

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Agriculture is one of East Africa's most important sectors, with about 80percent of the population living in rural areas and depending on agriculture for their livelihoods (East African Community(EAC), 2015). Despite this, the region is categorized amongst the poorest in the world with more than 60% of the population living below the poverty line (EAC, 2015). Poverty here is defined according to the human rights approach, in terms of a range of interrelated and mutually reinforcing deprivations, and drawing attention to the insecurity, stigma, discrimination, and social exclusion. The manifestation of poverty includes: low income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; social discrimination and exclusion; characterized by lack of participation in decision making and in civil, social and cultural rights (EAC, 2015).

The East Africa Region is characterized by low agricultural productivity and thus food insecurity. The reasons for this are high populations, small land sizes, environmental degradation; poor marketing structures; inadequate access to information, poor physical and institutional infrastructure and inappropriate government policies, there-by hindering sustainable development of rural areas. The region also has diversity of farming systems, from the humid highlands of Uganda, the coastal areas of Tanzania and Kenya to the dry lands of Sudan and Ethiopia.

According to Shepherd (2007), there is considerable scope for adding value to agricultural production. He argued that, “NGOs and others sometimes approach agro-processing from a supply-led rather than market-led perspective. That is, they decide to promote processing

because of an abundance of raw materials rather than because of a clearly identified market for the processed products.

According to Louw *et al.* (2007), the smallholder farmers can only have market power if they form co-operatives, which should be established with the help of the government. His work shows that groups have the potential to secure better terms of trade such as better sourcing production inputs prices, lower transaction costs, and greater access to training and other services.

Baloyi (2010) showed that considerable changes would be required in small holders farming operations if the economic benefits of increased incomes would be fully realized. These changes entail producing good-quality, high-value crops on a large scale and accessing high-value markets. This will only happen if smallholder farmers have access to comprehensive and holistic agricultural support services.

There are several conventional approaches in value chain development. One of these is the clustering and network approach which focuses on a cluster manager or network broker facilitating business and cooperation relationships between member firms. Having established a basis for cooperation, demonstrated benefits, and built a momentum, the cluster manager or network broker withdraws leaving the system fully functioning and able to move forward without further support. Clustering and network approaches offer a framework for identification of existing clusters, and some basic analysis of cluster dynamics (Marieke *et al.*, 2006). The process of analysis for intervention design tends to be generated through the intervention process itself. It is an approach similar to the cooperative-based in which the basis of their cooperation is tailored to achieving a purpose which can be inputs supply (seeds, pesticides, and fertilizers), irrigation and extension service.

The Value Chain Development (VCD) approach applies different types of innovations in the agriculture sector depending on the root cause of the problem in the specific location of study so as to competitively and sustainably increase productivity. The innovations had often led to agricultural growth, nutrition, food security and overall economic welfare of farmers, producers and marketers throughout the value chain. While it is recognized that low income and food security are critical to human development, issues of such have been addressed using different approaches, given adequate attention in prior agricultural development programs.

Katalyst approach is an intervention that focuses on training of agricultural input retailers and the development of “embedded services” within the input supply chain. The approach undertakes activities notably in relation to soil testing and packaging. However, the approach stimulates training of agricultural input retailers and there was knowledge and information sharing within the distribution system. The underlying cause was low levels of knowledge and information in the market which is a key cause of poor productivity and was attributed to weak private sector capacities (Gibson, 2005).

However the commitment to facilitate smallholder farmers in the market to do things rather than production was not there. In the Katalyst approach different role in intervention on the project was played, one of which was consistent with a future market vision in which other approaches have no role. This defined the boundaries for Katalyst intervention all aiming at increasing farmers’ productivity without an identified market.

The consortium approach is a relationship or an association of at least two people, organizations, associations or governments with the target of partaking in a typical movement or pooling their resources for accomplishing a shared objective. A good consortium improves efficiency and reduces transaction costs, through joint planning, monitoring, and mutual accountability (Friedman *et al.*, 2014). The approach is more strategic because individuals pool their resources together; thereby the potential return on investment is increased. On the other hand value chain is defined as the full range of activities required to bring a product or service from conception, through the different phases of production, delivery to final customers, and final disposal after use. In the context of food production, these activities include farm production, trade and support to get food commodities to the end-consumer (Kaplinsky and Morris, 2002). Its existence in the aspects of food security enables agricultural goods, services or information to be passed on between different actors. The consortium approach to value chain development is an approach that uses high quality knowledge and information on markets and demand characteristics to support market-driven formation of win-win business consortia, each anchored on an agribusiness SME as lead firm, and composed of sufficient actors along the entire value chain including the end market players linked to the final consumers. The adoption of this approach in value chain development enables actors, sell their surplus food commodities, and have access to efficient and reliable production inputs, common interventions that help to identify common problems among actors in the chain and a desired sustainable solution. The overall outcome of consortia is to attain tangible benefits in terms of economic performance and

poverty reduction in the lives of the actors. The project recognizes that increases in agricultural productivity with a defined market will result in improved incomes of the farmers.

This study seeks to assess and analyze the effectiveness of the consortium approach vis –a vis conventional-based approach in access to production inputs, finance, infrastructure, markets, foods value chain development on incomes of smallholder farmers. The finding is expected to reveal both the strengths, weaknesses; opportunities and threats (SWOT) for further development in the value chain. It will also proffer recommendations on further strengthen and up scaling of the project in value chain.

1.2 Problem Statement

In spite of the various approaches to value chain development in EAC, food and income insecurity is still a problem. The development of food markets in East Africa which is a vital aspect in achieving income and by extension food security is given very little attention in agricultural development program thereby limiting opportunities for enhanced incomes for the smallholder farmers, and good nutrition at prices that low-income earners in rural and urban areas can afford. One of the reasons for limited impacts in farmers' income is because most projects/programs work in isolation focusing on one or two nodes of the value chain and not the entire value chain. Kilimo Trust Consortium Approach to Value Chain Development (KTCA2VCD) is a holistic method that intervenes at all nodes of the value chain in a coordinated way to solve the challenges affecting the entire value chain towards delivering to a specified market.

Food and income insecurity have been attributed to limited access to production inputs such as seeds, pesticides and fertilizers. Other constraints are poor access to production inputs, finance, a well structured, reliable and timely market information; small volumes of products of varied quality offered by individual smallholder farmers; and poorly structured and inefficient markets (Nyende, 2011). This has resulted in wastage of produce and low prices to smallholder farmers.

There are several approaches that have been used to develop agricultural markets in East Africa. One of such approach earlier discussed is the co-operatives- based approach which has been extensively used in value chain development to access finance with the aim of to providing inputs supply for the production of the smallholder farmers. The approach has also helped to reduce transaction costs for smallholders and encourage more widespread participation in markets.

Accordingly in Kenya, evidence suggests that dairy co-operatives approach played a significant role in fostering dairy development, primarily by providing a stable market environment and delivering services to farmers. However, dairy co-operative development was heavily dependent on good co-operative management, honest and effective investment of resources and accountability to the interests of the farmer members. (Abdulsamad and Gereffi, 2016).

In Rwanda, the dairy cooperative- based approach however, was undermined because the general thrust of supply-side investment was not matched by market incentives. One of the major factors was the buying power and short-sighted behavior of processor firms (Makoni *et al.*, 2014). Farmers are not paid quality based pricing, and their income was further negatively affected by the seasonal variations of milk prices (Land O' Lakes Inc., 2012).The consortium approach is a new approach of food markets development that has been experimented in East African Countries. However, little is known about its effectiveness in easy access to production inputs and access to finance and markets. Therefore, this research will ascertain the effect of consortium approach vis- a -vis conventional approach in augmenting the income of the smallholder farmers.

1.3 Justification of the Study

The adoption of the consortium approach to food market development on smallholder farmers income is aimed at achieving inclusive agricultural productivity from all the actors in the value chain and increased income among small holder farmers which would bring about agriculture growth and improved nutrition status. The program recognizes that increases in agricultural productivity with a defined market will result in improved incomes of the farmers.

However not much is known about the benefits of the consortium approach in comparison with the other conventional approaches in value chain development. The assessment was done on the production, post-handling process of the goods, easy access to high quality inputs, credit facility and the acceptability of their produce to highly competitive trading systems on the income of the smallholder farmers. The research work will ascertain the effectiveness of the approach in easy access to production inputs, finance and markets in augmenting incomes for smallholder farmers, the level of participation of women and youth in the project, document the success factors for the sustainability of the approach for up scaling in other projects and investigate, strengths weaknesses, opportunities and threats of the approach vis- a- vis conventional approaches.

1.4 Scope of the Study

The assessment was done on the production, post-handling process of the goods, easy access to high quality inputs, credit facility and the acceptability of their produce to highly competitive trading systems on the income of the smallholder farmers.

1.5 Research questions

What is the effectiveness of the consortium approach vis-à-vis conventional approach on the income of the small holder farmers?

What are the critical success factors for sustainability of the consortium approach?

What are the strengths, weaknesses, opportunities and threats of the consortium approach in improving incomes of small holder farmers?

1.6 Objectives of the Study

- To determine the effectiveness of the consortium approach vis –a vis conventional approach on incomes of the smallholder farmers.
- To determine the critical success factors for sustainability of the consortium approach.
- To investigate strengths, weakness, opportunities and threats of consortium approach in improving incomes of smallholder farmers.

1.6.1 Analysis of Objectives of the Study

Table 1.1 Analysis of Objectives

Project Objectives	Data Required	Data collection	Method of Analysis
To determine the effectiveness of the consortium approach vis- a –vis conventional approach	Primary Data: 1.Skill & Knowledge - Training capacity(type and relevance e.g Farming as business,(profitability,) Markets Focus GAPs, agro processing, post-harvesting handling, record keeping; 2.Production inputs (access, affordability, quality) e. g Improved Seeds, fertilizers, pesticides/herbicides, technology; delivery	Questionnaire, focus group discussion (FGD), key informant interview (KII), structured interview, observation	Descriptive Statistics, (frequencies, percentages, charts and cross tabulation, simple percentage, ratio, measure of central tendency & dispersion) t-test (to establish the difference & the extent of ?).

	<p>mechanism, financing - credit, payment modalities, timeliness etc.;</p> <p>3. Production outputs e.g yield, volume, storage, etc.;</p> <p>4. Market requirements e.g. quantity, quality, timeliness, pricing, delivery mechanisms;and payment modalities;</p> <p>5.Access to finance e.g. pre-payment(credit to farmer), payment upon delivery, post delivery payment(credit to buyer), facility processes and; status of ?, etc.;</p> <p>6. Agreements with the off- takers (lead firms) i.e market guaranteed before production</p> <p>7. Gender Inclusion: Youths, women participation and empowerment.</p> <p>Secondary Data: Baseline data, Reports, publications, etc.</p>		
<p>To determine the critical success factors for sustainability of the consortium approach</p>	<p>Primary Data: <i>Performance indicators</i></p> <p>1. Level of capacity building training/responsiveness, GAPs, Farming as Business, Market Focus.</p> <p>2. Involvement and contribution of the Private Sector</p> <p>3.Benefits to the Value Chain Actors</p> <p>4.Joint problem solving/risk sharing</p>	<p>Questionnaire, focus group discussion (FGD), key informant interview (KII), structured interview</p>	<p>Descriptive Statistics, (frequencies, percentages, charts and cross tabulation, simple percentage, ratio, measure of central tendency & dispersion), t-test, ANOVA</p>

	<p>among actors in the value chain</p> <p>5.Level of understanding the market opportunity to drive production</p> <p>6. Access to production inputs, technology, finance, market</p> <p>7. Productivity</p> <p>8. Production cost</p> <p>9. Income and yield per acre (production)</p> <p>10. Decision- making (as group, individual)</p> <p>11. Local organizational capacity (institutional groups)</p> <p>12.Partnership (private-public partnership)</p> <p>13. Policy aspect (codes of conducts, rules and regulations, restrictions, laws)</p> <p>14. youths, women participation</p>		
<p>To investigate the Strengths, Weaknesses, Opportunities and Threats</p>	<p>1.Project design and implementation</p> <p>2. Composition of actors</p> <p>3. Funding mechanisms</p> <p>4. Agricultural practice</p> <p>5. Marketing framework</p> <p>6. Externalities – positive & negative</p>	<p>Key informant interview (KII) Guide</p>	<p>SWOT Analysis</p>

1.7 Research hypothesis

There is no significant relationship between the consortium approach and increase on the incomes of the smallholder farmers.

CHAPTER TWO

2.0 THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Consortium Approach to Food Value Chain Development and Smallholder Farmers

Small holder farmers generally do not have access to all factors that are needed for delivering a product that responds to market demand. They often face strong economic, social and physical disadvantages: in some areas the infrastructure is poor, while in other areas up to-date market information is not always available to everyone. Other challenge is the difficulty in accessing technical advisory services, agricultural inputs; lack of post-harvest facilities makes it difficult to deliver consistent supply of good quality produce and lack of financial services (Ellen and Bart, 2010). Farmers owning or renting less than two hectares of land are both the majority of the world's farmers and of the world's poor (Nagayets, 2005). These smallholder farmers represent half of the malnourished population globally (Hazell *et al.*, 2007). Bettering the lives of smallholder farmers is therefore crucial to alleviating global poverty. Although other sources of income (e.g., labor) are critical for smallholder farmers and the poorest (Mueller and Chan, 2015), sales of agricultural output remain important. Smallholder farmers constitute a majority of the working population in much of the developing world, and they tend to be stuck in patterns of semi-subsistence farming, unable to generate sufficient income to access key services to further their pathways out of poverty. However a research conducted by USAID 2015 reported that the first strategy of alleviating poverty is to improve production quantity and quality, which requires addressing information flow, knowledge of market requirements and production practices, as well as linkages to inputs and finance. Direct intervention strategies used to implement this include standardized production packages for smallholders to ensure appropriate ratios of inputs and increased access to credit. At a more systemic level, other projects facilitated the development of private-sector grading standards to clarify and communicate end market requirements, or developed contracts or market signals to decrease the perceived risk by both sides (USAID, 2015).

A second common strategy identified shifts from the direct interface between smallholder farmers and output markets, to reducing transaction costs to attract buyers to procure from smallholder farmers. These cost reductions were achieved through better cooperation, either on the supply side through producer collectives, or on the demand side through buyer coordination mechanisms (USAIDS, 2015).

The concept of consortium approach to food value chain development has not been attracted to many scholars in the marketing environment. For smallholder farmers to be integrated along the

value chain, they must be able to comply with market requirements such as economies of scale, good quality, and consistency. The concept of consortium approach in value chain is a horizontal alliance of enterprises collaborating to secure a more rewarding position in the market first. The term horizontal alliance means that agribusiness is connected from the production stage, through the processing stage to the marketing stage, until the products are in the hands of the consumers. Producers, processors and marketers become interdependent in the chain and work together to discuss challenges and share information.

According to Baloyi 2010 and ADB, 2005 the main compensation of being involved in an effective value chain are the ability to reduce the costs of doing business, increase revenues, increase bargaining power, and improve access to technology, information and capital, and by doing so, innovate production and marketing processes in order to achieve a higher value and provide a higher quality of product to consumers. The consortium approach can help smallholder farmers to access secure markets and enter into formal market contracts that can be used to access credit; to share information among partners, thus helping poor farmers to access information better than in spot markets; to consolidate production and minimize transaction costs; to improve their bargaining power; to add value to the products; and to access high-value markets. The consortium approach is a holistic approach to full value-chain membership, interdependent relationship is envisage on all the actors in the chain. It seems to work better than single segments approach previously used in value chain. Many scholars have emphasized that if a value chain approach is not adopted, especially in developing countries, the type of coordination (such as opportunistic behavior, self interest, short-term relationships, limited information sharing) will predominates in the conventional approach.

2.1.2 Theory Based Approach

Theory-based approaches was used in the study because it is in the design of Independent Office of Evaluation of IFAD (IOE) evaluations and particularly appropriate. It is also highly relevant for impact evaluation. The approach measures outcome/output and impact indicators. The Outcome /Output indicators are activities relating to the implementation of the project while impact indicators relates to changes that occur as a result of the project activities.

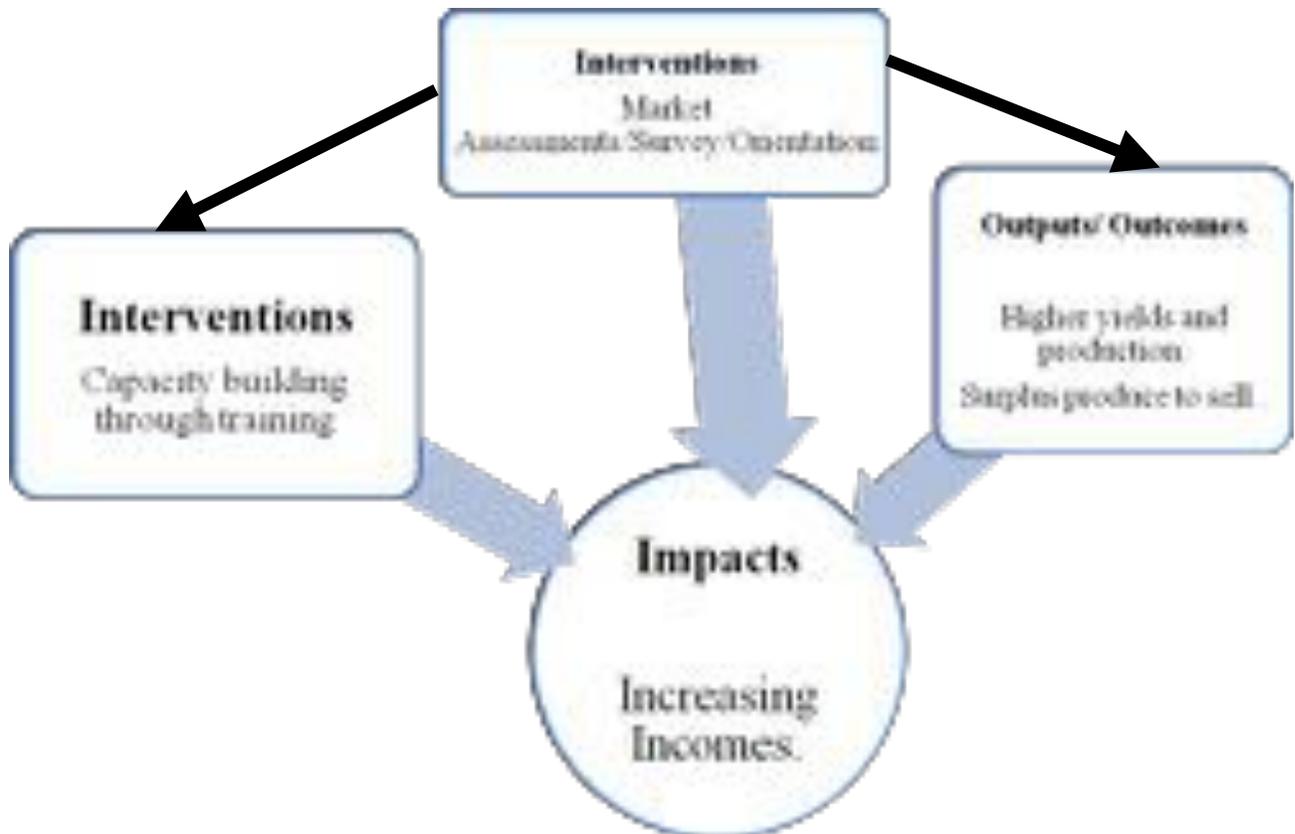


Figure 2.1 Diagram of the Theoretical Framework of Consortium Approach

Source: Survey (2017)

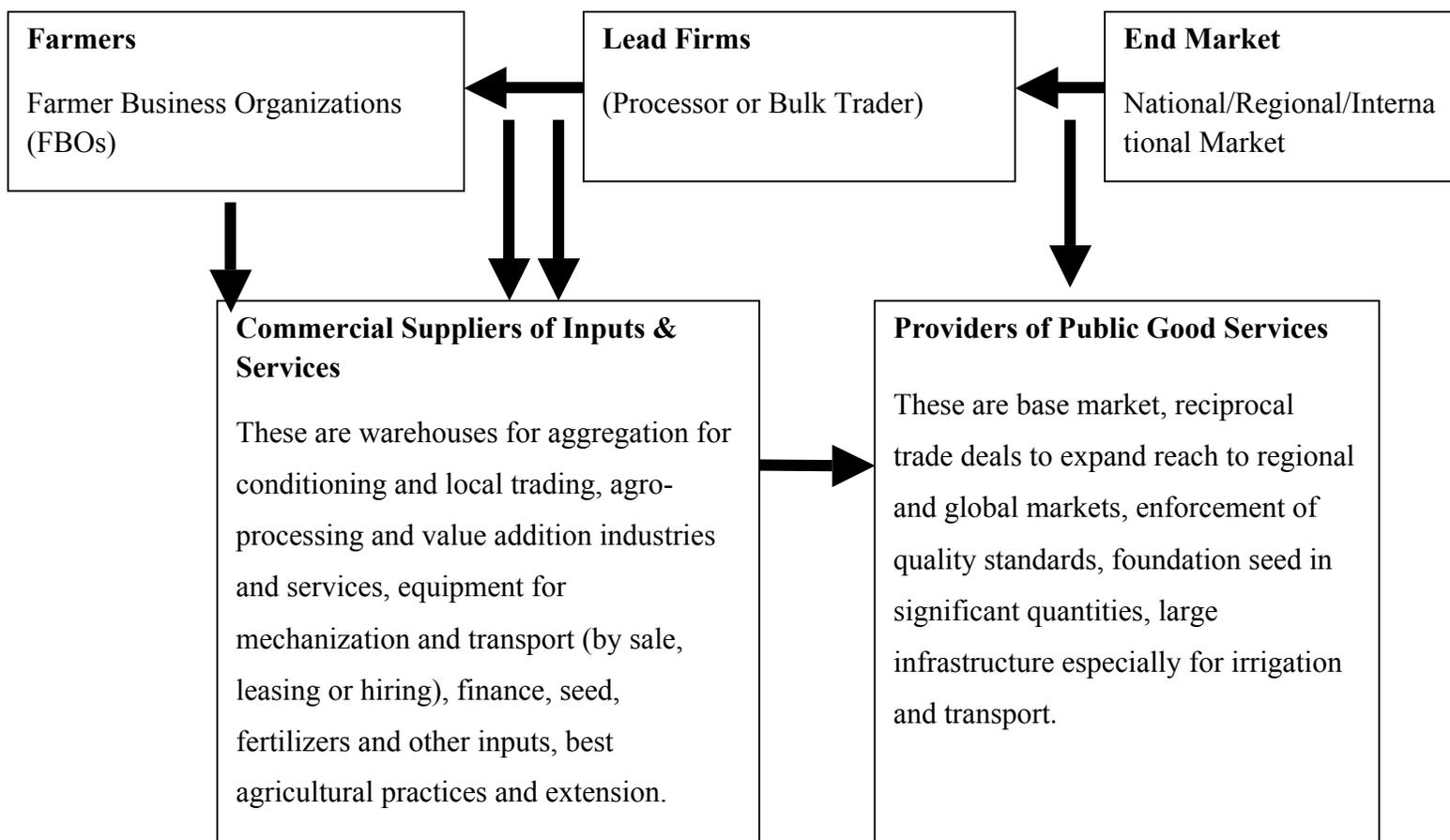
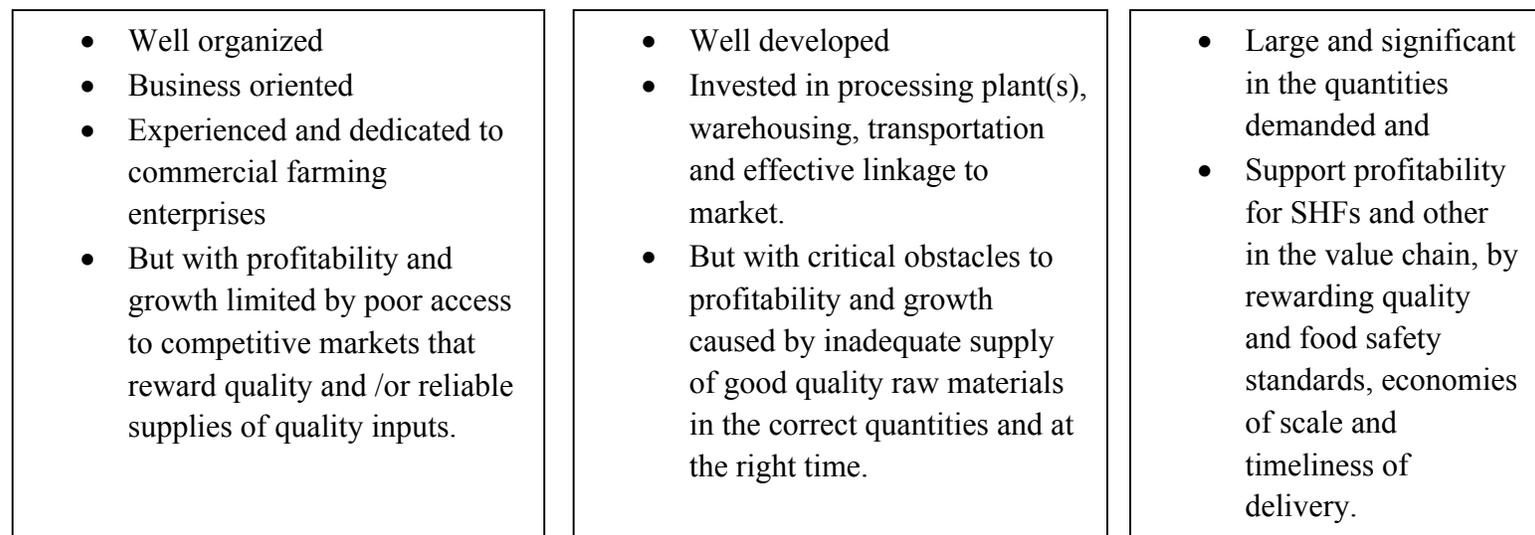


Figure 2.2 Kilimo Trust Consortium approach to Value chain Development (KTCA2VCD)

Source: Survey (2017)

Table 2.1: Five steps to form consortia

Step 1:

- ☑ Open Invitation to agribusiness firms and FBOs to express interest to forming consortia
- ☑ Intensive due diligence and selections of promising firms and FBOs

Step 2: TA and BDS to enable firms and FBOs to negotiate and agree on partnership and shared vision of success - i.e. putting the consortia backbone in place.

Step 3:

- ☑ Each consortium backbone then identify critical constraints to capturing and competing in the identified market, do as to deliver their VoS.
- ☑ They then determine which partners from the inputs and services sub-sector they should invite to their consortium.

Step 4: With support from KT Team the two parties, then identify, profile, assess, select and invite the most suitable suppliers of inputs and other services, to join their consortium.

Step 5: All the willing partners negotiate, develop and sign/approve:

- ☑ A Memorandum of Understanding (MoU), stipulating roles and responsibilities; and
- ☑ A sub-project to deal with the most binding constraints - to be supported by the project through matching grant funding

2.2 Definition of Concepts

2.2.1 Agriculture

This is one of the main sources of livelihoods for vulnerable poor smallholder farmers. Nevertheless, smallholder's farmers continue to face more changes that impede agricultural productivity with climate change being acknowledged as a major challenge to agriculture.

2.2.2 Smallholder Farmers

Smallholder farmers are also known as family farmers which have been defined in a variety of ways. Most common measures used for the definition are farm size, labor and limited resource. Smallholder farms definition with respect to farm size is define as those with less than 2 hectares of crop land. Others describe smallholder farmers as those depending on household members for most of the labor or those with a subsistence orientation, where the primary aim of the farm is to produce the bulk of the household's consumption of staple foods (Hazell *et al.*, 2007). The definitions of smallholder farmers are those with limited resources including land, capital, skills and labor. Moreover, World Bank's Rural Development Strategy defines smallholders as those with a low asset base, operating less than 2 hectares of cropland (World Bank, 2003). An FAO study defines smallholders as farmers with limited resource endowments, relative to other farmers in the sector (Dixon *et al.*, 2003).

2.2.3 Value Chain Concepts and Approaches

A value chain consists of all value-generating activities, sequential or otherwise, required to produce, deliver and dispose of a commodity (Schmitz, 2005). More specifically, it describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformations and the input of various producer services), to delivery to the final consumer and final disposal after use (Kaplinsky and Morris, 2000). A typical chain includes all of a product's stages of development, from its design to its sourced raw materials and intermediate inputs, its distribution, and its support to the final consumer (McCormick and Schmitz, 2002).

2.2.4 Value chain history and concept

The concept of the Value Chain was made popular by Harvard University's Professor Michael Porter. The Porter Value Chain has been widely adopted by the business community as a mechanism to understand and comprehend complexity in business environments, with the ultimate goal of structuring the business to maximize its competitive advantage (Van Rensburg, 2006). The early analysis emphasized local economic multiplier effects of input output relations

between firms and focused on efficiency gains. The later work gave the modern version of analysis an additional political economy dimension (Schmitz, 2005).

A value chain is an alliance or strategic network between independent enterprises, within a (vertical) chain of activities that compete on a specific market (defined by consumers and retail outlets) and to satisfy market demands. In more practical terms, an agricultural value chain covers all activities from input supply, production, processing, wholesale and retail to the final consumers. An organization's competitive advantage is based on their product's value chain. The goal of the company is to deliver maximum value to the end user for the least possible total cost to the company, thereby maximizing profit (Porter, 1985)

KIT *et al.*, (2006) defined value chain as, specific type of supply chain where the actors actively seek to support each other so they can increase their efficiency and competitiveness. They invest time, effort and money, and build relationships with other actors to reach a common goal of satisfying consumer needs so they can increase their profits.

According to Kaplinsky and Morris (2001), a value chain describes the full range of activities that are required to bring a product or service from conception, through the intermediary phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use.

Dempsey *et al.*, (2006) defined value chain approach as “a value chain is a supply chain “consisting of the input suppliers, producers, processors and buyers that bring a product from its conception to its end use. An effective value chain approach to development seeks to address the major constraints at each level of the supply chain rather than concentrating on just one group (e.g. producers) or on one geographical location.

Hoobs *et al.*, (2000) defined value chain as a vertical alliance or strategic network between a number of independent business organizations within a supply chain. The supply chain refers to the entire vertical chain of activities: from production of farm, through processing, distribution, and retailing to the consumer.

ILO (2006) defined value chain as a sequence of target oriented combinations of production factors that create a marketable product or service from its conception to the final consumption. This includes activities as design, production marketing distribution and support services up to the final consumer. The activities that comprise a value chain can be contained within a single firm or divided among different firms, as well as a single geographical location or spread over wider areas.

2.3 Conventional approaches to food value chain development

2.3.1 Value chain approaches

2.3.2 Global Value Chain Approach

The Global Value Chain (GVC) approach cut through all kind of economic realities and specify constraints surrounding a specific product. This approach combines two important analytical tools. Firstly it applies a business management approach by identifying constraints of individual firms (stakeholders), and secondly it uses power analysis to expose different types of governance within the firm. A combination of an analysis of constraints and governance type provide the right basis to compose upgrading strategies that have the ability to improve the value chain. However the approach is limited in providing insight into the heterogeneity in outcomes for different types of producers (Laven, 2010). The first shortcoming, lack of inclusion of institutions in the analysis is corrected by making use of literature on institutions, transactions costs, and social capital. The second shortcoming of GVC is its effects of upgrading at different scale levels and with different stakeholder groups.

According to Gilbert (2006), the term global value chains appears to be originally due to Hopkins and Wallerstein who proposed to analyze a sequence of processes culminating in the production of the final product. This endeavor in part motivated by the realization that many industrial goods are processed in multiple countries prior to final sale, and that trade in intermediate products has become a major component of all international trade. Industrial products typically combine a number of different raw materials and other inputs. Global value chain analysis looks at the value contribution of each of these to the final product without a well structured market.

Value chain analysis suggests a number of strategies for adding value. In particular, it emphasizes the opportunities for adding value through increasing buyer service elements of the total product package delivered to buyers. Particularly in fresh produce value chains, value can be added through reliability of delivery, speed of delivery, and product innovation. In other words, adding value need not involve physical transformation of the product. Global buyers such as supermarkets and large processors are not solely buying a physical product. They are buying a product that is bundled with a set of value-adding services. Moreover, GVC linkages offer the prospect of private sector knowledge transfers that should provide up to date and relevant information for producers, processors and exporters in developing countries. This knowledge transfer is not automatic (Humphrey, 2006).

2.3.3 The agriculture value chain analysis approach

The approach use concepts and analytical tools for analyzing the functioning of agricultural value chains are, therefore, important to understand the impact of chain development interventions on smallholders and the rural poor. Similar to the agricultural innovation systems perspective, value chain approaches help orient agricultural development thinking more towards a systems perspective (Rich *et al.*, 2008). Value chain has been used to analyze the dynamics of markets and to investigate the interactions and relationships between the chain actors. The agricultural value chain approach is utilized by many development interventions that intend to engage smallholders either individually or collectively into the production of market oriented high value crops (Anandajayasekeram and Berhanu, 2009). It is a dynamic approach that examines how markets and industries respond to changes in the domestic and international demand and supply for a commodity, technological change in production and marketing, and developments in organizational models, institutional arrangements or management techniques. The analysis look at the value chain as a set of institutions and rules; a set of activities involved in producing, processing, and distributing commodities; and as a set of actors involved in performing the value adding activities. Value chain analysis focuses on changes over time in the structure, conduct and performance of value chains, particularly in response to changes in market conditions, technologies and policies (Kaplinisky and Morris, 2001).

2.3.4 Cooperative-based approach to food value chain development and smallholders' farmers

Cooperatives are economic entities depending on the relevant legal system, which may combine commercial and not-for-profit features, and play a major role in the economic and rural development of many countries around the world. In certain geographical areas and for particular commodities, agricultural cooperatives gather very large numbers of producers and manage most of the production. They take several forms depending on their membership, object and activities. Cooperatives may vary considerably in size as well as in technical and economic capacities.

An agricultural cooperative perform different tasks. It may market the production of its members or even organize the production process itself. Moreover, cooperatives sometimes provide services (such as planning, technical assistance, access to equipment, supply of inputs and quality control). As the cooperative acquires more business and financial strength, activities and services to members could expand to include, for example, group certification or obtaining third-party certification, developing specialized products and labels, and engaging in downstream activities (such as pre-processing, transformation and packaging). These activities may often be

undertaken through commercial subsidiaries (vertical integration) or based on contract alliances and networks (horizontal integration). Cooperatives may also gather associations of producers rather than just individual ones. Cooperatives are regulated by a special legal regime, and particular rules are applied to those engaged in agriculture or the production of specific commodities (UNIDROIT, 2015). Cooperatives serve dualistic goals of organizing smallholders into larger, productive entities and facilitation the formation of the state. In many situations cooperatives were utilized as instruments of control by governments, through which national interests had dominance over individuals. Cooperatives is one of the best known type of producer organization is the cooperative, an ‘autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically-controlled enterprise’ (ICA, 2010). Although modified to adjust to different legal and local circumstances all cooperatives are built on generic principles (Williams, 2007). The purpose of a cooperative is to provide services to its members with regard to inputs, outputs and marketing. As members do pay contribution they also own the cooperative (Van Dijk and Klep, 2005). Economic benefits are distributed according to the members’ level of economic activity in the cooperative not according to his capital equity (IFAD, 2007). Cooperatives have difficulties in raising investment capital, as members have equal ownership and voting rights, there is little motivation to invest in the cooperative. Furthermore, cooperatives establish a lot of rules and regulations which can make them inflexible (Oxfam, 2007).

2.3.5 Value chain actors

These are those involved in producing, processing, trading or consuming a particular agricultural product. They include direct chain actors which are commercially in the chain (producers, traders, retailers, consumers) and in direct actors which provide financial or non-financial support service, such as bank and credit agencies, business service providers, government, researchers, and extensions (KIT *et al.*, 2006). According to GTZ (2007), the term value chain actor summarizes all individuals, enterprises and public agencies related to a value chain, in particular the value chain operators, providers of operational services and the providers of support services. In a wider sense, certain government agencies at the macro level can also be seen as value chain actors if they perform crucial functions in the business environment of the value chain in question.

According to Getnet (2009) value chain actors are those involved in supplying inputs, producing, marketing, and consuming agricultural products. They can be those that directly involved in the value chain (rural and urban farmers, cooperatives, processors, traders, retailers, cafes and

consumers) or indirect actors who provide financial or non financial support services, such as credit agencies, business service and government, researchers and extension agents.

Ponte (2002) also used a value chain analysis to examine the impact of deregulation, new consumption patterns and evolving corporate strategies in the global coffee chain on the coffee exporting countries in the developing world. The study concluded that the coffee chain was increasingly becoming buyer-driven and the coffee farmers and the producing countries facing a crisis relating to changes in the governance structure and the institutional framework of the coffee value chain. A value chain approach was used in Kenya to identify strengths and weaknesses of the cotton textile supply chain and formulate a strategy to improve the cotton-apparel sub-sector (RATES, 2003). The study identified lack of coordination among the actors in the cotton industry in Kenya as one of the major factors limiting the competitiveness of the cotton industry. Institutional innovations and harmonization of trade policies were proposed to solve the problems of institutional and policy failure.

Dereje (2007) used value chain approach to study the competitiveness of Ethiopian coffee in the international market. The study indicates that Ethiopian farmers have low level of education, large family size with small farmland and get only 3% of the retail price in the German market. Thus, policy intervention was suggested to improve farmers' performance. Further, a value chain study conducted on mango by Dendena *et al.*, (2009) indicated that the subsector is facing some challenges. Among others: highly disorganized and fragmented industry with weak value chain linkages, long and inefficient supply chains, inadequate information flows and lack of appropriate production are explained as the major problems. Moreover, a study conducted by Biruhalem (2010) on rice value chain revealed that there were multiple public and non-public actors involved along the rice value chain, upstream from input supply to downstream consumers, playing different roles. However, there is no mechanism to coordinate multiple actors together for effective and efficient functioning of the value chain. There is public sector actors' domination with limited private sector involvement in the value chain. A long tradition of limited responsiveness, top-down, hierarchical, non participatory/ exclusiveness and less risk taking type of organizational culture, habits and practices lead to have weak interaction, knowledge and information sharing with the various actors along the value chain. As to the linkage, weak and informal market linkage between chain actors characterizes the rice value chain. Lack of post harvest processing technology, limited access to supply of inputs, severe termite attack, non availability of well developed rice market, high labor demand for crop management, absence of responsible body who works on actors interaction were some of the

challenges identified for innovation at various stages of rice value chain. The study recommended partnership to be created among value chain actors to create an enabling environment for sharing information, knowledge and solve existing problems and as extension service should be strengthened to solve the existing problems and to increase competitive advantage of the rice production.

Mebrat 2014 work in tomato value chain analysis shows that cooperative is predominantly helpful in terms of agricultural inputs, and promotes use of quality/improved seeds increase the quantity of the product to be supplied to wholesalers.

2.3.6 Agro-Food Markets and Smallholder Farmers

With the increasing commercialization of agriculture and food systems worldwide, the food industry is increasingly dominated by large agribusiness firms whilst the influence of farmers is declining (Reardon & Berdegúe, 2002). International experience has shown that smallholder farmers produce low-value commodities, which face declining real prices and increasing competition from medium- to large-scale producers, and they are excluded from high-value markets. As mentioned above, small-scale farmers find it difficult to make the transition to a more commercial food system because they struggle to meet the private standards set by food processors, etc. and are also constrained by limited government support (Bienabe *et al.*, 2004). Experience with contract farming has shown that in both developed and developing countries, agribusiness integrators prefer to deal with commercial farmers in order to reduce transaction costs and also due to the need for greater consistency of quality and supply (Key & Runsten, 1999). However, Louw, Chikazunga, Jordan and Bienabe (2007) discovered that many commercial farmers are not interested in contracts or in supplying to supermarkets, as they are of the opinion that their ‘profits are squeezed’ and they cannot afford the additional capital outlays to comply with the stringent quality standards. Consequently this may offer smallholder farmers a major opportunity to engage in contract farming if they are supported along the value chain. For smallholder farmers to supply processors or wholesalers they need a certain size of production, high-quality products, a certain size and type of product, and consistency in quality and supply – requirements they find difficult to meet consistently. Smallholder farmers can only have market power if they form co-operatives, which should be established with the help of the government. Groups have the potential to secure better terms of trade such as better sourcing prices, lower transaction costs, and greater access to training and other services. The expansion of agro-processors, fresh produce markets and supermarkets is posing a major challenge to smallholder farmers in their efforts to position themselves as business driven competitors. The

buying practices of supermarkets and large processors, such as quality and safety standards, packaging and volumes, seriously challenge small producers, who are threatened with expulsion from the agricultural supply chain if they cannot take part in this new type of market. The chains thus require assurances from suppliers that all safety and health standards are being met and surpassed, and small-scale farmers must not be excluded from complying with these standards if they are to compete successfully in the agricultural value chain. Farmers are now faced with new challenges that include the consistent supply of products of consistently high quality, knowledge of acceptable agricultural practices, capacity to comply with market and regulatory requirements, new issues of conformity assessment, and traceability. This setup poses major challenges for producers, more especially smallholder farmers. As a result, smallholder farmers are still excluded from participating fully in the agricultural supply chain and are not linked to high-value markets. According to Louw, Vermeulen and Madevu (2006), dominant supermarkets and processors have tended to favour suppliers who can ensure consistent volumes and quality, and they have thus engaged in long-term production arrangements (informal contracts) with such suppliers. These criteria tend to favor more capitalized commercial producers and processors over the emerging sector (Louw *et al.*, 2006). The participation of smallholder farmers in high-value markets is constrained by the many challenges they must face. A range of impediments to market participation has been identified, including lack of access to finance, on-farm infrastructure, market information and training. The situation is worsened by the fact that farmers are located far away from the markets and have poor access to infrastructure.

Moreover, market access is facilitated through the exploitation of economies of scale, which depends on the extent of member participation. Shiferaw *et al.*, (2009) identified low volumes as one of the major limiting factors for the success of smallholder marketing groups in Kenya.

Hence, understanding the factors that contribute to high or low participation in collective marketing and other group activities is important to predict and enhance group performance.

Collective action is defined as voluntary action taken by a group of individuals, who invest time and energy to pursue shared objectives (Markelova *et al.*, 2009). It plays an important role in the context of family farms and agricultural production. For example, cooperative organization has helped to maintain the dominance of family farms in developed countries by offsetting some of their disadvantages related to size and bargaining power (Valentino 2007). In developing countries, the disadvantages of family farms are further exacerbated by various forms of market

failure, which are particularly severe in areas with poor infrastructure and communication networks. As a result, smallholders face high transaction costs that significantly reduce their incentives for market participation (Poulton *et al.*, 2010). Through achieving economies of scale, farmer groups can countervail some of these disadvantages, particularly those related to high external transaction costs and market power. But the success depends on member commitment. Commitment can be described as acting towards fulfilling mutual, self-imposed or explicitly stated obligations. It has received much attention in the social sciences, particularly in the literature strands of organizational behavior and rational choice (Robertson and Tang 1995). Organizational behavior focuses on the factors influencing the quality of an individual's involvement and performance in organizations. It includes attitudes, identification with the group, its objectives and values, as well as loyalty and affection. Rational choice theory focuses on how an individual's decision to engage in collective action depends on a comparison of the expected benefits and costs. Rational, self-interested individuals will act to achieve their personal rather than group interests, and have an incentive to free-ride if they can (Olson, 1971). Therefore, groups have to implement mechanisms that punish.

An example of a collective action in the Kenyan banana sector provides an interesting example to analyze the intensity of participation in farmer collective action. Bananas provide an important source of food and income for millions of smallholders in East Africa and other developing countries (Arias *et al.*, 2003). However, over the past decades, there has been a decrease in banana yields of African farmers, which is largely due to pests and diseases and threatens household food security. At the same time, due to urbanization processes, demand for high-quality bananas is growing. Hence, many smallholder producers have become more reliant on the cash income generated from banana sales, especially in areas that were negatively affected by declining incomes from traditional cash crops such as coffee (Wambugu and Kiome 2001). This trend of declining yields has been reversed more recently in Kenya, especially in regions where development initiatives were implemented to distribute improved banana planting material and support good agronomic practices. Recognizing the problem of low banana yields and the opportunities of rising demand, Africa Harvest and TechnoServe – two international nongovernmental organizations (NGOs) launched a joint initiative to improve banana production and marketing in Kenya. The project overall goal was to improve the welfare of smallholder banana-producing households. As a central part of the initiative, the formation of farmer groups dedicated to the production and marketing of fresh dessert banana was encouraged. Many of the new groups build on existing local networks and social ties. Members agreed on a group

constitution, membership fees, and they also elected their own leadership. The groups had to be legally registered as a pre-condition for further support by the two NGOs, such as provision of improved banana planting material and training on issues of banana production, marketing, and related business skills. In the initial stages of group formation, member farmers were trained by NGO representatives in group organization, leadership, and group dynamics, in order to build a solid foundation of social capital for future joint efforts. To plan joint activities and handle routine group business, groups hold regular group meetings, usually once a month. Participation in these meetings is voluntary, although the attendance of members is recorded. The actual group services can broadly be subdivided into production-related and marketing-related types. Production-related services focus on improved access to information, inputs, and innovation for the banana crop. For instance, NGOs carry out special technical training sessions for proper plantation establishment, maintenance, and pest control. In addition, group members were introduced to improved tissue culture (TC) planting material. Traditionally, bananas in Kenya are propagated by suckers from old plantations, a procedure through which pathogens are spread. TC banana plantlets are propagated in the lab, so that plantlets are free from pests and diseases. Farmer groups are linked to TC labs, nurseries, and markets for complementary farm inputs through NGO support; some of the groups have even established small-scale TC banana nurseries themselves. Market-related services are mostly in the form of organized group market days. To participate in these market days, members have to deliver their bananas to designated collection centers, where they are weighed, graded, bulked, and sold to wholesale traders. Farmers keep individual accounts and sales revenues from market days are distributed according to actual delivery. They only have to pay a small tax per kilogram of collectively marketed banana. Beyond the membership fee, this tax revenue is an important source of revenue for the groups to finance its service activities. But members are not formally required to market collectively; they are also allowed to sell bananas individually. Traditionally, most small-scale banana producers in Kenya have sold their marketable surplus to itinerant traders at the farm gate. The expected advantage of collective marketing is a higher sales price, because economies of scales can be realized and transaction costs reduced (Ouma *et al.*, 2010). However, effective price differences and individual benefits depend on a number of additional factors. In addition to the extra transport and time costs incurred, a disadvantage of collective marketing is also that group payments are often delayed. Smallholder farmers are still faced with low incomes and food insecurity. In order to overcome these challenges, several efforts have been made to organize smallholder farmers into groups and to take advantage effect of synergy-building. Smallholder

farmers are organized into cooperative societies. The organization of the farmers into cooperatives is need-targeted. Some are organized into cooperatives to access micro credit finance. Others are targeted at market, for better price bargain and risk reduction. These approaches have witnessed certain improvement in the income and productivity of smallholder farmers.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Area

3.1.2 Uganda

Uganda is a landlocked country in East Africa, stretching along the equator between the Democratic Republic of Congo and Kenya. Uganda faces a lot of challenges of access to international markets due to its landlocked feature. It has the title of 'The Pearl of Africa' due to the beauty of its natural features and significant natural resources.

Uganda takes its name from the Buganda kingdom, which encompasses a large portion of the south of the country including the capital Kampala.

The capital city, Kampala, lies on the shores of Lake Victoria, the biggest lake in Africa and second-biggest freshwater inland waterway on the planet.

The country has a tropical atmosphere, with temperatures running from 21-25°C (70-77°F), aside from the sloping territories, which are much cooler; the highest point of Mount Elgon is frequently secured with snow. The most sizzling months are December to February.

The regions of Uganda are known as Central, Western, Eastern, and Northern. These four regions are in turn divided into districts. There are 111 districts plus one city (Kampala). The Northern region is comprised of the West-Nile, Lango, Acholi, and Karamoja sub-regions. West-Nile sub-region, which includes the districts of Arua, Adjumani, Koboko, Maracha, Moyo, Nebbi, Yumbe, and Zombo. Lango is a sub region of Uganda covering the area that previously was known as Lango District until 1974 when it was split into the districts of Apac and Lira, Amolatar, Alebtong, Apac, Dokolo, Kole, Lira, Oyam, and Otuke. It is home mainly to the Lango ethnic group. The 2012 national population census showed that Lango population was estimated at one and a half million people.

3.1.3 Rwanda

Rwanda, a landlocked nation the size of Maryland in the US, is one of the poorest in sub-Saharan Africa. The population is largely comprised of two ethnic groups: the Tutsis (about 14%), who had been the dominant political and economic force until 1961, and the majority Hutu (about 85%), who took power at independence. Shortly after independence, many Rwandese Tutsi left Rwanda and became refugees in Uganda. For decades, Rwanda suffered from periodic ethnic clashes in which hundreds of thousands died. Rwanda's economy is market-based and primarily

driven by the agricultural sector. Agriculture is the backbone or mainstay of Rwanda's economy and the majority of households in Rwanda are currently engaged in crop or livestock production activity (Claude *et al.*, 2012). More than 85% of the labor force is engaged in subsistence agriculture. In recent years, Rwanda's economy has been growing at a fast pace, especially the service sectors. The country enjoys four seasons of which two are rainy and other two are dry, rainy season which extends from October to December, dry season which runs from January to February, and another rainy season from mid-February to mid-May and a dry season from mid-May to Early October.

3.1.4 Description of the Study Area

The main agricultural crops found in the EAC include banana, cassava, beans, potatoes, maize, finger millet, sorghum, rice, wheat, pulses, oilseeds, cotton, tobacco, fruits, vegetables, plantains, coffee, grains, sugarcane, cotton and tea. The livestock produced are sheep, pigs, fish and goat. The main agricultural export commodities include fish, cereals, horticultural crops, coffee (Robusta and Arabica), cotton, tea, sugar, tobacco, fruits and vegetables, banana, hide and skin.

In Uganda, the agricultural sector is an important source of income to her economy. It employs almost 75% of the labor force and 69% of the populace in this sector contributes about 26% to the GDP (UNDP, 2015). The government identifies agriculture as a vital contributory sector capable of reducing poverty and stimulating economic growth.

Developments ongoing in Uganda focus on increasing production and productivity, improving household food security, increasing farmers' income and increasing the value of exports (UNDP, 2015). In spite of the various agricultural development programs in the country poverty still remains a concern especially among the rural people. In Uganda, about 60% of the people are poor and 30% are very poor, and live below the poverty line (UNDP, 2015). Poverty is more intense in the rural settings than in the urban settings with 34% and 14%, respectively, and with high level of inequality (César *et al.*, 2013). Eighty seven percent of the population lives in rural areas out of which around 10 million live below the national rural poverty line (Cesar *et al.*, 2013).

In Uganda, vast majority of the population in rural areas, is linked with the agric-food sector for their livelihood (Gagnon 2012; Banson *et al.*, 2014). These agribusinesses, particularly small farmers, are under pressure to achieve economic sustainability. The smallholder farmers face

major challenges such as poor access to land; lack of on-farm and off-farm infrastructure; lack of access to finance for production inputs; lack of access to mechanization, transport logistics, extension and research support services; and limited access to high-value markets. Lack of access to markets is a major constraint facing smallholder farmer because without easy access to market, it is difficult to move from subsistence farming to commercial farming.

Likewise in Rwanda agriculture is the main driver of economic growth. It contributes 34% to the GDP and employs 85% of the Rwandan population (Claude *et al.*, 2012). The transformation of agriculture therefore will have the greatest impact on the economy in terms of poverty reduction and wealth creation in the country. In Rwanda, like in much of the developing world, small-scale subsistence farmers produce most of the agricultural output. Agricultural exports represent over 70% of the total value of exports; coffee and tea are the two main export crops and the most widely cultivated cash crops. The Government of Rwanda has also made efforts to diversify the country's exports by investing heavily in horticulture geared towards exports. The country produces several products as staple foods: maize, sorghum, rice, wheat, beans, soya beans, Irish potato, sweet potato, cassava and bananas (Claude *et al.*, 2012).

3.1.5 Study Location in Uganda and Rwanda

3.1.6 Lira District

The district is located in Lango sub-region in Northern Uganda and is bordered by the districts of Pader and Otuke in the North and North East, Alebtong in the East, Dokolo in the South and Apac in the West. There are 291,000 people in the rural areas of Lira District. The economy of the district is mainly based on agriculture, with 81% of the population engaged in subsistence farming. Other sector in economy includes agro processing industries (3.1%), commercial activities and banking (15.9%).

3.1.6 Otuke District

The district was carved out of Lira district in 2010. It is bordered by Agago district to the north, Napak district to the east, Abim district to the northeast, Alebtong district to the south, Lira district in the southwest, Amuru district in the southeast and Pader district in the northeast. The population of Otuke district comprises 78,420 people from 2012 National housing and population Census. Over 90% of the population is engaged in subsistent agricultural economy.

3.1.7 Oyam District

It has a population of 353,700 from 2012 National housing and population Census. The population is predominantly rural with 95% percent living in rural areas and is facing high poverty level, high level of illiteracy and low level of income. Oyam has a total area of 2,207km² of which

2,024.4km² is for human settlement and agricultural land area. Over 97% of the population is engaged in subsistent agricultural economy.

3.1.8 Gulu District

According to the 2012 census, Gulu had a total population of 407,500 people. Gulu District has a total land area of 6,850 Km². Agriculture still remains the major source of income to the population since over 80% of the population still rely on subsistence agriculture to earn a living.

3.1.9 Amuru District

The district's major economic activity is subsistence agriculture, which employs about 98% of the population. However with the construction of the great Juba road and ready market in South Sudan, agriculture is likely to transform from mere subsistence production to large-scale commercial farming and the district is likely to experience a higher level of economic activity. According to the 2012 census, the population of Amuru District has been increasing over the years from 135.723 in 2002 to approximately 183.600 in 2012.

3.1.10 Ngoma District

Ngoma like other regions of the country enjoys four seasons of which two are rainy and other two are dry. Generally the dry season begins earlier and ends later compared to other regions of the country. According to the 2012 National Census provisional results, the total population of Ngoma District is 338,562 inhabitants among which 162,388 are males and 176,174 are females (NISR, 2012). Agriculture is the main economic activity and also the main source of income for about 57% of households against only 21% whose source of income is wages. With regard to the income from the agriculture products, 23.6% of the agriculture products in Ngoma District are sold compared to 20.9% sold at national level. This shows at what extent the agriculture is for subsistence rather than a market oriented agriculture.

3.1.11 Gatsibo District

According to the 2012 National Census provisional results, the total population is 433,997. The percentage of males in the population is 48% while females are 52% of the population. Agriculture is the main economic activity. According to the Integrated Household Living Conditions Survey report, 84.9 % of Gatsibo population both men and women basically depend on agriculture and 80% use traditional agriculture practices. This district is known to have low rainfall and high temperatures that limit the availability of water. However the District has promoted Marshland reclamations for rice, banana and maize production on a large scale.

3.1.12 Bugesera District

The district covers a total surface area of 1337 Km² of which arable land is estimated at 91,930.34 ha. According to the 2012 National Census provisional results the total Population is 363,339 people in the following proportion: 177,404 males and 185,935 females. Crop farming and livestock rearing are the district's economy's backbones where by 77.8% of the population depend on agriculture. Subsistence agriculture is still dominant; hence less is still produced for the market (EICV report, 2012)



Figure 3.1: Map Showing Study Area.

Source: Geographical Information System (GIS) Authors (2017)

3.2 Nature and Sources of Data

3.2.1 Sources of Data: Both primary and secondary sources were used. The secondary data were collected from journals, newsletters, base-line survey, published research works and books .The primary data were collected through key informant interviews, focus group discussions, individual farmers' interviews, questionnaire and observations.

3.2.3 Instrument of Data Collection: Both structured and semi structured questionnaire were used to collect data from the beneficiary. Voice recorder and photo camera were also used following the proper ethical standard.

3.2.4 Sampling design

3.2.5 Sample selection and sampling procedures

A combination of different sampling procedures was used to select the samples to successfully meet the objectives of the study. The sample size was determined largely by financial and time constraints. However, effort was made to improve the reliability of the samples at each level of data collection processes.

3.2.6 Sampling Techniques

Multistage sampling technique was used. The sampling was carried out in stages using smaller sampling units at each stage. In this study, there are two strata: the district level and cooperative level in each selected district. At the cooperative level there are two groups of membership, the active members and non active members, random sampling technique was used to select respondents from the active members that grow the traded commodity in the consortium in each country since the population was evenly distributed. In Northern Uganda and Eastern Rwanda, districts with the highest and lowest number of active beneficiaries' members, and districts with close proximity were selected. The districts include: Lira, Otuke, Oyam, Gulu and Amuru in Northern Uganda and Ngoma, Gatsibo and Bugesera in Eastern Rwanda respectively. From each of the districts, the sample size from the population of beneficiaries was calculated using sample size calculator. Ten percent of the calculated sample size of the beneficiaries was selected. Questionnaires were administered on a total of 374 of beneficiary farmers in Uganda and Rwanda. The sample size for the survey was determined using the sample size calculator which is presented as a public service of Creative Research Systems via <http://www.surveysystem.com/sscalc.htm>. The Creative Research Systems calculator was used to determine how many people (beneficiaries) to interview in order to get results that reflect the

target population as precisely as needed. The sample size was calculated using the statistics on confidence level (95 percent), confidence interval (1.96), and the population of beneficiaries.

Table 3.1: Sample Size Determined for the Study

CONSORTIUM/LOCATION	DISTRICTS	NUMBER OF BENEFICIARIES	CALCULATED SAMPLE SIZE	BENEFICIARY SURVEY SAMPLE SIZE (10% OF CALCULATED SAMPLE SIZE)
NGETTA CONSORTIUM	LIRA	760	583	58
	OTUKE	822	619	62
	OYAM	405	349	35
EQUATOR SEEDS CONSORTIUM	GULU	311	277	28
	AMURU	129	123	12
BABC CONSORTIUM RWANDA	NGOMA	1088	758	76
	GATSIBO	895	659	66
	BUGESERA	400	345	36
TOTAL		4810	3713	373

The computation of the sample size yielded the following results: the calculated sample size was later rescaled by 10 percent for beneficiaries (actual survey respondents).

3.3 Method of Data Collection

3.3.1 Semi - Structured Questionnaire

This is a mix of unstructured and structured questionnaires. The questionnaires were structured in a way to capture the activities of the respondents before the consortium approach intervention and after the consortium approach intervention. This was done to compare the consortium approach with conventional approach in which the farmers are involved previously. The questionnaire include eight sections ,the background information, training capacity, inputs and technologies, production outputs, meeting markets requirements, access to finance, partnership modalities and assessment of the impacts of the approach on the incomes level of small holder farmers.

3.3.2 Focus group discussions

In this study, focus group discussions were held with farmers to explore the effectiveness, success stories and the strengths, weakness, opportunities and threats of the consortium approach. A topic guide, prepared after reviewing relevant literature, was used to conduct these discussions. The guide covered different aspects of the value chain such as training capacity, inputs and technologies, production outputs, meeting markets requirements, access to finance, partnership modalities gender inclusion and assessment of the impacts of the approach on incomes level of small holder farmers.

3.3.3 In-depth interviews

Semi-structured in-depth interviews were employed in this study to seek information from the value chain actors such as input suppliers, service providers, off-takers/ buyers/lead firms and other public stake holders involved like Kilimo Trust. Separate topic guides were prepared for different stakeholders by reviewing relevant literature before conducting the interviews. These guides covered economic issues such as value creation profitability, market linkages and postharvest losses; social issues such as training and gender balance; and environmental issues such as drought. Additional issues were discussed and data collected as the interviews progressed. After seeking prior consent, all of the interviews were recorded.

3.3.4 Observations

In this study, all interviews were conducted at the field site of the beneficiaries. Therefore, it was easy to make informal observations of the beneficiaries' characteristics, farming and business practices. All of them allowed photographs to be taken, which later not only helped to recall the interview settings and the participants themselves, but also contributed support to the findings of the study. During the interviews, observations were recorded as field notes, which provided added information. These observations and field notes were of substantial use in cross-checking the responses.

3.4 Analytical Methods/Techniques

3.4.1 Method/s of Data Analysis

The data collected were coded and analyzed using Statistical Package for Social Sciences (IBM SPSS statistics 20 and 22) and MS Excel spreadsheet. Collected data were collated, verified, coded, entered, cleaned and merged in the data sheet. Both qualitative and quantitative information were generated for the study and presented through a combination of cross tabulation, graphical and pictorial representations. Descriptive (frequencies, percentage, ratio, means, and standard deviation) and inferential statistics (t-test) were used to ascertain the distribution of the variables in the study. Quantitative data were analyzed to generate descriptive

statistics and qualitative data were analyzed to obtain frequencies, percentages and acquire applicable project specific information.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Demographic and socio-economic characteristics of respondents

Result of the study revealed that of the 374 smallholder farmers interviewed, in the three consortia majority were females as shown in Table 4.1 below.

Age as one of the household characteristics is important to describe households' situation and can provide a clue on working ages of households. It is assumed that age would have a relationship with farmer's investment, gender roles and decisions on the value chains in the consortia. Majority of respondents mean age were found to be 43 years. The similar findings of age distributions were revealed by Chenyambuga *et al.*, (2008) and Nenganjwa (2005).

On marital status, the findings show that majority of respondents are married, followed by single, widows, separated and divorced are the least. Similar findings were obtained by Aksoy *et al.*, (2011) and Lwelamila *et al.*, (2011). Married people have more responsibility for their families compared to those who are single that make them involve in income generating activities to cover family requirements. These findings implies that involvement in the consortia has been in a way influenced by the responsibility individual are shouldering in the family.

Findings of this study based on educational attainment revealed that majority of the smallholder farmer's in all the consortia had attained primary level education. Similar findings was also reported by Chang'a *et al.*,(2010), Omondi and Meindert (2011), Chagunda *et al.*, (2010), Evans (2013) and Ogola *et al.*, (2010).

Findings of the study revealed that March – July is the main planting for Ngetta consortium and Equator seeds consortium in Uganda, October –January and for BABC consortium in Rwanda as shown in Table 4.1 The reasons being availability of rain, lower pest infestation and good germination rate of crops during the various seasons.

Land is a critical factor endowment of any production activities and as such in agriculture. The land ownership before and after in the consortium by respondent ranges from leased/borrowed, inherited and self-owned. The findings show the source of land by respondents varies from among the consortium. In the consortia, majority of the land are self-owned. The minimum and maximum land owned in the consortium ranges from $\frac{1}{4}$ acres to 60 acres. In Ngetta consortium the land ranges from $\frac{1}{4}$ acre to 31 acres, in Equator consortium is from 2 acres to 60 acres, and BABC consortium is from $\frac{1}{4}$ acre to 17.25 acres.

Table 4.1: Demographic and Socio-economic Characteristics of the Smallholder Farmers (Respondents)

Domains	Number of Farmers (Respondents)		
	Percentage		
	Ngetta Consortium	Equator Consortium	BABC Consortium
Gender	n=156	n=40	n=178
Male	41.7	65.0	29.4
Female	58.3	35.0	70.6
Marital Status	n=156	n=40	n=178
Single	7.7	7.5	2.8
Married	84.6	75.0	93.2
Divorced	1.3	0.0	0.6
Separated	1.9	2.5	0.6
Widow	4.5	15.0	2.8
Educational Attainment	n=156	n=40	n=178
No Formal	17.5	15.4	5.6
Adult Literacy	1.9	10.3	2.2
Primary	51.2	64.1	81.5
Secondary	22.4	10.3	7.3
Advanced Level	4.5	0.0	0.0
University/Tertiary	2.6	0.0	3.4
Source of Farm Land	n=156	n=40	n=178
Self-owned	55.1	52.6	78.6
Inherited	37.8	47.4	16.3
Leased/Borrowed	7.1	0.0	5.1
Main Planting Season	n=156	n=40	n=178
March- July	98.1		
October – January		95.0	
November – March			100
Total land Owned (Acres)	n=156	n=40	n=178
Minimum	0.25	2	0.25
Maximum	31.0	60.0	17.3
Mean	5.5	14.0	2.7
Source of land	n=156	n=40	n=178
Self owned	55.1	52.6	78.6
Inherited	37.8	47.4	16.3
Leased/ borrowed	7.1	0.0	5.1

Source: Own computation based on survey data (2017)

4.2 Results based on research objective 1: determine the effectiveness of the consortium approach vis –a vis conventional approach on incomes of the smallholder farmers.

4.2.1 Skills and Knowledge Acquisition.

Training is one of the important components of the consortia. The respondents reported that before the implementation of the consortium approach, only few have skills and knowledge about being profit seeking, record keeping, producing for a well understood market, techniques for minimizing costs of production; good agricultural practices, post-harvest handling and financial literacy. After introducing the consortium approach 100% of the respondents from Ngetta and Equator consortium have received training on these skills and knowledge as shown in Figure 4.1 below

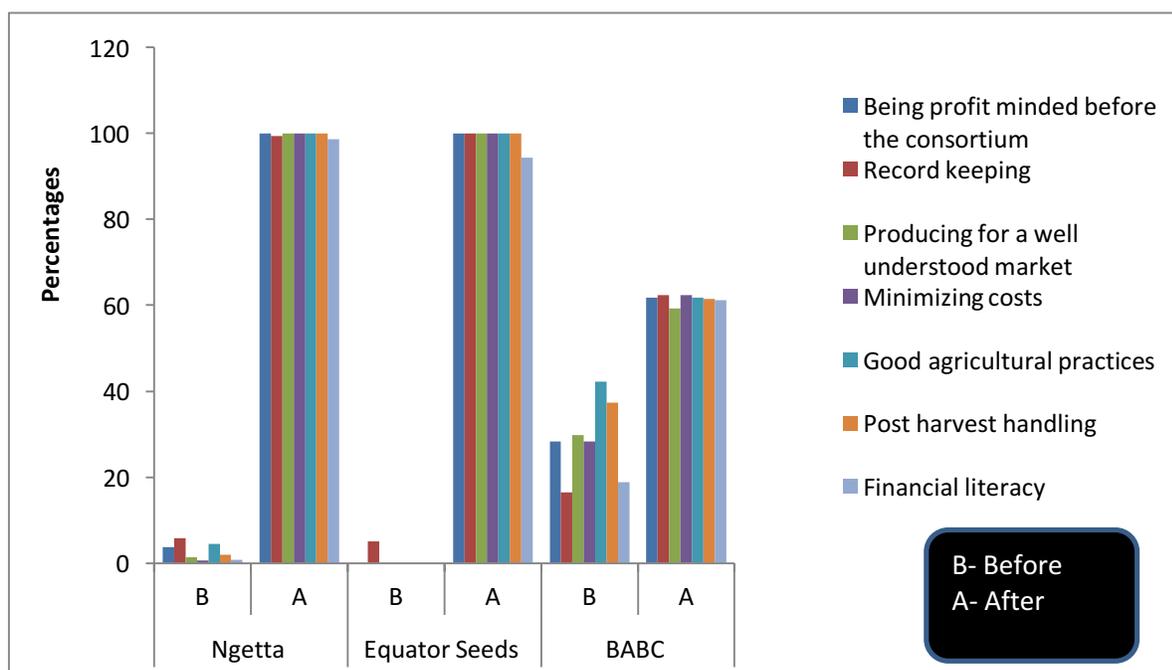


Figure 4.1: Distribution of respondents according to skills and knowledge acquired before and after the consortium approach.

Source: Own computation based on survey data (2017)

4.2.2 Production Inputs Accessed in Consortium

The respondents reported that the consortium helped them to access improved seeds, fertilizers, pesticides and herbicides, Tarpaulins and pumps as shown in Figure 4.2 below

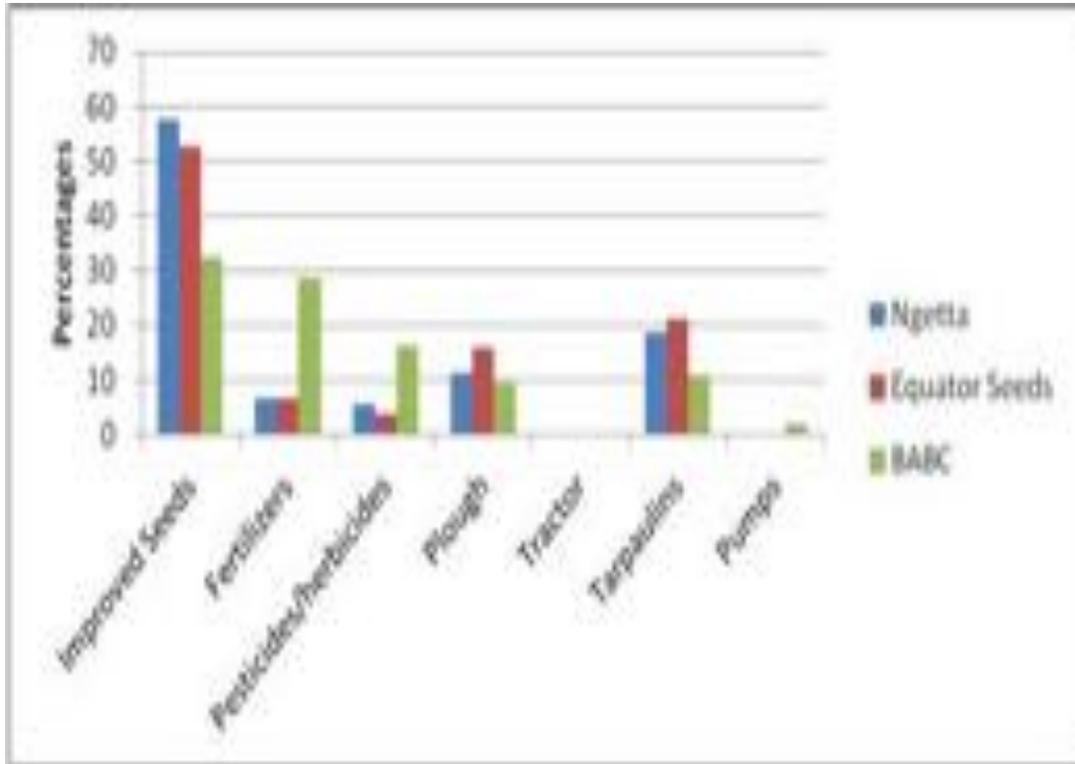


Figure 4.2: Distribution of respondents according to inputs accessed through the Consortia

Table 4.2 revealed the quantity of inputs accessed before and after from Ngetta, Equator seeds and BABC Consortium. Comparing the means values of quantities of inputs bought before and after consortium shows a significant difference. Being in the consortium, with assurance of a ready market, farmers are willing to invest more than before. The significant difference in consortium could also be attributed to the fact that farmers are linked to commercial inputs supplier who supplies to a large number of farmers through cooperative by bulking inputs to farmers. This saves them of their transport cost and helps them to take advantage of economies of scale. It was also reported by the farmers that inputs accessed are sometimes given on credit and at lower cost.

Table 4.2: Mean Value, Standard Deviation and Paired Means Value of Quantity of Inputs accessed Before and After in each Consortia

Inputs Accessed	Consortia		
	Ngetta Consortium	Equator Consortium	BABC Consortium
Improved Seeds			
Mean Quantity bought before	2.3	30.0	17.9
Mean Quantity bought After	2.7	46.4	22.7
SD Value Before	1.9	23.7	31.3
SD Value After	2.2	30.7	33.9
P-Value	0.032	0.001	0.008
Fertilizers			
Mean Quantity bought before	4.8		64.6
Mean Quantity bought After	12.6		86.5
SD Value Before	3.9		76.5
SD Value After	10.6		87.2
P-Value	0.108		0.000
Pesticides/Herbicides			
Mean Quantity bought Before	3.5		1.1
Mean Quantity bought After	7.2	1.5	23.3
SD Value Before	4.1		1.3
SD Value After	9.4	0.707	122.4
P-Value	0.128		0.351
Tarpaulins			
Mean Quantity bought Before	1.8	1.4	1.5
Mean Quantity bought After	2.6	2.0	2.4
SD Value Before	1.4	0.5	1.1
SD Value After	1.6	1.5	1.7
P-Value	0.004	0.000	0.000

Source: Own computation based on survey data (2017)

Figure 4.3 below shows the result of the actual quantity of inputs required for production before and after in the consortia. Findings of the study before the consortia shows that 58.7%, 69.4% and 32.3% from Ngetta, Equator and BABC consortium respectively were able to buy the actual quantity of inputs required for production against 41.3%, 30.6% and 67.7% from Ngetta, Equator and BABC consortium respectively that are not able to buy the actual quantity of inputs required for production but now after the consortia 91.4%, 94.4% and 69.5% respectively are able to buy the actual quantity of inputs required for production against 8.6%, 5.6% and 30.5% from Ngetta, Equator and BABC consortium respectively that are not able to buy the actual quantity of inputs required for production. The reasons given by farmers for not being able to buy the required quantity desired before the consortium were: financial constraints, lack of adequate planning prior to planting seasons, high prices of inputs due to individual retail purchases,, packaging of inputs at lower kilograms, low production outputs from inputs accessed, scarcity of inputs of good quality and others reported that they are used to the traditional method of farming by replanting from their previous harvest.

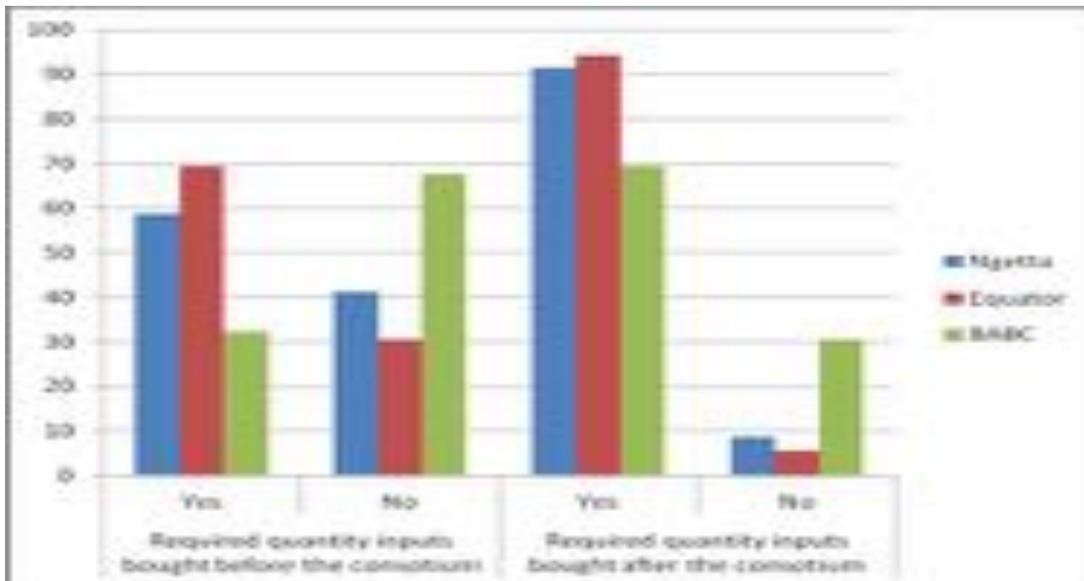


Figure 4.3: Distribution of respondents according to required quantity of inputs bought before and after Consortium.

4.2.3 Source, Delivery Mechanism, Payment Modalities and Satisfaction on Production Inputs.

In Ngetta and Equator seeds consortia, majority of the respondents sourced production inputs from off- taker/ buyer of the consortium while in BABC consortium respondents majorly sourced production inputs from commercial inputs supplier as shown in Table 4.3. The uniqueness of Ngetta consortium is that the off- taker / buyer of farmers' produce is the same person that supplies inputs to farmers; but in Equator and BABC consortia it is different, there is a separate commercial inputs supplier and an off- taker/ buyer in the consortium. The result revealed that there is increased use of improved seeds by all farmers in the consortia but other inputs – fertilizers, Pesticides and Herbicides, tarpaulins are still lowly bought except in BABC consortium. Farmers still needs to be reoriented from the mindset of getting free inputs from non- governmental organization, government, etc than to investing their own money into their farming business and also to being a commercialize farmer rather than being a subsistence farmer now that there is a ready market in the consortium. For example, in Ngetta Consortium, out of the 156 respondents, 15 reported use of fertilizer, representing 9.6% while 14 farmers (8.9%) use pesticides and herbicides, 19 farmers (12.1%) use ox- plough and 48 farmers (30.7%) use tarpaulins. Similarly in equator consortium, out of 40 respondents, only 1 farmer (2.5%) use fertilizer while 4 farmers (10%) use pesticides and herbicides, 9 farmers (22.5%) use ox- plough for ploughing and 13 farmers (32.5%) use tarpaulins for their farming activities. However from BABC consortium farmers have the mindset of farming as business and so a larger percentage have invested in other production inputs, out of 178 respondents 158 farmers (88.7%) use fertilizers while 108(60.6%) farmers use pesticides and herbicides, 67 farmers (37.6%) use ox- plough for ploughing and 71 farmers (39.8%) use tarpaulins. However in BABC consortium, Government of Rwanda has a subsidized policy that supports farmers to get production inputs at a reduced cost and the inputs supplier of the consortium is a beneficiary of the program thereby improving access and reducing costs of inputs to farmers.

The delivery mechanisms of inputs purchased by farmers in the consortium are cost-effective because purchase is done in bulk and supplied at cooperative store. It was reported that the contracted commercial inputs dealers delivers their request at cooperative store especially improved seeds with these percentages 96.2%, 90% and 92% from Ngetta consortium, equator consortium, and BABC consortium respectively. Comments made by farmers from individual interview and focus group discussion were that it was easier for them to access the inputs at the

cooperative store, assurance of availability from supplier, selling price of inputs was good, part payment is allowed and sometimes it is accessed on credits with payment done after planting season and also it enhanced them to plant on time during planting season. However during key informants' interview with the contracted inputs supplier and focus group discussion with farmers, it was reported that new technologies of production inputs are demonstrated on field site within farmers premises so that they see and decide on the best technology of production inputs that will purchase. These demonstrations are done earlier prior planting seasons.

As shown in the third section of Table 4.3, the payment modality, reported from Ngetta consortium, Equator consortium and BABC consortium with these percentages respectively 25.6%, 17.5% and 58.9% pay cash at the point of purchase for improved seeds, 12.8%, 7.5% and 29.5% pay in advanced for improved seeds but a larger percentage that is 61.5%, 75% from Ngetta consortium and equator consortium said improved seeds is accessed on credit/part payment while full payment is done after harvest. From BABC consortium 25% said that improved seeds are accessed on credit. The reason for this in BABC consortium is that production inputs are subsidized by the Government of Rwanda and so farmers paid stipend to purchased production inputs from the contracted commercial inputs supplier. However from Ngetta Consortium and Equator seeds Consortium this advantage is not available for farmers. From the focus group discussion held with farmers group or cooperative and key informant interview with a staff of Equator Seeds Company at Gulu District Uganda, it was reported that 30% payment of inputs accessed is done at the beginning of planting season while 70% of the payment is done after harvest and sales of produce. In addition to this the focus group discussion held with farmers group or cooperative and key informant interview with the managing director of Ngetta Tropical Holdings Company at Lira district Uganda, it was reported that 50% payment of inputs accessed is done at the beginning of planting season while another 50% payment is done after harvest and sales of produce

Table 4.3 Distribution of respondents according to Source, Delivery Mechanism and Payment Modalities on Production Inputs.

Inputs Features	Consortia		
	Ngetta Consortium	Equator Consortium	BABC Consortium
1. Inputs Source			
(i) Improved seeds	n=156	n=40	n=178
Off-taker/buyer	154(98.7)	29(72.5)	8(4.6)
Commercial Input suppliers	1(0.6)	11(27.5)	161(93.1)
Fellow farmers	1(0.6)	0(0.0)	4(2.3)
(ii) Fertilizers	n=15	n=1	n=158
Off-taker/buyer	12(80.0)	1(100)	6(3.8)
Commercial Input suppliers	3(20.0)	0(0.0)	146(92.4)
Fellow Farmers	0(0.0)	0(0.0)	6(3.8)
(iii) Pesticides/herbicides	n=14	n=4	n=108
Off-taker/buyer	8(57.0)	2(50.0)	8(7.4)
Commercial Input suppliers	5(35.7)	2(50.0)	87(80.6)
Fellow Farmers	1(7.0)	0(0.0)	13(12.0)
(iv) Plough	n=23	n=9	n=67
	OX- Plough	OX- Plough	OX- Plough
Off-taker/buyer	0(0.0)	0(0.0)	5(7.5)
Input suppliers	4(17.4)	2(22.2)	31(46.3)
Fellow farmers	19(82.6)	7(77.8)	31(46.3)
(v) Tarpaulins	n=48	n=13	n=71
Off-taker/buyer	21(43.8)	4(30.8)	8(11.3)
Input suppliers	14(29.2)	4(30.8)	57(80.3)
Fellow farmers	13(27.1)	5(38.5)	6(8.5)
2. Inputs Delivery to Farmers			
(i) Improved Seeds	n=156	n=40	n=173
Off-taker/buyer	1(0.6)	0(0.0)	0(0.0)
Farm premises	4(2.6)	0(0.0)	0(0.0)
Group/Cooperative store	150(96.2)	36(90.0)	159(92.0)
Input Shop	1(0.6)	4(10.0)	14(8.0)
(ii) Fertilizers	n=15	n=1	n=158
Farm premises	3(20.0)	0(0.0)	2(1.2)
Group/Cooperative store	10(66.7)	1(100)	147(93.0)
Input Shop	2(13.3)	0(0.0)	9(5.7)
(iii) Pesticides/herbicides	n=15	n=4	n=108
Farm premises	4(28.5)	0(0.0)	2(1.8)
Group/Cooperative store	7(50.0)	2(50.0)	65(60.2)
Input Shop	4(28.5)	2(50.0)	41(37.9)

(iv) Plough	n=19 OX- Plough	n=9 OX- Plough	n=67 OX-Plough
Farm premises	11(57.8)	5(55.5)	7(10.4)
Group/Cooperative store	3(15.7)	0(0.0)	32(47.8)
Input Shop	5(26.3)	4(44.4)	28(41.8)
(v) Tarpaulins	n=48	n=13	n=71
Off-taker/buyer	1(2.0)	0(0.0)	2(2.8)
Farm premises	9(18.8)	4(30.7)	5(7.0)
Group/Cooperative store	31(64.5)	6(46.2)	47(66.1)
Input Shop	7(14.6)	3(23.0)	17(23.9)
3. Payment Modality for Inputs to Farmers			
(i) Improved seeds	n=156	n=40	n=178
Cash at point of purchase	40(25.6)	7(17.5)	105(58.9)
Advance payment	20(12.8)	3(7.5)	51(29.5)
Credit	96(61.5)	30(75.0)	22(12.4)
(ii) Fertilizers	n=11	n=1	n=158
Cash at point of purchase	2(18.2)	1(100)	84(53.2)
Advance payment	6(54.5)	0(0.0)	53(33.5)
Credit	3(27.3)	0(0.0)	21(13.3)
(iii) Pesticides/herbicides	n=14	n=4	n=108
Cash at point of purchase	10(71.4)	2(50.0)	63(58.3)
Advance payment	1(7.1)	0(0.0)	34(31.5)
Credit	3(21.4)	2(50.0)	11(10.1)
(iv) Plough	n=19 OX- Plough	n=9 OX - Plough	n=67 OX- Plough
Cash at point of purchase	17(89.5)	7(77.7)	40(59.7)
Advance payment	0(.00)	0(0.0)	27(40.3)
Credit	2(10.5)	2(22.2)	0(0.0)
(v) Tractor			
Cash at point of purchase	0(0.0)	0(0.0)	0(0.0)
(vi) Tarpaulin	n=48	n=13	n=108
Cash at point of purchase	33(68.8)	9(69.2)	50(70.4)
Advance payment	3(6.3)	0(.00)	16(22.5)
Credit	12(25.0)	4(30.8)	5(7.0)

4.2.4 Distribution of respondents according to Satisfaction on Production Inputs.

As shown in Figure 4.4, farmers reported 100% satisfaction in improved seeds from Ngetta and equator consortium while in BABC consortium 93.6% satisfaction was reported against 6.4% dissatisfaction. Similarly 85.7%, 100% and 93% satisfaction in tarpaulins was reported while 14.3%, 0% and 7% dissatisfaction from Ngetta consortium, Equator consortium and BABC consortium respectively. Some of the comments given by farmers during individual interviews and focus group discussions were that the improved seeds supplied are of good quality, high germination rate, high yielding in terms of weight, early maturation and drought resistance.

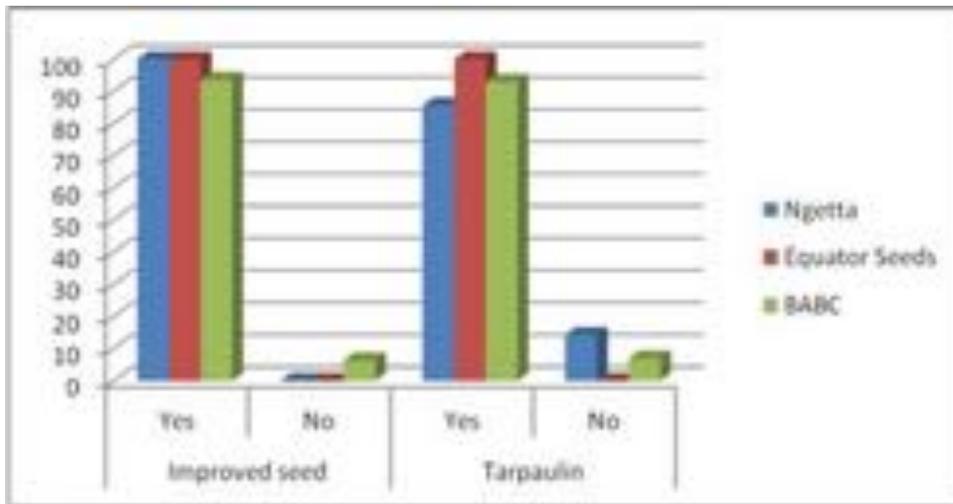


Figure 4.4: Distribution of respondents according to satisfaction on production of inputs accessed in Consortia.

Source: Own computation based on survey data (2017)

4.2.5 Access to Storage Facility and Market.

This study revealed that before the consortium approach 24.4%, 20% and 6.1% of respondents from Ngetta, Equator and BABC consortium respectively have accessed storage facility against 75.6%, 80% and 93.8% of respondents respectively that have not accessed storage facility but now after the consortium 97.4%, 97.5% and 76.4% of respondents from Ngetta, Equator and BABC Consortium have accessed storage facility against 2.6%, 2.5% and 23.5% of respondents that have not accessed storage facility.

The results of the survey also revealed that 99.3%, 100% and 89.9% of respondents from Ngetta, equator and BABC consortium respectively know who to sell their produce to after harvest that is the contracted buyer in each of the consortium aside other market of side selling through middlemen against 0.6%, 0% and 10.1% that do not know who to sell their produce to after harvest.

4.2.6 Market Requirements

Figure 4.5 below shows the mean volume/quantity required, vis-à-vis mean supplied volume/quantity and the volume/quantity grade of produce that met the required standard of contracted buyer in each respective consortium. BABC consortium has the highest mean volumes while Ngetta consortium has the lowest mean volumes for the three parameters. However during focus group discussion with farmers group from BABC it was reported that they are committed to collecting and bulking the production outputs at the collection center/cooperative store for the buyer because of the price offer which was always higher than other market price outside the consortium, also when the key informant was interviewed he reported that the buying price was determined through negotiation with ministry of agriculture and Trade, traders and farmers to set up the minimum price per season, after which he adds 10-20% to the minimum price from the farmers he patronize in BABC consortium buying the buyer. In addition to this it was also reported that the buyer stands as guarantor for farmers in bank to access finance for their farming and likewise help to source for a registered commercial inputs supplier in the consortium. All these were possible because of the level of mutual relationship developed already within the partners of the consortium. The Managing director of Bugesera Agric business Company also known as BABC who was the contracted buyer in BABC consortium reported during the key informant interview that in the aspect of collecting and bulking of produce, farmers are committed to doing that and he even added that two seasons back farmers bulked / supplied to his company more than the volumes he required those seasons, that he bought excess raw material from farmers that he had to supply to other processing

company like his own company but last season government food security affected the volume that was supplied to the buyer because the government bought a larger percentage of farmers produce first before the rest was supplied to the buyer.

In the aspect of the standard requirements of the buyer, he reported that farmers have not yet met the East Africa Community (EAC) standards because they lack the technologies and machineries that will enable them to achieve this, however he said that a great improvement have been recorded recently compared to when the consortium started that about 35% of the produce (maize) bulked was rejected but now only 25% of the produce was rejected last season.

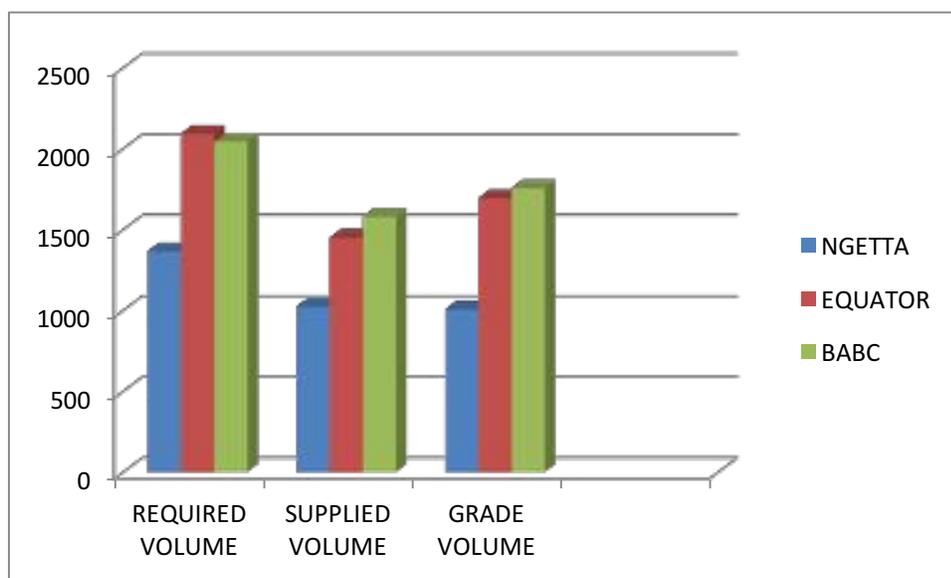


Figure 4.5: Average Value of required volume, supplied volume and grade volume from Ngetta, Equator consortium and BABC Consortium.

Source: Own computation based on survey data (2017)

4.2.7 Delivery Mode of Produce

Survey results on mode of delivery as shown in Figure 4.6 revealed that the buyer pick up produce from cooperative aggregation center after bulking from a larger percentage of the farmer; 83.9%, 92.5%, and 88.7% from Ngetta, Equator and BABC consortium respectively while 8.3%, 2.5% and 0.5% from Ngetta, Equator and BABC consortium respectively said that buyer picks up from individual farmer which is the issue of side selling through middle men and 7.7%, 5% and 10.7% from Ngetta, Equator and BABC consortium respectively said that cooperatives deliver produce to buyer premises which also means side selling to another buyer outside the consortium.

Also the graph depicts that there is still a lot of side selling from Ngetta consortium, this was confirmed from focus group discussion held with farmers group that after bulking produce for the buyer of the consortium, during waiting period for other farmers who did not plant early to

bulk/ buyer waiting for the quantity bulk by farmers to be in large number, some farmers who bulk earlier do go back to the cooperative center to collect part of the produce which is sold to middlemen for quick cash. Similarly the buyer in BABC consortium also made the same comments that bulking of produce by farmers are seen as an expensive process and they are unwilling to wait for other farmers to sell collectively.

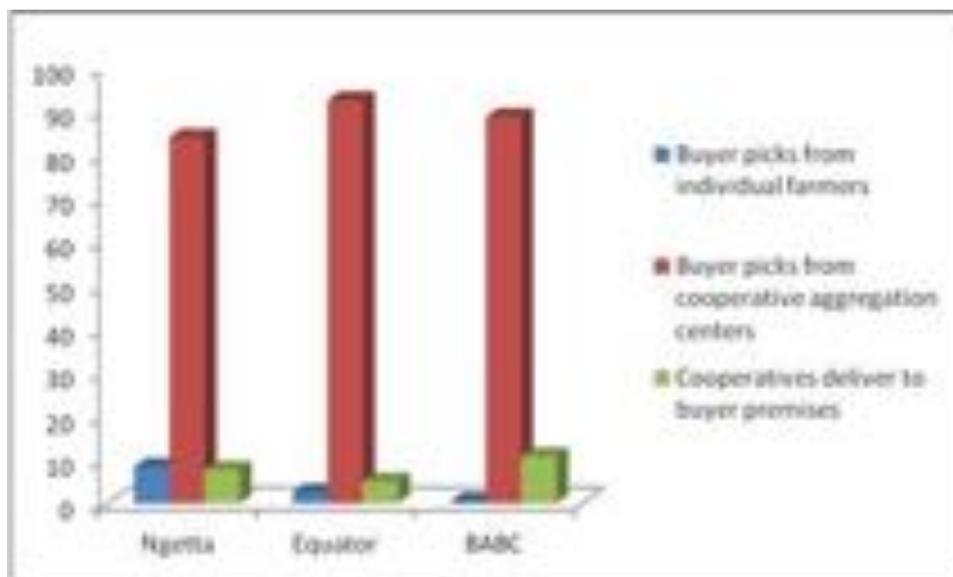


Figure 4.6: Mode of Delivery of Produce to the Buyer of Ngetta, Equator consortium and BABC Consortium.

Source: Own computation based on survey data (2017)

4.2.8 Access to External Finance

This section discusses the extent to which respondents accessed external finance. It was revealed that 31.4%, 37.5% and 29.7% from Ngetta, Equator and BABC consortium respondents respectively accessed external finance against 68.6%, 62.5% and 70.2% from Ngetta, equator and BABC consortium respondents respectively that did not access external finance as shown in Figure 4.7 while 79.6%, 100% and 59.6% said that the external finance accessed was suitable for their farming business against 20.4%, 0% and 40.4% that said the finance accessed was not suitable for their farming business. 28.2% of respondents in Ngetta and 100% in Equator consortium respectively accessed finance from Village Savings Loan Association (VSLA). Finance accessed was at a low interest rate of 10% and yearly the overall profits realized is shared among members who have accessed loans. Others source where external finance were accessed are Bank of Africa, Centenary Bank and Uganda Microfinance. In BABC consortium

12.9% of the respondents accessed external finance from Urwego Opportunity Bank, 8.9% from Duterimbere Bank, and 7.8% from Village Savings Loan Association (VSLA).

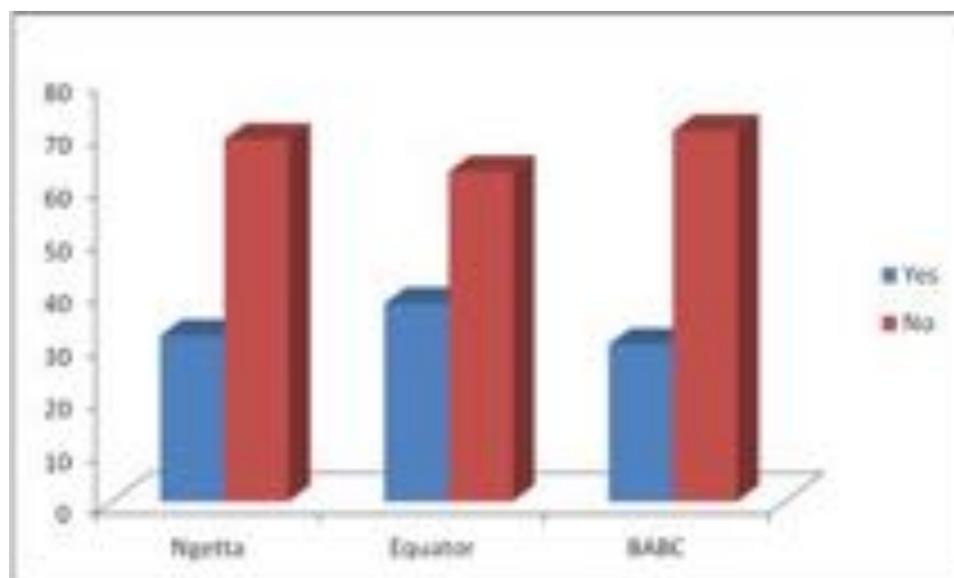


Figure 4.7: Distribution of respondents according to external finance accessed in Ngetta, Equator consortium and BABC Consortia.

Source: Own computation based on survey data (2017)

4.2.9 Contractual Agreements

100% of the respondents from Ngetta and Equator seeds consortium and 66.3% from BABC consortium have contractual agreements with the buyer. 99.1% 100% and 39.5% from Ngetta, Equator and BABC consortium respectively have contractual agreements with inputs supplier. It was also revealed that 74.1%, 75.0% and 28.8% from Ngetta, Equator and BABC consortium respectively have contractual agreements with financial institution.

4.3.0 Impact of Consortium on Mean Harvest, Gross Margins and Total Revenue

As shown in Tables 4.4- 4.10, respondents from Ngetta reported that the mean harvest in one acre of sunflower cultivated before and after consortium approach were 0.2034MT and 0.4641MT respectively. The gross margins before and after the consortium was 85USD and 12USD respectively. The gross margins before indicated that farmers make a loss of 85USD but after the consortium a profit of 12USD was realized. The mean revenue before and after the consortium was 66.7USD and 166.7USD respectively. The p-values for mean harvest, gross margins and mean revenue shows that there was a significant difference as shown in Table 4.4

Table: 4.4 Effectiveness of Ngetta Consortium on Mean Harvest, Gross Margins and Total Revenue per Acre for Sunflower

VARIABLE	BEFORE	AFTER	P- VALUE
Mean harvest per acre (MT)	0.2034	0.4641	0.000**

Gross margins per acre (USD)	85	12	0.000**
Mean Revenue per acre (USD)	66.7	166.7	0.000**

Source: Own computation based on survey data (2017)

Similarly, results revealed that the mean harvest per season before and after the consortium were 0.3865MT and 1.2531MT respectively, mean revenue per season before and after the consortium were 131.5USD and 366.3USD while the mean land cultivated and dedicated for sunflower before and after were 1.9acres and 2.6 acres respectively, the p- values for harvest per season, mean revenue per season and mean land cultivated for sunflower shows that there was a significant difference as shown in Table 4.5

Table 4.5: Effectiveness of Ngetta Consortium on Harvest per Season, Mean Revenue and Mean Land Cultivated for Sunflower

VARIABLE	BEFORE	AFTER	P- VALUE
Mean harvest per season (MT)	0.3865	1.2531	0.000**
Mean revenue per season (USD)	131.5	366.3	0.000**
Mean land cultivated for sunflower (acres)	1.9	2.6	0.000**

Respondents from Equator consortium reported that before and after consortium approach, the mean harvest in one acre of beans cultivated were 0.4964MT and 0.839MT respectively. The gross margins before and after the consortium was 15USD and 471USD respectively. The gross margins before indicated that farmers made a loss of 15USD but after the consortium a profit of 471USD was realized. The total revenue before and after the consortium was 58.3USD and 544.4USD respectively, the p-values for mean harvest, gross margins and total revenue shows that there was a significant difference as shown in Table 4.6

Similarly, the mean harvests per season before and after the consortium were 0.9433MT and 1.9392MT respectively. Mean revenues per season before and after the consortium were 129.8USD and 961.2USD while the mean land cultivated and dedicated for beans before and after were 1.9acres and 2.3 acres respectively, the p- values for harvest per season, mean revenue per season, shows that there was a significant difference while mean land cultivated for beans shows that there was no significant difference as shown in Table 4.7

Table 4.6: Effectiveness of Equator Consortium on Mean Harvest, Gross margins and Total Revenue per Acre for Beans

VARIABLE	BEFORE	AFTER	P- VALUE
Mean harvest per acre (Kg)	0.4964	0.8395	0.005**

Gross margins per acre (USD)	15	471	0.000**
Mean Revenue per acre (USD)	58.3	544.4	0.000**

Source: Own computation based on survey data (2017)

Table 4.7: Effectiveness of Equator Consortium on harvest per season, mean revenue and mean land cultivated for Beans

VARIABLE	BEFORE	AFTER	P- VALUE
Mean harvest per season (Kg)	0.9433	1.9392	0.005**
Mean Revenue per season (USD)	129.8	961.2	0.000**
Mean land cultivated for Beans (acres)	1.9	2.3	0.094**

Source: Own computation based on survey data (2017)

Respondents from BABC consortium reported that before and after consortium approach the mean harvest in one acre of maize cultivated were 0.797MT and 0.8893MT respectively. The gross margins before and after the consortium were 124USD and 150USD respectively. The gross margins before indicates that farmers made a loss of 124USD but after the consortium, a profit of 150USD was realized. The mean revenue before and after the consortium was 125USD and 357.1USD respectively. The p-values for mean harvest, gross margins and mean revenue shows that there was a significant difference as shown in Table 4.8.

Similarly, the mean harvests per season before and after consortium were 1.355MT and 2.668MT respectively. Mean revenues per season before and after the consortium were 167.1USD and 782.0USD while the mean areas of land cultivated and dedicated for maize before and after were 1.7 acres and 3.0 acres respectively. The p- values for harvest per season, mean revenue per season, shows a significant difference while mean land cultivated for maize shows no significant difference (Table 4.9)

Table 4.8: Effectiveness of BABC Consortium on Mean Harvest, Gross Margins and total Revenue per Acre for Maize

VARIABLE	BEFORE	AFTER	P- VALUE
Mean harvest per acre (Kg)	797	889.3	0.000**
Gross Margins per acre (USD)	124	150	0.000**
Total Revenue per acre (USD)	125	357.1	0.000**

Source: Own computation based on survey data (2017)

Table 4.9: Effectiveness of BABC Consortium on harvest per season, mean revenue and mean land cultivated for Maize

VARIABLE	BEFORE	AFTER	P- VALUE
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Mean harvest per season (Kg)	1355	2668	0.000**
Mean Revenue per season (USD)	167.1	782.0	0.000**
Mean land cultivated for Maize (acres)	1.7	3.0	0.067**

Source: Own computation based on survey data (2017)

4.3.1 Costs-Benefits/Profitability Analysis

This section discusses the cost benefits/profitability before and after the consortium. In all the three consortia accessed, farmers were at a loss before; but after, farmers make profits as shown in Figures 4.8-4.10. The explanation for this is because farming before the consortium was done as usual, best agricultural practices were not practiced by farmers. Majority replanted from previous harvest; no proper record keeping; cost of production was not minimized; no reliable market; produce were sold through middlemen and low market price were offered (e.g. 1Kg of sunflower grains was sold at 0.21USD, 1Kg of beans grains was sold at 0.42USD and 1Kg of maize grains was sold at 0.17USD).

However, after the consortium farming is done as a business; good agricultural practices are adopted; farmers have acquired the skills to be business-minded and they also know that it is not about the price offer but it is about making profit. Record keeping is done which enables them to determine the best price at which they sell the commodity. Farmers know whether they are doing a good business or not. Improved seeds are planted now; cost of production is minimized through use of family labor, and collective action in accessing production inputs and marketing of produce.

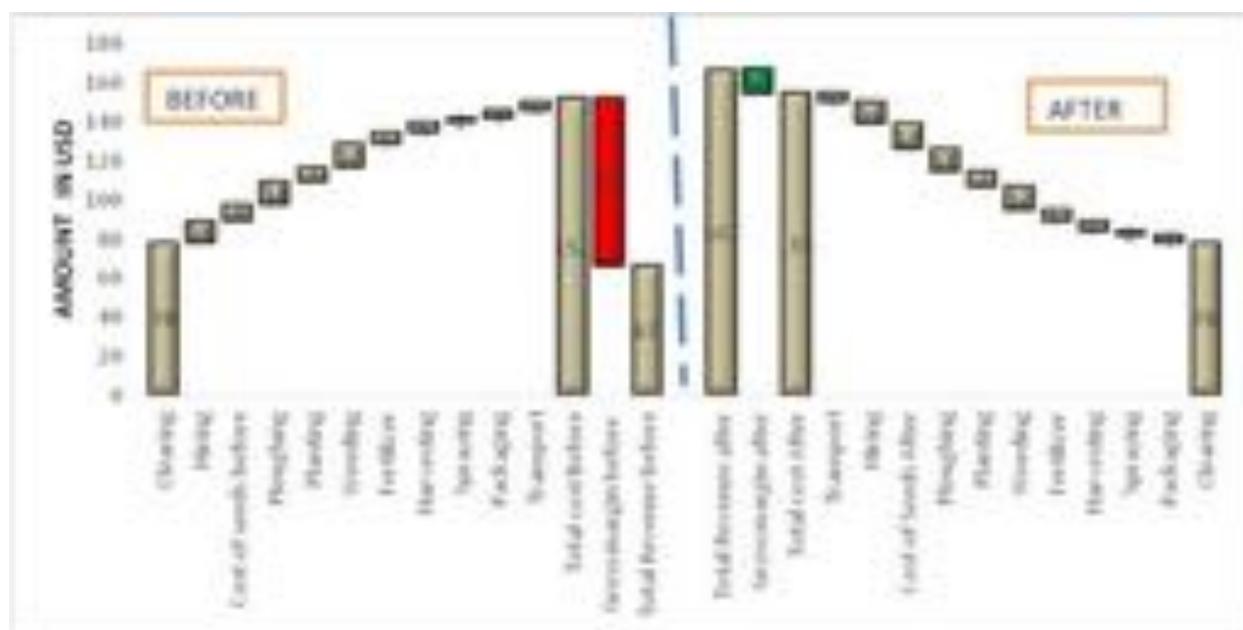


Figure 4.8: Cost- Benefits/Profitability Analysis of Ngetta Consortium for Sunflower Per Acre.

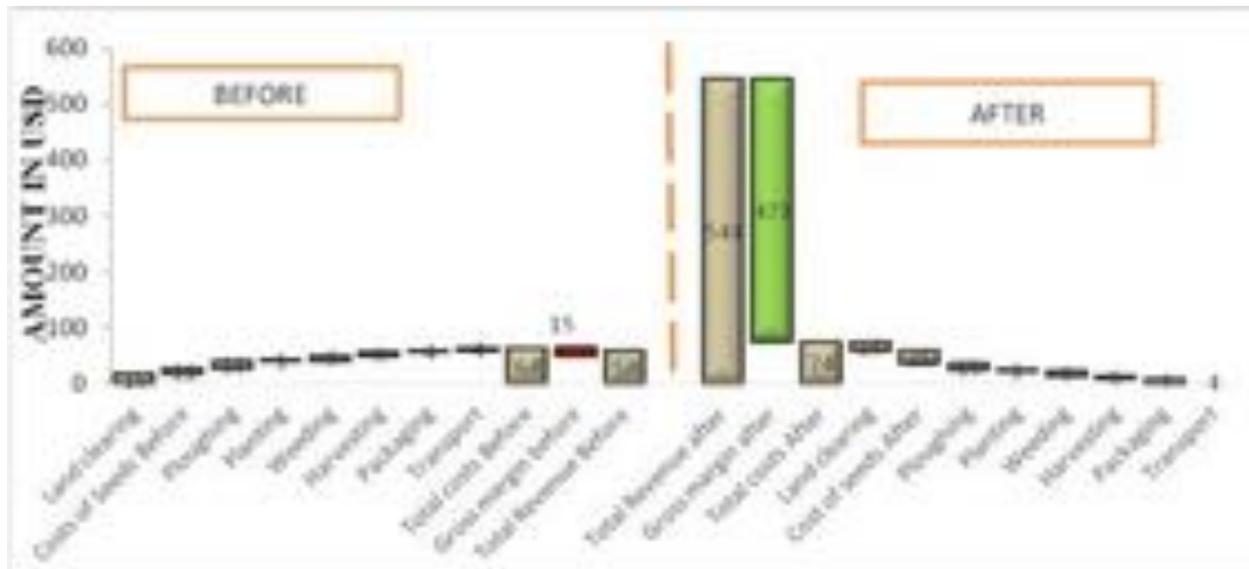


Figure 4.9: Cost- Benefits/Profitability Analysis of Equator Consortium for Beans Per Acre.

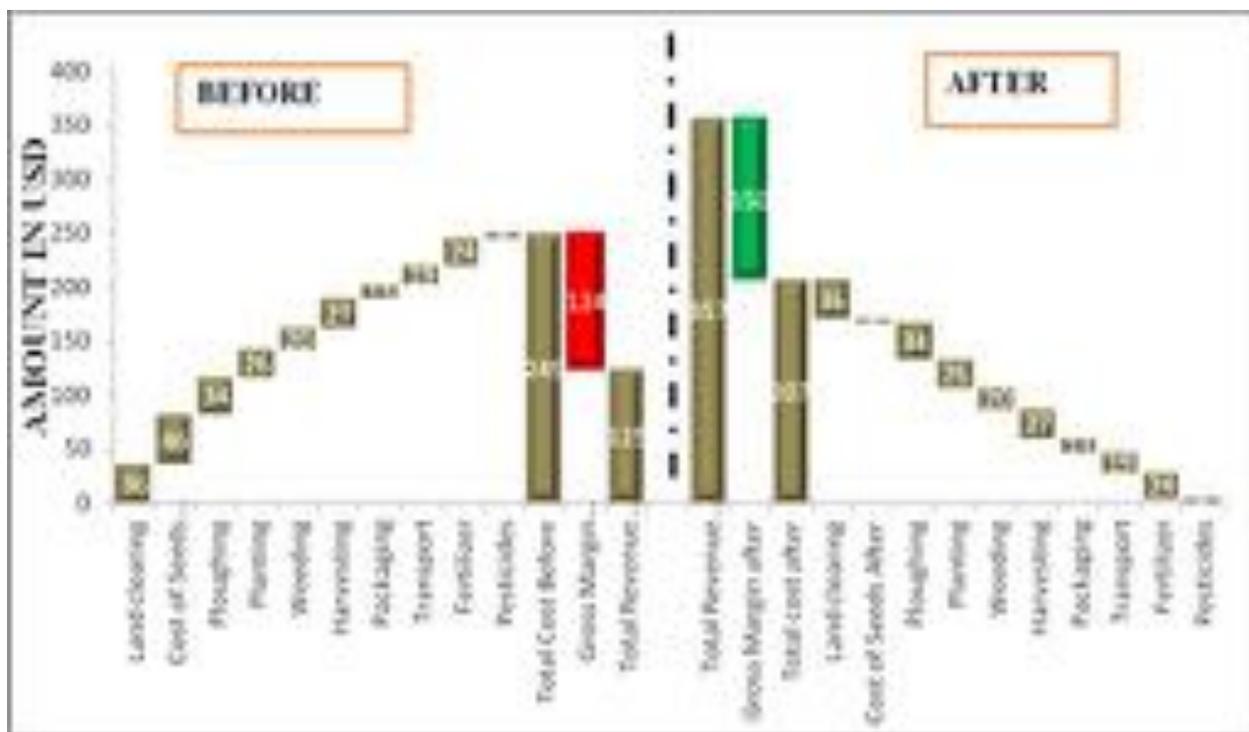


Figure 4.10: Cost- Benefits/Profitability Analysis of BABC Consortium for Maize Per Acre.

4.3.2 Results based on research objective 2: determine the critical success factors for sustainability of the consortium approach.

The critical or key success factors of consortium approach involve a strong capacity training on skills and knowledge that enhance the adoption of ‘farming as a business’ concept and market orientation for farmers as referenced from results as shown in figure 4.1 and figure 4.5. These two points are key and given to farmers in form of training as part of the module use in Kilimo Trust Farmers Business School (KTFBS). Close monitoring and check is also important for farmers so that dedication and commitment is ensured. Availability of a lucrative market in the consortium is key and farmers’ understanding of the market opportunities /requirements is also important with reference to figure 4.5. Joint/Seasonal planning among all value chain actors is important to ensure that targets/satisfaction /expectations of all actors in the consortium are met. Supply of good quality production inputs by the contracted commercial inputs supplier is germane because these directly have an impact on the farmers’ production outputs and the quantity of produce that is supplied to the buyer with reference from figure 4.4. Trust and collective action or working as a team among the actors is crucial in the consortium. Joint problem and equal risk sharing from both parties especially between farmers and buyer in the consortium is also important. Table 4.10 revealed the comparison of key attributes of before and after the consortium approach in food value chain development.

Table 4.10: Comparison of Key Attributes/Success factors of Conventional Approach (Before) and Consortium Approach (After) in Value Chain Development.

Attributes	Conventional Approach (Before)	Consortium Approach (After)
Transaction Terms	Short- term transactions(individually)	Long-term transactions (group)
Market Decision	Made on price/role of personal bargaining	Made on value/joint- decision making
Partnership	Many	Fewer are selected
Interdependence	Low	High
Production	Supply-driven and low	Demand-driven and High
Communication	Limited	Open
Coordination	Limited	Strong
Level of Investments	Avoided /low level	Higher level
Information	Proprietary	Shared
Improvement	Unilateral initiatives	Continuous joint activities

Activities	Separate	Engaged
Goals	Disharmonious (conflicting) goals	Compatible / common goals
Opportunism	Behave opportunistically	Mutual trust
Incentives	Adversarial attitudes	Common, mutual attitudes
Acting	Act only in own interest	Act for mutual benefits
Orientation	Win-Lose	Win- win

4.3.3 Results based on research objective 3: investigate strengths, weaknesses, opportunities and threats of consortium approach in improving incomes of smallholder farmers. The SWOT Analysis of Kilimo Trust Consortium approach to food value chain.

4.3.4 SWOT Analysis of Kilimo Trust Consortium approach

4.3.5 Strengths

Market-first orientation and market certainty before production: In the consortium approach, producers have market requirement understandings of the traded commodity as demanded by the buyer/lead firm in the consortium. They have the information of the specific varieties, quality, quantity, time and how the traded commodity would be delivered to the buyer. Production is done according to market demand; this is one of the strength of consortium approach.

Business stand of making profits from all actors: Actors in the consortium all have the chance of making profits and this is because of the number of farmers involved, well organized into farmers group or cooperative.

High demand to attract market: The organization of the approach makes it to attract marketable volume of the commodity traded and so it has the potential to attract agro processors in need of raw materials for production.

Optimization of economies of scale: The collective action, the number and voice of people involved has made it easy for all actors to minimize the cost of production through joint purchase of production inputs supplied at the cooperative stores after placing their orders of demand, bulking of commodity at the cooperative store which is being picked up by the buyer. These saves farmers, inputs supplier and buyer cost of transportation compare to when they are not well organized.

Joint decision making is high and price determination through negotiation: In the consortium decision at farmers level and the buyer level are made based on average cost of production of the traded commodity per kilogram and these determines the set price at which commodity will be sold to the buyer through proper negotiation.

4.3.6 Weakness

High dependency on the lead firm/Buyer/Off-taker in the consortium: In the consortium only one lead firm / Buyer/ offtaker is contracted from the onset before production although other key lead firm/buyer are also profiled.

Low source of income diversification: Farmers tend to slowly switch from cultivating low value crops rather than high value crop with a ready market income. Advocacy of governments in Uganda and Rwanda giving out free inputs with low quality standard could threaten the approach because farmers tend to diversify their income.

Lack of trust due to limited transparency among partners on transactions: Among actors in the value the level of trust is low and this is a weakness of the consortium approach.

Low volume storage capacity at the farmers' cooperative collection center: At the storing center the carrying capacities of the available stores is lower than the bulk produce after harvest and so farmers group rent stores to meet the target of produce that would be bulked for the buyer/ lead firm.

4.3.7 Opportunities

Well organized: The consortium is highly organized, and because of this it tends to attract investors like banks and leverages a lot of financing for the value chain which helps farmers to invest money.

Ease of scaling up: The ease to scale up the approach is very high, once the lead firm, producers (these are the backbones of the consortium) are contracted, other actors are easily sourced and so it can be applied both to other value chain food crops and other districts were the project has not being piloted.

Demand-driven rather than supply- driven: The approach is tailored towards what the market requires and so farmers produce what they can sell to the lead firms/buyer.

4.3.8 Threats

Government rules on food security: For example Rwanda first harvest last season was sold to the government store before consideration of bulking to the buyer in the consortium.

Fellow farmer: Low carrying capacity of available storage facility, improvising this by renting, high rate is given to farmers.

Buyer: farmers demand of exorbitant prices on produce. Low quality and quantity of produce from farmers especially in post harvest handlings.

Financial Institution: Delay in payment from the buyer after the off taking farmers produce.

Pests and disease infestations or outbreak and changing climate-drought is a threat to the approach.

Poor infrastructures: such as bad road, and unavailability of transport facilities.

CHAPTER FIVE

5.0 SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Major Findings

The findings of the study describe the demographic characteristics of farmers in the consortia undertaking sunflower farming, beans farming and maize farming from Ngetta, Equator and BABC consortium respectively from the study areas. Generally it was noted that there are variations between age, marital status and education level of respondents. The findings shows that most of the farmers are married, most have primary level of education and most are distributed between ages 40 years. The main planting season for Ngetta and Equator consortium are distributed between March- July while BABC consortium are distributed between October-January.

The findings revealed that majority of the respondents do not have the skills & knowledge of being business minded in their farming activities and so subsistence farming is majorly practiced. Farming is done on a low scale and low production output; farmers are not ready to invest money in production inputs rather the mindset of accessing free inputs from government, NGOs etc was in them. However after consortium approach farmers have acquired skills and knowledge of being business and market first orientated before production, there is now a shift from subsistence farming to commercialized farming.

Generally, it was revealed that collective action or organization as a cooperative played a great role in consortium activities. This is seen in farmers' involvement in accessing production inputs and marketing produce. This is achievable because of the large number involved the voices of farmers are heard.

There are significant differences on mean harvest seasonally and per acre cultivated before and after consortium, mean revenue generated seasonally before and after consortium, gross margins before and after consortium, total revenue generated per acre before and after, and total land dedicated / cultivated for commodity traded before and after consortium. The reason given as causes of difference on the aforementioned variables above were; market first orientation before production, ready market to supply, good market price offered directly to farmers without interference of middle men, and use of good quality inputs with high germination rate and yield. Generally it was revealed the consortium is a profitable approach to food value chain development. The results of cost benefits analysis in all the consortia shows that farmers business before was at a loss but now they are making profits in their farming business. The result revealed that the key success factors for consortium approach are market and business

orientation of all the actors and collection action. The SWOT analysis results showed that the main strengths of the approach is that all actors in the value chain stands the chance to make profits, the main weakness is that there is high dependency of other actors on the identified lead firm/ off-taker/ buyer in the consortium, the opportunities is that the approach is demand driven rather than supply driven and the main threat of the approach is advocacy of given out free inputs to farmers.

Starting from the farmer level, the first strategy is to improve production quantity and quality, which requires addressing information flow, knowledge of market requirements and production practices, as well as linkages to inputs and finance. Some direct intervention strategies to implement this include standardized production packages for smallholders to ensure appropriate ratios of inputs and increased access to credit. At a more systemic level, other projects facilitated the development of private-sector grading standards to clarify and communicate end market requirements, or developed contracts or market signals to decrease the perceived risk by both sides.

In summary the consortium approach has been an effective approach in food value chain to increasing production outputs and hence incomes of small holder farmers in the project areas.

5.2 Conclusions and Policy Implications

Smallholder farmers constitute majority of the working population in much of the developing countries, and they tend to be stuck in patterns of semi-subsistence farming, unable to generate sufficient income to access key services to further their pathways out of poverty. Value Chain Development (VCD) approach applies different types of innovations in the agriculture sector depending on the root cause of the problem in the specific location of study so as to competitively and sustainably increase productivity. Some of other value chain approaches previously used aside the consortium approach are clustering and network approaches, katalyst approach, and French Filière Approach, have been applied in agricultural sector to address the underlying challenges of low productivity and income faced by smallholder farmers. The Clustering and network approaches offer a framework for identification of existing clusters, and some basic analysis of cluster dynamics (Marieke *et al.*, 2006). Having established a basis for cooperation, demonstrated benefits, and built a momentum, the cluster manager or network broker withdraws leaving the system fully functioning and able to move forward without further support. Cluster-based approach to value chain development is agglomeration or networks of production populated by strongly interdependent firms (including specialized suppliers) within a value-adding production chain as well as service providers and associated institutions in a particular field (Theus and Zeng). The approach was built on the thinking that individual firms face constraints within the sector they operate and the solution to it requires the inputs of other

firms in the sector. The process of analysis for intervention design tends to be generated through the intervention process itself. It is an approach similar to the cooperative-based in which the basis of cooperation is tailored to achieving a purpose which could be inputs supply (seeds, pesticides, and fertilizers), irrigation and extension service. It views collaboration between cluster members as the source of resolutions of common problem. Based on the geographic focus of the approach, cluster approach does not always focus on the entire value chain but on core and supporting companies in specific locations (USAID 2008). Katalyst approach focused on training agricultural input retailers and the development of “embedded services” within the input supply chain. The approach undertakes activities notably in relation to soil testing and packaging. The result of the work in this approach believed that stimulated training of agricultural input retailers and the flow of knowledge and information within the distribution system is especially interesting. The underlying cause was low levels of knowledge and information in the market which is a key cause of poor productivity and was attributed to weak private sector capacities (Gibson, 2005). The French Filière Approach to value chain development used the flow of physical inputs and services in the production of final products of goods and services with concern on quantitative technical relationships. The early time of the approach, focus was to ensure that public institutions are in charge of creating smooth flow of commodities have steady flow of the selected commodities. The issue of ensuring better commodities price by better management of transaction cost was not given due consideration. Filière focus on local production system and consumption. Regulatory, transaction cost, trade and market dimensions have been incorporated in the approach to enhance the efficacy of the approach following the negative consequences of market liberalization in developing countries (Raikes et al 2000 and Kaplinsky and Morris 2002). Indicative of outcome of the approach is the inability to integrate smallholder farmers in the value chain in a manner that builds local capacity to sustainably develop agribusiness rather than servicing the supply needs of source of raw material for industries.

Some of the shortfalls of these approaches entails lack of market information, price glut, delink of stakeholder involvement, and in the event of these outcomes, the smallholder farmer is at the losing end.

In view of the study of consortium approach in value chain development the results of the approach catalyze the involvement of actors in a more integrated manner which generate better competitiveness, enhanced efficiency, capture more value and improve growth which address the challenges of meeting end-users interest, increased investment in skills and knowledge, working

capital requirements, technology, warehouse system to which the attainment of these investments are not only costly for individual farmer(s) in a value chain, but can be undertaken if there is assurance for supply of quality inputs, produce and provision of support services as well as market. This creates the need to strengthen the commitment amongst actors in value chain and contract seeks to be a valuable option. The approach integrates actors in a collaborative manner to increase competitiveness, increase efficiencies, capture more value, gain transaction cost savings. The result of consortium approach revealed its effectiveness in addressing the constraints of smallholder farmers characterized by inadequate or lack of knowledge of good agricultural practices, lack of access to credits, lack of access to quality production inputs, good post-harvest practices and efficient markets and produce commodity that meet the requirement of competitive market. The evidence based findings from the study, revealed that the consortium approach has been effective in improving/increasing incomes of small holder farmers in the project areas and there is need to establish more value chain platforms, plan a monitoring and evaluation system to draw lessons for future improvement of the value chain and for up scaling.

Lessons learnt from the study was that evidence helps decision making to be faster. Evidence of the opportunities and gap also helps adoption of recommendations for all actors in the value chain to be faster and sending a constant message of the success of the Regional East African Community Trades in Staples (REACTS) project. It has also been learnt that more diligence should be required when choosing or selecting a lead-firm /Off- taker/Buyer in the consortium to reduce farmers' disappointment after production. The policy implications and options of the study implies that Government of Uganda and Rwanda should continue to ensure that the National trade policies encourage cooperatives/ farmers group to be operationalised. Government to adopt stable and supporting policies that will enhance forming consortium for important and selected food crops with diary or livestock. Government policy to ensure increase production/productivity and also provide a warehousing/ good storage capacity to support this increment at farmers group level. Government policy on export bans and rules for country's food security should be considerate enough to support buyer in the consortium. Government policy should ensure that private sector investment, ownership and leverage of public sector involvement are providing with a good enabling environment. Plan a monitoring and evaluation system to draw lessons and adjust policy implementation as necessary.

5.3 Recommendations

Government should invest more in storage facilities at district level. Payment of produce received by the buyer from farmers should not be delayed, advanced payment of produce should be done to farmers' cooperative in each consortium, farmers should have a diversified source of income, all these will help to reduce rate of side-selling through middlemen and enable farmers to improve on post harvest handlings. Contracted financial institution involved in the consortium should be considerate on the interest loan given to farmers to at least 15% per year. In addition to this Village Savings Loan Associations (VSLA) should be encouraged because the interest rate on money accessed is lower than financial institutions is at 10% and at end of the year the returns are shared among members of the association which is more better than financial institution. More service provider should be selected so that training program /capacity can be increased. The buyer of each consortium should be linked to many cooperatives to avoid buying low volumes when there is an unforeseeable risk on production output. Accountability level and transparency of each actor's activities level should be improved so that the level of trust among partners is increased. Trainers should always link farmers to private sector to enhance their performance and activity level which could be in response to getting quality inputs, finance and market for their produce. Farmers should be constantly sensitized and be constantly mobilized into groups/cooperative so that training can be easy and their voices can be heard. Trainings on pest and disease management and cooperative governance/management should be included in Kilimo Trust training module (Farmers Business School) of farmers. Fast mechanisms or climate smart program or technologies in the aspect of inputs such as short cycle; early maturing seeds should be introduced and supplied to farmers to address the issue of drought. More advocacy and constant sharing of the success stories of the adoption of consortium approach from beneficiaries. Government, NGOs and industries should support climate smart program or technologies to develop a much larger range of varieties and hybrids that are better adapted to the changing environments to combat drought. The choice of the varieties to be promoted must be determined by agro processors.

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Appendix

Plan of study

Calendars	Activities
14 th of March 2017 to 7 th of April, 2017	Review of baseline study, formulation of research questionnaire and interview guide.
10 th April 2017 to 28 th of April 2017	Conduct a pretest of the survey instrument, data gathering exercise on the beneficiaries of the project.
1 st May of 2017 to 12 th of May 2017	Data gathering exercise with the suppliers and markets actors.
15 th May 2017 to 26 th of May, 2017	Coding ,entry of data and data analysis
29 th of May 2017 to 2 nd of June 2017	Write up of the report
5 th of June to 13 th of June 2017	Presentation and submission of preliminary report

PICTURE GALLERY



Adero Scovia, a Field Assistant/Enumerator, administering questionnaire to respondents at Lira Village Uganda.



Focus group discussion with Amilobo farmers Cooperative Society at Amuru Village, Amuru district Uganda.



Demonstration plot use for practical training of farmers on best varieties of improved sunflower seeds using good agricultural practices that can be adopted. The location is Oyam Village in Oyam District



Cooperative Store use for bulking and collection centers of produce for Koremu Farmers Cooperative at Ngoma District , Eastern Rwanda



Focus Group Discussion with Covepanga Farmers Cooperative, Gatisbo District, Eastern wanda.



Mr. Alex (Head of gribusiness Manger of Kenya Commercial Bank) at Rwanda, after an interview session with him.



Immediate past Team Leader for REACTS project (Mrs. Fiona Lukwago) at Kilimo Trust.



From Left Dr Olayide, DPP Coordinator from Center for Sustainable Development University of Ibadan, Cecilia a graduate student of Masters in Sustainable Development University of Ibadan, Mr. Patrick Muganga , Team leader for Regional East Africa Community Trades in Staples (REACTS) during on –site Supervision held at head office of Kilimo Trust in Bugolobi Uganda

