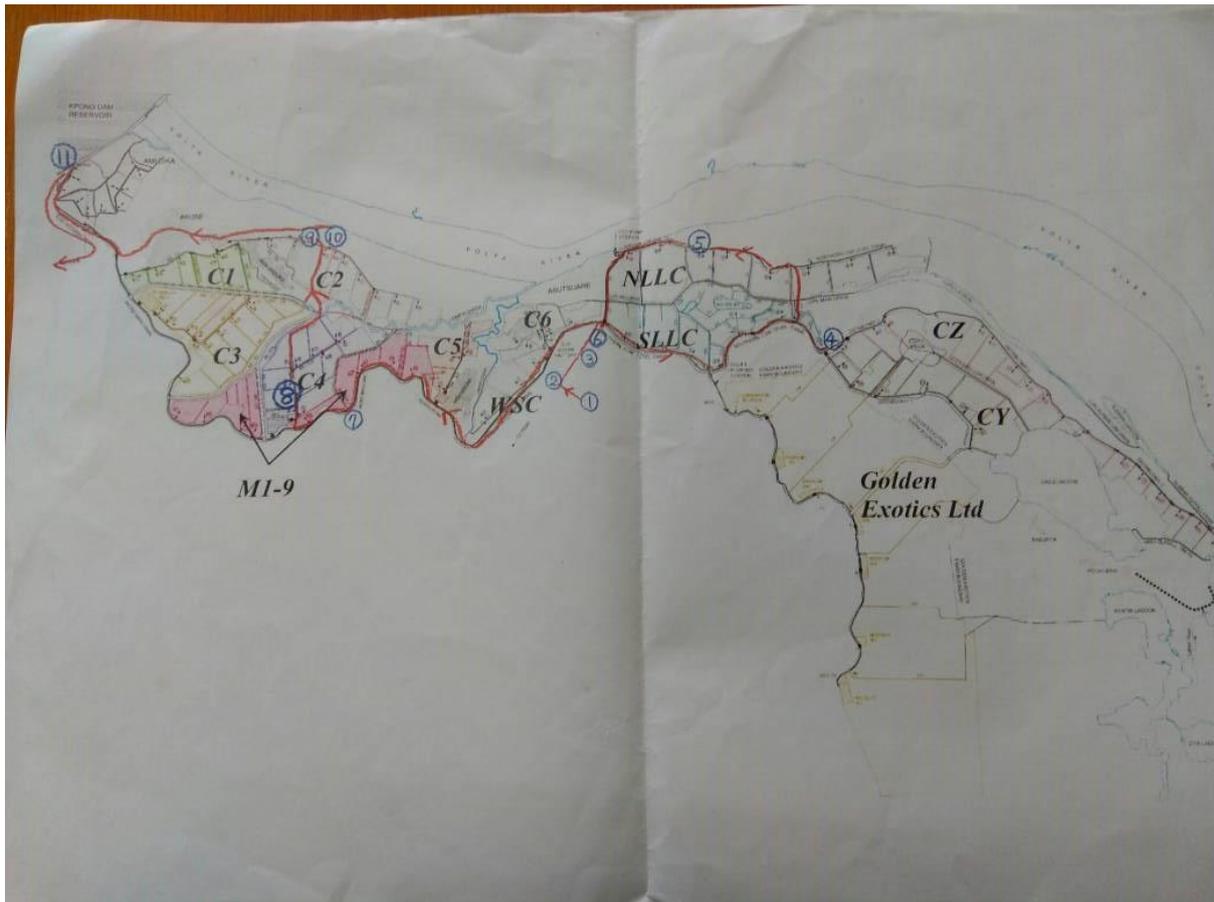
The figure below is a map of Ghana showing the map of the Shai Osudoku District and the study area.

Figure 6: Map of Shai Osudoku District



Source: Google, 2017

Figure 7: Map of Kpong Irrigation Scheme



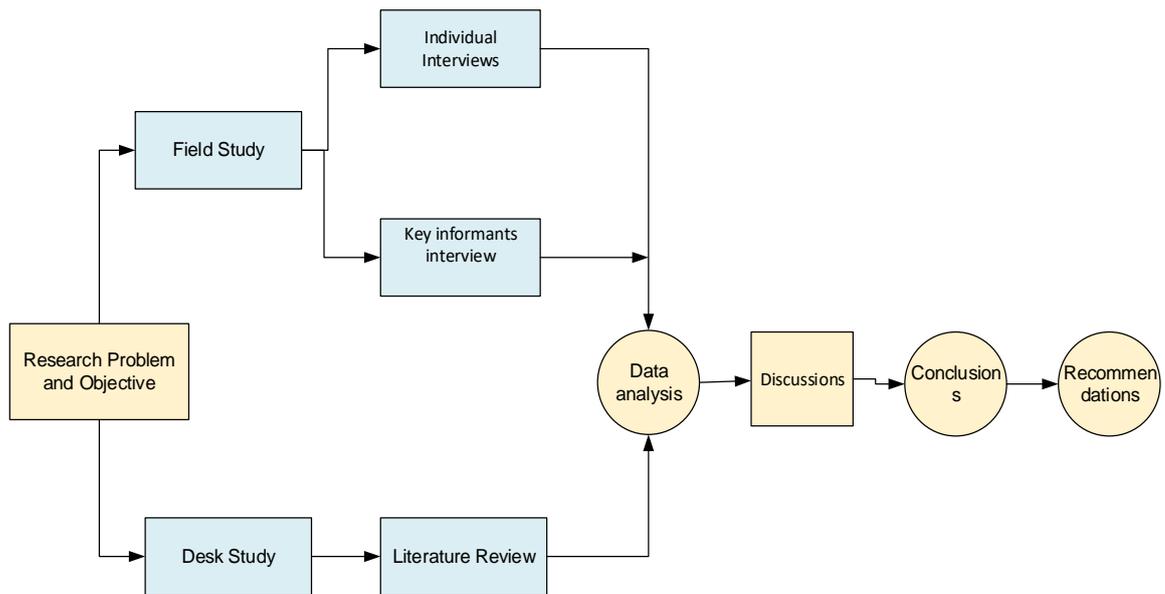
Source: KIS, 2017

The choice of the Kpong Irrigation Scheme in Asutsuare was made by the fact that the major crop produced in the area is rice. Also, the distance away from the capital of Ghana is about 40.8 kilometres. The district is rural but is gradually catching up with the rapid urbanisation of the peripheral areas surrounding the city of Accra. Approximately 45,600ha of the land is under cultivation of which about 2,200ha was used for irrigation. Medium scale farmers (about 16 percent) use irrigation agriculture in the district (MDTP, 2013).

3.3 Research Design

The research design was formulated based on the objective of the research and the research questions. The framework below shows the procedures to be followed to achieve the research objectives.

Figure 8: Research Framework



Source: Researchers own construction

3.4 Research Strategy

The research strategy was a case study of rice farmers in the rice value chain within the Kpong Irrigation Scheme. Triangulation of sources was used to gather relevant information involving the use of desk research, interviews and survey.

Table 2: Summary of Information Sources

3 Central Question	Sub questions Keyword	Source of information	Method used
What strategies can be used to improve the usage of value chain financing by small-scale farmers in the Kpong Irrigation Scheme	Current situation	Framers, aggregators financial institutions, KIS,	Interviews
	Awareness level	Farmers, financial institutions	Interview
	Problem faced by farmers	Farmers	Interviews, desk research
	Financial services or schemes	KIS, Farmers, aggregators	Interviews, desk research
	Problems of financial institutions	KIS, financial institutions	Interviews,
	Improvement of VCF	Farmers and other stakeholders	Interviews

Source: Researcher's own Construction

3.5 Methods of data collection and Sources of Data

The method of data collection was formal interviews using semi- structured questionnaires. Both quantitative and qualitative data were collected.

The data for the study was obtained mainly from primary and secondary sources. Primary sources of data were collected from rice farmers in within the Kpong Irrigation Scheme through interviews. Secondary data was collected from reports of KIS office in Asutsuare and other relevant government and private stakeholders. Other sources of information to be utilised are scholarly and grey literature from internet sources and related databases.

3.5.1 Desk study

A desk study was done to obtain data on secondary data on the rice value chain. It was also used to gather most of the information on the value chain business models, the financial sector in Ghana, value chain financing and the schemes prevailing in the rice value chain within the Kpong Irrigation Scheme. The desk study was used to answer research questions with the view of comparing with what was researched. This information were gotten from the internet, books, journals and libraries. Information were also obtained from reports of the Kpong Irrigation Scheme under the Ghana Irrigation Development Authority (GIDA) and Japan International Cooperation Agency (JICA).

3.5.2 Interviews

Interviews were conducted with the various stakeholders in the rice value chain within the Kpong Irrigation Scheme with the aid of a semi-structured questionnaire and checklist (see appendix 1).

Interviews was conducted for thirty (30) rice farmers, four (4) aggregators, four (4) millers or processors and two (2) wholesalers. Key informant's interviews was also done for the managers of three (3) banks, and staff of two microfinance institutions. The Operations Manager of the Kpong Irrigation Scheme, an Agriculture Extension Agent (AEA) of the Department of Agriculture, a staff of the Ghana Rice Inter-Professional Body (GRIB) and a representative the Japan International Cooperation Agency (JICA). These interviews was combined with information obtained from reports and other relevant documents to get an in-depth view of the current situation within the rice value chain.

3.5.3 Observations

The researcher observed the research area to see if other stakeholders like Non-Governmental Organisations, financial institutions and other private agencies that had interest in the rice value chain exist within the Kpong Irrigation Scheme. The observation enabled the researcher to have interviews with the identified stakeholders.

3.6 Target population/ Respondents

The target population were smallholder rice farmers within the Kpong Irrigation Scheme in the Shai Osudoku District of Ghana. According to a KIS (2017) report, there are 2,840 smallholder rice farmers in the area. Key informants from the Kpong Irrigation Scheme also form part of the target population.

3.7 Sampling techniques

The Kpong Irrigation Scheme was selected purposively because it is one of the major rice producing areas in the country. Within this area, twelve (12) irrigation branch canals were identified. Four (4)

major producing canals were purposively selected representing 1,452 smallholder rice farmers as the sampling frame for the study.

A total of thirty (30) rice farmers was randomly selected from the four (4) different branch canals to get the sample size. Canals 3 (C3) and Canals 4 (C4) from Akuse and North Lower Level Canal (NLLC) and South Lower Level Canal (SLLC) from Asutsuare within the Kpong Irrigation Scheme and interviewed for the research. For map of the branch canals, refer to figure 4.

Table 3: Sample Size of Rice farmers

Branch Canal	Study Population	Sample Size
Canal 3	230	5
Canal 4	179	3
NLLC	642	12
SLLC	401	10
Total	1,452	30

Source: Researcher's own construction

The table below shows sample frame and sizes of key informants.

Table 4: Supporters and Actors

Supporter and Actor	Study Population	Sample Size
Aggregator	10	4
Millers	20	4
Wholesalers	2	2
Bank	3	3
Microfinance	2	1
Kpong Irrigation Scheme	1	1
Department of Agriculture	1	1
JICA	1	1
Ghana Rice Inter-Professional Body	1	1
Total	41	18

Source: Researcher's own construction

3.8 Pre-testing

This was done in one of the branch canals within the Kpong Irrigation Scheme on 5 rice farmers to ascertain whether the questions are appropriate. After the pretesting, irrelevant questions were removed or modified to make the questionnaire more appropriate.

3.9 Data analysis

Both qualitative and quantitative data was collected after the research. The data was collected, analysed and interpreted by observation. It took into account the context of research, the existing value chain within the area and the various stakeholders existing within the Kpong Irrigation Scheme. Descriptive statistics was used to analyse quantitative data by the use tools such as statistical package for social scientist 23 (SPSS 23) and excel data sheet. Data was presented using percentages, frequency and means.

CHAPTER FOUR: RESULTS/ FINDINGS

4.1 INTRODUCTION

This section gives the results of the various interviews conducted. The interviews answered the sub-questions related to the central question of the research on the strategies needed to improve the usage of value chain financing by smallholder rice farmers within the Kpong Irrigation Scheme. Interviews were done with farmers and other actors within the value chain. The actors are aggregators, processors and retailers. Some supporting stakeholders were also interviewed, and they include the Kpong Irrigation Scheme, District Agricultural Development Unit (DADU), some financial institution, Ghana Rice Inter-professional Body (GRIB) and Japan International Cooperation Agency (JICA).

4.2 Contextual Information (Kpong Irrigation Scheme) – Key Informant Interview

The Kpong Irrigation Scheme is a government facility and one of the largest Ghana Irrigation Development Authority (GIDA) Schemes in the country. It is a government-funded project extending to the right bank of the Volta River from the Kpong Hydro-Electric Power Station at Akuse. The central canal that takes water to the fields stretches about 38km downstream. Funds for the project is from the Government of Ghana with support from the African Development Bank (AfDB). The office of the project is at Asutsuare. Asutsuare is 80km North-East of Accra and about 15km East of Accra-Akosombo Highway.

The primary objectives of the project are:

1. Increase food production under sustained rice base cultivation system
2. Improve the living standards of the rural people in the project area

The project covers a total area of 4,052Ha of land, but the developed area is 3,028Ha. The scheme is divided into three sections. These are:

1. Sections A - which is located in the Akuse area
2. Sections B - which is at the Asutsuare area which is mainly used for paddy production
3. Sections C – a high land occupied by a private company called Golden Exotics for banana production

The sections A operates a gravity irrigation system, and therefore, there is a natural flow of water. Water needs to be lifted in the highland areas of Section C used for the banana plantation. The source of water is the Kpong Dam from which it derives its name. Currently, out of the developed area, 2000Ha is used for irrigation of paddy rice every season, 1000Ha is utilised for the banana plantation and still under expansion and vegetable growers which are located in the out-of-command areas also use about 36Ha of the developed area. There are also six dotted fish ponds which take water from the main canal for aquaculture. A key informant from the Kpong Irrigation Scheme indicated that on the average, rice farmers produce 5 tonnes of paddy rice per hectare during the major season (April to July), but in the minor season (October to December), yields are about 4.5 tonnes on average per hectare. There are about 2,840 rice farmers within the Kpong Irrigation Scheme of which 30% are females. There are also about 18 agro-processing units or milling houses in the scheme, but some have folded up. There are agro-input dealer's s as ABIANS, machinery service providers regarding tractors and combine harvesters. There is also the Copa-connect which is a subsidiary of GADCO which also provides farmers with inputs. They currently support about 200 of the rice farmers with inputs and take their paddy rice after cultivation.

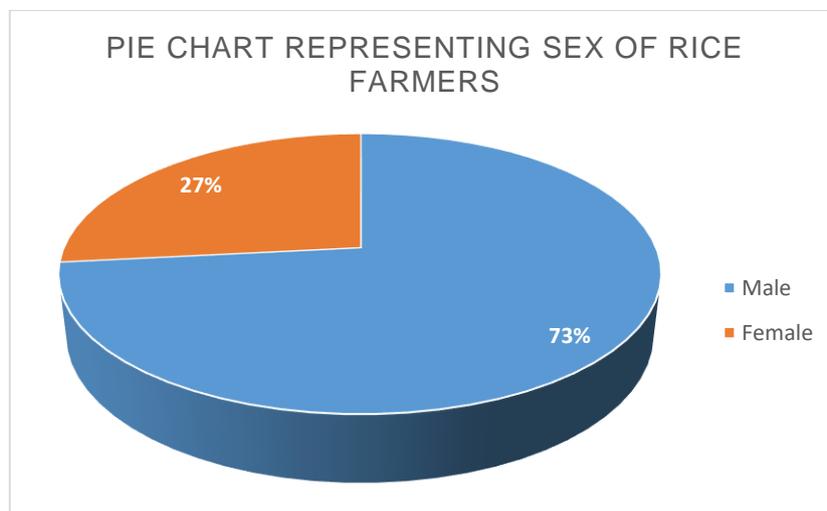
4.3 Findings from farmers

4.3.1 Demographic Characteristics of farmers

4.3.1.1 Age and Gender of the Respondents

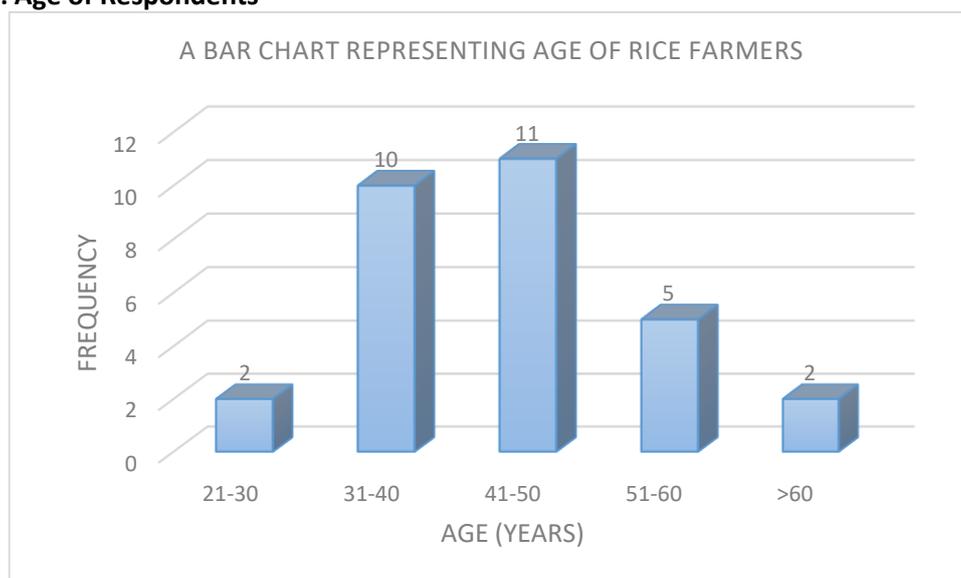
Results indicated that more males (73%) than females (27%) were involved in the production of rice in the Kpong Irrigation Scheme. A key informant confirmed this that about 30% of the farmers within the Kpong Irrigation Scheme was made up women. The age of rice farmers within the Kpong Irrigation Scheme ranges between 25 and to about 70 years of age. From the figure below, it was noticed that only two farmers representing 6.7% are between the ages of 21-30, ten rice farmers representing 33.3% were between the ages of 31-40 and eleven farmers representing 36.7% were between 41 and 50 years. Also, only five rice farmers representing 16.7% were within 51-60 years, and two representing 6.7 percent were above 60 years.

Figure 9: Sex of Respondents



Source: Researcher's field work

Figure 10: Age of Respondents



Source: Researcher's field work

4.3.1.2 Level of Education of respondents

Most rice farmers representing 73% had Secondary/Middle school education. 13 % had completed Tertiary education, and 6.7% of the farmers finished primary school. 6.7% of the farmers did not have formal education

Table 5: Educational Level

Educational level	Frequency	Percentage (%)
Secondary/Middle School	22	73.3
Tertiary	4	13.3
Primary	2	6.7
None	2	6.7
Total	30	100

Source: Researcher's field work

4.3.3.3 Number years of Experience

The number of years of rice farming by the farmers ranged between less than five years and more than a decade. 57% of the farmers had more than ten years' experience, 33% had between 5 to 10 years, and 10% of the farmers had just less than 5. The table below shows the years of experience and their corresponding percentages.

Table 6: Experience

Experience (years)	Frequency	Percentage(%)
<5	3	10
5-10	10	33
>10	17	57
Total	30	100

Source: Researcher's field work

4.4 Sub-Questions of the Research

4.4.1 Current Situation of Value Chain Financing in the Rice Value Chain

4.4.1.1 Size of the farm

The sizes of farms of rice farmers ranged between less than one hectare to more than three hectares. 63% of rice farmers had farm sizes between 1 and 3 hectares, 26% had more than 3 hectares with the highest been 15 hectares, and 10% of farmers had farm sizes less than one hectares.

Table 7: Size of farm

Size of farm (Ha)	Frequency	Percentage
<1	3	10.0
1-3	19	63.3
>3	8	26.7
Total	30	100

Source: Researcher's field work

4.4.1.2 Average yield of rice (Major and Minor Seasons)

The average yield of rice ranged from less than 1 tonne to 6 tonnes for the major season. 67% of rice farmers had between 4 to 6 metric tons per hectare followed by the farmers producing between 1 to 3 tonnes per hectare representing 30%. Only 3% had less than 1 tonne per hectare. For the minor season, rice yields ranged between less than one tonne to 6 tonnes. 63% of rice farmers were having between 1 to 3 tonnes per hectare, 33% had between 4 to 6 tonnes and the remaining 3% had less than 1 tonne.

Table 8: Major Season

Yield (tonnes)	Frequency	Percentage (%)
< 1	1	3.3
1-3	9	30.0
4-6	20	66.7
Total	30	100

Source: Researcher’s field work

Table 9: Minor Season

Yield (tonnes)	Frequency	Percentage (%)
< 1	1	3.0
1-3	19	63.7
4-6	10	33.3
Total	30	100

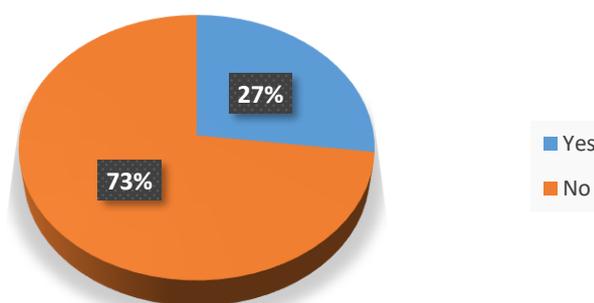
Source: Researcher’s field work

4.4.1.3 Contractual agreements

27% had contracts with buyers, and 73% had no contracts. But most of these contracts were a verbal agreement between traders and the rice farmers.

Figure 11: Pie Chart representing contractual agreements of respondents

PIE CHART REPRESENTING CONTRACTUAL AGREEMENTS OF RICE FARMERS

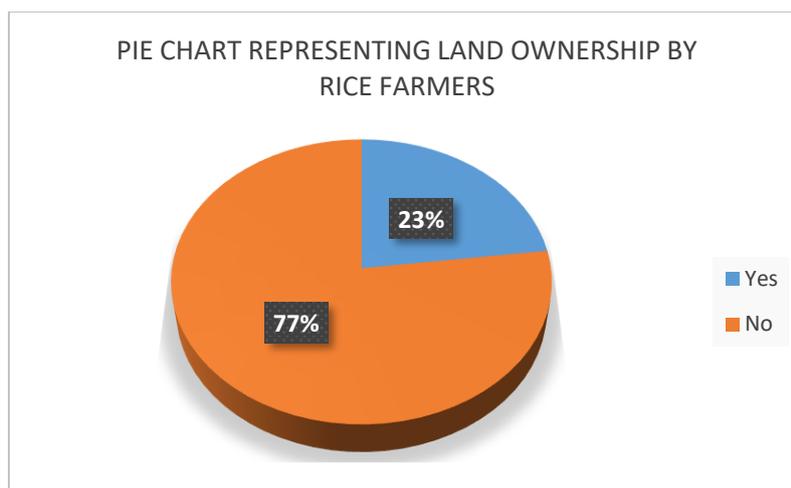


Source: Researcher’s field work

4.4.1.4 Land ownership

23% had their own land, and 77% got it from the government. According to a key informant from the Kpong Irrigation Scheme, a farmer had to be registered and be part of the Water User Association (WUA) to qualify for land allocation from the government. When lands are allocated to the farmer, he or she had to pay a mandatory irrigation service charge which is paid annually. When a farmer defaults in payment, the land is taken and given to a new farmer.

Figure 12: Pie Chart Representing Land ownership of respondents



Source: Researcher's field work

4.4.1.5 Main source of income

The primary source of income for the farmers within the area was rice farming. 63% of them were engaged in rice farming while 23% do other jobs like mining, carpentry and 13% were employed in various organisations.

Table 10: Sources of Income

Income source	Frequency	Percentage (%)
Rice farming	19	63.3
Other (mining, carpentry)	7	23.3
Employment	4	13.3
Total	30	100

Source: researcher's field work

4.4.1.6 Problems faced with accessing Insurance

From the table below, 67% of rice farmers decided that asymmetry of information was the problem they had in accessing insurance. 60% agreed that insurance is expensive and cannot afford it. 53% said insurance companies are not readily accessible and 23% decided that inadequate assistance from Producer Organisation (PO) is a problem.

Table 11: Problems with accessing Insurance

Problem	Frequency	Percentage (%)
Asymmetry of information	20	67
Expensive	18	60
Not readily accessible	16	53
Inadequate information from PO	7	23

Source: Researcher's field work

4.4.2 Services provided by financial institutions

The table below shows the different formal and informal financial institution together with some supporters and the services they provide within the Kpong Irrigation Scheme.

Table 12: Institutions and Services Provided

Institution	Services
Agriculture Development Bank	Savings, Loans
Dangme Rural Bank	Current accounts, Savings, Loans, Time deposits, Susu for traders, Government Treasury Bills,
Ghana Commercial Bank	Savings, advisory services, E-mobile cash
3A'S Microfinance	Savings, loans, investments
Yilo Star Microfinance	Savings, loans, investment
Trader credit	Loans
Kpong Irrigation Scheme	Technical advice
Mechanisation services	Machinery for farmers
JICA	Capacity development, advocacy, technical and advisory services
GRIB	Advocacy, technical and advisory services, capacity building, mechanisation, Agro- business support services

Source: Researcher's own construction

4.4.3 Awareness level of farmers on value chain financing

The awareness level of value chain financing schemes is shown in the table below. 97% of farmers were aware of the existence of banks in the area. 83% of the existence of Microfinance institutions. 70% were aware of the existence of the trader credit scheme and 67% of the availability of other services like extension and mechanisation services. 37% were aware of some NGO'S providing some services, and 7% said they receive help from friends and relatives. Despite the high awareness level for the formal financial institutions, only 47% goes for loans from the institutions and 5% are saving with them. 73% and 63% uses mechanisation and technical and advisory services.

Table 13: Awareness Level of Financial Institutions by Respondents

Value Chain Finance	Frequency	Percentage (%)
Bank	29	97
Microfinance	25	83
Trader Credit	21	70
Other (extension, Machinery)	20	67
NGOs (JICA, GRIB)	11	37
Friends/Relatives	2	7

Source: Researcher's field work

4.4.3.1 Information about Financial and Non-financial institutions

Sources of Information about financial institutions were gotten by rice farmers from friends and relatives (33%), radio and newspaper advertisements (30%), bank agents (20%), other sources (10%) like television and the distribution of brochures and fliers (7%)

Table 14: Sources of Information

Institution	Frequency	Percentage (%)
Friends and Relatives	10	33
Radio and Newspaper Advertisement	9	30
Bank agents	6	20
Other (Television)	3	10
Brochures and Fliers	2	7
Total	30	100

Source: Researcher's field work

4.4.3.2 Reason for Choosing services

The table below shows the factors considered by rice farmers when selecting a financial institution. 77% of farmers indicated that proximity to the area is what they deem. 57% of the farmers reported low-interest rates as a factor. Another 57% found the flexibility of terms as a factor and 43% considered how well established a financial institution is especially the formal ones.

Table 15: Factors or Reason for Choosing Financial Services from Financial Institutions

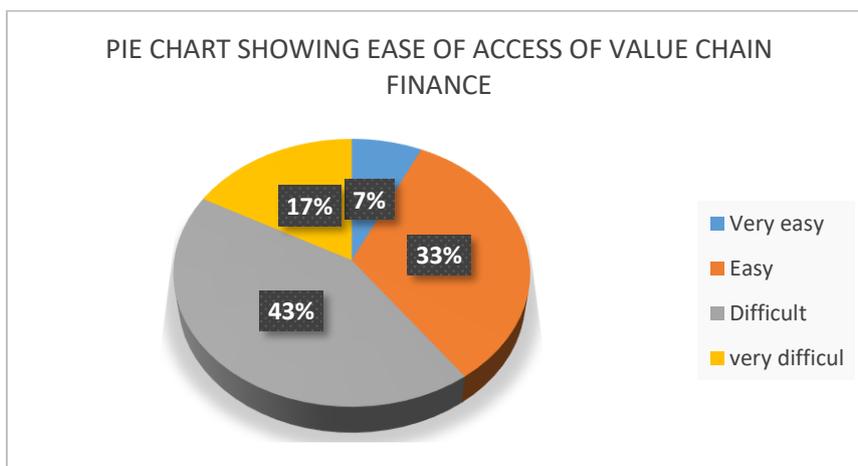
Reason	Frequency	Percentage (%)
Proximity	23	77
Low-interest rates	17	57
Flexible terms	17	57
Well established	13	43

Source: Researchers field work

4.4.3.3 Ease of access to Value Chain Financing

The figure below shows the ease of access to value chain financing in the scheme. 43% of rice farmers said it is difficult to access. 33% indicated that its is easy while 17% said it is very difficult. The remaining 7% said it is very easy Farmers that responded that it is difficult do not use the various means of value chain financing. Rice farmers who said its easy or very easy make use of other services like mechanisation services and services provided by Government organisations and NGO's.

Figure 13: Pie Chart showing ease of access to value chain finance



Source: Researcher's field work

4.4.3.4 Services Benefited or Used from financial Institutions

Rice farmers within the Kpong Irrigation Scheme benefit from various services from financial and non-financial institutions. These services are savings and loans with corresponding percentages of 17% and 37% respectively. They do not benefit from insurance and leases. 10% benefit from inputs from suppliers and majority (63%) benefit from technical and advisory services offered by these institutions. They also benefit from other services like machinery for their production activities

Table 16: Benefit or Usage of Services from Financial Institutions

Services	Frequency	Percentage (%)
Other (Machinery,)	22	73
Advisory and Technical	19	63
Loans	11	47
Savings	5	17
Inputs	3	10
Insurance	0	0
Lease	0	0

Source: Researcher's field work

4.4.4 Problems rice farmers face in accessing value chain finance

The table below shows problems rice farmers face in accessing value chain financing. 80% of rice farmers agreed that high-interest rates are a factor that prevents them from accessing financing from some financial institutions. 63% decided that Asymmetry of information is another factor. 63% again agreed that they need assistance from the producer organisation (PO). 40% looked at the high risk of default, especially with contracting loans. 37% agreed on high transaction cost. Only 27% agreed on inadequate collateral.

Table 17: Challenges rice farmers face in accessing services by financial Institutions

Problems	Frequency	Percentage (%)
High-Interest rates	24	80
Asymmetry of information	19	63
Inadequate assistance from PO	19	63
High risks of default	12	40
High transaction cost	11	37
Inadequate collateral	8	27

Source: Researcher's field work

4.4.5 Challenges faced by financial and No-financial institutions in meeting the needs of rice farmers

Interviews with the Managers of the various financial institutions revealed the problems faced in meeting the needs of farmers. Some of the challenges encountered are;

1. High default rates
2. Inability of farmers to meet banks requirements
3. Uptake of technology by farmers,
4. funds for conducting field trials,
5. government policies
6. over-reliance of farmers on government services

4.4.6 Improvement of Value Chain Finance

The table below shows the various ways of improving value chain finance. 77% of the farmers said they need good government policies like reducing importation of rice into the country to enable them market the local brands. 67% concurred that they require financial institutions like banks and microfinance which are affordable and with lower interest rates. 50% of rice farmers agreed that it is imperative to have a stronger producer organisation to improve value chain financing. 37% of farmers agreed capacity building is necessary. Others (30%) say there should be adequate infrastructure for the production of rice in the scheme.

Table 18: Improvement of Value Chain Financing

Improvement	Frequency	Percentage (%)
Good Government policies	23	77
Affordable financial Institutions	20	67
Strong Producer Organisation (PO)	15	50
Capacity Building	11	37

Source: Researcher's field work

4.5 Stakeholder Analysis

A stakeholder analysis was carried out during the research to find out the various actors, supporters, and their risks and challenges. The table below shows the different players, supporters and their challenges.

Table 19: Stakeholder matrix and their challenges

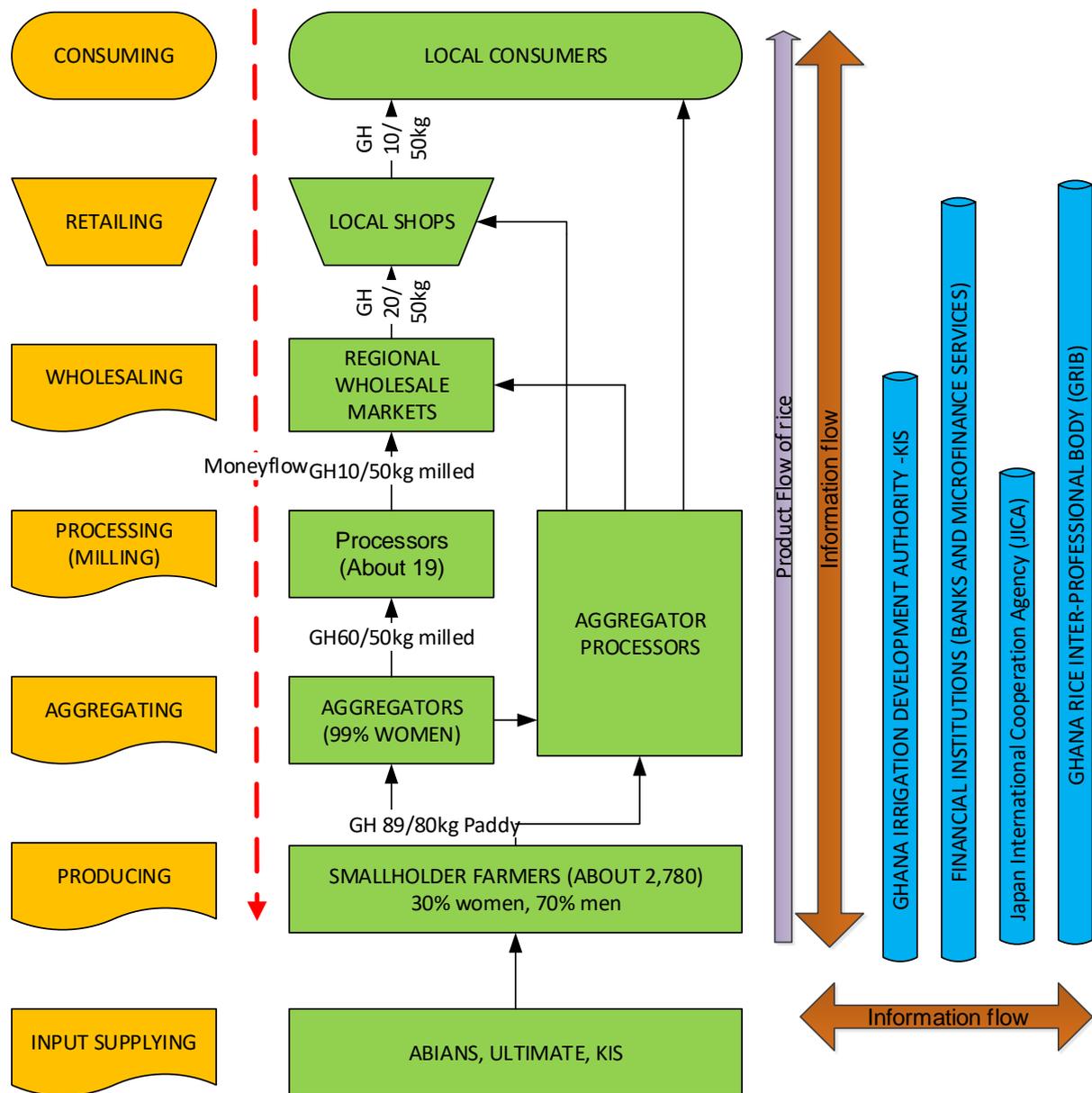
Stakeholder	Roles	Challenges
Input suppliers (Eg. ABIANS, Ultimate, KIS)	Sale of inputs such as pesticides and fertilizers to farmers. KIS sells rice seeds to the farmers	Poor storage facilities, high transportation cost
Farmers	Production of rice	Problems involve machinery, financing, marketing.
Aggregators (Market Women)	Buy paddy rice from farmers, give loans to farmers	Bad roads to farms.
Aggregator-Processors (EG. ABIANS)	Buy paddy rice from farmers and process them into milled rice. They have their milling facilities.	Bad roads. Outmoded machines
Processors	They are responsible for milling rice	Outmoded machines.
Retailers	Buy rice from wholesalers and sell them to consumers	The quality of rice is not good
Government	Responsible for the provision of policy direction for the rice sector	Inadequate funding. Inadequate extension staff
JICA	Provides technical and advisory services in the area of capacity building, marketing	Overdependence of farmers on public/government services
GRIB	Serves as an advocacy body for farmers. Provides capacity building, technical and advisory services. Also, provides mechanisation to farmers	Uptake of technology by farmers. Funding to undertake trials is also a major challenge and unfavourable government policies.
Financial Institutions (Banks and Micro finance)	Provide loans to farmers	Credit default

Source: Researcher own construction

4.6 Rice Value Chain Map in the Kpong Irrigation Scheme

The figure shows the value chain map of all the actors and supporters within the Kpong Irrigation Scheme. The map shows the various players and supporters and the profit each player is making along the chain.

Figure 14: Value Chain Map of the Kpong Irrigation Scheme



Source: Researcher own construction

4.6.1 Chain Relationships

In the rice value chain in the Kpong Irrigation Scheme in Asutsuare, the aggregators which are made up of women are the key players within the chain. According to an extension agent from the District Agricultural Office, about 99 percent of aggregators are made up of women. Only 1 percent or even less of the men are involved in aggregation. The smallholder rice farmers within the scheme prefer to sell their paddy rice to the aggregators. In this way, they can get a market for their produce. Some of the farmers within the scheme take loans in the form of cash from the aggregators and use it to finance their activities. By going for the loans, the farmer is obliged to sell all his produce to the aggregator

4.6.2 Product and Financial Flows

Product flows from the rice farmers to aggregators, processors, wholesalers, retailers and the consumers. Financial flow also comes from the customers to the rice farmers within the rice value chain. Finance also other supporting services flows horizontally from the financial institutions, government agencies and Non-Governmental Organisations to the farmers, aggregators and processors. There are formal financial institutions within the Kpong Irrigation Scheme, but the farmers hardly go for loans from them. The institutions are also unwilling to give the farmers loans.

4.6.3 Sustainability

Sustainability is ensuring the continuity of the rice value chain and involves three main issues: People, Planet and Profit.

4.6.3.1 People

The inhabitants in and around the Kpong Irrigation Scheme are benefiting a lot from the rice project in that it has created jobs for a lot of people especially the youth within the area and its surrounding. it serves as a source of income for the people. Most of the young people within the area are now engaged in rice farming to support themselves. Apart from the rice farming some are also engaged in aquaculture. The constructions of irrigation facilities has benefited vegetable producers outside of the irrigation scheme whereby farmers use the facilities to water their crops

4.6.3.2 Planet

An interview with a key informant indicated that farmers are undergoing training in Integrated Pest Management(IPM) Strategies for the control pests and diseases and the use of pesticides. According to him farmers that are adopting IPM strategies within the scheme have lowered productions cost and yields have increased to 5.8 tonnes per hectare as compared to those 3 metric tons from those practicing conventional means. The informant quipped that they hope to bring all farmers on board to use the IPM strategies to reduce excessive use of pesticides and to boost yields

4.6.3.3 Profit

There is an uneven distribution of profits in the rice value. While aggregators, retailers and wholesalers have the chunk of the profits due to low operational costs, the farmers have to meet all the cost involved in production thus do not make much profit from the sale of the rice.

4.6.4 Quality Management

An interview with an aggregator - processor, indicated that there is high demand for quality rice in some areas of the country. Traders within the Kpong Irrigation Scheme noted customers require the absence of stones, uniformity of the grains and should have good taste. The rice must not be broken

rice, and the price must match the price. The rice to the wholesale and retail shops packaged in 50kg packaging bag. There is a standard developed by Ghana standards Authority for processing of rice.

4.7 Major/Minor Production Cost Per Hectare of Paddy Rice

The table below shows the production costs for both the major and minor seasons for rice production. According to a key informant from the Kpong Irrigation Scheme, rice farmers incur a cost of GHC 7,111.30. The cost goes into seed purchase, land preparation, transplanting and the purchase of fertilizers and agrochemicals. Also, the farmers make use labour, pay an irrigation service charge and a miscellaneous expense of 2% of total cost of production.

Table 20: Cost of Production of rice

No	Item	Description			
		Qty.	Unit	Unit Cost/GHC	Total Cost/GHC
1	Seed	80	Kg.	2.5	200
2	Land Preparation	1	Ha	600	600
3	Transplanting	1	Ha	600	600
4	Fertilizers & Agro – Chemicals				
	NPK	8	Bags	105	840
	Urea	1	Bag	100	100
	Ammonium Sulphate	3	Bags	95	285
	Foliar Fertilizer	1	Bottle	25	25
	Total herbicide	6	Litres	15	90
	Selective Herbicide	2	Bottles	90	180
	Fungicides	4	Kg	18	72
	Insecticides	2	Bottles	25	50
	Total				1,642.00
5	Labour				
	Bund reshaping	1	Ha	200	200
	Nursery beds preparation & sowing	1	Ha	120	120
	Hand weeding	1	Ha	500	500
	Spraying	6	Frequency	50	300
	Fertilizer Application	3	Frequency	60	180
	Scaring of birds	30	Days	10	300
	Manual Harvesting	1	Ha	1,500	1,500
	Post Harvest Handling	1	Ha	700	700
	Total				3,800.00
6	Irrigation service Charge	1	a/season	101.5	130
	Total				6,972.00
7	Miscellaneous (2% of Total)				139.44
	GRAND TOTAL				7,111.30

Source: KIS,2017

4.8 Key Informants Interview

Government Organisations – Kpong Irrigation Scheme (KIS) and Department of Agriculture

Services provided Government Organisations

The government agencies include the Kpong Irrigation Scheme under the Ghana Irrigation Development Authority and the Department of Agriculture. Services provided by these Government Organisations include negotiation of loans for rice farmers from commercial banks like the Agricultural Development Bank. No collateral is needed to access the loans by the rice farmers, but the farmer had to be a registered rice farmer with the scheme, have access to water and be in have some capital. Sometimes savings is required with the bank. The Kpong Irrigation Scheme had to ensure that rice farmers have access to irrigation facilities. All facilities are under KIS and therefore are must allow all recognised farmers within the scheme to use the irrigation facilities without any discrimination. As far as the farmer is registered and lands are allocated to the farmer, he or she can have access to the facilities. Maintenance operations of the irrigation facilities are some of the services rendered by the Kpong Irrigation Scheme. KIS ensures that the facilities are in good shape and functioning properly. There is the department in charge of the maintenance at KIS that ensures the proper handling of irrigation facilities. Also, fees charged from the farmers are used to maintain the facilities. KIS also provide technical advice to farmers in production and agronomic practices. They ensure farmers stick to Good Agronomic Practices (GAPs) and make use of Integrated Pest management Strategies to increase yields. KIS also provides that rice farmers have access to machinery service providers for their production activities.

The Department of Agriculture provides extension services to the rice farmers within the scheme.

Challenges faced by the Government Organisations in meeting the needs of rice farmers

Some of the problems encountered by the Government Organisations in addressing the needs of the rice farmers within the Kpong Irrigation Scheme include logistical constraints. There is inadequate transportation (e.g. Motorbikes) for Agricultural Extension Agents (AEAs) within the scheme to carry out field visits to and from the farmer's fields. The situation makes it difficult for the AEAs to carry out their work very efficiently. Thus, sometimes, when there is a problem on the field, it is not attended to on time. There is also the problem funding of the scheme by the government. The scheme is under the Government of Ghana, and therefore the Government is obligated to provide financial resources for the smooth operations of the project. But the allocation of these resources delays thereby hampering the work of staff within KIS. Another challenge is the lack of access to loans by farmers which delay the season. This situation is due to the high default rates of farmers with the financial institutions. Therefore, the banks are unwilling to give loans to the farmers. The farmers are also complaining of the high-interest rates offered to them, and the payment terms are inflexible. They have to pay monthly, meanwhile farming is seasonal. The interest rates provided by the banks is between 26% to 33% per annum, and those of microfinance institutions are about 5% per month. The inability to maintain irrigation facilities is also a challenge. Fees charged from the farmers for using the irrigation facilities are meant to be used to keep up the irrigation facilities. But the recovery rates of these costs are only 30% making maintenance of the facilities very difficult.

Awareness of Value Chain Financing Schemes in the Kpong Irrigation Scheme

Interviews with key informants indicated that various value chain financing schemes exist within the Kpong Irrigation Scheme. They stated that there is the input supplier credit, trader credit scheme, financial institutions like banks and microfinance services, machine service providers and some Non-

Governmental Organisations (NGOs) like the Japan International Cooperation Agency (JICA) that provides Non-financial services to the farmers.

Non-Governmental Organisations (NGOs) and Private Organisations Representatives

The Non-Governmental Organisation and private organisation include the Japan International Cooperation Agency(JICA) and the Ghana Rice Inter-Professional Body (GRIB) respectively.

Services Provided by NGOs

The services provided by these NGOs include the building of capacities of rice farmers within the scheme. The rice farmers were trained on the need to use GAPs for their farming activities. The NGOs also ensure farmers have access to markets. According to a key informant from JICA, the organisation is currently implementing a project on Market Oriented Agriculture where rice farmers would be linked to identified marketing channels. Also, a key informant of GRIB stated that its members are linked to the relevant market centres and customers within the country and outside. The NGOs also provide both advisory and technical services to the rice farmers.

GRIB serves as an advocacy body for its members lobbying policymakers on the need to develop good and beneficial policies and regulations for rice farmers in the country. GRIB also provides mechanisation services to its members. The needed machinery necessary for the production and harvesting of rice is provided for by this organisation. Services provided are subsidised for its members and paid for by non-members.

Challenges of Non- Governmental Organisations to meet the needs of farmers

During the research, it was realised that some of the problems they face were the over-reliance of rice farmers on government services. According to a key informant, farmers lack self-reliance and depending on government to provide is not sustainable. They need to see farming as a business and own the business. Another problem is the uptake of technologies by rice farmers. Key informants noted that several training programmes had been undertaken for the farmers in conjunction with field trials to boost their yield. But only a few (About 30%) are adopting these technologies. This leaves a huge gap in the rice value chain. Key informant noted that financing for trials is a challenge. He stated that in a quest to increase yields, high yielding varieties need to be developed and field trials need to be conducted. Finance is needed for these field trials.

Ways of Improving Value Chain Financing within Kpong Irrigation Scheme

Key informants stated that to enhance value chain financing, there need to be favourable government policies to boost the sector. Currently, there is no system to regulate the import of rice into the country thereby making rice farmers within the scheme disadvantaged. The foreign rice competes with the local rice, and due to their high grades, they are well patronised by consumers to the disadvantage of the local ones. There needs to be a policy that regulates the quantity of foreign rice to be brought into the country. This situation prevents rice farmers from investing a lot of financial resources into the farming. Another way of boosting value chain financing is the formation of farmer associations. According to one of the key informants, plans are advanced to form producer associations within the scheme. This will help farmers get access to finance more easily and also market their produce. The informant lamented that the lack of a producer association is hampering activities within the scheme. Also, there need to be more machine service operators within the rice value chain to provide support services to the rice farmers. According to a key informant, they are in the process of putting all machine service providers into an association to link them to machine dealers to purchase farm machinery at a discount. These developments will help farmers have access to the relevant machinery

more easily. Provision of inputs like seeds and fertilizers to rice farmers is one of the ways of enhancing value chain financing within the scheme. Farmers need to have access to inputs at the right time for their production activities. Lastly, relationships between farmers and aggregators need to be improved. There is a lack of trust between farmers and aggregators.

Awareness of Value Chain Financing Schemes in the Kpong Irrigation Scheme

Key informants from the NGOs noted that there is the aggregator credit scheme operated by traders with the Kpong Irrigation Scheme. According to them, few farmers work on contract farming with some companies, but their activities are minimal.

Aggregators

Four (4) aggregators were interviewed during the research. During interviews with aggregators, it was realised that services they provide to the rice farmers are informal. According to the key informants, loans are given to the farmers between GHC 1,000.00 and GH 10,000. These loans are used by the rice farmers to buy inputs and do other production activities. There are no collaterals and interest. The only condition is the farmer's ability to produce required quantities of paddy rice and own a land. Repayment is in kind. There is a verbal contract that after production, the aggregator would buy the paddy rice from the farmers. A bag of paddy is 80kg which is milled into 50kg. At the milling or processing house, the quality of rice is determined by the removal of stone and foreign matter, minimal broken grains and the uniformity of the rice. The key informants quipped that consumers also prefer aromatic short rice variety. Prices of rice ranges from GH180.00 and GH220 depending on the grade. They indicated that their customers are located in the market centre within the regions.

On the awareness of financial institutions, key informants stated that rice farmers also go for loans from banks but are not aware of any other financial institutions.

The challenges they face are limited access to credit and outmoded machines to grade their rice

Millers/ Processors

During the research, it was realised from the key informants that they do not give any financial assistance to rice farmers or other actor. They mill the paddy rice. But most of the time, the paddy rice comes from the market women (traders). They mill between 100 bags and 500 bags per day depending on the season. The paddy rice is processed at GH5.00 per bag into 50 kg bags.

On the issue of loans, key informants do not go for loans from banks. The reason is the high rate of interest. They prefer to self-finance their activities.

The challenges they face is the high cost of electricity. They also need more warehouses for the storage of rice.

Retailers

Retailers stated that due to the small nature of their business within the scheme, they buy between five to ten bags of milled rice for sale to their customers. They responded that sometimes, traders also give them. rice to sell and pay them after sales. There is no financial support to the farmers. Their primary challenge is that the local rice does not sell faster than the imported rice.

Key Informants Interview with Financial Institutions

Three banks and a microfinance institution were interviewed. Concerning the support services offered by financial institutions like banks and microfinance to rice farmers within the Kpong Irrigation Scheme, all interviewees indicated their willingness to help rice farmers and other actors in the scheme. All the interviewees reported that the services they provide are savings, loans, investments, current accounts, time deposits, government treasury bills, Susu for traders, e-mobile cash, Automated Charted House (ACH) and Internet Transfer (I-Trans). Out of these services, the rice

farmers are only interested in saving and loans. The managers from the banks indicated that currently, the banks do not give loans to the farmers due to the high default rates from the rice farmers. Interview with the manager from one of the banks indicated that since 2008, they have given loans to the rice farmers, they were unable to recover all. Showing a warning notice to defaulters published in the daily graphic to the researcher. Another key informant from the bank also said, their office had closed down due to the default rates for some time now, but they are currently in contact with the Kpong Irrigation Scheme to re-establish collaboration. When asked about interest rates, respondents indicated that the rates range from 26% to 29% per annum depending on the type of work. A key source from the microfinance institutions noted that interest rates from them are 5% per month. With regards to conditions for taking loans, the source from the microfinance indicated that rice farmers need to deposit 20% of the loan amount with the institution before loans are giving them. They also assess the farmer. Another informant from a bank stated the need for farmers to be in groups. All the interviewees agreed that for the farmer to access loans, they do a background check on the rice farmer's experience and the ability to pay. All interviewees stated that they make use of agents and radio/ newspaper advertisement to create awareness among rice farmers. But he agents are used more. They also stated that patronage of their services currently is low. One informant quipped that rice farmers do not even save with the bank and when they do they come for the funds immediately for their activities.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

This chapter discusses and critically review and link the results of the current study with those of other peers and also includes the researcher's opinion when necessary. The discussion is based on the subquestions of the research.

5.2 Current situation of Value Chain Financing (VCF) in the rice value chain

5.2.1 Current Actors and Supporters within the Rice Value Chain in the Kpong Irrigation Scheme.

The rice value chain in the Kpong Irrigation Scheme is made up of various players like input suppliers, producers (2,840 rice farmers), aggregators, aggregator-processors, millers (processors), wholesalers and retailers. There are also organisations that provide supporting services to the actors within the chain. These are Governmental Agencies like the Kpong Irrigation Scheme under the Ghana Irrigational Development Authority (GIDA) and the Department of Agriculture which is also under the Shai Osudoku District Assembly. There are also Non-Governmental Organisations like the Japan International Cooperation Agency (JICA) and private organisations like the Ghana Rice Inter-Professional Body (GRIB). Apart from these bodies, there are also mechanisation services and formal financial institutions like the banks and microfinance institutions. These findings are in line with a study conducted by USAID (2009) that the rice value chain in Ghana is made up of these actors such as farmers, aggregators, aggregator-processors, wholesalers and retailers. The study further stated that there are government, Non-Governmental and private companies that support the rice value chain.

5.2.2 Roles of Actors and Supporters in Value Chain Financing in the Kpong Irrigation Scheme

These actors and supporters provide various services to meet the needs of rice farmers. There are two main sources of financing within the Kpong Irrigation Scheme. During interviews with farmers and key informants, it was discovered that both formal financial and informal financial institutions within the Kpong Irrigation Scheme provides services to the farmers. There are also organisations that provide technical and advisory services to the rice farmers.

The ease of access to these services is difficult according to the farmers because they need to go through rigorous processes. For the financial institutions, farmers have to meet requirements like be registered producer have a land and for microfinance institutions, deposit 20% of loan amount. 27% of rice farmers have contractual agreements with their buyers, but most of these agreements are verbal. Most of the lands for the production of rice is given to the producers by the government as service to them, and the main source of income for the farmers is through the rice farming although others are involved in employment with other agencies and other jobs like mining, masonry and carpentry. Services benefited from financial and non-financial institutions include savings, loans, inputs, technical and advisory services and machinery services. All the farmers do not have insurance for their farms. They also do not go for lease. The reasons given by the producers for not going for insurance include asymmetry of information (67%), expensive (60%) and cannot afford it. 53% said insurance companies are not readily accessible and 23% decided that inadequate assistance from Producer Organisation (PO) is a problem. Currently, the banks are not offering any loans to the farmers.

The rice value chain in the Kpong Irrigation Scheme at Asutsuare, value chain financing is not efficient. This inefficiency could be as a result of inadequate coordination among various stakeholders within the chain. Miller and Jones 2010, suggested that, to promote cooperation and growth of a value chain, there need to be strong relationships among various stakeholders.

Rice farmers within the scheme are not part of any producer organisation. The only association existing in the scheme is the Water User Association (WUA). Their only responsibility is to ensure that water is distributed to its members for irrigating their rice. According to a key informant from the Department of Agriculture, there used to be a producer organisation, but it was disbanded. They are now finding a way to form a new one. Thus the Water User Association cannot serve as a group looking to the interest of rice farmers within the scheme. Rice farmers within the chain have land sizes between a one (1) hectares and three (3) hectares yields between four (4) tonnes and six (6) tonnes per hectare during the major season and one (1) to three (3) tonnes per hectare during the minor seasons. A key informant stated that averagely rice farmers could make about five (5) tonnes and four (4) tonnes in the major and minor seasons respectively. He quipped that yields are a factor when determining who gets a loan. This supports Musuva (2015) assertion that the average hectares of land owned by farmers affect their credit worthiness.

5.3 Financial schemes and models existing in the Kpong Irrigation Scheme

Miller and Jones (2010) defines value chain finance to include the flow to and through the value chain of support services needed to address the problems faced by actors within the chain. It must be noted that for a chain to be effective, finance alone is inadequate. Other support services are also relevant to ensure the smooth functioning of the value chain. Both the direct (within the chain) and indirect (from outside of the chain) value chain financing schemes exist within the Kpong Irrigation Scheme. The direct value chain financing is provided by input suppliers and aggregators (market women) while banks, microfinance institutions provide the indirect value chain financing. Other non-actors like government and Non-Governmental Organisations also provide this kind funding.

5.3.1 Direct Value Chain Financing in the Kpong Irrigation Scheme

5.3.1.1 Input Credit

Calvin and Miller (2010) defines input credit as when an input supplier advances inputs to farmers for repayment at harvest or at an agreed time. An interview with the Operations Manager of the Kpong Irrigation Scheme indicated Global Agri-Development Company (GADCO) provides farmers with inputs like seeds and fertilizers for production purposes and comes for the produce after harvest.

5.3.1.2 Aggregator Credit

Aggregator credit is also known as trader credit is where an aggregator advances a loan to the farmer to support the production activities (AfDB, 2013). The loans are paid in kind at harvest. In the Kpong Irrigation Scheme, traders made up of 99% women gives loans to farmers to support their activities. During the research, 70% of rice farmers indicated the existence of aggregator credit and that the credit they benefit from the aggregators are used for purchasing of input (47%), land preparation (60%), sowing (43%), household use (10%), harvesting and threshing (60%) and other services like transportation (7%). This kind of financing ensures that the farmer has the needed cash for production activities and a guaranteed buyer (Miller and Jones, 2010).

5.3.1.3 Lead firm financing or out grower schemes

In this case, a farmer produces crops under a buy-back clause, and the lead company finances all requirements at the production stage. The lead firm provides technical and advisory services to farmers (AfDB, 2013). It is also known as contract farming or out-grower schemes. According to the operations manager of the Kpong Irrigation Scheme, GADCO has an out-grower scheme referred to as the Copa Connect Out-grower scheme with over 200 rice farmers and still expanding. GADCO had contractual agreements with these farmers to produce rice for the company. GADCO provides cash, inputs and technical advice to the farmers. The scheme also links the farmers to markets. This supports the assertion of Asuming-Brempong et al., (2016) of the existence of the scheme.

5.3.2 Indirect Value Chain Financing in the Kpong Irrigation Scheme

AfDB (2013) indicated that indirect value chain financing is in the form of savings, loans, insurances and remittances.

5.3.2.1 Traditional finance

This type of financing comes from Agricultural Development Banks, commercial banks, NGOs, investors or cooperatives. In the Kpong Irrigation scheme, Three (3) banks were identified. These are the Dangme Rural Bank, Agriculture Development Bank (ADB) and the Ghana Commercial Bank. During interviews with the managers of these institutions, it was realised that they offer various products and services to rice farmers and other actors within the rice value chain. These are savings, loans, time deposits, government treasury bills, “ Susu” for traders, E-mobile cash and Internet Transfer (I –Trans). It was observed that the banks do not offer loans to farmers any longer. This supported by Konu (2013) that ADB in conjunction with Kpong Irrigation Project provides loans to smallholder rice farmers at an interest rate of 26% per year.

5.3.2.2 Microfinance

This product aims to make financing more accessible to rural and vulnerable populations especially farmers (Principles for Responsible Investment, 2013). Two (2) microfinance institutions were identified within the Kpong Irrigation Scheme during the field research. They are 3A’s Microfinance located in Akuse and Yilo Star Microfinance Institutions based in Asutsuare. The microfinance companies offer savings, loans and investments to the rice farmers. Some even offer payments and guarantees for accessing finance. It is now common in most developing countries.

5.3.3 Other indirect Value chain financing

During interviews with rice farmers, it was realized that other indirect sources of financing are from Government, Non-Governmental and Private Organisations.

Also, the Kpong Irrigation Scheme provides extension services and manages the irrigation facility for the farmers.

Non-Governmental Organisations like the Japan International Cooperation Agency (JICA) provides services like training regarding water management, cultivation and marketing of the farmers produce. Services rendered by the government and JICA are free.

There is also the Ghana Rice Inter-Professional Body (GRIB) which provides advocacy, technical and advisory services, capacity building, mechanisation and Agro-business support services. Services rendered by GRIB is subsidized for its members and fully paid for by non-members.

There are also mechanisation services which provide the necessary machinery to rice farmers for their production activities. Some of the machines are tractors and combined harvester.

These services were confirmed by key informants from the government and Non-Governmental Organisations.

5.4 Awareness level of farmers of value chain financing Institutions

A study conducted by Kirui et al. (2010) indicated that education, distance to a commercial bank, membership to a producer organisation and the use of agents by financial institutions create awareness about financial products by financial institutions. During the fieldwork, the researcher discovered that rice farmers were aware of the financial institutions existing within the Kpong Irrigation Scheme. The awareness level included banks (97%), Microfinance Institutions (83%) and trader credit (70%). The awareness level of services like mechanisation and extension services is 67% and Non-Governmental Organisations (NGOs) like the Japan International Cooperation Agency (JICA) and the Ghana Rice Inter-Professional Body (GRIB) representing 37%. 7% also receive some financial

help from friends and relatives. Interview with a staff of JICA indicated that they give support to rice farmer through training and technical advice and therefore they are aware of their availability. The rice farmers get information about these services from bank agents, radio and newspaper advertisements, friends and relatives, brochures and fliers from the institutions and other sources like the Television. The reasons for the awareness level with the banks and the microfinance institutions is the proximity (77%), low interest rates (57%), flexible terms (57%) and well established financial institutions (43%). Although there is a level of awareness among farmers of the of the financial institutions, the usage varies. The rice farmers make use of mechanisation services (73%) and technical and advisory services (63%) from the government and NGO's than from the formal financial institutions. For the mechanisation services it is readily available for use and the government and NGO'S are continually training and building the capacities of rice farmers and thus offering them advisory and technical services. Only 47% go for loans, and 17% save their monies at the banks and microfinance institutions. They do not make use of insurance and leases.

5.5 Problems rice farmers face in accessing value chain finance

Rice farmers in the Kpong Irrigation Scheme in Asutsuare faced many challenges in obtaining value chain financing. 80% of rice farmers decided that high-interest rates offered by formal financial institutions are the biggest challenges they are facing. This makes accessing loans from banks and other institutions difficult. An interview with an an agregator concured with the rice farmers. According to the aggregator, interest rates offered by banks and microfinance institutions are abnormal, and the terms of payment are also not flexible, and that farming is seasonal work, but these financial institutions expect them to pay for the loans and its interests on a monthly basis. AgrinFin (2012) stated that while importers are receiving loans at the lowest interest rates from financial institutions in Ghana, smallholder farmers received the highest interest rates. 63% of farmers also noted that asymmetry of information is a factor that affects them in accessing financing. According to farmers funds are available from some financial NGO's at lower interest rates, only a farmers benefit. Also, information is also not available on market prices of the rice. According to an AfDB (2013) publication on Agricultural Value Chain Financing, farmers are often exploited by aggregators or intermediaries by paying lower rates for agricultural produce in comparison with prices prevailing in the larger markets. This situation is prevalent in the Kpong Irrigation Scheme especially when aggregators finance activities of the growers. Farmers lamented that because they do not have access to the markets, they are often short-changed by the women traders. They have to always sell their rice below the market price. This situation has resulted in mistrust between farmers and the aggregators. Also because there is no farmer association within the scheme, information flow is also a problem for the farmers. 63% of the farmers also noted the need for assistance from producer organisations. They agreed that the existence of an association would link them to markets and the affordable financial institutions. This was confirmed by an Agricultural Extension Agent from the Department of Agriculture on the need to have a producer organisation for rice farmers. Bijman and Wollni (2008) indicated that the formation of an association that represents actors within the value chain can perform both advocacy and economic functions. The support is political where the union lobbies policymakers and economic services are by integrating forward into the value chain, that is performing both processing and marketing of products, or by integrating backwards that is, purchasing and producing farm inputs. 40% of farmers asserted that the high risks of default are a challenge to them. Some of the farmers admitted that they were in debts from previous loans taken from financial institutions and would not go for another. They indicated that terms of payment were a factor contributing to their inability to pay. Emerole et al. (2013) noted that default risk occurs when farmers are unable to meet principal and interest repayment obligations on loan contracts. 37% and 27% of rice farmers indicated the high transaction costs and inadequate collateral respectively is a challenge.

5.6 Challenges of financial institutions to satisfy the demand of smallholder farmers

All the formal Financial institutions in the rice value chain within the Kpong Irrigation Scheme pointed out that the primary challenge they face as an organisation is the high rate of default among rice farmers. An interview with the Operations Manager of the Kpong Irrigation Scheme indicated that there used to be a credit facility which is a collaboration between the Scheme and the Agricultural Development Bank (ADB). Because of the high rates of default by the farmers, the bank pulled out of the collaboration. As at the time of the research, the office of the bank was closed. AfDB (2013) identified high rates of defaults as one of the challenges facing the financial sector. Non-Governmental Organisation like the Japan International Cooperation Agency(JICA) and the Ghana Rice Inter-Professional Body (GRIB) providing embedded services face the challenge of the over-dependence of farmers of government support and uptake of technology by farmers respectively. The Kpong Irrigation Scheme which is the organisation managing the scheme had problems with funds. That is government's inability to allocate funds to the scheme for extension and the maintenance of the facilities. KIS is only able to recoup 30% of irrigation service charge for maintenance purposes from the farmers.

5.7 ways to improve Value Chain Finance in the Kpong Irrigation Scheme

Stakeholders had suggested several ways of improving value chain financing in the rice value chain in the Kpong Irrigation Scheme within the value chain. When rice farmers were interviewed, 77% of them indicated the need for government to bring in sound policies that will protect domestic rice production limiting the quantity of imported rice into the country. The policies should aim at boosting domestic rice production encouraging banks to give to the agricultural sector. This was confirmed by a staff of the Ghana Rice Inter-Professional Body (GRIB). According to Webber and Labaste (2010) as cited in Musuva (2015) that government creation of the right policies will serve as a motivation for actors within the value chain to address the rapidly fluctuating market environment for small scale farmers. 67% concurred that financial institutions like banks and microfinance institutions must offer them affordable services with lower interest rates. Services provided must also be flexible. This will enable the rice farmers to go for financial support from these institutions for their activities. According to an aggregator interest rates on loans are high and modes of payment are also not flexible therefore most of them cannot go the banks for loans, they use their own funds. During the research, it was realised that interest rate on loans from banks within the scheme was 26% and 29% per annum. Microfinance institutions were charging 6% per month which looks very high to the rice farmer. A study was conducted by Pervaiz et al. (2011) mentioned in Musuva (2015) on the factors that affect the disbursement of agricultural loans. In the study, high-interest rates was identified as one of the challenges affecting access to the loans. Robinson (2001) quoted in Konu (2013) quipped that interest rate provision had led to most development based financial institutions from reaching their target groups. It is therefore imperative that interest rates on loans and other services to smallholder farmers have the goal to satisfy their needs in the area of production and related activities. It should cover all the costs involved in its acquisition. Also, 50% of farmers agreed that there is a need for a stronger producer organisation that will cater for the needs of rice farmers. During the research, it was recognised that the only association existing in the scheme is the Water User Association (WUA) which incorporates producers of different types of crops like banana, vegetable and the rice itself. The association does not cater for the needs of rice farmers. According to an Agricultural Extension Agent from the Department of Agriculture (DOA), plans are advanced to help rice farmers set up their association which will look to their interest. An active Producer organisations are considered to be the tool to solve issues like credit access, market information and technical assistance confronting smallholder farmers (Bijman and Wollni, 2008). 37% of farmers said they needed capacity building. It is important rice farmers are schooled on the importance of finance to the activities and what they must do in order to access it. Training must be conducted in other areas such as quality management and bookkeeping.

Lastly, other rice farmers (30%) indicated that a way to improve value chain financing is to provide adequate infrastructures such as roads, storage facilities and machinery to enable the production of rice to the maximum yield. This was confirmed by an aggregator that it is hard to go to the farms to convey the rice to the milling facilities. This is because the roads are bad. The Manager of the K-Line processing facility noted that customers use the company's storage facilities for free and the facility is always full and needed expansion.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Results of the research show that various actors and supporters exist in the value chain within the Kpong Irrigation Scheme. The actors include smallholder rice farmers, aggregators, aggregator-processors, processors, wholesalers, retailers and consumers. There are also supporters like the Kpong Irrigation Scheme, Japan International Cooperation Agency, Ghana Rice Inter-Professional Body (GRIB) and Financial Institutions (Banks and Microfinance).

The findings indicated that there are formal and informal financial institutions within the rice value chain. The formal institutions include the commercial and rural banks and the informal are the trader or aggregator and input credits. There are other institutions like the Kpong Irrigation Scheme, Japan International Cooperation and the Ghana Rice Inter-Professional Body which provides services to Rice farmers within the Kpong Irrigation Scheme.

Both direct (within the chain) and indirect (outside of the chain) types of value chain financing exist in the rice value chain within the Kpong Irrigation Scheme. Actors that provide the direct form value chain financing are input suppliers like the Global Agri-Development Company (GADCO) which advances inputs to rice farmers for production purposes. The company comes for the produce after harvest. Another form of direct value chain financing is trader or aggregator credit. The majority involved in this type of financing is the market women. The lead firm financing or out-grower schemes also exist within the scheme. Indirect approaches to value chain financing involve the use of the formal financial institutions like the banks and microfinance institutions. Other sources of indirect financing are from the government agencies, NGO's and Private Organisations. They provide embedded services to rice farmers within the value chain.

Rice farmers within the Kpong Irrigation scheme are aware of the formal and informal financial institutions within the rice value chain. The institutions use their agents, radio and advertisement, friends and relatives and brochures and fliers and other sources such as television to create awareness. Despite the sensitization from these institutions especially the formal financial institution banks and microfinance, the usage of their services is very low among farmers. The rice farmers prefer to utilise services provided by traders. They go to the traders for loans.

Many problems confront rice farmers face in accessing value chain financing. These include high-interest rates from the formal financial institutions, asymmetry of information, assistance from the producer organisation (PO), high risk of default, especially with contracting loans, high transaction cost and inadequate collateral. It was discovered during the research that the rice farmers do not have a producer organisation. They are members of the Water User Association (WUA) which on comprises different types of farmers and only distribute water to its members. The farmers indicated that due to the high interest rates, the ease of access to the financial institutions is difficult.

Also, the institutions that offer services to the farmers face several challenges which among other thing include a high rate of default among farmers. As some of the institutions have adopted strategies in retrieving loans giving to farmers, some are helpless.

6.2 Recommendations

The recommendations formulated are related the main and the specific objectives of the research. It is also crafted in such a way that it ca be useful to the Ministry of Food and Agriculture for the purposes of implementation. It further took into consideration the duration of implementation and therefore can be implemented in the short or long term. The research identified areas to be improved in addition to what various actors and supporters within the rice value chain have suggested.

6.2.1 Formation of Producer Organisation and Cooperatives

To make value chain financing very efficient within the Kpong Irrigation Scheme, there is the need to form a Producer organisation. The Producer Organisation will serve as a voice for all the rice farmers within the Kpong Irrigation Scheme. The Producer Organisation which in most cases perform both political and economic functions can serve as a bridge between financial institutions and the farmers. Under the Producer Organisation, cooperatives should be formed at each branch canal level to ensure its effectiveness and proper flow of information. It is important that the Ministry of Food and Agriculture facilitate their formation. It is a short term goal and linked to the main objective of the research.

6.2.2 Review of government policies on agriculture financing

6.2.2.1 Reviewing policy rates for agriculture development

The Agriculture Development Bank and Rural and Community Banks were formed to cater for the financial needs of farmers in the country especially those in the peripheries but are no longer fulfilling their mandate. The banks now offer interest rates as the other commercial and private banks. It is important that when the Bank of Ghana is reviewing its policy rates, it should consider the agriculture sector. The policy rates of the banks involved in financing agriculture should be lower than the other commercial banks. This will enable the banks to offer services that are affordable and at lower interest rates for the farmers to patronise. This recommendation is long term and linked to the second specific objective.

6.2.2.2 Warehouse Receipt System

The Ministry of Agriculture should initiate and implement the warehouse receipt system for the rice farmers. It should collaborate with private organisations and financial institutions especially the Agriculture Development Bank and the rural and community banks in implementing this system. The system is hinged on farmers having a strong producer organisation. Pilot systems can be started in one of branch canals and then spread it later to others. This recommendation is linked to the first specific objective and can either be short or long term depending on the level of involvement of NGOs and Private Organisations.

6.2.3 Risk Mitigation Product

6.2.3.1 Insurance

Currently there the farmers do not have any insurance for their farms. It is important that their farms are insured against adverse conditions like floods and bus fires. The insurance companies do not also have any insurance packages for the farmers. it is important that the Ministry of Food and Agriculture and Producer Organisations meet with the various insurance companies in the country with the view of developing innovative insurance schemes for the rice farmers within the Kpong Irrigation Scheme. The Multi-Peril Crop Insurance can be developed to cover adverse situations during crop production. The formation Producer Organisation by rice farmers is important to ensure that payments for this insurance is done since only a few farmers can access it. This recommendation is long term since it is based on the yields produced by farmers. It is associated with the first specific objective.

6.2.4 Capacity building

It is important that financial literacy is put into extension services where capacities of the rice farmers will be built on business management which should include basic financial management and record keeping of their financial transactions. The Ministry of Food and Agriculture should regularly monitor

the rice farmers to audit their financial records. Copies of records should be given to the Ministry of Food and Agriculture. This is short term and linked to the second specific objective.

6.2.5 Promoting linkages

The Ministry of Agriculture in collaboration with Producer Organisations should link farmers to appropriate services inside or outside of the rice value chain. These linkages will help rice farmers to build healthy relationships with value chain financiers and in the long term. This is a short term recommendation and linked to specific objective two.

REFERENCES

Ackah, C. and Asiamah, J.P., 2014. Financial Regulations in Ghana: Balancing inclusive growth with financial stability. Overseas Development Institute, London. Available at: <https://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9287.pdf> [Accessed 16 June 2017]

African Development Bank (AfDB), 2013. Agriculture Value Chain Financing (AVCF) and Development for Enhanced Export Competitiveness. Available at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Agricultural_Value_Chain_Financing__AVCF__and_Development_for_Enhanced_Export_Competitiveness.pdf [Accessed 19 June 2017].

AgCLR, 2008. Commercial Legal and Institutional Reform Diagnostic of Ghana's Agriculture Sector. Available at: http://pdf.usaid.gov/pdf_docs/Pnadq022.pdf [Accessed 21 June 2017]

Agriculture Finance Support Facility (AgriFin), 2012. Access to Agriculture Finance in Ghana. Available at: <https://www.agrifinfacility.org/resource/access-agriculture-finance-ghana> [accessed 20 June 2017].

Asuming-Brempong, S., Asuming- Boakye A., Kuwornu, J.K.M. and Ofori P.K., 2016. Linking West African smallholders to greater value-added activities: A case study of selected rice value chains in Ghana. Available at: http://fsg.afre.msu.edu/srai2/Linking_SH_Farmers_to_Markets-Rice_Final_14June2016.pdf > [accessed 25 June 2017].

Bank of Ghana, 2011. Quarterly Bulletin January—March 2011.

Bijman J. and Wollni M., 2008. Producer Organisation and Vertical Coordination: An organic organisation theory Perspective. Available at: https://www.researchgate.net/publication/37791276_Producer_Organisations_and_vertical_coordination_an_economic_organization_perspective > [Accessed 10 June 2017].

BoG, 2016. The List of 140 Licensed Rural and Community Banks by Region. Available at: <https://www.bog.gov.gh/supervision-a-regulation/register-of-licensed-institutions/rural-a-community-banks> [Accessed 26 June 2017]

Business and Financial Times, 2017. 66% of rice consumed in Ghana imported. Available at: <http://www.ghanaweb.com/GhanaHomePage/business/66-of-rice-consumed-in-Ghana-imported-503906> [Accessed 26 June 2017]

Casuga, M., Pagua, F., Garabiag, K., Santos, M., Atienza, C., Garay, A., Fernandez, R. and Gruce G., 2008. Financial Access and Inclusion in the Agricultural Value Chain. Available at: <http://www.apraca.org/upload/book/10/08-01%20Financial%20Access%20and%20Inclusion%20in%20the%20Agricultural%20Value%20Chain.pdf> > [Accessed 6 September 2017].

Emerole C.O., Nwachukwu A.N., Anyiro C.O., Osondu C.K., Ibezim G.M.C. and Jonah M., 2013. Default Risk and Determinants of Farmers Access to Micro-Credit from cooperatives Societies in Abia State, Nigeria. Available at: http://www.journalrepository.org/media/journals/AJAEES_25/2013/Dec/Emerole312013AJAEES6949_1.pdf > [Accessed 5 September 2017]

FAOSTAT, 2012. Trade Statistics. Available at: <http://faostat3.fao.org>

Food and Agriculture Organisation, 2013. Analysis of Incentives and Disincentives for rice in Ghana. Available at: <https://agriknowledge.org/downloads/dv13zt216> [Accessed 27 June 2017]

Food and Agriculture Organisation, 2013. Analysis of Incentives and Disincentives for Rice in Ghana – Draft. Available at: <<https://agriknowledge.org/downloads/dv13zt216>> [Accessed 17 June 2017].

Gereffi, G. Humphrey, J. and Sturgeon T. 2005. The Governance of Global Value Chains. Available at: <http://www.fao.org/fileadmin/user_upload/fisheries/docs/GVC_Governance.pdf> [Accessed 6 September 2017].

Ghana News Agency, 2017. Ghana imports US\$300m worth of rice in 2016. Available at: <https://www.ghanabusinessnews.com/2017/05/11/ghana-imports-300m-worth-of-rice-in-2016/> [Accessed 15 June 2017].

Ghana Statistical Service, 2014. District Analytical Report. Available at: <http://www.statsghana.gov.gh/docfiles/2010_District_Report/Greater%20Accra/SHAI-OSUDOKU.pdf> [Accessed 7 June 2017].

Ghana Statistical Service, 2014. Ghana Living Standards Survey Report of the sixth round (GLSS6). Available at: http://www.statsghana.gov.gh/docfiles/glss6/GLSS6_Main%20Report.pdf [Accessed 21 June 2017]

Ghanaian Times, 2016. Asutsuare rice farmers receive the financial empowerment. Available at: <http://www.ghanaiantimes.com.gh/asutsuare-rice-farmers-receive-financial-empowerment/> [Accessed 18 June 2016]

GIZ, 2011. Financing Agricultural Value Chains in Africa. Available at: http://www.africancashewalliance.com/sites/default/files/documents/giz_-_pineapple_cashew_cocoa_in_ghana_2011.pdf [Accessed 20 June 2017]

GIZ, 2013. Contract farming handbook. A practical for linking small-scale producers and buyers through business model innovation. Available at: <https://www.giz.de/fachexpertise/downloads/giz2013-en-contract-farming-manual.pdf> [accessed 4 June 2017]

Griffith-Jones S. and Karwowski E.,2013. Policy and Research issues on finance and growth for Sub-Saharan Africa. Available at: http://www.un.org/en/development/desa/policy/wess/wess_bg_papers/bp_wess2013_griffith-jones_et_al.pdf [Accessed 2 June 2017]

Humphrey, J. and Schmitz H. 2001. Governance in Global Chains. Available at: <http://www.fao.org/fileadmin/user_upload/fisheries/docs/GVC_Governance.pdf> [Accessed 6 September 2017].

IFPRI, 2010. Overview of the Agricultural Input Sector in Ghana. September. Discussion Paper 01024. Available at: <http://www.ifpri.org/publication/overview-agricultural-input-sector-ghana> [Accessed 24 June 2017].

IFPRI, 2011. Assessing Crop Production and input use patterns in Ghana-What can we learn from the Ghana Living Standards Survey (GLSS5). Available at: <http://dspace.africaportal.org/jspui/bitstream/123456789/31918/1/GSSP%20Working%20Paper%2024.pdf?1> [Accessed 5 June 2017]

International Food Policy Research Institute (IFPRI), 2014. Ghana Strategy Support Program. Available at:

<https://books.google.nl/books?id=z3PEBAAQBAJ&pg=PT1&lpg=PT1&dq=ghana+strategy+support+program+,+catherine+ragasa&source=bl&ots=ayrVz2XXXd&sig=Bdvch3sR8k0aHzS5uzt99cq70sk&hl=en&sa=X&ved=0ahUKEwid08L_qZDWAhXGYIAKHblcC0cQ6AEIWzAJ#v=onepage&q=ghana%20strategy%20support%20program%20%2C%20catherine%20ragasa&f=false> [Accessed 5 June 2017].

International Fund for Agriculture Development (IFAD), 2012. Agriculture Value Chain Finance Strategy and Design. Available at: <<https://www.ifad.org/documents/10180/8d74b792-33e4-4f57-96b4-e348af035a3c>> [Accessed 6 September 2017].

International Institute for Sustainable Development (IISD), 2015. Financing for Agriculture: How to boost opportunities in developing countries. Available at: <<https://www.iisd.org/sites/default/files/publications/financing-agriculture-boost-opportunities-developing-countries.pdf>> [Accessed 5 June 2017]

Joy Business News, 2015. EDAIF approves ₵ 28.5m for 135 beneficiaries. Available at: <http://www.myjoyonline.com/business/2015/august-23rd/edaif-approves-285-million-for-135-beneficiaries.php> [Accessed 18 June 2016]

Kaplinsky, R. and Morris, M. 2001. A handbook of Value Chain Research. Available at: <<https://www.ids.ac.uk/ids/global/pdfs/VchNov01.pdf>> [Accessed 20 August 2017].

Kirui, O.K., Okello, J.J. and Nyikal R.A., 2010. Awareness and Use of M-banking services in Agriculture. The case of smallholder farmers in Kenya. Available at: http://www.journalrepository.org/media/journals/AJAEES_25/2013/Dec/Emerole312013AJAEES6949_1.pdf [Accessed 1 September 2017].

KIT and KIRR. 2010. Value Chain Finance: Beyond Microfinance for rural entrepreneurs. Royal Tropical Institute, Amsterdam; and International Institute of Rural Reconstruction, Nairobi. Available at: http://www.kit.nl/sed/wp-content/uploads/publications/1610_chainfinance%20d8.1.pdf [Accessed 1 May 2017]

Konu L.M.A., 2013. Access to and Management of credit by rice farmers at Kpong Irrigation Project. Available at: http://ugspace.ug.edu.gh/bitstream/123456789/5827/1/Lilian%20Mawuse%20Afua%20Konu_Access%20to%20and%20Management%20of%20Credit%20by%20Rice%20Farmers%20at%20the%20Kpong%20Irrigation%20Project_2013.pdf [Accessed on 19 June 2017]

Miller, C., & Jones, L., 2010. *Agricultural Value Chain Finance Tools and Lessons*. Available at: <http://www.fao.org/docrep/017/i0846e/i0846e.pdf> [Accessed 15 June 2017]

Ministry of Food and Agriculture, 2015. National Rice Development Strategy (NRDS) -Draft.

Mohanty S, 2013. Trends in global rice consumption. *Rice Today* 12(1):44–45

Musuva, G.M., 2015. Factors affecting the effectiveness of value chain financing in tea industry: a case of smallholder farmers in Kiambu County, Kenya. Available at: <http://erepo.usiu.ac.ke/bitstream/handle/11732/2676/DBA%20Thesis%20Gladys%20Musuva.pdf?sequence=1&isAllowed=y> [Accessed 21 March 2017].

Nair and Fissaha, 2010 Rural Banking: The case of rural and community Banks in Ghana. Agricultural and Rural Development Discussion Paper 48. The Worldbank.

Nasrin, S., Lodin J.B., Jirstrom, M., Holmquist, B., Djurfeldt, A.A. and Djurfeldt, G., 2015. Drivers of Rice production: Evidence from five Sub-Saharan African Countries. Available at: <https://agricultureandfoodsecurity.biomedcentral.com/track/pdf/10.1186/s40066-015-0032-6?site=agricultureandfoodsecurity.biomedcentral.com> [Accessed 2 June 2017].

National Development Planning Commission (NDPC), 2014. Ghana's Shared Growth and Development Agenda. Available at: <https://s3.amazonaws.com/ndpc-static/pubication/GSGDA+II+2014-2017.pdf> > [accessed 6 September 2017].

Organisation for Economic Cooperation and Development (OECD) and Food and Agriculture Organisation (FAO), 2015. OECD-FAO Agricultural Outlook. OECD Publishing, Paris. Available at: http://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-agricultural-outlook-2015_agr_outlook-2015-en [Accessed 5 June 2017].

PricewaterhouseCoopers (PwC), 2014. Ghana Banking Survey. Available at: <https://www.pwc.com/gh/en/assets/pdf/gh-banking-survey-2014.pdf> [Accessed 10 June 2017]

Principles of Responsible Investment, 2013. UN Principles of Responsible Investment. Available at: <https://malk.com/wp-content/uploads/2015/05/UNPRI-Guide-for-Private-Equity-Fund-Managers.pdf> [Accessed 5 September 2017].

Quartey P., Udry C. and Seshie H., 2012. Agriculture Financing and Credit Constraints. Available at: <https://www.theigc.org/wp-content/uploads/2014/09/Quartey-Et-Al-2012-Working-Paper.pdf> > [Accessed 15 June 2017].

Sjauw-Koem-Fa, 2012. Cooperatives – a Key for Smallholder Inclusion into Value Chain, Rabobank Group, Utrecht.

Thun, E. 2008. The Globalisation of Production. New York. Oxford University Press.

USAID (2009) "The Global Food Security Response West Africa Rice Value Chain Analysis: Ghana Rice Study", Micro-report, August 2009 USDA, 2011 Grain and Feed Annual Report

Vorley, B., Lundy, M., MacGregor, J., 2008. Business Models that are inclusive of farmers. Available at: <http://pubs.iied.org/pdfs/G02340.pdf> > [Accessed 19 June 2017].

Worldbank, 2012. Agribusiness Indicators: Ghana. Available at: <http://documents.worldbank.org/curated/en/901711468032641580/pdf/681630ESWOP1190ribusinessOGhana0web.pdf> > [Accessed 18/06/2017].

APPENDICES

Appendix 1: Reflection

Introduction

As a requirement to obtain a Master of Science (MSc) Degree for International Students at the Van Hall Larenstein University, it was required that each student goes back to his or her country for data collection and in my case, I went back to Ghana. The research is hinged on an identified problem in my field of work. I decided to work on assessing value chain financing in the rice value chain in Ghana. The problem with rice farmers is that they are facing challenges in accessing credit. I conducted my research in the Kpong Irrigation Scheme at Asutsuare. The Kpong Irrigation Scheme is one of the several schemes under the Ghana Irrigation Development Authority. The organisation is under Ministry of Food and Agriculture of which I am an Extension Agent and a Plant Protectionist. Before this study, I do not have any knowledge about value chain financing until I came for my MSc at the Van Hall Larenstein University. I decided to challenge myself with the issue of financing in rice with consent from my commissioner which is MoFA. To be honest, it was a daunting task I was going to take, but I wanted to also test the limits of my knowledge as a chain facilitator. As part of the commissioning organisation, I formulated my problem statement, objectives and research questions.

Methodology

During the research, I collected both primary (on the field) and secondary data (desk study). I used interviews with the various actors and supporters within the rice value chain to collect primary data. I used four weeks in the collection of my data from the field. I started the data collection on the 5th of July. Before that, I sent a letter of permission to the Department of Agriculture in the Shai Osudoku District to be delivered to the Kpong Irrigation Scheme, but it was not delivered. I got to the research site before I was told that I sent the letter to the wrong place which would have stalled the data collection. I did not do much diligent work to get information about the Kpong Irrigation Scheme and make follow-ups on the permission letter. In fact, I was told to go back home and return later but looking at the distance, one of the staff of the Kpong Irrigation Scheme decided to offer me a place. During the research, I pre-tested my questionnaires. I realised from the pre-test that some of the questions were not relevant and I either removed or rephrased them. I realised from there the importance of pre-testing. I interviewed 30 farmers confirming their answers with that of key informants. From the interviews, I learnt how quantitative and qualitative data is collected. I learnt how to interpret the actions and words of the respondents and put these actions into words. I mastered the art of visualisation and cross-checking facts and figures. I realised taking pictures is very useful and therefore I insisted on pictures to be taken. I also learnt to have a good rapport with your respondents will enable you to get the necessary information you want.

A desk study was used to collect secondary data. I must note that it was not easy getting information for this research. I discovered so many articles, publications and books on the value chain financing but I had difficulty in putting them together especially in a chronological manner. I had to judge which information is relevant and which is not. Drawing my experience from the research we conducted during Chain Entrepreneurship, and the Research Design module taught my Robert Baars, I was able to identify some of the relevant literature. Sometimes I have to replace whole documents with new literature. Based on the desk research, I have gained a lot of knowledge on value chain financing and I also learnt that whatever information you are looking for is available. There is no limitation to you if you want to seek knowledge.

Results and Data Analysis

I was not comfortable with the use of the Statistical Package for Social Science (SPSS). I found it difficult in putting the data I collected into the system. But with the help of my brother, I was able to put the data into the software. With his guidance, I was able to put the rest of the data into the software. I analysed the data myself but learnt that you can always draw knowledge from those around you. With qualitative data, I realised the use of diagrams is essential so therefore I demonstrated this by drawing chain maps and tables. To be frank, this portion of the research had made me learn a lot about the use of Microsoft office. There are some tools which I had never used before but had to get to use them. It was exhilarating.

With my constant contact with my supervisor, I was able to learn how to structure my results based on the research questions. One of the things I had learnt from my supervisor is that the results and discussions must be based on the research questions and trying to support findings with relevant literature. He also taught me how to summarised my results when writing my conclusion. One thing I will never forget is the recommendation part. He taught me how to formulate recommendations to answer all the objectives of the research. I incorporated all his suggestions and thoughts into my research. I learnt from here that, it is important to seek advice from those who have done researches before and are very experienced with research. Their inputs are useful.

Overall Impression

I have not done social research before, but the writing of my thesis research had given me a lot of knowledge on how to go about it. The tools and the methodology to use to get reliable data. I have learnt that one cannot work in isolation and to get any information, one has to work with people. As a chain facilitator, I have learnt to build relationships with people I have never met before from my research site with different beliefs and culture. I have learnt that during research, one might find lots of obstacles on his or her way but as a researcher and the same time a chain facilitator, you must learn to take no for an answer.

Drawing from my experience on the field and knowledge from different people during my data collection and data analysis, I hope to improve upon my research skills when another opportunity comes taking all my weaknesses as my point of learning. It was a good research, and the results had, and the feedbacks have met my expectation.

Appendix 2: Questionnaire for Farmers

Interviewer _____ Interview date: ____/____/____

Section one: Farmer Characteristics

1. Community: Asutsuare Akuse
2. Gender: Male Female
3. Age: 21 – 30 years 31 – 40 years 41 – 50 years
 51 -60 years > 60 years
4. Marital Status: Married Divorced Single
5. Education: None Primary Secondary/Middle school
 Tertiary
6. Ethnicity: Dangme Ewe Ga Akan Other (Please specify)
7. Residence: Rented Personal
8. How many children do you have?.....
9. What is the number of people in your household?.....

Section Two: Farm characteristics

10. What is the number of years you've been in rice farming?
 < 5 years 5 - 10 years > 10 years
11. What is the size of your farm?
 < 1 Ha 1 – 3Ha > 3 Ha
12. Which varieties of rice do you produce?
 Jasmine 85 Agra rice
13. What is the average yield of rice?
 - a. Major Season..... MT/Ha
 - b. Minor Season.....MT/Ha
14. What is the cost and selling prices of a bag of rice?
15. Who are customers?
 - a.
 - b.
 - c.
 - d.
16. Do you have contracts with your customers? Yes No
17. Do you own your land? Yes No
18. What is your main source of income?
 Employment Rice farming Other (Please specify).....

Section Three: Main questions on Value Chain Financing

19. Which financial institutions are existing in this area?
 Banks Microfinance Financial NGOs Producer organisation/Traders
 Friends/Relative Other (Please specify).....

20. What services do they provide?
 Savings Loans Insurance Leasing Inputs
 Advisory services Other (Please specify)
21. Which of the services you mentioned above do you benefit from for your farming activities?
 Savings Loans Insurance Leasing Inputs
 Advisory services Other (Please specify).....
22. Which financial institution provide the services you benefit?
 Banks Microfinance Financial NGOs Producer organisation/Traders
 Friends/Relative Other (Please specify).....
23. Why did you choose these institutions?
 Low interest rates Proximity to area Flexible terms
 Well established Other (Please specify).....
24. How did you get information about the financial institution you use in your area?
25. Bank Agents Radio/Newspaper Advertisement Television
 Friends/Relatives Brochures/fliers Other (Please specify).....
26. What conditions do you need to access these services?
 Character as farmer (e.g. Background and experience as a farmer)
 Capacity to pay (e.g. Primary source of income)
 Collateral or guarantee
 Capital (Availability)
 Condition (e.g. purpose of loan)
 Other (Please specify)
27. What type of collateral do financial institutions require you provide?
 Bank Deposits Insurance Guarantor
 Personal Properties (e.g. House, Car, Land etc.)
 Other (Please specify)
28. How do the financial institutions monitor the services they give you?
 Frequent visits to the farm to assess loan usage
 Phone communication to with farmers in case of default
 Write to farmers in case of default
 Take collaterals used to secure loans by farmers
 Legal means
 Other (Please specify)
29. What is the reason for going for the services especially loans?
 For inputs Land preparation Sowing Household use
 Harvesting/threshing Other (Please specify)
30. How will you consider the ease of access to value chain financing in this area?
 Very easy Easy Difficult Very difficult
31. How long does it take for these services to be rendered by the financial institutions?
 < Less than 1 week 1 – 2 Weeks 2 – 4 Weeks 4 – 10 Weeks
 >10 Weeks
32. How much loan did you take for your business last season?
 < GH 5,000.00 GH 5,000.00 – 10,000.00 > GH10,000.00
33. What are the risks/challenges associated with your business?
 Climate Change Pest and diseases Inadequate infrastructure
 Land tenure Market failures
34. What mechanisms do you put in place to reduce the risks?
 Integrated farming Government policies Adequate infrastructure
 Contracts Insurance Other (Please specify).....
35. Do you use any insurance for your business? Yes No

36. What problems do you face in accessing insurance?
 Asymmetry of information Expensive Not readily accessible
 Inadequate assistance from farmer organisation
 Other (Please specify)
37. What problems do you face in accessing Value Chain Financing (VCF) in the area?
 High-Interest rates Inadequate collateral High transaction cost
 Asymmetry of information High risk of default Price risks
 Inadequate assistance from farmer organisation Other (Please specify).....
38. What could be done to improve Value Chain Financing (VCF) in the area?
 Strong producer organisation Capacity building
 Affordable financial institutions Good government policies
 Other (Please specify)

Appendix 3: Interview Checklist for Financial Service Providers

1. What is the name of the financial institution?
2. What is the location of the financial Institution?
3. What kind of services do you provide?
4. Savings Loans Insurance Leasing Inputs
5. Advisory services Other (Please specify).....
6. What kind of service do you provide specifically to rice farmers?
 Savings Loans Insurance Leasing Inputs
 Advisory services Other (Please specify).....
7. How long have you been providing these service?
 < 5 years 5- 10 years > 10 years
8. What conditions do they have to meet?
 Character as farmer (e.g. Background and experience as a farmer)
 Capacity to pay (e.g. Primary source of income)
 Collateral or guarantee
 Capital (Availability)
 Condition (e.g. purpose of loan)
9. What amount do you give each farmer?
 < 5,000 5,000-10,000 > 10,000
10. What rate of interest do you charge in the case of loans?
11. What is the period taken to repay loans or credit?
 < 5 years 3 – 5 years > 5 years
12. How long does it take to access services after application is put it?
 < 1 week 2 Weeks 4 Weeks > 4 weeks
13. How do you ensure farmers are aware of your products?
 Bank Agents
 Radio/Newspaper Advertisement
 Television
 Other (Please specify)
14. Do you have any strategies in place to ensure farmers utilise the services effectively?
 Yes No
15. If yes to Question 14, what plans have been introduced?
 - a.
 - b.
 - c.

16. What is the level of patronage of the services by rice farmers?
 Very low Low High Very high
17. What are some of the challenges faced when financing rice farmers in Asutsuare?
 Inadequate collateral
 Farmers defaulting
 Land tenure
 Seasonality of agriculture
 Agriculture is risky
 High transaction costs
18. Any other general information with regards to providing loans to farmers?

Appendix 4: Government /Non-Governmental Representative

1. Can you kindly tell us about your organisation?
2. What kind of services do you provide for rice farmers in the area?
3. What is your organisation doing to enhance value chain financing in the area?
4. What value chain financing schemes are available in the area?
5. What are the challenges you face in the provision of your services?
6. What can be done to improve value chain financing in the area?
7. Any other comments?

Appendix 5: Pictures Showing Interviews with Selected Stakeholders



Photo 1: Interview with Key Informant from the Kpong Irrigation Scheme



Photo 2: Interview with a processor/miller



Photo 3: Interview with a rice farmer

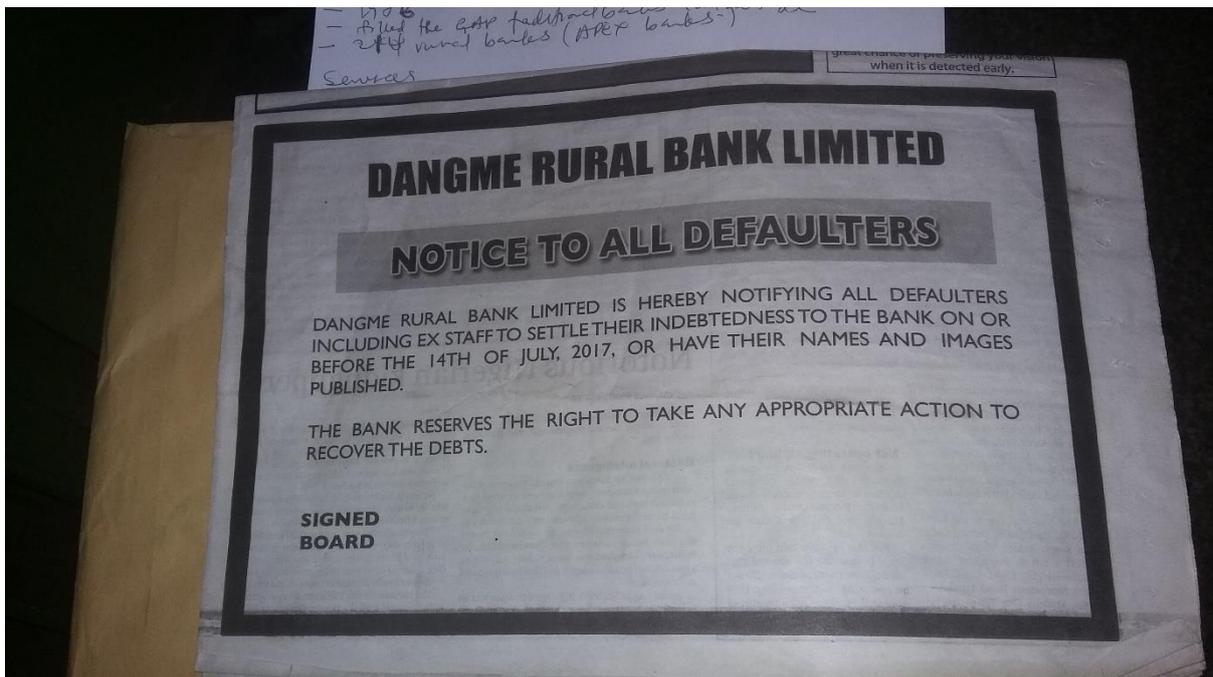


Photo 4: Default notice from one of the formal financial Institutions.