Improving Soybeans market for smallholder farmers: Constraints and Opportunities:

A case of CARE International programme Iringa District, Tanzania

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By

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Dedication

This work is dedicated to my lovely wife Claudia Kileo, my daughters Alpha and Victoria who endured a year without fatherly love. It is also dedicated to my lovely mother Clemensia Kaponda.

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ABBREVIATIONS

AMCOS	Agricultural and Marketing Cooperative Society
ARI	Agriculture Research Institute
ASA	Agricultural Seed Agency
DAICO	District Agricultural, Irrigation and Cooperative Officer
DC	District Council
FAO	Food and Agriculture Organisation
FFBS	Farmer Field Business School
FGD	Focus Group Discussion
NGO	Non-Government Organisation
PASS	Private Agricultural Sector Support
PESTEC	Political, Economic, Social, Technological, Environmental and Cultural
QDS	Quality Declared Seeds
SACCOS	Savings and Credit Cooperative Society
SAGCOT	Southern Agriculture Growth Corridor of Tanzania
SES	Solvent Extracted Soybean Seed
SPSS	Statistical Package for Social Science
SWOT	Strength, Weakness, Opportunities and Threats
TADB	Tanzania Agricultural Development Bank
TAGRODE	Tanzania Grassroot Oriented Development
TFDA	Tanzania Food and Drug Authority
TSDS	Tanzania Soybean Development Strategy
URT	United Republic of Tanzania
VICOBA	Village Community Bank
WOPATA	Woman and Poverty Alleviation in Tanzania

Abstract

This research was conducted to find out information on improving soybean market for smallholder farmers in Iringa district by assessing constraints and opportunities in the soybean value chain. The push was to find out the constraints and opportunities on the market to recommend to CARE International practices or ways which can improve soybean market for smallholder farmers.

The study was carried out in Iringa DC under CARE International project called ''Kukua ni Kujifunza'' (Growing is Learning) implemented under soybean value chain. This study was done by using both qualitative and quantitative approach through desk study to obtain secondary data field study to obtain primary data with the aid of a structured and unstructured questionnaire, interview with the aid of checklist and Focus group discussion. A study was conducted in five villages named as Kiponzelo, Makongati, Magunga, Lupembe lwa senga and Malagosi where 40 farmers were interviewed to fill in the questionnaires. Focus group discussion was also done other stakeholders were like the actors (input suppliers, traders, processors) in the chain and supporters (Government, NGOs, financial institution), were also interviewed to give information on their views and activities.

Data which were collected from the interviews, discussions and observations were processed into transcripts. The qualitative and quantitative analysis was done through models, and thematic analysis since field data obtained was in descriptive, narrative and model forms such as the value chain map, Venn diagram and the business canvas model. The findings were processed into results by answering the research questions. Stakeholder matrix was used to identify the actors and stakeholders and their roles in the in the soybean value chain including the challenges they face. Value chain map for the smallholder soybean value chain in the district of Iringa was used to identify information flow, product flow and the overlays of the chain. MS Excel was used to indicate how value shares in the soybean chain are distributed among the various actors using tables and charts. Venn diagram was used for indicating the chain relations among the actors and supporters in the smallholder soybean value chain in Iringa district. Canvas Business model was to give farmers an overview of the current business and to identify the major challenges and proposed business model or practices they adopt. Data collected was also combined to complete the PESTEC and carrying out a SWOT analysis.

The findings of this research show that; there are constraints facing farmers to access the soybean market. It was discovered the main major ones being the following; low production and productivity of soybeans, unavailability of improved seeds, lack of awareness of consumption of soybeans and use of it as protein supplement at family level, importation of soybeans and soy cake (SES) has discouraged entirely the domestic market, inability of smallholder farmers to extend activities beyond selling raw soybeans like processing has caused the fall of the market.

Lastly, the study also discovered some opportunities which farmers can use to improve the soybean market. It was observed that farmers could add values instead of selling raw soybean, they can process and produce other by-products of soybean like crude cooking oil, soybean cakes full fat and extracted ones. These by-products have been identified to be needed by manufacturers of animal feeds and small processors of animal feeds who are not able and willing to process soybeans, but farmers have not been able to meet these demand because of berries of entering in, but there is an agricultural bank which is willing to disburse loans to farmer organizations. Seed multiplication through the system of quality declared seeds (QDS) is also an opportunity for farmers

CHAPTER ONE: BACKGROUND INFORMATION

1.1 INTRODUCTION

Agriculture is the backbone of the Tanzania economy since it employs more than 75% of her people and accounts for about 30% of export earnings (URT, 2009). Soybeans production is characterized by small-scale farming (or smallholder farming) whose farm ranging from 2- 10 hectares (Chamberlin, 2008)). Soybeans are not amongst the major crops in Tanzania, but it contributes to the income of the people in the place where it is produced.

Soybeans are among the most valuable crop in the world. It is the source of protein for the human diet apart from being as oil seed crop, seed for livestock and aquaculture. It is estimated that, by the year 2030, the world production of soybeans will increase by 2.1% annually to 359.7 million tons (Masuda and Goldsmith, 2008). According to UNCTAD (2016), soybeans can grow best in temperate, tropical and subtropical and if water is available, it can be grown throughout the year. It also requires a well-drained soil with a reach of fertility. It requires high moisture at the time of germination, flowering and pod forming stage. The dry weather is important in ripening.

1.2 Farmers' livelihood in Iringa district

Agriculture is the mainstay of the district economy. It thus provides about 80 per cent of employment and is the main contributor to the district as well as to the regional economy. About 21 per cent of the region GDP of about 1,447,270 million was contributed by agriculture activities in the district (Iringa Regional GDP Report 2008).

Cereals are the main crops grown in the district with maize leading, followed by paddy. Other crops grown are finger millet, sorghum, barley, soybeans, and vegetables.

The main ethnic group in Iringa District is the Hehe. They constitute almost 90 per cent of the entire population. Their major occupation in the district is agriculture. According to 2012 census, Iringa Rural District had a population of 245,032 persons and 60,484 households. It ranked the second largest number of households in the region. Its average household size was about 4.2 persons per household (NBS,2013).

1.3 Production of Soybeans in Iringa

The Southern Highland regions of Tanzania are the most soybean procedures. Smallholding production takes place especially in Songea and Njombe regions, and large-scale production in the area south Iringa region. Soybeans are highly demanded as it is an ingredient of animal feed and human nutrition. Iringa is located in the Southern highland in Tanzania. The Southern Highland regions of Tanzania are the major cereal producing area. In Iringa, the climate is warm and moderate temperate. The summers have a good deal of rainfall, while the winters have very little. The average annual temperature in Iringa is 19.1 C. In a year; the average rainfall is 690 mm. This allows different crops to be produced in the region like horticultural crops (onions, tomatoes, avocados, and other vegetables. The driest month is July with temperature averaging 16.7 C. and the warmest month is November with an average of 21.1 C. The area exhibits unimodal rainfall pattern from November to April.

1.4 Soybean price and marketing in Tanzania

Other marketing of crops characterize soybean marketing. This involves the transfer of produce from the farmer to the consumer which happens along the market chains. There are different methods which soybeans are sold. For example farmer takes produce from farm to local rural market (the produces here are at small quantities), Farmer takes the produce from the farm to the wholesale market where retailer purchase the produce from wholesaler and sells it to consumers, and farmer

takes Soybeans from the farm to the assembly market (Chianu *et al.*, 2008). Farmers can use any of the options to sell his Soybeans. At the farmer level, the production is very low. Average production for a farmer is about 750-1000kg/ha under poor management while under good management he/she can harvest up to 2000kg/ha which is potential production. The price of soybeans is between 750-800 Tsh at farm get price. In Iringa, soybeans are purchased by small-scale traders and big company called Silverland, a processing company who is a consumer and big buyer of soybeans in the region. It purchases soybeans for poultry feeds production and-old chick.

1.5 Care International and farmers in Iringa region Tanzania

CARE International in Tanzania (referred to as "CARE" for the rest of this text) is embarking on the transformative "Kukua ni Kujifunza" (Growing is Learning) Programme in Tanzania's Iringa Rural District, with the objective of ''increasing food and nutrition security, income and climate change resilience, among vulnerable and rural small-scale women farmer. This will be achieved through gender transformative programming over a four-year period, targeting 3,825 direct beneficiaries, with a focus on the soybean value chain'' (CARE International, 2017)

CARE is working with smallholder farmers who own between 2-4 acres of land. The most dominant farmers in this project are women. There are about 3600 farmers and more than 70% of soybeans farmers are females. The project under '' Growing is Learning" is intending to empower and support women through soybeans production by increasing their income and improve their livelihood. This project stands out in this area as experienced most projects have more male than female. According to FAO (2015) women comprise an average of 45 per cent of the agricultural labour force in developing countries. Should women farmer have the same access to productive resources as men they could increase yield on their farm by 20-30 per cent and undernourishment could decline by 12-17 per cent. Women smallholders frequently have less opportunity in accessing the market, as a result of several specific constraints (FAO, 2015).

1.6 Problem Statement

Iringa is one of the regions in Tanzania producing soybeans. The crop has been popular in the area in the past four years. Recently, there has been an instability of soybean markets. The collapse of the soybean market has so far affected the producers in Iringa district since the potential off-takers traders in the region like silverland ltd, are no longer buying soybeans in the place. There is accumulated soybean from producers for two seasons which has no place to sell. Therefore, producers seem to be discouraged to produce the crop which is a source of their livelihood. The collapse of the soybean market has pushed the attention of looking for the reason behind the situation by looking at the constraints and opportunities in the soybean market.

1.7 Problem Owner

Care International Tanzania

1.8 Research Objective

To assess the constraints and opportunities on the soybean market along the soybean value chain in Iringa District, and provide recommendations to Care International on soybean market improvement for smallholder farmers.

1.9 Research Questions

1. What are the dynamics in the soybeans value chain in Iringa District?

1.1 Who are the stakeholders and their role in the soybeans value chain?
1.2 What are the value shares among the actors in the soybeans value chain?

1.3 What are the sources of market information in the soybean value chain?
1.4 What methods does CARE International use to link farmers to the market?
1.5 What are the relations among the actors in the soybean value chain?
1.6 What are the constraints to accessing market by smallholder farmers in the soybean value chain?

2 What are the opportunities for the improvement of the soybeans market to smallholder farmers in Iringa District?

2.1 What are the quality attribute of soybeans produce from the farmers in Iringa District?

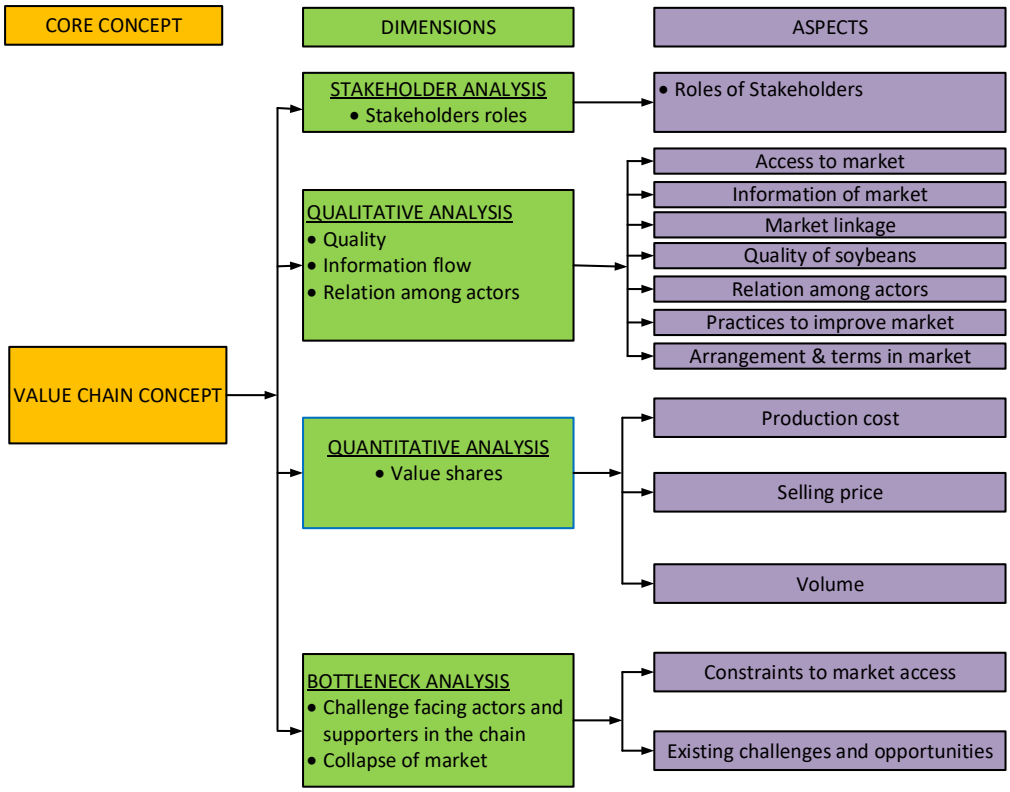
2.2 What are the possible practices that can be adopted by smallholder farmers to improve the soybean market?

2.3 What are the arrangements and term preferred in the soybean market segments?

1.10 Conceptual Framework

To conduct this research work, the following conceptual framework was used to generate the required information concerning improving soybean market for smallholders by looking the constraints and opportunities in the soybeans value chain from the study area (see figure 1)

Figure 1: Conceptual Framework



Source: Author, 2018

1.11 Concept Definition

- **Stakeholders –** people who are directly or indirectly involved in the soybeans value chain. These include actors, chain supporters and chain Influencers. Or **A stakeholder** ''is an individual or group with interest in the success of an organisation in fulfilling its mission - delivering intended results and maintaining the viability of its products, services, and outcomes over time''. (Ben Khudai and Abdalla, 2016)

- **Actors** – are those involved in producing, processing, trading or consuming a particular agricultural product or service. They include direct actors who are commercially involved in the chain (producers, traders, consumers) and indirect actors who provide financial or non-financial support services, such as bankers and credit agencies, business service providers, government, researchers and extensionists.
- **Value chain Supporters**: These are organisations, agencies, institutions in the value chain who are not directly involved in the soybeans value chain, but they support services which add value.
- **A value chain** is a specific type of supply chain- one where actors are actively seeking to support each other so they can rise their efficiency and competitiveness. By so doing they invest time, efforts and money, and build relationships with other actors to attain a common goal of satisfying consumer' needs so they can rise their profits. (Verschuren and Dooryard, 2010)
- **Smallholder soybeans farme**r – Is a farmer cultivating between 0.5-3 acres of soybeans for income generation.

- **Ward**: these are subdivisions of districts, or local authority area which are made up of villages which a councillor represents each ward.
- **Market Access**: Market access refers to the capacity of a company or country where they can be able to sell goods and service across borders

CHAPTER TWO: LITERATURE REVIEW

2.1 Value chain concept systematic

The value chain is a systematic and operative model which businesses obtain raw materials, increasing value to the raw materials through several processes to create an end product, and then sell that finished product to customers (Roduner, 2007).

Stonehouse and Snowdon (2007) defined value chain as, Porter`s techniques to understand the ability of the organisation to increase value through its activities and their internal and external linkages. It permits managers to identify where the value is added to the system. Therefore, there is potential to make the further value in the future by reconfiguration and improved coordination of activities. Lynch and Baul (2004) defined value chain as "The one which identifies where the value can be increased in an organisation and connected to the process with the main practical parts of the organisation''.

Kaplinsky and Morris (2000) defined the value chain as the ''full series of activities which are essential to convey produce or service from the beginning, passing through the intermediary stages of production, and bringing to last consumers, and the last disposal after use''. As the produce passes from one actor to the other in the chain, it is assumed to gain value (Hellin and Meijer, 2006).

Value chain includes typically three or more of the following player: producers, Processors, distributors, brokers, wholesalers, retailers and consumers (Richter, 2005). Value chain analysis is a method of accounting and giving the value that is created in a produce as changed from raw input to a final product consumed by end consumers. According to UNIDO (2009) describes value chain as the whole series of activities commenced to take a product from the early input- supply stage, through several steps of processing, to its final market destination, and it comprises its disposal after use. For them, value chain includes events which take place at the farm or rural level, including input supply, and continue through handling, processing, storage, packaging, and distribution. Many agricultural food chains in Africa, including Tanzania are very short because of the widespread informal market which restricts addition in the chain.

2.2 What are the benefits of taking a value chain approach?

The value chain approach concept involves the role of present stakeholders, key players, supporters and the policy environment. It looks at recent challenges in the value chain, and the probabilities to improve the efficacy of the value chain and the benefits for whoever participated. From a farmers' viewpoint, to be part of a strong- functioning value chain may bring bigger income. Simply stated, analyticaly, the value chain offers the chance of identifying its challenges, weakness, and strengths which can help to find new income generating chances.

2.3 Who benefits from value chains?

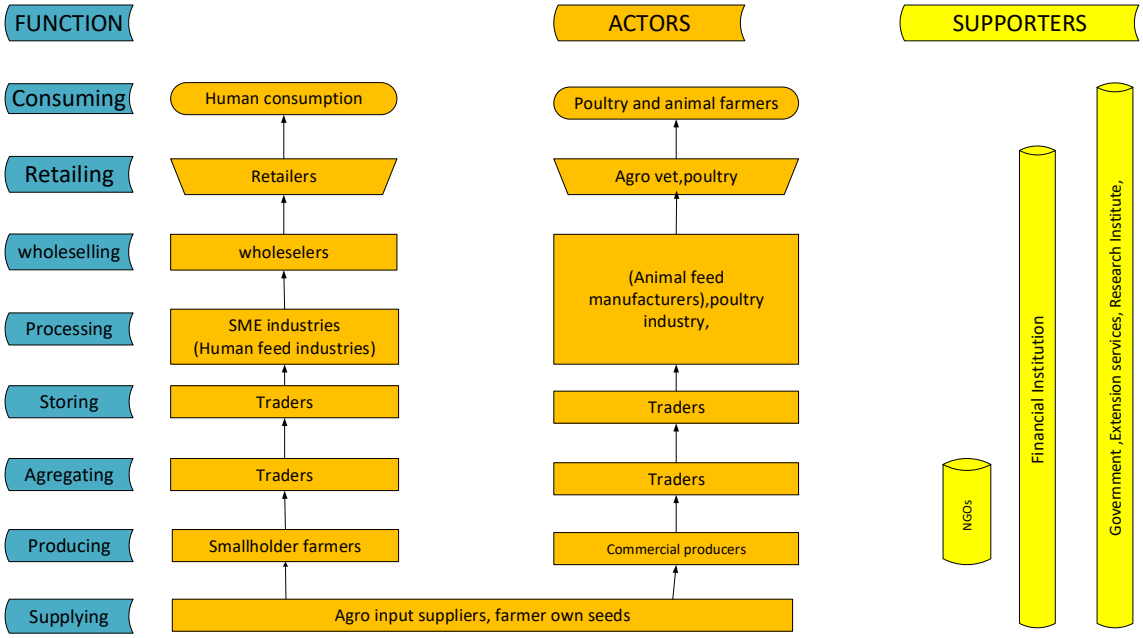
Anyone who joins in a value chain increases value as the produce passes from the start of the chain to the consumer. Therefore, by adding value, all contributors receive an economic payment. Thus, this is the main advantage of contributing to the value chain. The most people who are expected to gain profit from the value chain are entrepreneurs, are willing to communicate with people in diverse part of the value of chain, because they possess farms, financial resources, and the knowledge or skills to advance a new market or participate more effectively in current markets. Unlike farmers who have little farms, who are living in remote from markets, who have limited assets, language barriers, who have no access to irrigation and who are not associated with any farmer organisation find it more challenging to get profit from the value chain.

2.4 Soybeans stakeholders

Stakeholders in the soybeans value chain include the value chain actors, value chain supporters and value chain influencers. Value chain actors are those stakeholders who are directly involved with the product as it moves from production to the consumer. Input suppliers, producers, processor, wholesalers, retailers, and consumers are the actors in the chain. And those who are not directly deal with the product but deliver services that increase value to the product are chain supporters.

These are Government, donor agencies, local government authorities and transporters. Value chain influencer includes the regulatory framework, policies, infrastructure at the national and international level (Rounder, 2007).

Figure 2: Value chain map showing stakeholders



Source: Author, 2018

2.5 Value chain of soybeans in Iringa Region

According to FAO (2015), the soybean subsector is hugely immature with limited (or no) horizontal or vertical linkages in the chain. The demand for soybeans and its by-products is small. The subsector does not encourage farmers to invest in production because of a weak market linkage. Since demand of soybeans for home consumption is negligible, smallholder farmers sell soybeans in local markets to consumers who use them to fortify local food. Few small/medium scale producers of soybean foods and animal compound processors have already made use of domestic production. Procurements of soybeans are minimal (from small-scale producers) or periodic (from medium-scale producers) which hampers their potential function as production drivers.

2.6 Importance of soybeans

Soybean is significant in human nutrition and is particularly suitable as a supplement for children and the patients (Wilson, 2013). According to FAO (2015), Soybean has various strengths; it has a lot of health advantages which have increased strong human demand throughout the world. Soybean has shown to have high anti-cancer compounds, lecithin, calcium, phosphorous and fibre, it is low in

saturated fats, cholesterol free, and low source of high quality of protein (40-50%) and oil content 23%. It is appropriate for traditional staples as well as a nutritional supplement for certain susceptible groups. In agriculture, it acts as a nitrogen fixer for improving the soil fertility and structure.

2.7 Value shares

It is the percentage of the end retail price that the player earns (KIT and IIRR,2008). Mathematically value share can be calculated using the formula below.

$$value\ share = \frac{added\ value}{Final\ retail\ price} \times 100$$

Generally, in a market condition, with perfect competition and transparent information, the size of the value share mirrors the amount of labour, expenses, and risks that an actor incur in producing a product. The higher the cost and perils that an actor bears in creating a product. The higher the price and risks the higher the value share for a farmer to have more value share, he needs to add more value to his produces. Such a value can be like the packaging.

2.8 Agricultural Markets

The agricultural markets in East Africa region are characterised by some limitations, together with very extended chains of the transaction among the farmers and the customers; inadequate access to consistent and appropriate market information; small bulks of produces of high quality offered by smallholder farmers; and poorly designed and unproductive markets. This has caused wastage of food and little price to smallholder farmers. Shortage of timely and appropriate market information to all market players results in doubt and sometimes untruthfulness. Under such circumstance, uncertain intermediaries have flourished and further injured the trust relationship needed for the efficient and lucrative market along the entire value chain (FAO, 2011).

2.8.1 Constraints to access the market

Majority of farmers are living in countryside areas where they grow their crops. But to date, access to markets by rural countryside societies is an issue which is a topical issue presently. There is evidence that, rural smallholder farmers have less access to the agricultural market as compared to other market actors like food suppliers, gatherers, and traders. Some constraining factors can be recognised, together with physical access to the market; the market structure; and the producer' deficiency of skills, information, and organisation (Magesa et al., 2014).

A significant cause why many smallholder farmers who can produce excesses remain trapped in poverty cycle is a deficiency of access to the lucrative market, and more frequently such farmers are involuntarily selling their crops to the purchaser at whatever price commands. Market access can be strongminded by factors like the availability of credit, availability of produce, attributes, prices, efficiency, costs of processes and market information. (Mukwevho and Anim, 2014). According to FAO (2015), they say limitations for women smallholders in accessing market arise. Among others are caused by time limits, the regular concentration of women's labour on survival production, unequal responsibilities for unpaid work, unsatisfactory access to and benefit from, fruitful assets, know-how, finance, education and appropriate services, and having inadequate influence over decision making on economic stuff in the household and community.

According to Sanga and Mgimba (2016), marketing limitations increase due to several factors such as; inadequate knowledge and use of market information, insufficient access to the high-value strong market, high costs of the transactions, distance from the market, poor quality of the produce,

shortage of storage facilities, little educational level of small-scale farmers. They also add, insufficient agricultural extension services, limited financial support, lack of property rights, poor and inaccessibility of market infrastructure, lack of enough access to finance and socio-economic reasons of the farmers. For instance; training, agricultural experiences, age, educational level and the size of household, deficiency of access to decent roads, uncertainty and price risk, electricity, lack of communication, information concerning prices, scarce of domestic markets, insufficient bargaining power and excess of intermediaries (Sanga and Mgimba, 2016).

2.8.2 Market information

According to FAO (1997), Well-organized market information provision, has shown to have positive advantages for farmers, traders, and policymakers. To-date, market information appears to be a machine for farmers to bargain with buyers from a position of higher strength. It facilitates the spatial supply of goods from rural areas to urban areas and between market. Moreover, the type of information helps agricultural planners and researchers to make an essential contribution to early cautioning of imminent food security complications. Market information is considered to be a public good, mainly where many small farmers cannot pay for information. The existence of timely and precise information to whoever interested is therefore crucial, whether it is provided by the government or by the private sector. Various countries have tried to deliver market information, but their success rate has proven insufficient. Most smallholder farmers are living in countryside areas where they do agricultural activities and where poverty is prevailing. Eliminating poverty in developing countries will depend on the growth of the agricultural sector. Access to the market information has not been easy to most farmers in the rural areas.

Lack of market information accessibility to smallholder farmers is a significant limitation to the intensity of agricultural commercialisation (FAO, 1997). Therefore, it is challenging for farmers in most developing countries' economies to join in the market because of various limitations and barriers. Some studies like in Ghana has shown that, the use of radio, agricultural extension agents, friend and mobile phone are the primary source of market information to smallholder farmers (Marty, 2014). Radio, television and wireless technology, and the internet, are essential gears for getting the information needs of smallholder farmers ranging from extension of education and agricultural technology to agricultural credit and marketing. However, using mobile phones is progressively becoming a significant source of market information.

The low earnings of agriculture products to smallholder farmers is accompanied by the absence of market access and the marketing information. Due to inadequate market information, farmers can lose confidence to negotiate better on the prices of their products and thus are paid little. The small size of products and poor road conditions may demoralise farmers to travel to a far market to hunt for a lucrative price. Deficiency of market information has caused the introduction of middlemen or intermediaries who are well equipped with marketing information. (Magesa, Michael and Ko., 2014).

2.8.3 Why market information is important?

According to Magesa, Michael and Ko (2014), the market information supports farmers and traders to plan their marketing strategy and bargain with other parties. The suitable market information may assist farmers to choose on where to sell, when to sell, who to sell to and plan their production.

The market information assists farmers to recognise if the price presented by a buyer for their products is the top price the buyer can pay. If a lot of traders are competing aggressively with each other to buy the farmer's products, the farmer can feel self-confident that the trader is offering a fair price to the farmer. (Robin P et al., 2004). Unfortunately, in all over the world, including Tanzania, traders usually take benefit of farmers if they are not aware what the real market price is. Many traders will even bond with each other so that they can offer the farmer the same low price. However, farmers miss money because they don't have access to market information. Even though

facts about price are vital, farmers need various types of the market information to sell their produce effectively. They need information about a specific product which can be sold to a specific buyer. Traders are of different interests and capital, some deal in small bulk while others trade in large quantities.

2.8.4 Linking farmers to the market

The supply chain is altering speedily, with increasing transactions based on chains that include a coordinated link among farmers, trader, processors, and retailers. Most organisations which are working with farmers, such as donors, NGOs and government extension service ("linking organisations"), are looking for promoting farmers' well-being by using "linking smallholder farmers to the markets" approach, which frequently associates with organising farmers into clusters to supply recognised markets. To work with farmers will have little impact if the enabling environment that governments deliver is unsuitable for development of market linkage (FAO, 2007).

2.8.5 Type of market linkage

According to FAO (2007), there is a different type of market linkage to farmers.

Farmer to the domestic trader. It is the type of linkage where traders intermingle with farmers on a one-to-one basis, either procuring from them at local markets or the farm gate. Acquisitions at the local market can be comparatively efficient if they empower the trader to buy adequate quantity to attain economies of scale with subsequent transport, which is frequently the main marketing cost. On the other hand, buying at village level can often be enormously ineffective, and this can assist to the high marketing costs that often lead to accusations of exploitation of farmers by traders. Such expenses can be minimized if the farmer can work together to collect their entire produce at one place, for buying by one or more traders. However, such planning seldom grows without an outside catalyst. Many buyers experience essential cash flow limitations and while they may consider and make a procedure with them is often a transaction cost they cannot absorb. The most logical catalysts for such development would appear to be government extension staff. (FAO, 2007).

Farmer to the retailer. Supermarket chains will not often prefer working with individual farmers on a long-term basis. They would like to work with organised farmers like associations or groups (FAO, 2007).

Linkages through a leading farmer. The case studies provide two examples of where the large farmer has coordinated supply from other farmers in their areas. The coordinating role of farmers could not be entirely unselfish; increasing quantities available for sale may open up market opportunities that would not otherwise exist. (FAO, 2007).

Linkages through cooperatives. All over the world, there is a notable example of well- effective marketing cooperatives. The very achievement of this comparatively inadequate number of cooperatives frequently justifies the further investment to try to duplicate the success elsewhere. Unfortunately, with these few exceptions, the pathway record of cooperative development has frequently been unacceptable. (FAO, 2007).

Farmer to agro-processor. Among many constraints that processors come across is that, investment in structures and equipment requires the full utilisation of that capacity. Processing is therefore not undoubtedly viable for produces that have a limited growing season unless are stored for a significant time. (FAO, 2007).

Farmer to the exporter. A farmer can sell her produces to the exporter.

Contract farming. In agricultural production, farming with contract had been practised for a couple of years. There are many benefits to this mode of production for companies. Linking with small

farmers enable them to overwhelm land limitations that would be available if they attempt to produce everything themselves. It is therefore more efficient than plantation agriculture and certainly more politically acceptable. (FAO, 2007).

According to FAO (2007), farmers' organisations have restricted success in connecting farmers to market. The reasons for the restricted success are the inadequate managed skills, transparency and accountability for most farmers' organisations, which become specifically significant when marketing and money are involved. Moreover, farmers have less or are lacking bargaining power in the markets.

2.9 Quality Management

According to Luning and Marcelis (2009), "quality is meeting or exceeding customer and consumer expectations''.

2.9.1 Quality Attributes

- **Safety**: Most Consumers are more concerned about their health; they are willing to pay a high cost when the product is safe.
- **Hygiene**: Consumers need soybeans that are free from foreign particles, sediments
- **Maturity**: The attribute looking of maturity, the colour of soybeans for harvest is brown.
- **Appearance**: This attribute helps the consumer to know the quality of the soybeans as it must not be with a spot which is a sign of poor management during crop development stages.
- **Shape**: Many consumers prefer soybeans which is good in looking, the shape of the beans can attract the buyer to buy it.
- **Size**: The size of beans determines the quality of a product. The soybeans should be in the same size.

2.9.2 Attribute of soybeans quality

According to UNCTAD (2016), Quality features of soybeans can be clustered into three general types: defect, shipment and storage factors, and end-user related factors. End-use quality aspects are clustered as either physical properties or chemical composition characteristic. The physical features consist of germination, hilum colour, seed count, seed size, hardness, seed coat cracking, and purity. Therefore the level, plus presence or absence of these features is referred to as quality. Table 1 shows the quality attributes of soybeans which are needed by trader/ processors.

Table 1: Classification of soybean quality factors

Classification	Examples	Comment
Defects	• Foreign material • Damage • Splits • Heart damage • Toxic substance	Defect reduce the value of grain for all users

Ship and storage factors	• Moisture variation • Insect infestation • Sour heating	Unstable grain quickly become high in defects
End-use related factors	• Seed coat damage	Different users will have different needs and desire

SOURCE: (Hurburgh and Brumm, 2004)

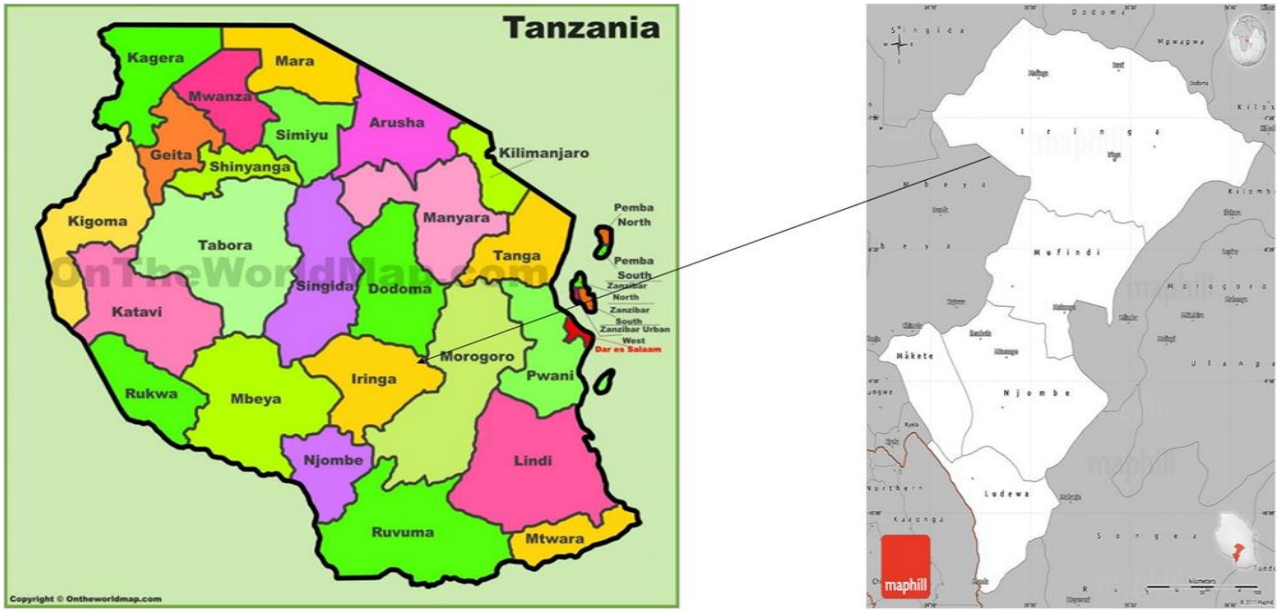
CHAPTER THREE: RESEARCH METHODOLOGY

This chapter explains the area of the study, study design and data collection strategy and the way data were collected and analysed. It highlights how data were collected and analysed. The research findings incorporated qualitative and quantitative methodology. It comprised primary and secondary data sources. Primary data were obtained through the interviews, focus group discussion and questionnaire. The secondary data were collected from desk study (book, journal, report and internet search)

3.1 The study area

The study was carried out in four villages in Iringa district council where CARE International works (see figure 2) This is because the villages are potential producers of soybeans in the district. District Council extends between 7'000 and 8.300 latitudes south of the equator and 340 and370 longitudes East of Greenwich. The Council has an area of 20,413.9 square kilometres of which only 9857.5 square kilometres are habitable, and the rest is occupied by National Parks, Forest, Rock Mountain or water bodies. Administratively, the Council comprises of 6 divisions namely Kalenga, Idodi, Pawaga, Ismani, Mlolo, and Kiponzelo, with 25 wards, 123 villages, 718 sub-villages and 60,484 households (families).

Figure 3: Map of Tanzania and Iringa District



Source: Iringa DC report

3.2 Research Design

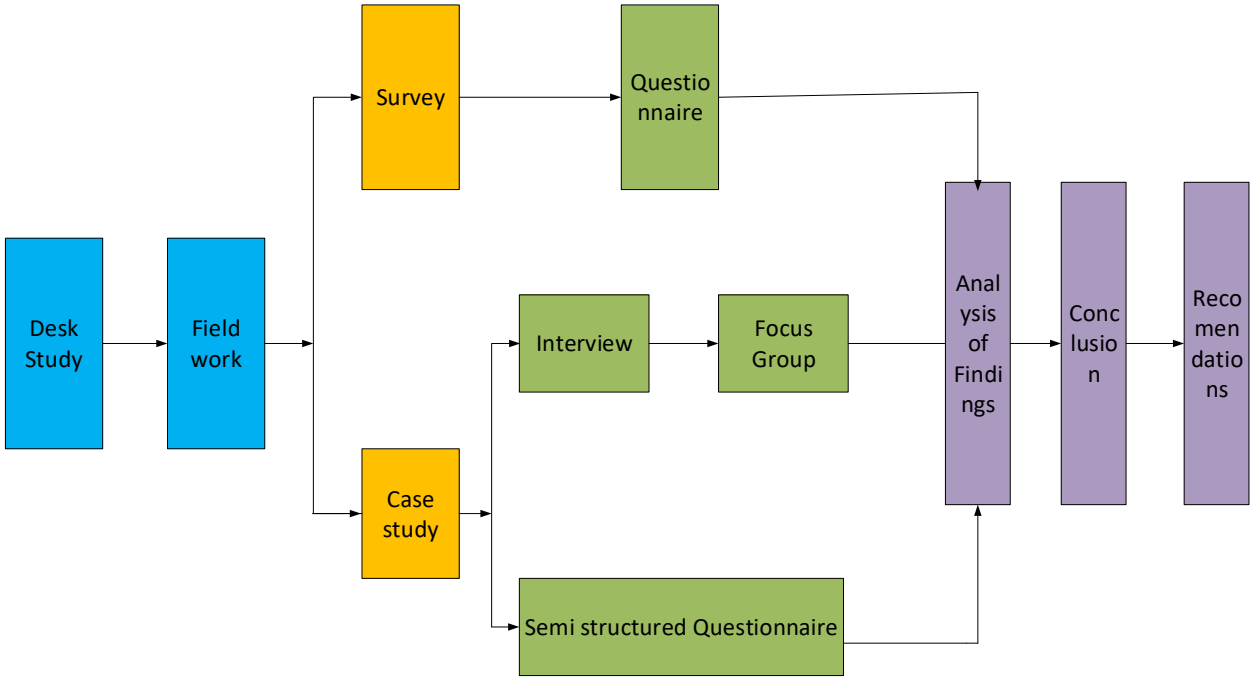
The research approach comprised both quantitative and qualitative through desk research to obtain secondary data and field research to collect primary data using interviews, questionnaire and focus group discussion.

3.3 Research Framework

The research framework is prepared for a diagram representation of the research objective through the different stages needed for the accomplishment of the research (Verschuren and Doorewaard, 2010). The research framework consisted of desk study, field work for data collection (Survey and

case study) data analysis, conclusion and recommendations (see figure 3). A value chain map was used to map out the actors, supports, and influencers of the chain.

Figure 4: Research Framework



Source: Author, 2018

3.4 Desk Research

Desk research was carried out to obtain secondary data on the concept of soybeans value chain and the issues related to the market (i.e market information, constraints to market of soybeans). Also, it was used to answer research questions and relate results against what has already been studied. This information was taken from books, journals, internet search and different agriculture reports in the Department of Agriculture, Irrigation, and Cooperative.

3.5 Case study

A face to face interview was conducted by using a checklist to, 1 officer (District, Agricultural, Irrigation and Cooperative Officer) from Local government authority (Iringa District Council), 1 officer from CARE International, 1 officer from Woman and Poverty Alleviation in Tanzania -WOPATA (A CARE International partner), 1 soybeans trader, 2 processors (Silverland and Tanfeed Ltd), joint 5 officers from Clinton foundation, 1 researcher from ARI Uyole, 1 officer from SAGCOT (Southern Agricultural Growth Corridor of Tanzania), 1 private input supplier, and 1 officer from Agricultural Seed Agency-ASA (Government agency for seed multiplication and supplying). From the government officer the aim was to find out functions, policies and regulations for soybeans markets and how they are helping farmers 'access soybeans market, challenges they are facing in soybean value chain and how to solve them. Traders and processors were interviewed to give out information on soybeans market, the selling, and buying price of soybeans and the problems/constraints they face in soybeans marketing and looking opportunities which farmers can grasp. Other stakeholders like CARE International, WOPATA, Clinton foundation were interviewed to give out information on how they relate to farmers, how they link farmers to the markets, their core functions and services they provide to farmers, also to know the challenges and opportunities they are facing in the soybean value chain and how they address them and improve the situation. A researcher was interviewed on

the availability of improved soybean seed and status of soil in Iringa district but also giving information on challenges they face and how they address them to improve the situation, while input suppliers were interviewed to give out the status of availability of inputs especially soybean seeds. On the other hand, SAGCOT was interviewed on the issue of strategies which focus on addressing the constraints in the soybean value chain in Iringa to stakeholders.

3.6 Focus Ground Discussions.

The Focus Group Discussion (FGD), refers to a group interview, methodologically is qualitative research. It is based on structured, semi-structured, or unstructured interviews and suggests qualitative researchers the chance to interview quite a lot of respondents critically and concurrently (Babbie, 2011)

Therefore, one FGD from Malagosi village was conducted; only farmers were involved in the discussion, with a total of 7 members, two males and five females. According to Denscombe (2007), "focus group involves a small group of people, normally among six to nine people, who are brought together by a trained moderator (the researcher) to explore attitudes and perceptions, feelings and ideas about a topic". The reason behind involving farmers in FGD was to discuss in depths issue related to constraints and opportunities about the soybean subsector and markets.

3.7 Survey study

The Survey study used both probability and non-random sampling. Forty farmers were purposively selected from 2 wards namely Maboga and Lyamgungwe. According to John and Christensen (2004), purposive sampling relies on the decision of the researcher. Based on the high rate of production and experience compared to other villages, five villages were selected in the two wards, Malagosi village was meant for Focus group discussion, and Kiponzelo, Magunga, Makongati, and Lupembe lwa senga were meant for survey data.

In each village, a sample of 10 farmers was randomly selected to make sure that every farmer had an equal chance of being selected. The names of the farmers were written on a piece of paper, put in a vessel and ten papers picked, and the farmer whose name appeared was selected. Therefore, the same technique was repetitively used in each village to make a total of 40 farmers. A structured or semi strutted questionnaire was used to collect information (volumes, chain relation, market linkage, market information and constraints to access market). Other stakeholders were purposively selected due to their positions.

3.8 Data collection

Data collection was done by using different methods. Pre-test of the questionnaire was done to test whether questions were clear to respondents (farmers). Various stakeholders were interviewed for information gathering. Farmers, Traders, Other supporters like NGO and government staffs were interviewed (see table 2). The audio recording was used to record interviews with all stakeholders and FGD

Table 2: List of selected and interviewed respondents

Name of Respondents	Ward	Institution	No. of members
Farmers	Maboga	Kiponzelo village	10
Farmers		Magunga Village	10
Farmers		Makongati village	10
Farmers	Lyamgungwe	Lupembe lwa senga	10
Focus group	Lyamgungwe	Malagosi vicoba group (farmers)	1
Government officer		Iringa DC	1

Traders		Individual	1
Processors		- Silverland - Tanfeed	1 1
Input suppliers		- Private sector - ASA	1 1
Care International officer		Care International	1
WOPATA officer		WOPATA	1
Researcher		ARI Uyole	1
SAGCOT officer		SAGCOT Ltd	1
Clinton foundation officer		Clinton Foundation	1
Banker		TADB	1
Total		-	**53**

Source: Author, 2018

3.8.1 Research Design Matrix

Table 3 indicates the methods of data collection, tools for data collection and source of information.

Table 3: Research design matrix

Sub-question	Data	Data source	Tools
1.1	Stakeholders and their roles in the soybeans value chain.	Desk research Smallholder farmers, stakeholders, and supporters	(Internet, Articles, Journals and books) Checklist
1.2	Value share among the actors like production cost, selling price and volumes	Desk research Smallholder farmers and other actors (traders, processor/retailer)	(Internet, Articles, Journals and books) Checklist
1.3	Source of market information to farmers	Desk research Smallholder farmers	(Internet, Articles, Journals and books) Questionnaire, Checklist
1.4	Methods used to link farmers to the market	Desk research CARE INTERNATIONAL	(Internet, Articles, Journals and books) Checklist
1.5	Chain relations in the soybean value chain?	Desk research, Stakeholders	(Internet, Articles, Journals and books) Checklist
1.6	Constraints to accessing market by smallholder farmers in the soya beans value chain	Desk research, Chain actors and Supporters	(Internet, Articles, Journals and books) Questionnaires, Checklist

2.1	Quality attributes of soybeans needed by farmers for market access	Desk research, smallholder farmers, traders and processor	(Internet, Articles, Journals and books) Interviews (Checklist), questionnaire
2.2	Possible practices that can be adopted by smallholder farmers to improve soybean market access	Desk research, smallholder farmers, traders, and processor, Chain Supporters	(Internet, Articles, Journals, and books) Interviews (Checklist), questionnaire, Canvas Business Model
2.3	Arrangements and terms preferred in the soybean market segments	Desk research, smallholder farmers, traders and processor	(Internet, Articles, Journals, and books) Interviews (Checklist), questionnaire

Source: Author,2018

3.9 Data analysis and processing

Data which were collected from the interviews, discussions, and observations were processed into transcripts. The qualitative and quantitative analysis was done through models, and thematic analysis since field data obtained was in descriptive, narrative and a model forms such as the value chain map, Venn diagram, and the business canvas model. The findings were processed into results by answering the research questions. Stakeholder matrix was used to identify the actors and stakeholders and their roles in the in the soybean value chain including the challenges they face. Value chain map for the smallholder soybean value chain in the district of Iringa was used to identify information flow, product flow and the overlays of the chain. MS Excel was used to indicate how value shares in the soybean chain are distributed among the various actors using tables and charts. Venn diagram was used for showing the chain relations among the actors and supporters in the smallholder soybean value chain in Iringa district. Canvas Business model was used to give farmers an overview of the current business and to identify the major challenges and proposed business model or practices they can adopt. Data collected was also combined to complete the PESTEC and carrying out a SWOT analysis.

3.10 Limitation of the study

Limitations of this study were to getting information from processors about costs and level of profit gained in buying and trading/processing soybean and its by-products. There were unable to disclose other information except for these areas. However, additional data collected was adequate for this study.

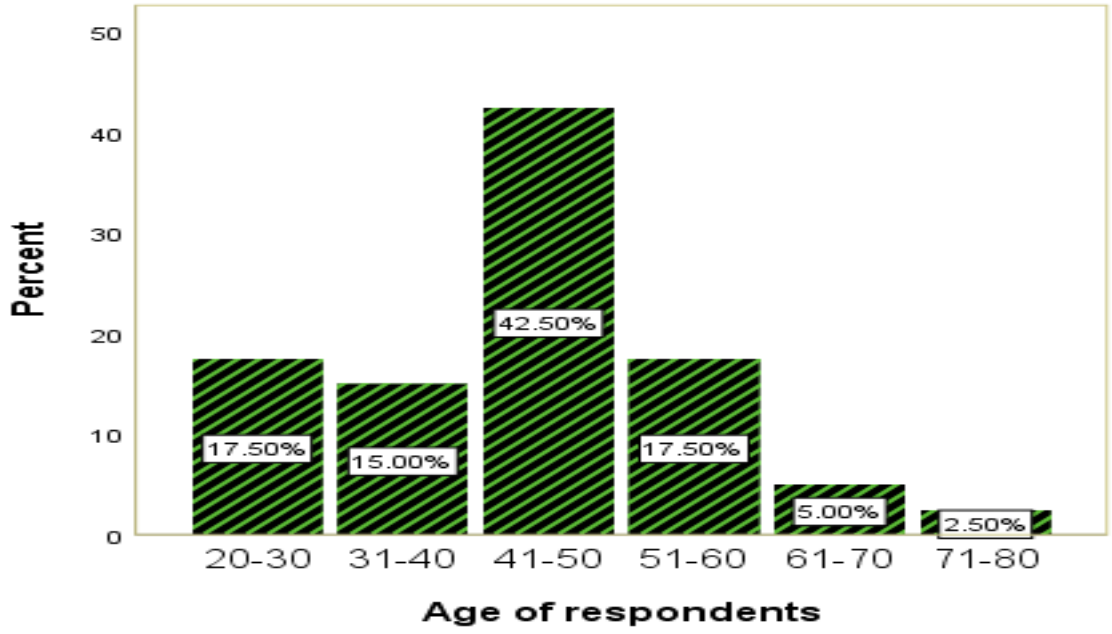
CHAPTER 4: RESULTS OF THE STUDY

This chapter presents findings from the field study and summarises the findings from the field surveys and interviews. It represents what was found in the field. The results are presented in two sections; section one represents the socio-economic characteristics of the respondents and soybean production. Section two presents the results from the interviews which involved, DAICO, Traders, CARE International officers, Processor, ARI Uyole officer, ASA, SAGCOT and Clinton foundation.

4.1 Age of respondents

Most of the respondents interviewed fall under the age of 41-50 (42.50%) showing that most soybean farmers are old ones followed by the youths falling under the age between 20-30 (17.50%). The results imply that soybeans farmers are distributed among all age categories, the youths, middle-aged, and the elders. They all engage in soybeans production. Most youths migrate to towns for searching for jobs, they don't participate in farming business at large unlike the old aged people who have dependent and families and they possess land for farming activities. Soybean production is tedious especially during planting and harvesting, so many youths engage in farming activities which has quick pay and simple to handle like maize and common beans.

Figure 5: Age of respondents

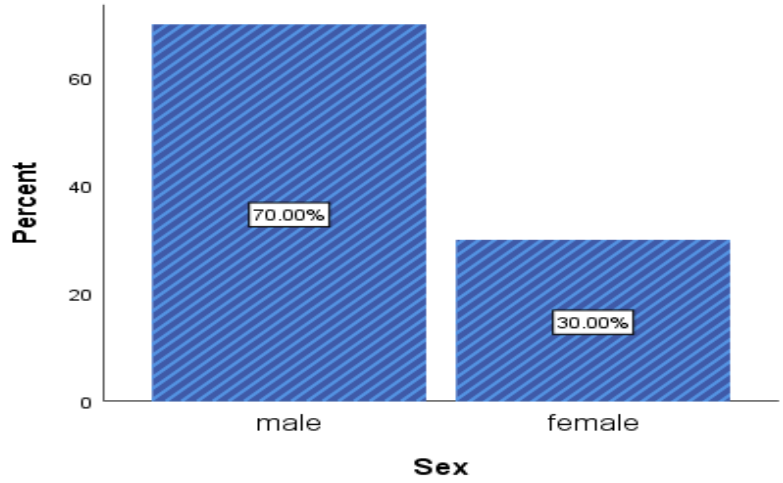


Source: Survey field data, 2018

4.2 Gender of respondents

Most of the respondents interviewed were males (70%) and females (30%), it shows most males have dominated the farming of soybeans in Iringa DC. This is contrary to the KnK (Kukua ni Kujifunza-Growing is learning) project which intended for women instead of men.

Figure 6: Gender of respondents

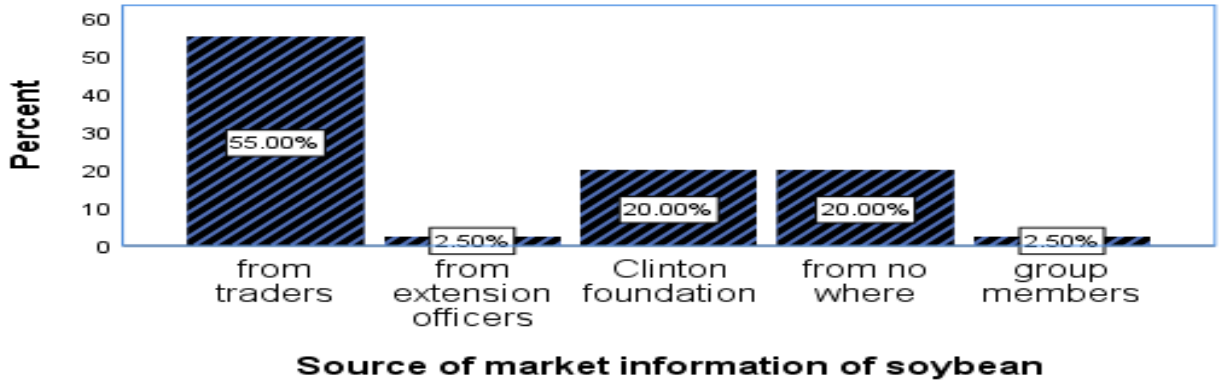


Source: Survey field data, 2018

4.3 Market information of soybeans

About 40 farmers were interviewed to answer the question 'where they get market information'' the results reveal about 55% of the respondents replied that they get market information from traders while 20% of respondents said they get market information from Clinton foundation. Farmers do not sell soybeans as individuals instead they aggregate and sell collectively at one point. Clinton in one hand organise the purchase of farmers produce, and traders on the other hand come to collect the produce in one location. Clinton foundation was negotiating the price with traders and last farmers pay the price to the trader. When traders make the exchange of money and soybeans, farmers regard that as contact between them and where they exchange information.

Figure 7: Source of market information of soybean

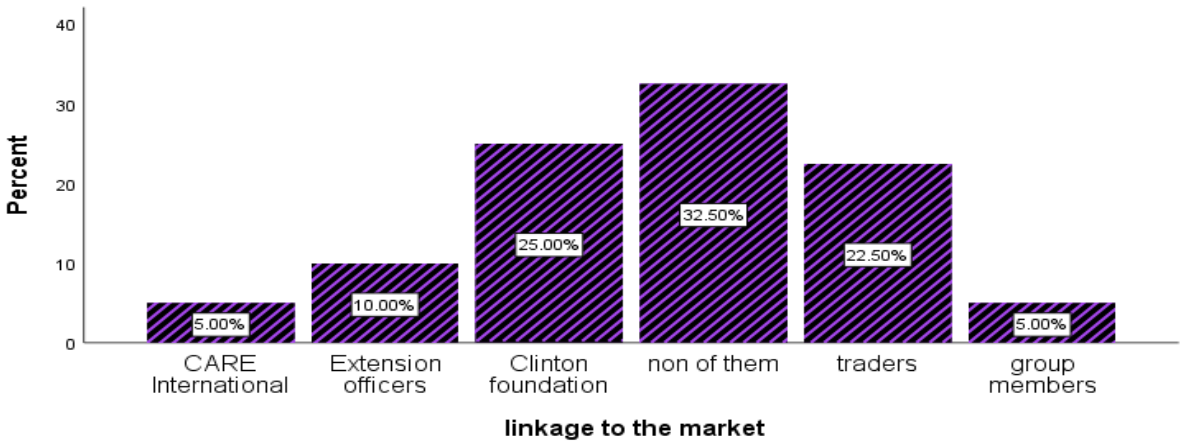


Source: Survey field data, 2018

4.4 Linkage to the market

The results of this study showed that the majority of farmers interviewed (32.50%) responded no one links them to the market for their produce after harvesting while others (25%) said that, Clinton foundation is the one who linked them followed by (22.50%) who said traders linked them to the market. Farmers cannot be aware of who link them to the market because they have a close relationship with the Clinton foundation. Clinton foundation is mentioned here often quit because it is the first organisation to work with smallholder farmers in the soybean value chain. CARE International came later.

Figure 8: Linkage to the market



Source: Survey field data, 2018

4.5 Constraints to market

In this section, farmers were given statements to give their opinions on constraints to access a market of soybean. The statements allowed them to give opinion on 1. Total disagree, 2. Disagree, 3. Agree, 4. Total agree. The following were some of the results according to the decreasing order.

4.5.1 Inadequate local market

About 36 farmers (90%) perceived inadequate local market as the constraint factor causing them not to access soybean markets. The absence of local market inhibits even their produce to be sold in their local markets, this is because of lack of awareness of the importance of soybean for human consumption at the family level.

Table 4: Farmer's opinion on the inadequate local market

	Frequency	**Per cent**
Disagree	1	2.5
Agree	36	90
Total agree	3	7.5
Total	**40**	**100**

Source: Survey field data, 2018

4.5.2 Lack of bargaining power

About 35 farmers (87.5%) perceived lack of bargaining power inhibits them to access soybean markets, poor bargaining power leading to the low price. They never bargain for the price, only traders have a decision on price making. Because of the lack of information about the markets farmers cannot make any decision because they don't have options of selling their produce out of the traders.

Table 5: Farmer's opinion on the lack of bargaining power.

	Frequency	Per cent
Disagree	2	5
Agree	3	7.5
Total agree	35	87.5
Total	**40**	**100**

Source: Survey field data, 2018

4.5.3 Inaccessibility of market infrastructure

About 32 farmers (80%) of farmers perceived inaccessibility of market infrastructure as the constraint factor causing them not to access soybean markets. Farmers perceive that, if they have the market infrastructure in their village can help them to sell their produce. Missing of the infrastructures of the markets in the village contribute the soybeans markets not be easily accessed.

Table 6: farmers opinion on the inaccessibility of market infrastructure

	Frequency	**Per cent**
Total disagree	1	2.5

Disagree	3	7.5
Agree	32	80
Total Agree	4	10
Total	**40**	**100**

Source: Survey field data, 2018

4.5.4 Lack of financial support

About 67.5% of farmers agreed as a lack of financial support inhibits them to access the soybean market, and they cannot expand their production. Having no money for increasing production could prevent farmers not to access markets. If they produce less, it is not easy for them to look for markets while the production capacity is very low. If awareness was enough created at the family level, farmers could sell their products domestically and they could get market. Unfortunately, Soybean use at the family level is very low.

Table 7: Farmer's opinion on lack of financial support

	Frequency	**Per cent**
Agree	13	32.5
Total agree	27	67.5
Total	**40**	**100**

Source: Survey field data, 2018

4.5.5 Lack of adequate access to finance

About 60% of farmers agreed as lack of adequate access to financial prevents them accessing soybean markets. Many smallholder farmers cannot access finance as individuals because they don't have collaterals.

Table 8: Lack of adequate access to finance.

	Frequency	**Per cent**
Disagree	1	2.5
Agree	24	60
Total agree	15	37.5
Total	**40**	**100**

Source: Survey field data, 2018

4.5.6 Producer lack of skills or knowledge

About 55% of farmers agreed as lack of skills or knowledge on the crop husbandry a constraint to access soybean markets. Many farmers apart from other factors lack knowledge about markets, on

how to access them. Lack of knowledge or skills cannot give farmers confidence and hence create fear on the curiosity of looking for markets of their produce.

Table 9: Farmer's opinion on the lack of skills or knowledge

	Frequency	**Per cent**
Total disagree	1	2.5
Disagree	12	30
Agree	22	55
Total agree	5	12.5
Total	**40**	**100**

Source: Survey field data, 2018

4.5.7 Producer lack of market information

About 52.5% of farmers agreed as a lack of market information a constraint to access soybean markets. Lack of market information is a barrier for many farmers to penetrate the markets. A combination of many reasons can cause this.

Table 10: Farmer's opinion on producer lack of market information

	Frequency	**Per cent**
Disagree	2	5
Agree	17	42.5
Total agree	21	52.5
	40	**100**

Source: Survey field data, 2018

4.6 Results from Interviews

This section presents the results from the interviews which involved traders, DAICO, processor, CARE International officers, SAGCOT officer, ASA, Clinton Foundation, and ARI Uyole. Results were presented basing on the research question asked. The first research question was about the dynamics in the soybean value chain in Iringa district by identifying the stakeholders and their roles, the value shares among actors in the chain, the present challenges, and opportunities that exist in the chain.

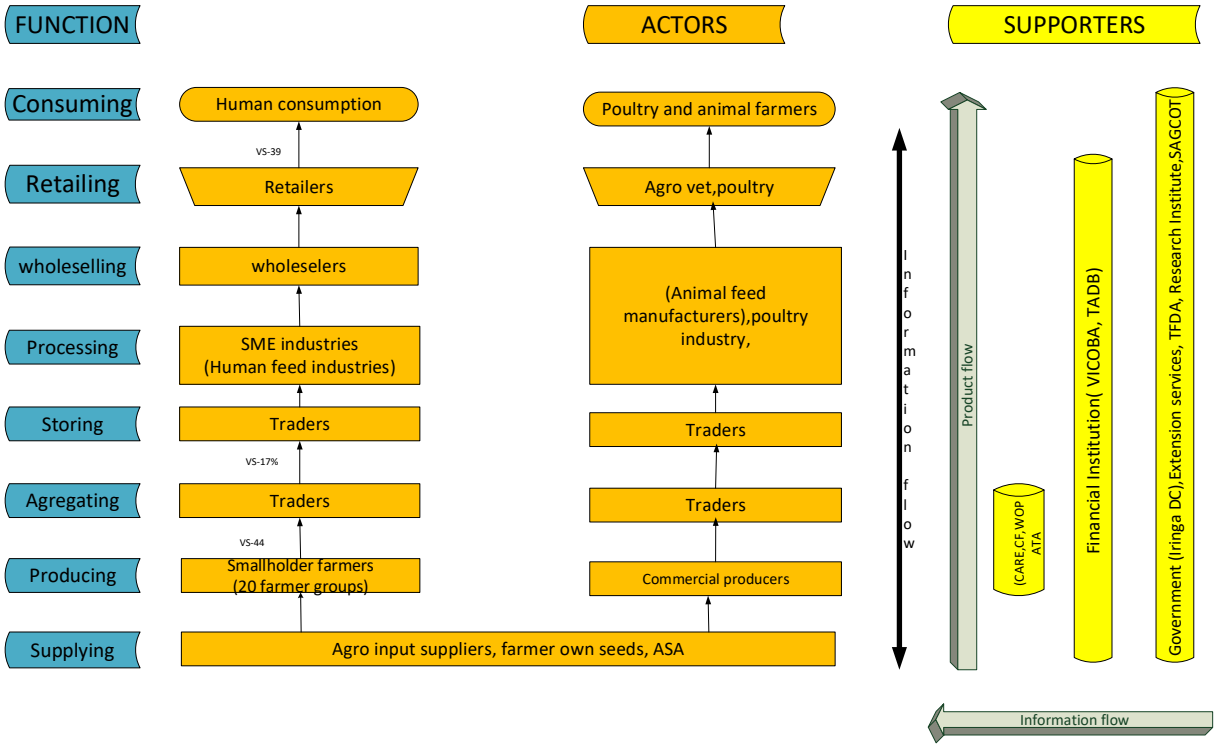
4.6.1 Stakeholder Matrix Analysis

The field assessment research has been carried out to identify the main value chain stakeholders of soybean and their key roles in the chain. In Iringa district, the main soybean value chain actors were input suppliers, producers, traders, and processors. The supporting services of soybean value chains in Iringa were CARE International, WOPATA, SAGCOT, Clinton Foundation, Research Institute, Tanzania Agricultural Development Bank and Iringa DC. The field research work had been conducted by arranging one-day focus group discussion (FGD) at Malagosi village at village office which comprised of seven members from Malagosi Vicoba (Village Community Bank) group.

This part highlights different identified actors and supporters with their roles in the soybean value chain in Iringa district including the challenges they face. Information gathered from or during the interview are the ones provided below.

The current soybean value chain map in Iringa

Figure 9: The current Soybean Value chain in Iringa



Source: survey field data, 2018

The following table below shows the stakeholders, roles and challenges they face

Table 11: Stakeholders, roles they play and the challenges they face in the soybean value chain in Iringa

ACTORS	FUNCTIONS	CHALLENGES
Input suppliers ASA, Agrodealers, Agrodealers, (SeedCo)	Agricultural Seed Agency is a government agency responsible for seed multiplication and distribution A private seed company which supplies improved seeds and other agriculture inputs	- They stopped multiplying soybean seeds because farmers bought no seeds. Therefore they don't have any soybean seeds. - Farmers use local seed so don't have improved soybean seeds
Soybean farmers	They produce soybeans and sell to traders or processors	- They have no reliable market - They have low productivity - They have soil acidity - They have soil leaching - They have no agro inputs for planting and harvesting because planting and harvesting activities are a tedious job - They have no improved soybean seeds - They have no market information - They don't have bargaining power on price decision
Traders (local traders, silverland	They buy soybeans from farmers and sell to processors	- Farmers don't produce enough soybeans -
Tanfeed Ltd (Processor)	They produce different animal feeds and soybean cake	- They face lots of obstacle on transporting soybeans from farmers like traffic fines, the small bulk of soybeans from farmers
SAGCOT	They convene, coordinate stakeholders in the soybean value chain, crowding in investors in the corridor, identify investment opportunities in agriculture, they network stakeholders and share networking	- Poor commitment from partners - Poor budget allocation from the public sector - Poor coordination among stakeholders - There are weak farmer organisations. Hence they are less treated as serious business partner in various dialogues.
ARI -Uyole	They research on improved seeds, giving an agronomic package of soybeans, promoting soybeans and other seeds	- The unstable price that fluctuates every year/time leading to the low adoption of approved technologies. - Instability of soybean price over every year. - Lack of investors in the processing industry that could add the value of the crop. - Low consumption rate by the communities. - Inaccessibility of quality seeds by farmers because of little investment by seed companies and other actors. - Uncoordinated markets

Clinton Foundation	Supporting farmers regarding training (demo plots), regarding linking farmers to inputs and markets	- Market Fluctuation - Soil acidity which leads to low production and productivity - Government policies specifically on importation and exportation (alteration of price) - Lack of value addition technology to farmers - Post-harvest handling especially quality control during harvesting (produce purity, moisture level)
Iringa District Council	- They give extension services by giving training to farmers about good agricultural practices, formation of farmer groups and give advice on agriculture production.	- the absence of market and unavailability of improved seeds - Low productivity caused by local seeds used by farmers - Shortage of resources to monitor and evaluate
CARE International	- Supporting women, farmers increase their productivity, income, and their family nutrition through Farmer Field and Business School (FFBS) - Improving farmer's skills to aggregate produce, reduce post-harvest losses and be well connected to markets - Conducting agribusiness training to support women farmers to participate in the lucrative market systems. - Improving household food and nutrition security	- Gender imbalance in value in the chain - Gender vulnerability in climate change where women are sufferers - Dissemination of weather information is not suitable for farmers - Lack of awareness of using soybeans as nutrition at the family level - Lack of soybean market - Lack of mechanisation in soybean production
TADB	- Agricultural bank disbursing loans to micro and macro agricultural projects. - Capacity building to farmers.	- Majority of farmers are not loanable - Majority of farmers have no collaterals. - Inadequate documentation of farmers on what they produce (poor record keeping) - Dependency on rainfed agriculture to farmers, if no rain, there is also a delay of loan repayment - Many farmers' produce has no reliable markets.

4.6.2 Value shares among the actors

4.6.2.1 Cost and returns of soybeans production from smallholder farmers

The result below shows an average cost, return and profit margin of soybeans production per season per year as indicated in table 12. The average gross income was 372,200 Tsh with the net profit of 1.7% per season per year which produced five bags per acre, whereby one bag is equivalent to 100kg and the price of one bag is 90,000. Tsh

Table 12: Costs and returns of soybean per season per year per farmer in 1 acre (1 Euro = 2600Tsh)

s/n	Activity	unit	Amount	Price	Total
1	Hiring farm	acre	1	40,000	40,000
2	Ploughing	acre	1	40,000	40,000
3	Harrowing	acre	1	35,000	35,000
4	seeds	kg	25	1,500	37,500
5	Inoculants @100gm	gm	100	72	7,200
6	Planting	acre	1	70,000	70,000
7	Weeding 1	acre	1	40,000	40,000
8	Weeding 2	acre	1	35,000	35,000
9	Pesticides 1/2L	acre	1	7,500	7,500
10	Spraying	acre	1	5,000	5,000
11	Harvesting and threshing	acre	1	40,000	40,000
12	Transport costs for 5bags	bag	5	3,000	15,000
13	**TOTAL COST (TC)**				**372,200**
	Revenue from Soybean (RS)	500kg*900 Tsh			450000
	Net profit	RS-TC (450,000-372,200) Tsh			77,000

SOURCE: Survey data (Author,2018)

4.6.2.2 Value shares among the actors (farmers, traders, and retailer)

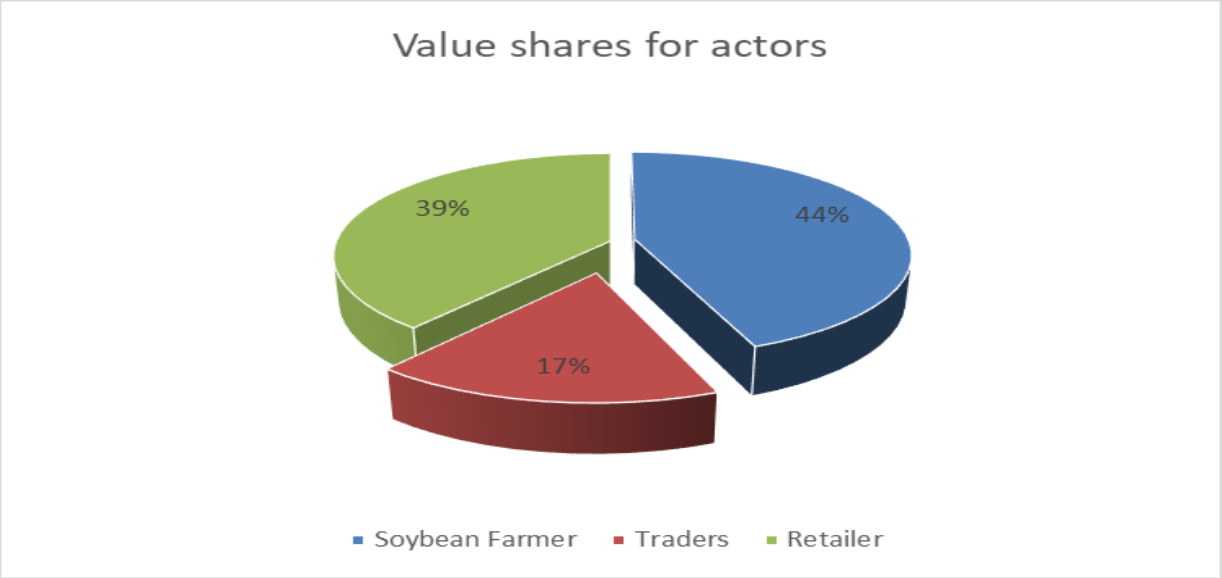
Table 13: The value share of soybean producers in the informal soybean marketing channel

Chain actors	Revenue (Selling price) (Tshs)	Added value Revenue – previous actors revenue	Value share (%) Added value x 100 /Retail price
Soybean farmer	800	800	44.44
Traders	1100	300	16.66
Retailer	1800	700	38.9

Source: Interviews with actors in Iringa district, 2018

The above table 13, shows the different value shares for the actors in the soybean value chain in Iringa district. Farmers are receiving a value share of 44% indicating the risks and costs they are incurring in soybean farming. Traders do incur many costs that is why they get the value share of 16%, but retailer having a value share of 39% do not have many costs or sometimes costs are very minimal that is why they get value share higher than traders.

Figure 10: Value shares for actors



Source: Survey field data, 2018

4.6.2.3 SWOT analysis of the soybean value chain in Iringa district.

Table 14: SWOT Analysis of the soybean value chain

STRENGTH	• Farmers have sufficient and appropriate land for soybean production. • Accessibility of roads. • There is enough rainfall which supports the production of soybeans • There is support from NGOs and government
WEAKNESSES	• Shortage or absence of improved soybean seeds in the area. • Limited access to financial institutions. • The unavailable market for soybeans • Unstable price of soybeans. • Limited market information • Shortage of agricultural inputs like planters and processing machines. • The poor farmer's organisation in the value chain, no formal farmer groups, and cooperatives • Shortage of resources and lack of education on value addition or processing of soybean crop. • Lack of awareness of the importance of soybean at the family level. • Poor coordination between actors • Low production and productivity. • No contract farming. • Lack of awareness of the use of inoculum which assists the soybean plants to fix their nitrogen from the soil.

OPPORTUNITIES	• There is room to process soybeans by-products like soybean milk. • Use of agricultural lime to combat the problem of acidity • Processing soybean for soy cake making or full fat (many animal feed manufacturers are not interested with raw soybean instead they are interested in processed full-fat soybean or solvent extracted soybean. • Presence of TADB (Agricultural bank for farmers) which is willing to give loans to farmer organisations. • The rapidly rising demand for diversified soybean products from health-conscious middle class and overall population growth. • The favourable condition for soybean production • Enough rainfall and land
THREATS	• Local value-added processing is negatively affected by the importation of soybean and its by-products. • The absence crop board (benefits are not identified to producers or processors) • Soil acidity • Soil leaching • Diseases • Climate change

Source: Field data, 2018

4.6.2.4 Market environment (PESTEC) of the smallholder soybean value chain.

Table 15: PESTEC of the smallholder soybean value chain.

SEGMENT	FACTORS
POLITICAL	• Unclear policy on Importation of soybean seeds • High taxes and levies.
ECONOMIC	• Unavailability of improved seeds. • Inaccessibility to loans. • Fluctuation of market prices. • Limited market information
SOCIAL	• Gender attachment
TECHNICAL	• The quality control mechanism is inadequate • Productivity and production of soybean are very low. • Inadequate processing education and plants.
ENVIRONMENTAL	• Soil leaching • Soil acidity
CULTURAL	• Use of traditional seeds

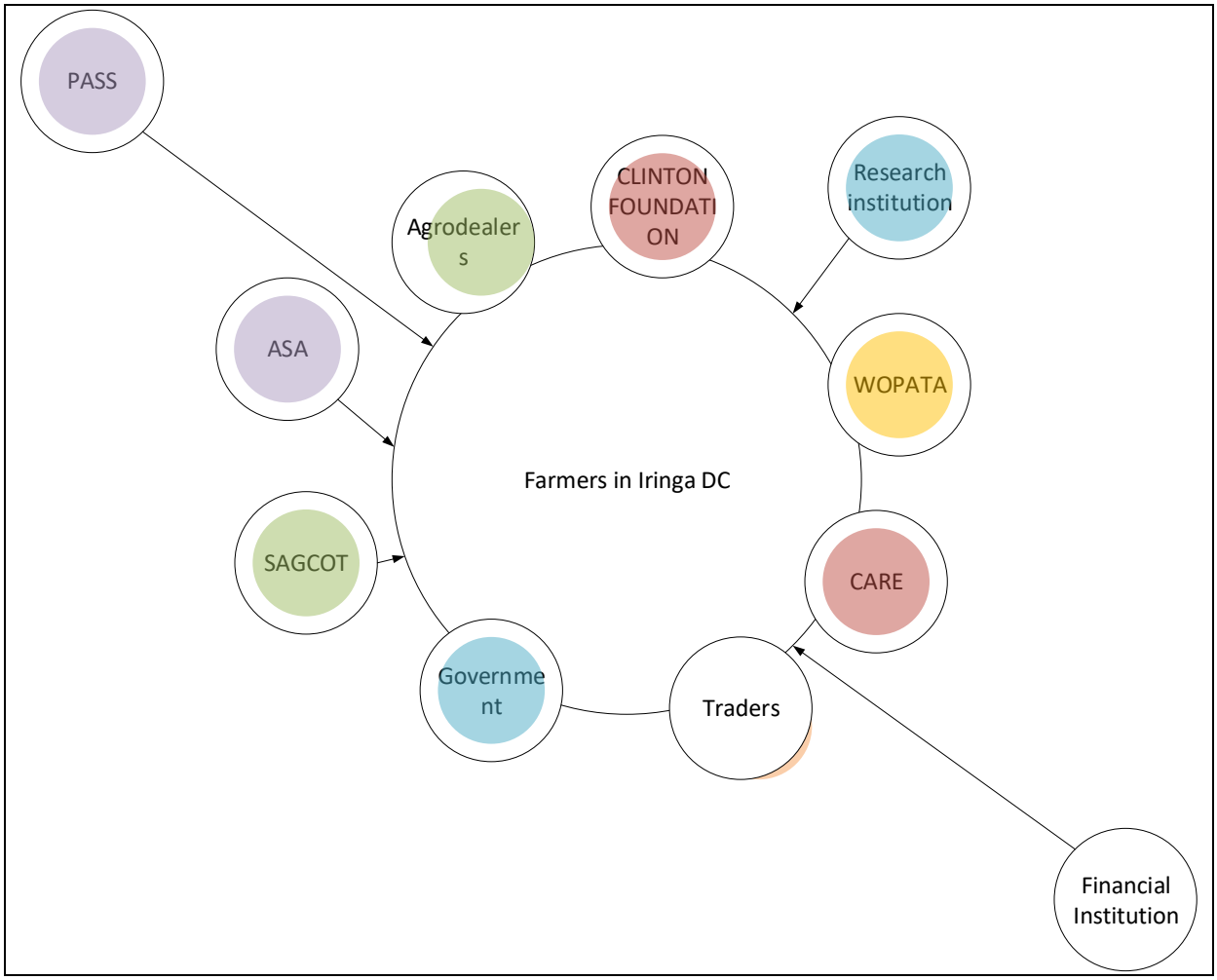
Source: Field data, 2018

4.6.2.5 Chain relations.

Most traders in Iringa have short-term relationships with the farmers. The relationship is evidenced only during harvesting time during which traders come to farmers and buy soybeans. There is generally no placement of orders, no contract, payment is strictly by cash. The supporters like Clinton foundation, CARE International, WOPATA and Iringa DC have strong relations with the farmers

regarding production information and market linkage. There is a weak relation between research institutes, ASA and farmers. The Venn diagram figure 9, shows how stakeholders are related in the soybean value chain. The financial institutions are away from the farmers, and it is because farmers have limited access to a loan. SAGGOT was put a little further away from the farmers because they are not directly working together. This information was given during an interview with stakeholders and focus group discussion.

Figure 11: Venn diagram showing chain relation among stakeholders.



Source: Field data, 2018

The diagram above shows how the strong or weak relationship is between or among stakeholders. The close the circle with farmers shows how strong relationship is, and the near the circle to the farmer shows a bit good relationship exists while the far the circle with farmers shows how weak the relationship is.

4.6.2.6 Co-ordination

There is poor performance of the chain which resulted from poor coordination between the chain actors right from the farmers to the retailers. Some signals are showing poor coordination in the soybean value chain in Iringa DC consisting of the longevity of time (about one year) of selling soybeans from the farmers to the retailers. The coordination is evidenced as solid at farmer level especially during collection of produces at the warehouse and cumulative sales where traders come. Both farmers and processors also see the poor coordination. In one hand farmers wait for processors

to come and pick produces, on the other hand processors want farmers to send their produces at their factory.

4.6.2.7 Policies and enabling environment

The government of Tanzania recognises soybean crop for agriculture sector development through Tanzania Soybean Development Strategy -TSDS. This creates a partnership with different partners in the value chain to advertise and create awareness of the produce. This is according to the SAGCOT officer. The strategy is there to allow all challenges in the chain are solved. There are much efforts to support the soybean value chain in the region with different stakeholders including the government, but there is poor coordination among actors. Agriculture is lacking effective and efficient support especially in research, which leads to poor technology transfer from research, limited diffusion of productive farm technologies, improved seeds as per farmers in Focus group discussion.

On the other hand, there are robust networked road infrastructures which make easy access to farmers taking their produce to the market, and traders collecting soybeans from the farmers. Awkward processes for registering soybean seed varieties from other countries, and tax exemption on the importation of the soybean brings more competition due to price sensitivity.

4.6.2.8 Market power.

Traders are the most powerful in the value chain, which emerge from the fact that they are aware of the market on when to buy the soybeans and where they will sell. They recognise the predominant soybean prices in the cities, towns and the neighbouring towns and the retail price and they hide this information without disclosing them to farmers.

4.6.2.9 Financial support.

Smallholder soybean farmers and traders are lacking access to working capital and are finding obstacles in getting agricultural finance which stalk from the deficiency of credit, financial services which are poorly adapted to the borrowing terms and conditions. Retailers and few wholesalers are close to the accessibility of finance because they can solely meet the requirements needed by financial institutions. From the group discussion farmers said, they are willing to access financial services to expand their farming if the conditions are friendly to them. On the other hand, Tanzania Agricultural Development Bank (TADB) was established for disbursing agricultural micro and macro projects loans for small farmers. What smallholder farmers lack, is a strong association which qualifies them to meet requirements for securing a loan from TADB.

4.6.2.10 Product and financial flows

Product flow

Product flows vertically from farmers to the consumers. Finances flow vertically from traders to farmers in the soybean value chain. There is a flow of money passing from banks to retailers and wholesalers, these two groups have access to financial institutions because they possess collaterals which help them to access working capital. There is no flow of money from a financial institution to farmers because smallholder farmers have no collaterals.

Information flow

There is two-way Information flow between adjacent actors but not across all the actors in the chain for example between Aggregators, smallholder farmers and processors. Farmers and aggregators can share information on numbers of bags present for being traded, prices and supply information.

Information on fertiliser and chemicals flow from input supplier to farmers. Farmers are unable to access market information such as prices, quantities and demand for soybeans. There is also information flow coming from chain supporters to farmers i.e CARE International, WOPATA and extension workers (from Iringa DC) who provide advisory and training on trials and demonstration information to farmers. There is no information flow from a financial institution to farmers because farmers have no collaterals. Marketing information is just given orally to possible buyers. The farmers also show their soybeans on field days or demonstrations/exhibitions organised by CARE International.

4.7 Constraints to access market in the soybean value chain

The study showed that there are some factors which hinder market access to soybean across the region or beyond the region. There are factors which are within farmers themselves while there are factors which are beyond farmers level. **First**, low production and productivity of soybeans, about all 40 farmers interviewed no any farmer was able to harvest beyond 1 ton per hectare. Majority of farmers harvest between 800kg -900kg per hectare. **Second**, unavailability of improved seeds which contribute to the low productivity per unit area. Farmers are using local varieties of seeds which have small yields compared to the improved ones. There is no relation among farmers and research institution. **Third**, there is still a lack of awareness of consumption of soybeans and use of it as a protein supplement at the family level; there is no market of soybean for home consumption purposes. **Fourth**, many animals feed manufacturers/processors are not interested in raw soybeans. Therefore, their interest is to get processed soybean which is in the form of full fat or solvent extracted soybean. **Firth**, importation of soybeans and soy cake (SES) has discouraged the domestic market entirely. **Sixth**, the inability of smallholder farmers to extend activities beyond selling raw soybeans like processing has caused the fall of the market.

4.7.1 Challenges facing soybean value chain in Iringa District.

The study interviewed different stakeholders and explored general challenges facing soybean value chain in Iringa district. The research discovered the following.

- Shortage of improved seeds of soybeans as a result farmer use stored seeds from the previous harvest causing low production. Improved soybeans seed varieties can only be recycled for about three seasons without losing vigour and potential yields, but smallholder farmers continuously use local recycled seeds.
- Shortage of agricultural inputs like planters and processing machines which are not available in the country.
- Shortage of postharvest facilities especially during harvesting has caused postharvest losses of soybeans.
- Lack of coordination among actors in the value chain with a financial institution has discouraged the availability of financial services to the growth of soybeans subsector.
- The weakness of farmers organisation in the value chain, there is no formal farmer groups and cooperatives like other legumes farmer associations.
- Shortage of the soybean market.
- Shortage of correct data of modern soybean farming.
- Poor use of fertilizers, vaccines and essential pesticides in the growth of the soybean crop.
- Shortage of education on the importance of soybean at the family level.

- ❖ Shortage of resources and lack of education on value addition or processing of soybean crop.
- ❖ Soil acidity. Most soils in Iringa district have soil PH of less than 5.5
- ❖ Leaching caused by excessive rainfall in most of the region.
- ❖ Low production and productivity of soybeans.

4.8 Quality attributes of soybean produce from the farmers in Iringa district preferred by Traders

The interviewed traders, processors and farmers indicated that soybeans which are clean, dustless, well dried (with a moisture content of 13), disease free, are preferred by their clients. They also indicated that most farmers meet their standards. Farmers do adhere to the customer prescriptions. But one trader said it happens sometimes farmers are not trustful by adding sands to the soybeans to add weight. ''*The quality of soybeans I want is that one which is free from dust, well matured and disease free. There are some challenges in quality management; sometimes farmers are not faithful they put sands in the soybean bag to increase volume*.''

4.9 Arrangements and terms preferred in the soybean market segments

Majority of processors showed that they don't prefer doing business with contracts to the farmers because of unstable price instead they buy soybeans with market price prevailing during that time. One of the processors said,

''To avoid conflict with farmers, we don't write any contract with them but during the season of harvesting we invite traders to sell soybeans at our factory, so we receive soybeans at our factory''. On the other hand, one trader also on the issue of contract business said,

''I don't have any contract with buyers of my soybeans. It happens that you find the market somewhere and they tell you how much of the soybeans they require then you supply.''

Farmers were very much interested in producing soybeans by writing contract with buyers; this was evidenced in the Focus group discussion, this study quoted one farmer who insisted by saying,

''When a buyer comes we would like to have contract farming, this would be very effective to us, If he comes and place order of tons of soybeans before we produce, it will be easy for us to mobilize each other and maintain the required number of tones, and if we fail to meet that requirement, we can take responsibilities on the other hand''.

4.10 Possible practices that can be adopted by smallholder farmers to improve soybean market

The table below shows the Canvas business model which is a strategic management template for developing new or documenting existing business models. The model has elements describing a firm's activities, partners, value proposition, revenue channels, vital resources, customers segments, and costs. Formal descriptions of the business become the building blocks for its activities (Osterwalder, 2010). With this business model design template, a producer organisation like Farmers in Iringa district can easily describe their business model see table 16 below.

Table 16: Current Farmers Business Model Canvas

<table>
<tr>
<td rowspan="2">Key Partners

CARE International
WOPATA
TAGRODE
GOVERNMENT
CLINTON FOUNDATION
LOCAL GVT</td>
<td>Key Activities
Crop farming</td>
<td rowspan="2">Value Propositions
Soybean production</td>
<td>Customer Relationships
Field days
Agricultural shows</td>
<td rowspan="2">Customer Segments
Animal feed manufacturers
Traders</td>
</tr>
<tr>
<td>Key Resources
Group Members
Farms
FFBS
Demo</td>
<td>Channels
Collectives sales of soybeans</td>
</tr>
<tr>
<td colspan="3">Cost Structure
Labour
Cost of inputs</td>
<td colspan="2">Revenue Streams
Membership contributions
Soybeans sales</td>
</tr>
<tr>
<td colspan="3">Social and Environmental Costs
Use of agricultural lime in farms
Risk of erosion due to leaching</td>
<td colspan="2">Social and Environmental Benefits
Agricultural lime is lowering the acidity of the soil.</td>
</tr>
</table>

Source: Survey field data, 20

5.0 CHAPTER FIVE: DISCUSSION

5.1 Soybean Stakeholders and their roles

This study identified key players in the soybean value chain in Iringa district. The actors who are directly involved in the chain were, smallholder farmers, input suppliers selling agrochemicals, aggregators (traders), processors (wholesalers) and retailers. The supporters identified in the chain were Local Government (Iringa DC), CARE International, WOPATA, SAGCOT, Clinton foundation, TADB, Agricultural Seed Agency (ASA), Research Institute (ARI-Uyole). Their roles are summarised in (Table 11). A strong link between actors is therefore essential, hence the need for effective and efficient communication in all stages, from input supply, production, and delivery of outputs to ultimate consumers. (Sanga *et al.*, 2013). The aim in a value chain is to add value to a product as it moves from different actors in the chain (Changwony, 2012).

5.2 The chain relation among the actors in the soybean value chain.

The relationship among stakeholders within the chain determines the strength or weakness. The relation between actors in the soybean value chain is not very strong as compared to the supporters. It was observed that most of the actors have a short-term relationship especially during the purchasing of the produce. The Cordial relationship is evident between traders and farmers during harvesting time when traders do business with each other. The relation between supporters and the farmers is held durable. Government and Non-Government organisation have a close relationship with smallholder farmers. They give services to farmers through training, trials and demonstrations.

5.3 Value shares among actors

From the results it was discovered that although farmers are the standing point in the existence and development of the soybean value chain, they are the least beneficiaries in the chain.it is caused by some factors in the whole process from production to the marketing. Some of the reasons being farmers have no access to market information, weak groups, lack of skills or knowledge, and low bargaining power. Farmers are the ones who do a lot of work which incurring higher production costs and uses a lot of time not less than six months from production to harvesting. Farmers have a low-value share in the chain which is below 50 per cent. Hence to have relative value shares farmers at least should earn not less than 50 per cent of the value shares.

The results show that all the work that farmers do they ended with the value shares of 44% (see **table 13**) for the relative value shares among actors in the soybean value chain in Iringa district. Figure 9 indicates the relative value shares among three actors in the soybean sector in Iringa district.

5.4 Constraints to accessing market by smallholder farmers.

It was observed from the study challenges facing farmers in accessing the soybean market in Iringa district. Low production and productivity, unavailability of improved seeds, lack of awareness of consumption of soybeans, importation of soybeans and soy cake (SES) from nearby countries of Zambia and Malawi. According to Agada (2015) who observed farmers perception on the constraints of accessing market, extracted some factors, which in order of importance being marketing problems, production problems and linkage problems. On the other hand, this study took views from farmers opinion on the constraints of accessing soybean market in order of importance were inadequate local markets, inaccessibility of market infrastructure, lack of financial support, lack adequate access to finance, lack of skills or knowledge and producer lack of market information.

5.5 Soybeans value chain dynamics

Soybeans markets are poorly immature, missing an officially recognised marketing channel. The Iringa soybean farmers are in the same dilemma because of poor marketing systems and information

flow. The poor marketing systems cause the poor market linkages. The related environment policy plays a critical role in market functioning (IFAD, 2003). Large-scale farmers and formal traders are characteristically beneficiaries from market liberalisation while smallholder farmers are always side-lined because of market competition, quality matters and deficiency of access to information. Smallholder farmers in the soybean value chain in Iringa are not also confronted with the same challenge except the quality monitoring issues where to them is not a big problem. The smallholder farmers progressively find themselves in the grounds in which the market sets prices, demands products of the consistent specification and in commercial quantities. Poor extension and coordination have failed in the supply of these markets. This implies that to understand and secure benefits from the current dynamics, market intelligence is needed.

5.6 Chain constraints

From the study it was observed Smallholder soybean farmers facing obstacles such as; shortage or absence of improved soybean seeds in the area, limited access to financial institutions, the unavailable market for soybeans, the unstable price of soybeans. Other constraints were limited market information, shortage of agricultural inputs like planters and processing machines, weak farmers organisation in the value chain, scarcity of resources and lack of education on value addition or processing of soybean crop. Lack of awareness on the importance of soybean at the family level, poor coordination between actors, low production and productivity and lack of awareness in the use of inoculum which assists the soybean plants to fix their nitrogen from the soil were also identified.
According to Wilson (2013), the soybean value chain from input supplying, via production and processing to marketing and retailing and to the consumer is perplexed by many technical and institutional inhibitions, he continues saying that, the soybean value chain in Tanzania is fragmented, unorganized, disorganized, uncontrolled (in spite, in some links, of being overregulated) and uncoordinated. This is also evidenced in Iringa in the context of this study.

5.7 Possible practices which can be adopted by smallholders' farmers to improve soybean market

This study observed different practices which farmers can adopt to improve soybeans market, among them are using agricultural lime to enhance their soil to neutralize or balance the acidity of the land. It is observed that low production and productivity is a barrier to accessing the soybean market, therefore for commercial production purposes, farmers should increase output. Either should farmers produce soybeans by mechanisation as most of the activities like planting and harvesting are tedious works to farmers or use simple machines which can be available from local industry that would help farmers to produce soybeans by reducing more time. Other options from the study was observed is that, because soybeans is much consumed by animals for raw materials in animal feed manufacturing other than human being, the best option for farmer, is to undergo processing activities by themselves and create income by selling soybean by-products which are needed from the local up to the external markets because the demand of soybean by-products like soybean cakes in form of full fat and solvent extracted soybean is increasing in the society. The increased demand is caused by the growth of the poultry industry which uses soy cakes as an ingredient in the formulation of feed.

CHAPTER SIX: CONCLUSION

The objective of my study was; to assess the constraints and opportunities of the soybean market along the soybean value chain in Iringa District and make recommendations to Care International on soybean market improvement for smallholder farmers. The following conclusions are made from analyzed data from the interviews, observations, focus group discussions and secondary data:

This study identified stakeholders in the soybean value chain in Iringa. Apart from farmers themselves, the study identified the following stakeholders, Input suppliers (Agro dealers) like ASA, Traders (local traders), processors (Tanfeed ltd, Silverland), financial institution like TADB, Supporters like local government (Iringa DC), CARE International, WOPATA, SAGCOT, Clinton foundation and ARI Uyole. These are active stakeholders in the chain. It has been observed that the value chain of soybeans in Iringa district is unorganised, undeveloped, uncoordinated and no good chain actor's relationship. The chain is weak from among stakeholders. From input supplying level, it observed that there are no clear suppliers of soybeans seeds which engineered the low productivity of farmers, research institutions have not made efforts for the realisation of improved seeds to farmers. Inoculants which are vitally important in the production of soybeans which help soybean to fix nitrogen is unavailable from suppliers. This has contributed to the low productivity of the soybeans per unit area. As a result, production which seems to be for domestic consumption rather than commercially intended. Farmers, on the other hand, have limited access to financial institutions which could help them access money for the expansion of their farming activities.

There are constraints facing farmers to access the soybean market. The study discovered the following major ones; low production and productivity of soybeans, unavailability of improved seeds, lack of awareness of consumption of soybeans and use of it as protein supplement at the family level, many animals feeds manufacturers/processors are not interested with raw soybeans. Therefore, their interest is to get processed soybean which is in the form of full fat or solvent extracted soya. Also, importation of soybeans and soy cake (SES) has discouraged the domestic market entirely, the inability of smallholder farmers to extend activities beyond selling raw soybeans like processing has caused the fall of the market.

The study observed that, farmers are the least beneficiaries in the chain because, even though they use a lot of time to raise crops and use a lot of resources, but at the end of the day is not realising a profit. The value share of 44% is very small compared to the value share of the retailer (39%) and a trader (17%).

The chain relation to some extent is weaker among the actors compared to the supporters. Only traders show in term relationship when they want to purchase soybean, the chain is stronger between farmers and supporters like the Government and Non-Government Organisations.

This study discovered that, in case of arrangements and terms preferred in the soybean market, farmers are willing to produce and sell their produce by contract. This will ensure them on what quantity they can produce because they are sure of the market, processors would not prefer to have contracts with farmers because of many challenges. Traders would also prefer to do their business on a contract basis. Quality management on soybean seems to be adhered to by farmers as traders said all requirements of soybean qualities are met with farmers. Farmers, on the other hand, said it is very easy to meet traders' requirements on quality management because if you plant soybean on time and harvest on time, you are more likely to harvest a quality soybean.

The soybean value chain in Iringa is facing lots of challenges which this study discovered. Amongst them are, shortage of improved seeds of soybeans. As a result farmer use stored seeds from the previous harvest causing low production, improved soybeans seed varieties can only be recycled for about three seasons without losing vigour and potential yields, but smallholder farmers continuously use local recycled seeds. Shortage of agricultural inputs like planters and processing machines which

are not available in the country. Lack of postharvest facilities especially during harvesting has caused postharvest losses of soybeans, poor coordination between actors in the value chain with financial institution, has discouraged the availability of financial services to the growth of soybeans subsector, weakness of farmers organization in the value chain, there is no formal farmer groups and cooperatives like other legumes farmer associations. Other challenges are; shortage of soybean market, scarcity of correct data of modern soybean farming, poor use of fertilisers, vaccines, and essential pesticides in the growth of soybean crop. Lack of education on the importance of soybean at the family level, shortage of resources and lack of knowledge on value addition or processing of soybean crop, soil acidity on which most soils in Iringa district have soil PH of less than 5.5 and leaching caused by excessive rainfall in most of the region.

Lastly, the study also discovered some opportunities which farmers can use to improve the soybean market. I found that farmers could add values instead of selling raw soybean, they can process and produce other by-products of soy like crude cooking oil, soybean cakes full fat and extracted ones. These by-products have been identified to be needed by manufacturers of animal feeds, and small processors of animal feeds who are not able and willing to process soybeans, but farmers have not been able to meet these demand because of berries of entering in, but there is an agricultural bank which is willing to disburse loans to farmer organizations. Seed multiplication through the system of quality declared seeds (QDS) is also an opportunity for farmers.

CHAPTER SEVEN: RECOMMENDATIONS

From the study and findings discovered, the following are recommended to CARE international to help farmers improve the soybean market.

1. **Strengthening farmers group**

- From research, it was observed that farmer groups are very weak in the sense that they are even not formalised. The formal farmer organisation which is recommended here are AMCOS or SACCOS. This kind of farmer organisations is recommended and accepted for producer organizations. CARE is advised to facilitate the formation of a registered farmer organisation.

- Training on capacity building in term of leadership, lobbying and advocacy. Leaders must be capacitated with confidence and readiness to change others. Having strong leaders can help them have strong bargaining power with traders.

- CARE International should link farmers to financial institutions which provides loans for agricultural projects. TADB delivers loans with small interest rates compared to any financial institutions in Tanzania. Unlike other financial institutions, TADB interest rates are 8% to 12% depending on the longevity of the loan. Long-term loans can take up to 15 years for repayments. So, if farmers are well trained, they can eventually be able to bring changes in the value chain.

2. **For producers**. Farmers are advised to use liming materials to their farms to boost or neutralise soil acidity. This will aid to increase production which is a barrier to reach markets because of the low outputs. This can only be achieved through demonstrations supported by CARE International through agricultural officers.

3. **For Agricultural Research Institute**-Uyole. CARE International should invite ARI Uyole to deliver approved seeds (Soya 2 & 4) to farmers through Quality Declared Seed system. Farmers can multiply and sell seeds to themselves. This can be allowed to be used for three rotation seasons to maintain the quality of the seeds. Research Institute (ARI-Uyole) is willing to disseminate seeds through QDS systems because Agro seed companies are not multiplying seeds which are self-pollinated.

4. **Market linkage and information**: CARE International should link farmers to other markets in big cities like Morogoro, Dar es Salaam and Arusha where farmers can sell their produce.

5. **Chain upgrading**

- Farmers can take activities higher up in the chain. This can be a medium or long-term plan, which farmers take or do some activities vertically in the chain. They can process soybean and get some of the soybeans by-products like soy milk, full-fat soybean, and crude soybean oil. By using simple technology machines and getting trained, they can increase the value and sell their products profitably. This study observed that animal feeds industrial are the big consumers of soybean by-products like soy cakes and full-fat soybeans. They don't need raw soybean instead they buy. Farmers can further be trained to produce animal feeds too.

6. The study revealed that there is no assurance of a market for soybean in Iringa region. Apart from other suggestions for the market improvements, practically the future of the soybean doesn't look good in Iringa district. Alternatively, there could be crop diversification to generate incomes of the farmers apart from soybeans. Soybeans can still be intercropped with other crops and used for improving nutrition security for domestic purposes. Farmers

often prefer to produce crops that have market assurance. The existing options for farmers to have access to a ready market are not an immediate one; it requires time before this can happen. For this reason, It is recommended that Care International should advice the farmers to intercrop soybean with other crops. Its production is also not supported by the soil characteristics in Iringa district because the soil in the region is acidic. It is therefore a threat to the crop. It is not economic for the poor farmers to spend so much on the liming material to fix the soil acidity since it is costly if the same soil can support other crops.

Proposed business canvas model

The suggested business additions are marked in red in table 17 to make the Farmers in Iringa district business model viable and sustainable.

Table 17: Proposed business canvas model for Soybean farmers in Iringa DC

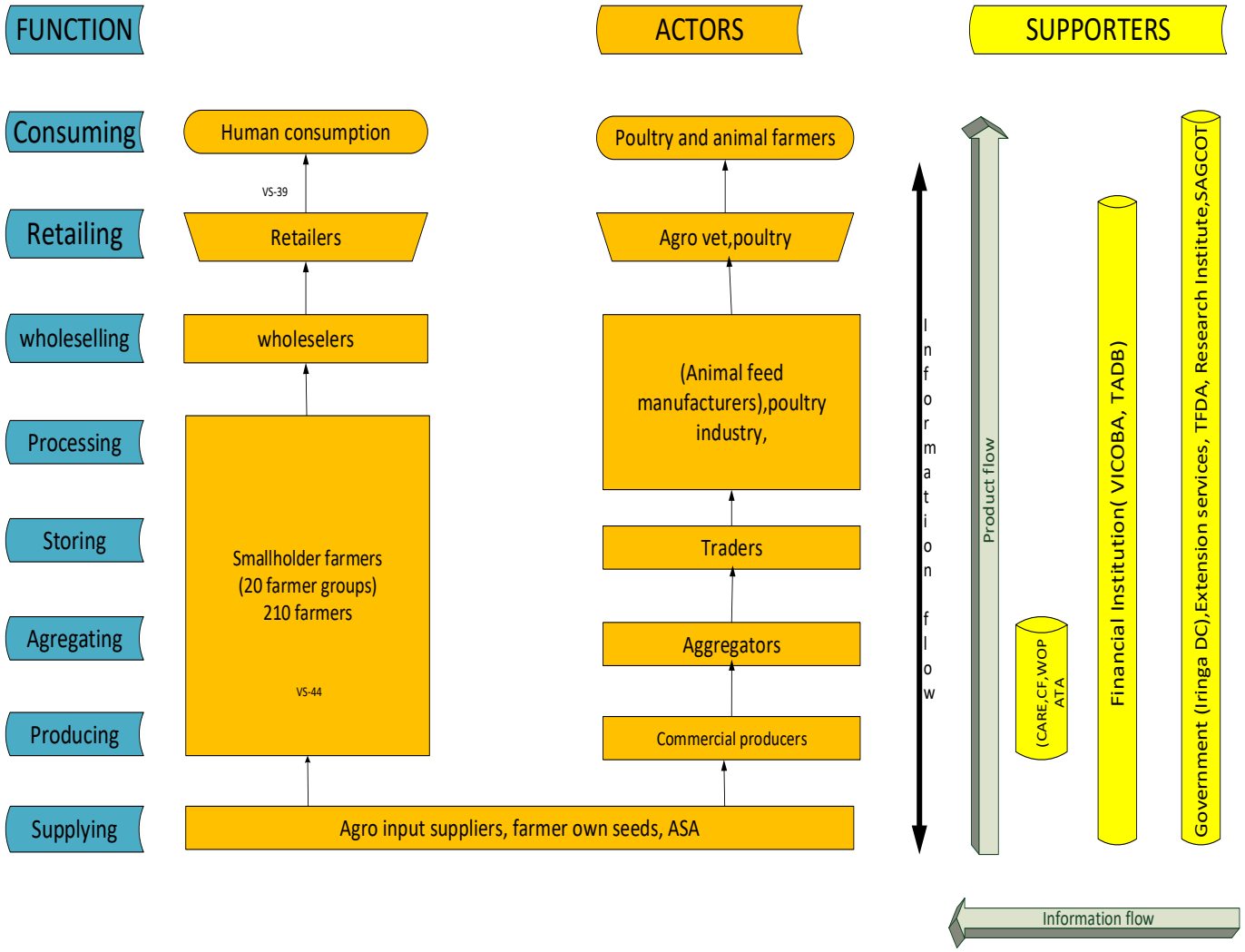
<table>
<tr>
<td rowspan="2">Key Partners

CARE International
WOPATA
TAGRODE
GOVERNMENT
CLINTON FOUNDATION
ARI-Uyole
LOCAL GVT
PASS
TADB
TFDA</td>
<td>Key Activities
Crop farming
Liming
Processing
Mechanization especially in planting</td>
<td rowspan="2">Value Propositions
Soybean production
Crude cooking oil
Solvent Extracted soybean
Processed full-fat soybean
Packaging
Processed human flour for porridge</td>
<td>Customer Relationships
Field days
Agricultural shows
Facebook
Instagram
Twitter</td>
<td rowspan="2">Customer Segments
Animal feed manufacturers
Traders
Cooking oil refiners
Human feed manufacturers</td>
</tr>
<tr>
<td>Key Resources
Group Members
Farms
FFBS
Demonstrations
Training for processing package</td>
<td>Channels
Collectives sales of soybeans</td>
</tr>
<tr>
<td colspan="3">Cost Structure
Labour
Cost of inputs
Electricity costs</td>
<td colspan="2">Revenue Streams
Membership contributions
Soybeans sales
Sales from processed products</td>
</tr>
<tr>
<td colspan="3">Social and Environmental Costs
Use of agricultural lime in farms
Risk of erosion due to leaching</td>
<td colspan="2">Social and Environmental Benefits
Agricultural lime is lowering the acidity of the soil.</td>
</tr>
</table>

Source: Survey field data, 2018

Proposed Value Chain of soybeans in Iringa district

Figure 12: Proposed soybean value chain in Iringa



Source: Survey field data, 2018

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APPENDIX

Appendix 1: Farmers' survey questionnaires

Introduction to the study.

I am Beda Mitungi, a masters student from Van Hall Larenstein University of Applied Sciences conducting academic research on the Soybeans Value Chain in Iringa District. Your participation is needed and appreciated for this study to understand the constraints and opportunities so that I can recommend for improvement of the soybean market. You are kindly requested to cooperate in answering questions from this questionnaire; the information you provide is going to be used for academic purposes only and will remain confidential.

Section 1: Socio-demographic information

1. Village…

2. Farmers' ward……

3. Age ……..

4. Sex (1) Male (2) Female

5. What is the area of the farm under soybeans cultivation? (1) 0- 0.99 (2) 1-1.99 (3) 2-2.99 (4) 3 and above

6. Is production output mainly for?

(1) Domestic (2) Commercial (3) Both (4) Others specify

7. What's your education background?

1) Never been to school 2) Primary level 3) Secondary level 4) Certificate level 5) College level

Section 2: Soybeans production & Marketing….

8. How many soybeans do you harvest per hectare? _____

9. How much of these (soybeans harvested per hectare) are rejected during grading? _____

10. Where do you sell your soybeans? (1) traders (2) local market (3) processors (4) Retailer (5) others specify

11. Where do you get about market information of soybeans?

(1) From traders (2) from the radio (3) from television (4) from extension officer (4) CARE International (5) others specify

12. What are the problems that face in marketing?

13. Do you have decision making on price? (1) Yes (2) No

14. What is the price of soybeans per 90kg bags during harvesting? _____

15. Who are your customers?

(1) Local markets (2) Institution (3) Supermarkets (4) Others specify

16. What is the quality of soybeans that your customers require? (1) Appearance (2) Big size (3) Others specify

17. Do you get any support from CARE International or other organization? (1) yes (2) no

18. Which support do you get? (1) training (2) incentives (3) advice (4) others specify

19. Do you get any support from Government (1) yes (2) no

20. Which Support do you get? (1) training (2) incentives (3) loans (4) others specify

21. Who links you to the market? (1) CARE Inter. (2) Extension officer (3) Others specify

22. What do you think is the fall of soybeans market?

23. Do you see any opportunities to improve the market for soybeans?

24.

In the following statement you can agree or disagree by writing 1-4 on your opinion					
Score 1=Total disagree,2=Disagree,3=Agree,4=Total agree					
No	**Statement**				
No 1	Constraints to market access (Market acess constraints are caused by the following)	1	2	3	4
1.1	Physical access to market (poor infrastructure)	1	2	3	4
1.2	Structure of the market/inaccessible market infrastucture	1	2	3	4
1.3	Producer's lack of skills/knowledge	1	2	3	4
1.4	Procucer's lack of information & organisation	1	2	3	4
1.5	Lack of access to high-value reliable markets	1	2	3	4
1.6	High transaction costs	1	2	3	4
1.7	Distance from the market	1	2	3	4
1.8	Poor quality of the products	1	2	3	4
1.9	Lack of storage facility	1	2	3	4
1.1	Poor agricultural extension services	1	2	3	4
1.11	Lack of financial support	1	2	3	4
1.12	Lack of adequate access to finance	1	2	3	4
1.13	Inadequate local markets	1	2	3	4
1.14	Lack of bargaining power	1	2	3	4
1.15	Excess of intermediaries	1	2	2	3

CANVAS BUSINESS MODEL CHECKLIST FOR FGD

KEY PARTNERS	**VALUE PROPOSITION**	**CUSTOMER RELATIONSHIPS**
• Who are your important key partners? • Who are your input suppliers? • What support do you get from your key partners? • What activities do your partners perform?	• How do you handle customer complaints? • Which customer needs are you satisfying? • How do customers access your product?	• Do you have a contract with your customers? • Do have open days for customers to visit your farm? • Do you have any training or workshops with your customers?
KEY ACTIVITIES	**CUSTOMER SEGMENTS**	**CHANNELS**
• What do soybeans production activities you	• How many products are you producing?	• Where do you sell your soybean?

perform? • What marketing and sales activities do you have? • What research and development activities do you perform?	• What group of customers are you targeting? • Which customer group is most important	• How do you communicate with your customers? • How do you reach your customers? • How do you cope with your customer routines?
KEY RESOURCES • Do you have a brand name? • Do you have enough labor during farm activities? • How do you finance your production? • What is the size of your land?	**COST STRUCTURE** • What are the average production costs incurred in soybeans production? • What are the sales and marketing costs? • Which resources are most expensive for your production?	**REVENUE STREAMS** • What is the price of soybeans per kilo? • What other products apart from soybeans are you selling and at what price? • What is the method of payment?
MARKET INFORMATION & CHALLENGES • Which key market information do you get from partners • How do you get the market information? • What are the challenges in the marketing of soybeans to traders? • Do you sometimes collaborate with other firms to produce and deliver customer orders? • Which aspects of your business do you intend to change (machinery, equipment, processing, new products, marketing strategy, quality control, management system	**SUSTAINABILITY (3Ps)** • Who is mainly responsible for the project- ownership • How are the roles mainly divided? • Who is mainly responsible for the production and marketing activities • Do men and women have equal access to capital and resources like livestock inputs	**FINANCE** • Where do you go when you need money for your business? • Do you get credit from input suppliers or buyers? • What are the terms? • Do you get production financing from your buyers? What are the terms?

2.2 Checklist interview questions to traders /processors

1. Where are you buying the soybeans and its by-products?
2. Where are you selling the soybeans and its by-products?
3. What are the costs and level of profit gained in your buying and trading soybeans and its by-products?
4. Do you get the required quality of soybeans from smallholder farmers?
5. What quality attributes do you want from farmers to meet your market?
6. What are the challenges you encounter in soybeans trading?
7. What challenges do you think are facing the soybeans value chain most in the District?
8. What do you see as opportunities in improving soybeans value chain in the District?
9. What are your suggestions in general improvement of the soybeans value chain in the District?

2.3 Checklist interview questions to DAICO

1. What support and services do you provide to the soybeans smallholder farmers in the District?
2. What are support and services do you provide for improving the soybeans value chain in the District?
3. What do you think is the reason for soybeans market to collapse in your District?
4. What challenges do you encounter in supporting the soybeans subsector in the District?
5. What do you see as opportunities in the soybeans subsector?
6. What is your plan for improving the soybeans value chain in the District?

2.4 Checklist interview question to CARE International officers, WOPATA, CLINTON FOUNDATION

1. What support and services do you provide to the soybeans smallholder farmers in your programme?
2. Do you link farmers to the market? Which method do you use in case you link farmers to the market?
3. What do you think are the reason for soybeans market to collapse in your programme?
4. What challenges do you encounter in supporting the soybeans farmers in your programme?
5. What do you see as opportunities in the soybeans subsector?

ANNEXES

Annex 1: Interview with DAICO- IRINGA DC (Lucy Nigalu)

She explained to me and said, soybean has been introduced in the Iringa region recently and got popularity, it is a new crop in the region. It was introduced and promoted in the region through demonstration and trials. There are some few groups in the areas at Kitayawa where seeds were given out for trials and demo; we also demonstrated how to cook using soybean.

They work with Uyole Research Institute who brought soybean seeds. She said, in the district, they have made some efforts with other development partners to promote the crop to farmers. When Clinton foundation came, they introduced many demo plots and trials and linked farmers to the market. After that, there was no direct market for soybean thus why farmers were not putting it in much consideration. But currently, they partner with CARE International who made research for a market that links farmers to the market.

Therefore, we simply want to extend promotion of the crop. More so, enough training about the production of soybeans has been given to the farmers. The problem of soybeans production foreseen in the future is soybean seed, there are no enough soybean seeds, and there are unknown places to get improved soybean seeds. Soybean seeds are not available to the agro-input suppliers. Farmers are getting soybean seeds from the local market where its source is unknown. We also partner with SAGGOT who is developing agriculture production and soybean is amongst the list of crops. The programme starts from Dar es salaam to Rukwa along the southern highland corridor. Some crops which are within SAGGOT target are tomatoes, dairy production, soybean, potatoes, and tea. Why soybeans? It mainly used for animal feed making. Nowadays sardines are not preferring for making animal feed because they contain some bacteria which are the vector of diseases to the animals. Instead, soybeans replace the use of ''dagaa'' (small fish).

''*We have a partner known silverland, who is a sole producer of animal feed. He takes Soybeans from Zambia, and why Zambia? it's because production costs over there are cheaper than here that is why prefers there, he also takes soybeans from Songea from his farm and contracted with CARITAS, although we have tried to convince him to take our soybeans, he has not shown a positive response*.''

Therefore, it is a challenge for us to persuade farmers to produce and yet we are unsure of the market. We have a partner who before starting producing green beans he looked for a market to sell his products, he found the market and started producing, and he has been unable to feed the market yet. The other problem of soybeans is that, to our farmers is a crop for them which has no multiple uses like beans which you sell for commercial at the same time you can consume it, other partners we are partnering with are SAGGOT, unlike silverland who has been able to cooperate with us. As Govt. We took the initiative to look for the soybean market by discussing with silverland to consume farmers soybeans. The main challenges for soybean in Iringa are the absence of market and unavailability of improved seeds. We do not have political problems either environmental problem. We need improved seeds which will increase yields per unit area. Farmers harvest on average 500kg per acre. And we would prefer seeds which can raise up to 2.5tonnes to 3 per hectare. We plan to cooperate with partners to look for market and improved seeds. If these two challenges are solved, our farmers are willing to produce more. Soybeans are not a country crop priority, but this is not the case to justify the lack of soybean market.

There are opportunities to sell soybean in other regions like Morogoro, Arusha and Dar es Salaam; there is a team from CARE staffs and our officers who went for market survey.

Annex 2: Interview with Soybean Trader

My name is Lazaro Boniface Kufakunoga. Soybeans production started in our area since 2012, after that Mr. Richard brought soybeans from America for trials, we researched by making trials for 11 types of soybeans, I observed about nine types doing well, and about 80 percent of 5 types of soybeans performed well. Then, we distributed to farmers for more demonstration to test the quality of oil content. The types of soybeans which performed well and distributed were, safari, spike, semeke, samba, and Tuti.

These are seeds which are commonly used here and compatible with our land. These seeds are available to the farmers because we distributed to them, safari and spike have been used for five years, Semeke and samba are used in kilolo upper and lower. These seeds especially safari and spike have been used for more than five years. The types of seeds which performs well are safari, samba, and spike. Spike and safari did not perform well in Songea Madaba and mbinga; they use local variety which is performing well. Soya 1 and two didn't perform well. Uyole research institution did not want those seeds to spread because they want their seeds to spread out. In facts, Uyole 1 and two are not performing in the areas. Later they brought Semeke saying its Soya 2 and when tried here it performed, but it was the same as their seeds they use it. Safari and Samba, semeke and spike have shown positive response in our area.

I am a trader, farmer and a facilitator or local extension officer. I worked as a local extension staff for three years. I have groups which I am working with, I give training on soybean to farmers, I provide seeds to them, and I buy soybeans from them. I have been buying soybeans for three years now; I buy from farmer groups to make easy collection procedures, I work with seven groups.

I sell my soybean in the first year to Tanfeed, in the second year I sold to silverland and the third year I sold to G2L in makambako. I was able to buy up to 60 tonnes of soybeans to date. Farmers collect soybean in collection centers and I go there for collection.

Last year I bought 1000 tsh per kilo. The cost of transport per kilo is estimated as follows.

Transport cost from Ulete to Morogoro for example 100kg bag = 100,000 Tsh,

Transport cost per 100kg = Tsh 5,000/bag

Tax charged per 100kg = Tsh 4,000.

Cost of loading = Tsh 500 and

Cost of unloading = 500 tsh,

Packaging material = 600-700 Tsh per empty bag.

The selling price ranges between Tsh 1300-1500 per kilo.

''I don't have any contract with buyers for my soybeans. It happens that you find the market somewhere and they tell you how much of soybeans they require, then I supply. Nevertheless, I have an informal contract with farmers and I do that because I want to maintain trust with them''.

The quality of soybeans I need from farmers the ones which are free from dust, well matured and disease free. There are some challenges in quality management. Sometimes farmers are not faithful by putting sand in the soybean bags to increase volume.

Other challenges we get is multiple payments of the levy. Other challenges are just minor. In the first year, Tanfeed wanted a bulk of soybeans which I could not manage to supply. Other challenge with silverland was a huge demand of tonnage of soybeans with low price which farmers could not manage to afford. But silverland buys soybean from Malawi by Tsh 600, and now he does not buy not soybeans from Iringa. Today , G2L and Silverland are no longer buying soybeans from our farmers.

To have and explore opportunities to improve soybean market,

- Traders need to cooperate and be togethe. We have to speak the same language unfortunately traders are working separately without association, for example farmers from Iringa and songea if use the market we have and if we can convince them, if we process in group we can make changes, because we can direct get soybean oil, soybean cake for animal feed, we can even get other products like milk.
- The processing machines are simple to operate because last three months I attended a training in mafinga on how to process soybean, the machine was brought by whites from America, we sent soybeans for test and saw how it worked. The machine has a slit difference compared to sunflower machine. It is possible to train people to operate it.
- Our groups are not registered, and mmbersare not less than 300 farmers. On average a farmer harvests 700 kg per acre.
- A farmer can cultivate up to 2 acres of soybeans. If given the opportunity to advice whoever like to assist us, we need to get facilitation of machines and infrastructure, and training so that we can move from this step to another step. We have enough land for soybeans production and getting seeds, which produce enough oil is no big problem.

''To be honest, there is totally no market of soybeans to date, the market has fallen''. But surprisingly, the rate of malnutrition in Iringa is high yet people are not willing to use cheap source of protein from soybeans. Other traders who were buying soybeans from Iringa were G2L and CLINTON Foundation who are currently no longer buying soybeans.

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Annex 3: Interview with WOPATA Officer

My name is Habibu Masanja working with WOPATA cooperating with CARE International. We are directly working with farmers and implementers of all field works; we partner with CARE in the field of markets. Our main functions in the village are promoting about soybeans production because it's a new crop, we form groups and another already existing group we strengthen them and influence farmers to join new groups for those who did not have a group before. We also run Farmer Field Business School (FFBS) at this school farmers are selected from each five group only one farmer is selected. In farmers day each group is nominating five members to attend FFBS. The difference between FFS and FFSB is that in FFS only technical know-how is being taught and every member of the village is invited to attend but in FFBS few people are selected from 5 groups, and each group nominates only one member, but during FFSB day each group selects 5 participants which in total makes 25 members. You cannot accommodate all members of the group; it is not easy to manage a total of 150 members. These five members of FFBS are taught, and they go to spread education. In FFBS we have five farmers day, farm selection, planting, weeding, scouting, and harvesting. In farmers day we have Paraprofessional (in each FFBS we have one member from the particular village, must come from that village whereby he knows about that society), Village Agric. Extension officer (from the government, she/he knows many things in that village) and wopata extension officer, all of them, are responsible during FFSB day. It is called business school because many trainings is given for example soybean production, marketing, processing, and gender issues. WOPATA is the main facilitator of the farmers financed by CARE International.

We have a market problem of soybeans in Iringa. I started working with SOYA NI PESA Project funded by Americans. Some of the areas which are producing

From 2016 to 2017 there was a bumper harvest of soybeans in Mbeya, Njombe, Songea, and Morogoro. Due to the availability of soybeans in the market, the price of soybean dropped in 2015/16 from 1300 tsh to 600 tsh/kilo in 2016/2017 because of a bumper harvest. Why? First, there

was the importation of soybeans from Malawi and Zambia; many traders imported soybeans from there. The third reason was the economy instability of the country, many traders used to take loans for doing business but at the moment, many banks had shaken and their ability to disburse loans dropped and bank sector was not health, many traders failed to access loans and their business dependent much on loans thus why many traders failed to buy enough soybeans especially Tanzanian traders. Therefore, due to that, many soybeans from farmers were not bought and in stabilizing the soybean market. Clinton foundation, on the other hand, was also collecting and buying soybeans from smallholder farmers and sold to the same traders who underwent financial crisis but failed to sell it and accumulated it in the warehouse.

Iringa, we have big processor known silverland, is a big industry, he imports soybeans from Malawi and Zambia, the government pushes to buy Tanzanian soybeans, but he has enough stock of soybeans and does not buy soybean from smallholder farmers, he can't manage to buy from them because of small quantities they produce, he wants to collect a bulk of tonnes where he can pick and put in his warehouse for consumption, so the problem with Iringa is low productivity of soybeans. Production from our farmers is very low, so big traders are not willing to bring their truck to collect a small quantity of soybeans. If we produce enough and invite traders, we will get the market. The problem in Iringa is low productivity, maximum production for our farmer is 2000kg/ha compared to our fellow Zambians where production is about 4000kg/ha, other problems are leaching (because Iringa receives lots of rainfall which affects the land), soil erosion, acidity. They are the major reason, the rate of leaching is high, soil infertility. The land cannot support good productivity. There is also a problem of seeds. Only Uyole no.1 and two are certified and released. The major varieties which are used now are; semeke, spike and safari are commonly used by farmers are not yet certified but have higher yields compared to Uyole1 and 2. we are not allowed to import soybeans seeds from Zambia because of policy issues, so the certified seeds have no good yields compared to other, farmers are now not using their farms to produce soybeans, only 3 acres has been proven to the highest farm used for soybean production. So, farmers are somewhat reluctant to fully engage in production because of those reasons, more so they want to realize market even before they start producing.

We have tried to link farmers to soybean buyers. First, we identify traders who can buy soybeans from our farmers then we lobby them, after they agree, we go to the farmers and tell them trader so and and so is willing to buy a certain amount of soybeans.

Annex 4: Interview with Tanfeed Manager

We are processing, and supply animal feeds in Morogoro, Coast region and Dar es Salaam. We get soybeans from Morogoro, Mbeya, Iringa, Njombe, and Songea. We buy soybeans based on the market price of the particular time; we don't have a fixed amount of price that we offer for soybeans. Our final products are. First, animal feeds (rabbit, fishmeal, pigs, dogs, cow sheep, and poultry) we produce poultry feeds for broiler, layers and Saso. Only these foods are available by order. Soybean is a big ingredient replaced by small fish which seem rejected by customers; they claim animal feed which mixed with small fish produce a certain smell which affects the meat. Therefore soybeans take about 15% of the ingredients we use in feed formulation. Second, we produce Soybean cake, soybeans meal, soybeans oil. We get enough soybeans from farmers, we previously used to follow soybeans from farmers, but we stopped due to many risks involved in the transporting like traffic disturbances, accidents etc instead we receive soybeans at our factory from farmers. If they bring their soybeans, we pay them according to the market price. We don't have contracts with farmers because it is a risk to the company.

The quality which the company requires from farmers are, matured soybeans, cleanness, out of diseases should be out of stones and dust.

Interview with Tanfeed Manager

Annex 5: Interview with Clinton Foundation

The organization started in 2014 in Iringa especially in kilolo district, but production started in 2015. They support farmers through groups. Their main function or service they provide to farmers are;

1. Training (agronomic practices)

    - They give training using demo plot of about 0.5 acre and soybeans as a rotated crop with maize (where all costs are incurred by Clinton foundation), they give loans for inputs to farmers

    - They help farmers sell their produce through the collective market

2. They link farmers to inputs.

3. They link farmers to the market.

They encountered some challenges during implementation.

1. The crop was new to farmers

2. Productivity per unit area is very low

- Farmer produce between 100kg-300kg per acre, but practically production should be between 400kg -1000kg/acre.

Why there is low productivity?

- Education about the crop was very low;
- There is a problem of soil (soil acidity) where soil PH is less than 5.5,
- There is leaching in the place because there are lots of rainfall

- There is an unavailability of improved seeds (no seeds are available at suppliers).

3. The market of soybeans has been discouraged by a price which has decreased over time while production costs are still the same. For example, the price of soybeans per kilo in 2015 was 900 tsh, 2016 price was 1000-1200 tsh, 2017 price was 659 tsh.

Clinton foundation link farmers to the market through the collective market. The reasons behind for market problem are;

- In 2017 there was a bumper harvest of soybeans in the regions of Morogoro, Mbeya, songea, njombe, and Iringa.
- Importation of soybeans from Malawi and Zambia.
- Traders are not interested in raw soybeans instead many traders are interested in soybean cake.

Way forward that Clinton foundation can improve the problem.

- Through demo plots soil has improved by using agricultural lime (chokaa mazao). More than 100 tons of lime have been ordered by farmers to cure the soil. By so doing, production has increased from 400-1000kg by using local seeds (samba, safari, and spike)
- Collective market mobilization.
- We are in the processing of making sure that farmers are adding value through processing.
- Giving more training on the use of pesticides and other agronomic practices.

Opportunities which can improve the soybean market are;

1. Improving soil acidity through demos and later to individual farmers
2. Individual farmers to multiply seeds through QDS (Quality Declared Seed)

Annex 6: Interview with Agricultural Seed Agency officer (ASA)

This is government agency for seed multiplication and distribution within the country. They stopped producing seeds a long time ago because of accumulation of soybean in the warehouse for a couple of years. The reason was simply that; farmers stopped buying them for a long time.

Annex 7: Interview with a Researcher from Agricultural Research Institute- Uyole

ARI -Uyole is an agricultural research institute located in the southern highland zone in Mbeya region. The research institute is based at Uyole. We cooperate with seed companies like Agri-seed, ASA.

Their core functions are;

1. To research on good seeds. 2. Giving an agronomic package of soybeans and 3. Giving promotions through field days

-They produce Soya 1,2,3 and 4 varieties.

- The most varieties preferred by farmers are Soya 2 and 4. Soya 2 is short (early maturity) while soya 4 is long which takes a long time for maturity and requires enough rain. For the areas where there are enough rains Soya 4 is doing well and has more yields.

-Productivity per unit area for Soya 2 is up to 3 tonnes per hectare.

- Soya 4 yields up to 4 tonnes per hectare which is potential but not yet tested at farmer level. Its maturity goes from 4 to six months. Farmers prefer its color of milky.

- Farmers cannot reach that 4 tonnes per hectare because of plant population is still a big problem for farmers.

- They can't manage, it's very tedious for farmers to maintain because the seed size is very small. So, farmers never reach required/desired yields because of two things which are very crucial

1. Spacing or plant population which is maintained by farmers and

2. Low application of fertilizer, by thinking that because soybeans can fix nitrogen, therefore, they cannot use fertilizers. But also, farmers are making mistakes in planting Soya for example if you plant late Soya 4 they will occur flower abortion. Managerial practices are also a problem for farmers. Areas with short rains or dry, Soya 4 faces a challenge.

We now use quality declared seeds to make the easy reach of our seeds to farmers. Self-pollinated crops have challenges to companies producing seeds because farmers can multiply and use them more than once, so companies are shirning away from producing soybeans seeds because of that, farmers do not repetitively buy seeds from companies. Our weakness is promoting seeds; promotion is still very low

Challenges they face in supporting soybean value chain

- Ustable price that fluctuates every year/time leading to the low adoption of approved technologies.
- Instability of soybean price over every year.
- Lack of investors in the processing industry that could add the value of the crop.
- Low consumption rate by the communities.
- Inaccessibility of quality seeds by farmers because of meager investment by seed companies and other actors.
- Uncoordinated markets

Opportunities to improve soybean value chain in Iringa

1. Iringa is well connected to Dodoma and Morogoro roads which is easy to transport soybean
2. There is a big demand of cooking oils in the country whereby, processing of soybeans can bridge the gap.
3. There is a growth of poultry industries therefore there is a huge demand of animal feeds. Soy cakes as an ingredient in the feed formulation is needed.
4. There is a potential land for soybean production in Iringa district

Annex 8: Interview with SAGCOT Officer

The Southern Agricultural Growth Corridor of Tanzania (SAGCOT), is a public-private partnership that seeks to catalyze responsible agribusiness investments in the country's southern corridor. The SAGCOT Centre Ltd serves as a partnership broker and information hub among SAGCOT partners to facilitate socially inclusive and environmentally sustainable value chain investments. Each year, several strategic partnerships emerge that SAGCOT actively promotes and facilitates due to their high. There is significant potential to expand the production of soya for animal feed and oil in Tanzania. The majority of the demand for animal feed protein is currently being met by imports and dagaa fish. Despite the Government of Tanzania having identified soya production as a key priority for the country's agricultural development, presently, domestic production of soybeans remains limited. The Southern Highlands region is home to the majority of the country's soya cultivation, with Ludewa Cluster (Songea) taking the lead and the impact and potential for expansion

Ihemi Cluster as a particular focus for smallholder production. Smallholder yields are often low, however, due to acidic soil, minimal use of fertilizers, limited availability of quality seeds and poor crop management.

SAGCOT is working with a range of partners, led by the Clinton Development Initiative and it's Anchor Farm project to build an interlinked value chain in maize, soya and animal feed. The Soya Value Chain will develop linkages along the value chain and tackle some of the obstacles to the growth of the sector, such as seed availability, regulation, and production methods. Key Stakeholders in the Soya Partnership are Clinton Development Initiative, SeedCo, Silverlands, TOSCI, ARI-Uyole, IITA, TRA, MAFC, CARE International, Caritas, CRS, Tanfeed ltd, TAFMA (Tanzania Animal feeds manufacturers Association), Farmers Association, NADO.

Core functions of SAGCOT

1. Convening (they bring partners together)
2. To coordinate stakeholders
3. Commission studies
4. To identify investment opportunities
5. Crowding in investors in the corridor
6. Information sharing and networking

The Value chain which SAGCOT is working with are Soybeans, Tea, Tomato, Diary, and Potato.

Challenges facing soybeans value chain in Iringa region

1. Shortage of improved seeds of soybeans as a result farmer use stored seeds from the previous harvest causing low production.
2. Shortage of agricultural inputs like planters and processing machines which are not available in the country.
3. Shortage of postharvest facilities especially during harvesting has caused postharvest losses of soybeans.
4. Poor coordination between actors in the value chain with a financial institution has discouraged availability of financial services to the growth of soybeans subsector.
5. The weakness of farmers organization in the value chain, there is no formal farmer groups and cooperatives like other legumes farmer association.
6. Shortage of the soybean market.
7. Shortage of correct data of modern soybean farming.
8. Poor use of fertilizers, vaccines, and important pesticides in the growth of soybean crop.
9. Shortage of education on the importance of soybean at the family level.
10. Shortage of resources and lack of education on value addition or processing of soybean crop.

Annex 9 : Interview with Malagosi (Focus Group Discussion)

There were 7 members who were interviewed. Males were 2 and Females were 5. They have 3 years in the production of soybeans. Their group is called Vicoba Malagosi group. They work with Clinton foundation and WOPATA. They have been working with that institution in soybeans production for

one year after that CF did no go on working with us with soybeans production. We were about 60 members. Clinton foundation was giving us seeds which we were supposed to return after harvest. One acre can take up to ……kg of soybeans. CF gave us training for soybeans production. We get training in markets, gender, business plan, production of compost. Education on processing will follow later. The buyer of soybeans is currently unknown. We have a problem of soybeans market which is attributed by,

1. Low productivity
2. Shortage of soybeans buyers
3. Shortage of education on nutrition at the family level
4. Lack of soybean market information

We have different challenges on soybean production.

1. The acidity of soil hinders the production of soybeans
2. There is no clear buyer of soybeans.
3. Insufficient education of soybean crop and market.
4. There is a shortage of improved seeds.
5. There is a problem of pesticides like rabbits, goats, ducks, and chicken.
6. Malnutrition.
7. There are no inputs in the village like fertilizers, pesticides.
8. Planting and harvesting soybean is tedious work.
9. There are no inputs like planters and harvesting machines which are very expensive. Our income is a challenge to the production of soybean. *''Production costs of soybeans are not so high if you hire people during planting, costs are high, but if we get machines (planter) costs will be meager''*. *''We are very much interested with soybean planters, if we get someone to loan us as a group at least two machines, we use to our farms and extend services to other people.''*
10. We have no contract farming. *''When a buyer comes we would like to have contract farming, this would be very effective to us*, *If he comes and place order of tons of soybeans before we produce it will be easy for us to mobilize each other and maintain the required number of tonnes, and if we fail to meet that requirement we can take responsibilities on the other hand''.*

Opportunities on soybean market.

1. We are ready to produce soybean if markets are open.
2. There is enough land for cultivation.
3. There is a favourable condition for soybean production.
4. There is a possibility of doing a soil test for diagnosis of soil health.
5. Education is still needed because there is malnutrition, therefore if the crop is promoted, can be sold by using the internal market.
6. There is enough rainfall to support soybeans production.

7. There is room to process soybeans if farmers are well organized.
8. Use of agricultural lime to combat the problem of acidity.
9. Availability of good road networks.

Picture of farmers in the FGD

Annex 10: Interview with Silverland officer (processor)

They started in 2013. They produce animal feeds processing for broiler and layers. We have poultry division (Ihemi poultry feeds at makota farm). We produce animal feeds and chicks for layers, broiler, and so, we have a training center. We have an agricultural division where we produce maize, barley for beer, soya for feed meal, potato, avocado, and Canora.

We also produce soybean and buy from other sources like in Songea, and currently we have a stock of 6000 tons, therefore, we no more need soybeans at present. We buy soybean cake (Solvent Extracted Soybean Seed) from Zambia- Mount Meru. We need some quality soybeans with no dust, well dried with a moisture content of 13.

Challenges they face;

1. Getting soybeans with poor quality but does not occur frequently. Soybeans in animal feed are required in small quantity as compared to maize and other ingredients.
2. Availability of few soybean plants to process soybean oil.

Annex 11: Interview with Input Supplier

The owner of the shop provides services by selling animal feeds for poultry, pigs and other small ruminants.

- They purchase soybean by product (soy cake, full fat and solvent extracted soybean) from Dar es Salaam.

- There are no Soybean by products from within Iringa
- If small processing industries producing soybean by products are being installed in Iringa, I will stop purchasing from Dar es Salaam.
- There is transition period from using fish meal like small fish (dagaa) to soy cakes.
- I don't sell soybean seeds.

Challenges facing

- Purchasing of soy cakes from Dar e Salaam which is far from Iringa.
- There is no awareness of using soy cakes instead of small fish (''dagaa'')
- High cost of transactions
-

Annex 12: Interview with CARE International

- They launched the project ''Kukua ni Kujifunza'' KNK Growing is Learning in 2017. The KNK project is supporting women farmers to improve their crop yields, learn how to improve their family's nutrition and increase their income from new markets of Soy.

- They work with co partner called WOPATA , other partners they work with are Clinton foundation, ARI Uyole, Proccessors of animal feed

- They give srevices to about 15 villages in Iringa District Council

Services they support
What Is CARE's role through KNK project

1. CARE support women farmers to increase their farming productivity, income and their family's nutrition through Farmer Field Business Schools
2. Farmer will learn new skills to improve their existing crop yield such as organic fertilizer production and seed multiplication
3. The project will support women farmers to enter the profitable Soy market by training them in production and supporting women to link into the local markets to sell their supply and earn an income. Soy is a highly suitable crop for the region due to its nutritious benefits, resilience and soil enhancing qualities. Household nutrition will also be improved through awareness session and cooking demonstrations, the project will encourage farmers to grow Soy alongside maize as they grow together.
4. The project will teach farers about climate resilient techniques, organic fertilizer production and see multiplication
5. CARE will train women farmers in soy production, connect them with input suppliers and help them access finance through saving groups and banks

6. All the above will be done by CARE through two CSO as core implementing partners namely TAGRODE and WOPATA.

Challenges facing CARE International in implementing the project

- Gender imbalance in value in the chain
- Gender vulnerability in climate change where women are sufferers
- Dissemination of weather information is not suitable for farmers
- Lack of awareness of using soybeans as nutrition at the family level
- Lack of soybean market
- Lack of mechanization in soybean production

Iniative taken by CARE International to help farmers get market of soybeans

-conducting tours in different towns and cities to look for market opportunities

- to link farmers to the market

Annex 13: Photos of researcher interviewing


KRISTO
DAIMA
LEO
Wilson