

## **Enhancing cassava firm - farm relationships in Rwanda**

### **The Case of ‘Kinazi Cassava Plant’ and ‘Mbakungahaze Cassava Farmers Cooperative’**

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**A Research Project Submitted to Larenstein University of Applied  
Sciences in Partial Fulfilment of the Requirements for the Degree of  
Master of Development, Specialization of “Rural Development and  
Food Security”**

**By**

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## **DEDICATION**

This thesis is dedicated to my wife Assumpta Yamuragiye and my daughter Abera Laura Alleluia whom I deprived a family paternally presence.

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## ACRONYMS

APF	: Agro Pro Focus
BRD	: Banque Rwandaise de Développement
CDI	: Centre for Development and innovation
CIP	: Crop Intensification Program
CMD	: Cassava mosaic diseases
CRECAM	: Mutual Aids Funds for Agriculturalists and Pastoralists
DRC	: Democratic Republic of Congo
EDPRS	: Economic Development and Poverty Reduction strategy
ENA	: Enquête National Agricole
FAO	: Food and Agriculture Organisation
FGD	: Focus group Discussion
GDP	: Growth Development Product
GoR	: Government of Rwanda
IFAD	: International Fund for Agricultural Development
IITA	: International Institute of Tropical Agriculture
INGABO	: Ishyirahamwe Nyarwanda Rigira Abahinzi-Borozi Inama
ISAR	: Institut des Sciences Agronomiques du Rwanda
ISO	: International Standards Organisation
NISR	: National Institute of Statistics of Rwanda
MINAGRI	: Ministry of Agriculture
MINECOFIN	: Ministry of Economic Planning and Finance
PSTA 2	: Plan stratégique pour la transformation de l'agriculture II
RADA	: Rwanda Agricultural Development Authority
RCA	: Rwanda Cooperative Agency
RBS	: Rwanda Bureau of Standards
SNV	: Stichting Nederlandse Vrijwilligers (Foundation of Netherlands Volunteers)
UNDP	: United Nations Development Program
UNIDO	: United Nations Industrial Development Organisation
USAID	: United States Agency for International Development
WUR	: Wageningen University and Research Centre

## ABSTRACT

Cassava is one of six main crops of special consideration in Rwanda. Cassava is grown on around 10% of all of the farms of Rwanda and is a major source of carbohydrates to 11 % of the Rwandan population. Cassava plays a double role first as source of food, hence it is a key food to fighting hunger, and secondly a source of income, not only for farmers, but also for business people who are interested in investing in it. The processing of cassava in modern ways is an opportunity that investors have started to promote in Rwanda.

The objective of this study entitled, *Enhancing Cassava Firm Farm Relationships between 'Kinazi Cassava Plant' and 'Mbakungahaze Cassava Farmers' Cooperative in Rwanda*, is to contribute to the promotion of cassava by investigating the relationships between farmers grouped into cooperatives and 'Kinazi Cassava Plant' in order to increase the production and processing of this crop. Low collaboration between the buyer (Kinazi Cassava Plant) and the producers, the farmers, mostly represented by the cooperatives is the rationale at the heart of this study. The Ruhango district located in the Southern Province of Rwanda has been selected to host this study because Ruhango is the major producer of cassava and hosts a modern cassava processing plant.

To achieve the above stated objective, the researcher used the 2-2 tango methodology. The 2-2 tango is consistent in generating and analyzing data as it uses a survey as a strategy and three specific tools: the interview, the questionnaire and the focus group discussion.

The interview was used to gather information to help develop a business case description, the questionnaire which helped to get quantitative data and the focus group which contributed to getting the views from both farmers and the company on the issues of their stake and a desk study was used to provide second hand information related to the relationships between producer and buyer. The collected data were processed and analysed by using excel workbook and value chain.

The results were obtained in consecutive system. The above mentioned business case description revealed the following eight challenge areas: production and productivity, functioning of 'Mbakungahaze Cassava Farmers' Cooperative, functioning of 'Kinazi Cassava Plant', markets and prices, cost and benefits of farming agreements, communication, stakeholders network and collaboration and the perspectives. The development of these challenge areas was endorsed by scores of both famers of the 'Mbakungahaze Cassava Farmers' Cooperative and employees of Kinazi Cassava Plant. The results from scoring phase were once again presented to both sides of the business to be discussed. The discussion showed how each side can work to improve the relationships, hence the benefits from cassava business.

The conclusion is that the production and processing output should increase by the improvement of relationships between the partners of the business. While accessibility to means of production is major issues for farmers, access to sufficient raw materials is necessary for the processing company. This requires addressing production and processing constraints.

In regard of improving relationships between Mbakungahaze Cassava farmers' cooperative and Kinazi Cassava Plant the study proposed recommendations to the cooperative, the processing plant and the Agri-Hub. The recommendations include knowing and respecting their roles as important means for their relationships, recognizing the importance of contracts and making the advocacy. The study recommended also trainings to farmers and staff of the processing plant and the Agri-Hub Rwanda shall steak on good relationships with other stakeholders to enhance and facilitate the relationships.

## **1. INTRODUCTION**

### **1.1 Organisation of the thesis**

This research report is made up of six sections. It starts with chapter one which is an introduction to this thesis. The same chapter covers the background, problem statement, justification of the study, research objective, research questions, limitation of the study and definition of key concepts. The second chapter is concerned with literature review, a compilation of relevant information that is important for supporting data collected from the field. The third chapter is the methodology. The fourth chapter is the presentation of research results while the fifth is the analysis and discussion of results. This report ends up with the sixth chapter which is the conclusion and recommendations to various instances.

### **1.2. Background information**

Rwanda is a landlocked country located in central Africa. Rwanda is also described as an East African country because it has developed an economical partnership with the East African countries. The size of Rwanda is 26,338 Km<sup>2</sup>; the free land extends on 24,948km<sup>2</sup> while the water covers 1,390 km<sup>2</sup>. Rwanda is bordered by Uganda in the North, Tanzania in the East, Burundi in the South and Democratic Republic of Congo in West. Physically, Rwanda is known as a country of high mountains which decline from 4519m to 950m in Northwest to Eastern. This attributes to Rwanda the Tropical mountainous climate. The population is estimated at 11 million people; the density is about 370 persons per Km<sup>2</sup>. The Growth rate is 2.8% per year and the population is expected to rise to about 12 million by 2015(NISR, 2009). The Rwandan GDP per capita is USD 520 and over 65% of the population lives on less than one USD per day. Rwanda ranks among the poorest countries of the world (UNDP, 2009).

National economy relies heavily on agriculture employing 87%of the population and accounts for 80% of all exports (MINAGRI, 2009). The agriculture makes up 41%of GDP. More than 75%of the population is engaged in subsistence agriculture. As reported by MINAGRI (2007), Rwandan agriculture depends much on climatic conditions and faces mainly the following constraints: Subsistence farming, weak connection to the market, poor productivity, over exploitation and erosion of the soils and poor performance of agricultural services.

However, with the EDPRS (Economic Development and Poverty Reduction strategy), the GoR decided to develop the agricultural sector. This is the reason why 10% of the total budget is allocated to the agriculture sector i.e. 67 billion (MINECOFIN 2011/2012). The major part of the budget will be spent on increasing potential in the sector through promoting

exports and facilitating farmers' access to markets (MINECOFIN 2012). And also various policies have been developed to enhance the situation, among them are:

- The prospective long term vision 2020 for Rwanda
- The national Poverty Reduction Strategy and its successors , the Economic Development and Poverty Strategy both adopted by all development partners
- The National Investment Strategy.
- Sector policies and strategies covering different priority areas(MINAGRI,2009)

Started in September 2007, the Crop intensification program (CIP); an agricultural development program with main goal of increasing agricultural production and productivity in high potential food crops to ensure national food security for all (MINAGRI, 2007). It focuses on six crops of priority namely maize, wheat, rice, Irish potato, beans and cassava. Under this program, the farmers synchronize the cultivation of crops in lands that are consolidated and rearranged to form larger and more rational holdings. Farm inputs such as improved seeds and fertilizers were imported and distributed to farmers through public-private partnerships, and extension services on the use of inputs and improved cultivation practices are rendered to farmers by Ministry of Agriculture. As a result, the crop productivity has increased in the following ways for the last four years. The production of maize and wheat has increased by 6-fold, and that of Irish potato and cassava has tripled. The production of rice and beans has increased by 30%. Through sheer efficiency, the program was able to deliver the expected change in production levels (Kalisoni, 2007).

Cassava as one of the six crops of priority has a special concern in Rwanda. Cassava was first introduced in Rwanda in 1930 by Belgians (UNDP and FAO, 1992). Since then, it has spread in different agro-ecology zones of Rwanda. It is a staple food crop and ranked the 3rd source of income after bananas and potato. It is the main source of calorie for 11% of the population (UNDP/FAO, 1992). The estimations of MINAGRI (2005) showed that cassava was cultivated on 134,386ha and the total production was 1,004,878 tones.

Cassava is generally produced by different categories of farmers including individual farmers, associations and cooperatives of farmers. According to ENA (2008), cassava producers take 42% of the total farmers who holds 700,000 cassava farms. Farmers are classified into three categories according to the size of their farms, small holders whose the size of their farms is below 0.5ha, which takes 57% of the total farms, intermediate holders whose the farm size is between 0.5 and 1.5hectares, which takes 30% of the total farms; and large producers whose the farm size is above 1.5 hectares, which takes 13% of the total farms. In general cassava takes around 200,000 ha i.e. around 10% of the total arable land of Rwanda (ENA, 2008).

In the continuation of supporting and promoting agriculture, the government of Rwanda through the Ministry of industry and commerce and other partners, the post-harvest handling facilities have been introduced. It is in the sense that on the already available markets, the new processing units have opened and still starting new business in cassava. Among them is the Kinazi cassava plant which has a milling capacity of 144 tons per day. It is located in Ruhango district, Southern Province. It is quite good to recall that this province provides 42% of the total production. The processing of cassava follows three major destinations i.e. home processing, small scale processing and modern processing. So some organisations including the Agri-Hub Rwanda have launched the program of supporting the entrepreneurship for farmers and firms involved in agriculture sector in Rwanda.

### **1.3 Problem Statement**

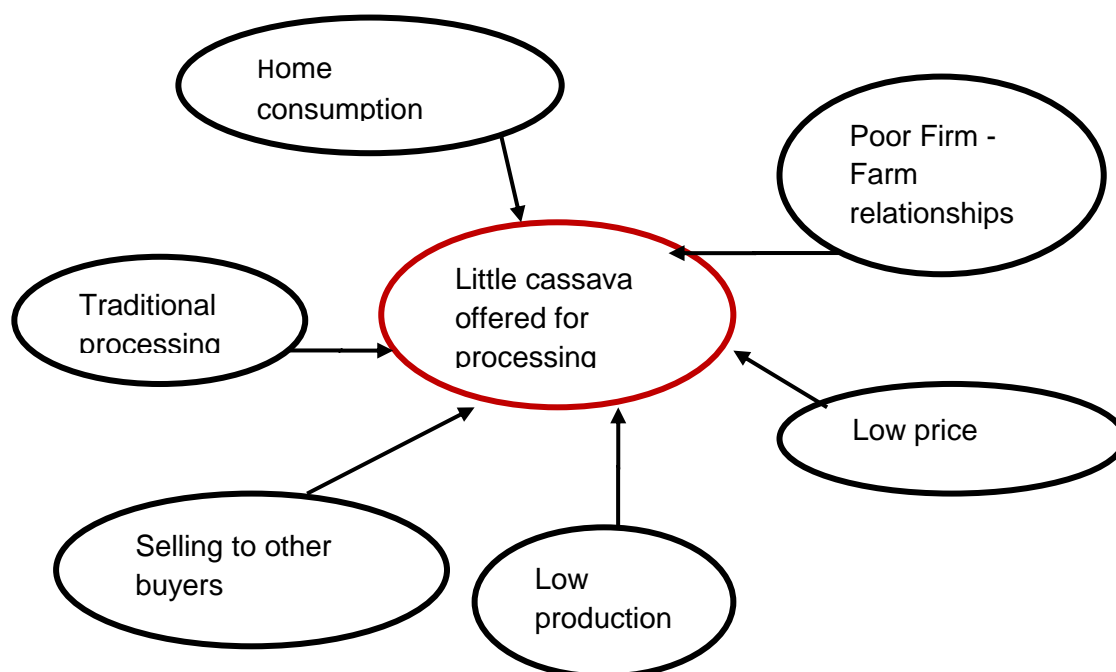
Kinazi Cassava Plant has opened on 16<sup>th</sup> April 2012 with a capacity of processing 144 tons of fresh cassava into 48 tons of flour per day. Actually only an average of 15 tons of flour is produced daily. Even if farmers produce a lot of cassava, very little is supplied to Kinazi Cassava Plant because of unfavourable relationships are prevailing between the producers and the processor. The price offered for fresh cassava and the way it is fixed are the main concerns of weak relationships.

The production of cassava has been increasing generally in Rwanda starting from 2007. The increasing has been boosted by different programs such as land consolidation that started in 2007, availability of new cassava varieties that started in 2006, post-harvest handling and storage among others started by the government of Rwanda. The district of Ruhango in southern province is the major producer throughout the country. Almost 10 000 hectares are cropped with cassava which can give around 57783 tons per year (Ruhango, 2011). This yields has interested BRD as in investor and decided to open a processing company in order to add value to the farmers produce. Kinazi Cassava plant intended also to buy the production from the neighboring sectors such as Muhanga, Kamonyi, Nyanza and Huye.

The relationships between the Mbakungahaze cassava farmers cooperative and Kinazi Cassava Plant are mainly based on the communication, the price and the quantity that one side can give or pour from the business of cassava. While Kinazi Cassava Plant continue to process at very low rate compared to its high capacity, farmers are unmotivated to supply their cassava to the processing plant because of they are not interested with the price. They sell most of their fresh cassava to other buyers who mostly buy dry cassava and offer good price. Another destination of an important portion of cassava is the home consumption as it was mentioned that around 85% of the total production of cassava in Rwanda is consumed by producers (NISR, 2011)). However the processing plant accepts to buy fresh cassava

regardless their quality and other impurities, and collect it from the farm while the farmers want to negotiate the price as well as they claim to sell their production through the cooperatives and take it themselves to the processing company.

The Agri-Hub Rwanda, a member of APF has an orientation of supporting the relationships between the producers and the buyers in order to enhance the farmers' market access and improve the quality of agricultural products including the ones for cassava. Among the participating organisations of Agri-Hub are the producers, processors, buyers, inputs suppliers, finance institutions and rural development service providers (Agri-Hub, 2012). With the intention of understanding the relationships between Kinazi Cassava Plant and farmers, it was availed necessary to Agri-Hub to carry out an assessment on firm farm relationships in cassava crop with the aim of reversing the trends. The following figure is the visualization of the problem.



**Figure 1: Problem visualisation**  
**1.4. Justification of the Study**

The firm – farm relationships is based on linking farmers to market. In Rwanda, a high percentage of the population is involved in farming as a way earning their livelihood. It is then worthy to enhance the linkage of farmers as a way of covering their transaction costs and protecting them from low price paid by middleman (KIT, 2010).

This research will be helpful to farmers where they will produce for market as well for firms due to the insurance of source of raw materials as a result of firm-farmer relationship improvement.

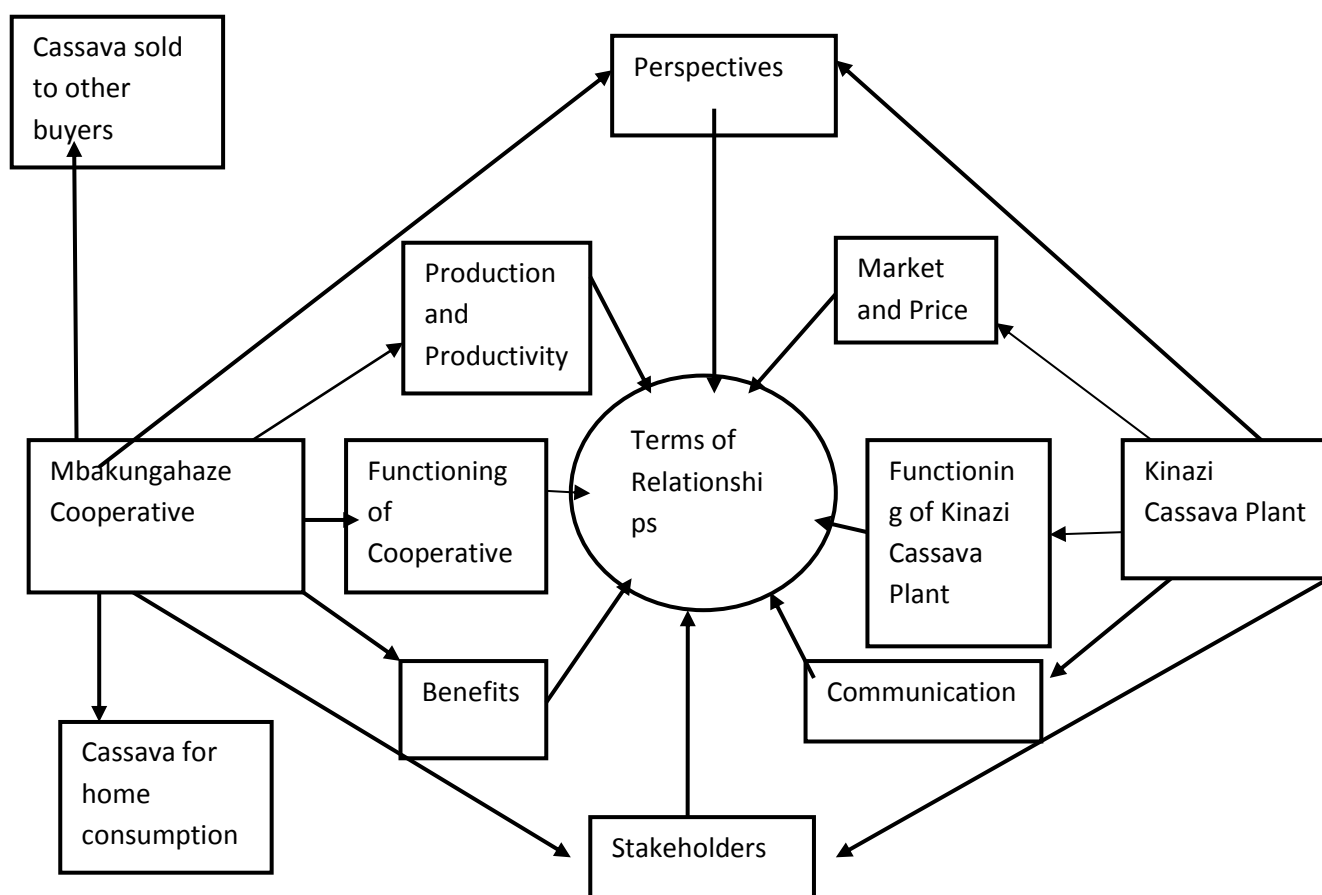
The study will also contribute to the development of two tango tools as well as it can give inputs for further research. The two to tango tools is a self-assessment used for farmers and

buyers; it follows three steps (interview, survey and debriefing meeting) and helps to get information on the performance of actors in their relationships.

This research will also use the theories of firm farm relationships applied in other areas as a way of facilitating the involvement of rural farmers in their integration to the processing and markets.

### 1.5 Conceptual Framework

The relationships between firm and farms are tied up by the agreements which facilitate the firms to get the materials from the farmers. The firms address themselves to the farmers by their way they function, the price they offer and the communication they use to address the farmers. Farmers respond through the way their organizations functions and by the quantity and quality of their production as well as the benefits they expect from the firms. However both firms and farmers have a perspective towards which their relationships are directed. Moreover the relationships can mostly be influenced by other stakeholders. The figure 2.shows the elements around which the relationships between Mbakungahaze cassava farmers' cooperative and Kinanzi Cassava Plant evolve.



**Figure 2: Conceptual framework in cassava firm farm relationships**



The type of relationships and trust between Mbakungahaze cassava farmers cooperative and 'Kinazi Cassava Plant' are the central element to move the business. Kinazi Cassava Plant fixes the price for fresh cassava and communicates it to the farmers. Farmers can request the agronomist of Kinazi Cassava Plant to come to buy their fresh cassava. If they agree the harvesting is done and cassava taken to the processing plant by the agronomist of the company. Furthermore the farmers produce has two other important destinations: Home consumption take a major part of it while selling to other buyers mostly after traditional processing takes another portion.

## **1.6 Research objective**

The objective of this study is "To contribute to the promotion of cassava by investigating the relationships between the 'Mbakungahaze cassava farmers' cooperative' of Ruhango district and Kinazi Cassava Plant in order to increase the production and the processing".

## **1.7. Research Questions**

### **1.7.1 Main question**

What factors influence the relationships between 'Mbakungahaze Cassava Farmers' Cooperative and 'Kinazi Cassava Plant' of the district of Ruhango?

Based on the dimensions of firm farm relationships the following sub-questions are formulated.

### **1.7.2 Research sub questions:**

1. What is the current situation of relationships between 'Mbakungahaze Cassava Farmers Cooperative' and Kinazi Cassava Plant in production and productivity of cassava?
2. What are the constraints in the functioning of 'Mbakungahaze Cassava Farmers' Cooperative'?
3. What are the effects of the functioning of Kinazi Cassava Plant?
4. What is the influence of the price of fresh cassava on the relationships between 'Mbakungahaze Cassava Farmers Cooperative' and 'Kinazi Cassava Plant'?
5. What farming agreements between 'Kinazi Cassava Plant' and 'Mbakungahaze Cassava Farmers Cooperative' do exist?
6. What are the opportunities and constraints in communication between 'Mbakungahaze Cassava Farmers' Cooperative' and Kinazi Cassava Plant?
7. What are the perspectives of 'Mbakungahaze Cassava Farmers' Cooperative' and Kinazi Cassava Plant?

### 1.8 Dimensions of Firm farm relationships

The firm farm relationships between Mbakungahze cassava farmers' cooperative and Kinazi Cassava Plant have been illustrated into eight dimensions (Table 1). Each dimension is subdivided into sub dimensions and has been used to set the research questions. The indicators have been used to develop the questionnaire, and were used to ensure the answering to the research questions. The collection of data will be done using interviews, questionnaires and observation.

**Table 1:** Dimensions of firm-farm relationships in cassava

Dimensions	Sub dimensions	Indicators	Means of data collection
Production and productivity	Inputs Postharvest Losses	Cuttings, fertilizers Infrastructure labourer, land	Farmer interviews observation
Functioning of the cooperative	Structure/positions Functions, accountability	Reports Files, offices, finances	Interview and questionnaire to Managers and members, Observation
Functioning of Kinazi Cassava Plant	Buying Processing Selling	Records Infrastructures Employees	Observation Interview Questionnaire (annex 5)
Market and price	Depends on quality, negotiations, Fixed, Calculated	record, receipts, side selling, home consumption, timeliness, trust	Observation Interview Questionnaire(annex 5)
Benefits of the agreement	immediate long term	document, income, inputs, loan, other activities, guaranteed market	interview ,questionnaire (annex 5)
Communication	formal Informal	Means, channel, regularity, clarity,	interview ,questionnaire(annex 5)
Perspectives	long term Short term	plans, quality standards, contract, shares	interview ,questionnaire(annex 5)
Stakeholders	Known Roles	action plan reports Communication	Observation, interview ,questionnaire

### 1.9. Limitation of the study

The government of Rwanda with the stakeholders in the agricultural sector has embarked on the post-harvest handling of six crops of priority, including cassava. But, most of the cassava yields is handled in traditional ways and used at household level hence contributing mostly to rural livelihood where data lacks recording methods. The informal way of trading cassava within and outside the country leaves data unregistered. Although there are a big number of cassava farmers, this study will consider only a major part of the farmers grouped into: "Mbakungahaze cassava farmers cooperative". 'Kinazi Cassava Plant', although it's higher processing capacity, it is still new and works at a lower rate than its capacity even as the lack of agreement with the producers.

### 1.10. Definitions of key concepts

**Contract:** The contract is the arrangements fixed for a given time, in verbal or written form between a cassava farmer and the firm. The contract specifies the conditions through which farmers are provided with resources and the conditions of marketing.

**Contract farming:** Oral or written arrangements for a fixed term between the cassava farmer and the firm governing the benefits of both sides from the production of cassava.

**Cooperative:** The cooperative is an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled way (ILO, 2007), In this research Mbakungaze is a cooperative

**Benefits:** it means the advantages that are drawn from farming cassava

**Farm:** The farm will be used as an area of land that is used for growing cassava in order to sell it to the firm

**Farmer:** In this research the farmer is used to design a producer of cassava, he can belong to any cooperative of cassava producers and sell to any buyer his produce

**Firm:** a firm is an organization, be a cooperative or a processing plant which buys raw cassava tubers from farmers for further sale or processing. In this research Kinazi cassava Plant qualifies to be called a firm

**Market:** The market refers to the place where buyers and sellers meet, sellers give goods while buyers buy. The market can be done at fixed times (RTI and IIRT, 2010), for the purpose of this study, the market refers to the capacity of Kinazi cassava plant of buying fresh cassava as well as other places where farmers can sell their produce.

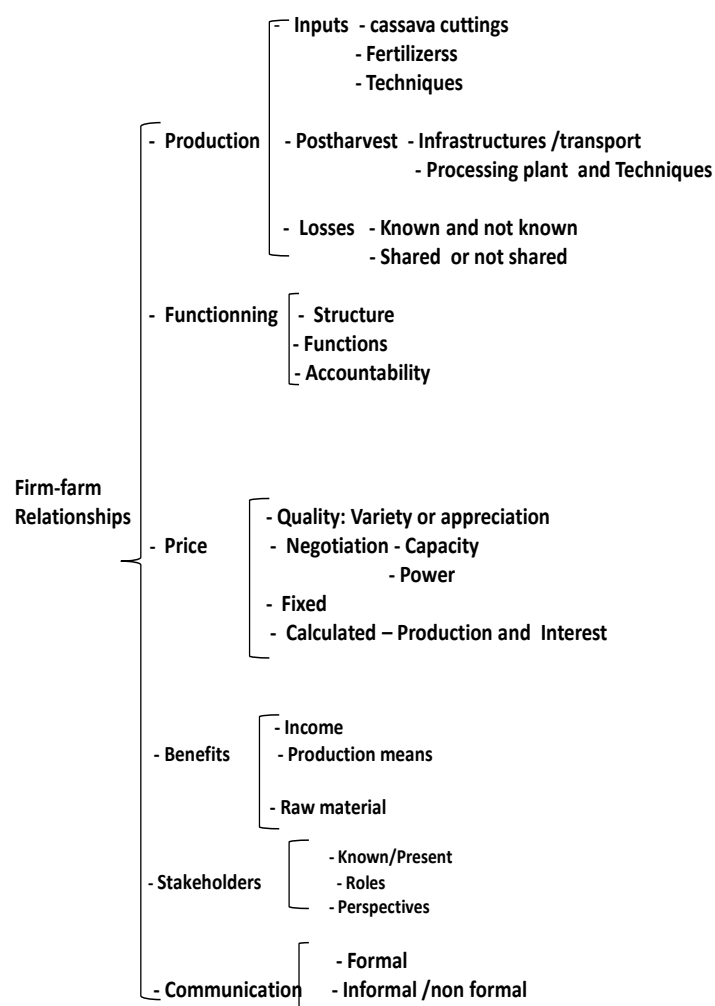
**Price:** The price of cassava is the amount of money that the farmer receives for one kg of fresh cassava

**Processing:** In this thesis, processing is defined as the process of transforming fresh cassava tubers from its raw state into new products such as dried cassava, cassava flour, starch etc...

**Production:** The production is the process of either growing or processing raw material in large quantities (RTI and IIRR, 2010). In this research the production is used to determine the quantity of fresh cassava after harvesting

**Relationships:** for the purpose of this study, relationships means the way in which firms and farmers get connected, feel and behave towards each other. The relationships can be regulated by a written or oral contract (Roy, 2003).

The figure 3 is the operationalisation of the concepts mentioned in the figure 2. It has contributed to the development of the questionnaire (annex 5).



Source: author

**Figure 3: Operationalisation of concepts**

## **2. LITERATURE REVIEW**

### **2.1. Firm farm partnerships**

#### **2.1.1. Types of firm farm relationships**

Echanove and Steffent (2004) argue that the agro industry plays a key role in restructuring agriculture in many countries. They found various principles mechanisms that agribusiness uses to secure suppliers of agricultural raw materials. Among them are: the procurement of crops at open markets. The vertical integration which is holding the suppliers of raw materials. Contractual relations which is the share of responsibilities on each part. The contractual relations are subdivided into sharecropping, purchase-sale agreement, and contract farming. The sharecropping allows the tenant to use the land in growing crops and share the produce with the landowner. In the purchase sale agreement there is a contract that facilitates the relations between the seller and the buyer. The farming contract which is an ongoing support to minimize the risks between the farmers and the buyers.

The use of those procurement methods depends on several factors including product type, seasonality, demand, the type of grower with whom firms establish relationships, and specific policies of the firm. Land tenure and political conditions of the country where such firms operate also influence their decision. Global standards of product quality and appearance have to be met by agribusiness. According to USAID (1996), the contract farming enables producers to achieve greater production efficiency, income stability, and market security, access to capital and credits and technological advances. Growers also benefits from firms' technical assistance, greater experience in administrative matters and better knowledge of markets. The contract farming was first talked in developed countries around the 19<sup>th</sup> century for the processing of sugarcanes. The US department of agriculture states the contract farming takes around 35% of their production (Silva, 2005).

Prowse (2012) explains the contract farming in the terms of a contractual arrangements for a fixed term between a farmer and a firm, agreed verbally or in writing before production begins, which provides resources to the farmer and or specifies one or more conditions of production, in addition to one or more marketing conditions, for agricultural production on land owned or controlled by the farmer, which is non-transferable and gives the firm, not the farmer, exclusive rights and legal title to the crop. He said that the following reasons are at the basis of opening developing countries to contract farming: access to higher incomes and changing the food habits from low nutritious to high nutritious foods, expanding urbanization and the booming of the population; the production side feels also the change in transport and logistics, liberalisation of markets, the use of technology in production and others. The same author describes the following types of contracts model in farming:

**Centralized model:** A large number of farmers is contracted by a firm to answer to large volumes required to make success in their processing, with strict quality requirements and

quantity targets. The products suited in this model require substantial processing prior to retail e.g. tea coffee.

**Nucleus estate model:** The firm which should be a processor enters the production node through an estate or plantation but also can contract independent producers. It is more suitable for perennial crops like palm oil and more preferred model with resettlement or transmigration programmes.

**Tripartite model:** It is a joint venture between public entity and a private firm that contracts with farmers. It involves government (national or local) as it is particular for China. This kind of contract is potentially politicized due to the lot of government involvement.

**Informal model:** Smaller firms or traders make annual contracts with limited number of farmers often in verbal terms frequently for fruits and vegetables that require minimal processing. Other providers like the state and NGOs can offer inputs to influence the success. This model is heavily affected by contractual side marketing.

**Intermediary model:** The firm subcontracts the interaction with the farmers to an intermediary level like a farming committee or a trader, e.g. in Thailand and Indonesia where it decreases the degree of control (made by the increased distance between firm and farm) that the firm has over the process and the product.

The contract farming in Africa especially in tropical regions was described by Sietze(2002) as an innovative way for farmers to deal with the financial and technological conditions in order to increase the income. It is in the same regard that Maurice et al. (2008) stressed that contracted farmers have earned higher profits and lower costs compared to non-contracted farmers.

### **2.1.2. Contract farming, commercialization and food security**

Different aspects of contract farming have an impact on food production and consumption especially by producers, their families, employees and other population segments. According to the results of the study done in East and Southern Africa by Glover and Kusterer (1990), the contract farming provides farmers with income generation through market accessibility. Farmers would not be able to sell to international markets some of their products like perishable crops without contract farming. However, the data on income is difficult to compile because farmers have poor data record. The contract is also a way through which inputs are accessed as well as the quality standardisation of foods crops. In remote areas contract farming schemes has had broader rural developments impacts like in Kenya and Tanzania where the schemes have acted as growth poles in terms of opening up underdeveloped areas of the country in which they are located, construction of roads and other infrastructure and expansion of integral trade have been some of the consequences of the contract farming schemes (Glover, 1994). Little, P.D., (1994) stresses that crop growers should diversify their livelihood strategies by participating in contracting schemes like peasants or

other rural inhabitants who access a variety of sources both on and off the farm. In developing countries where the contract farming takes 21% of the total production, Prowse (2012) ensures the increased availability of food crops like Maize.

### **2.1.3. Contract and policy implications**

Proponents of contract farming argue that that kind of farming is an opportunity for small scale farmers also to get access to lucrative markets and solve most of the problems that small scale farmers. However opponents argue that the imbalance in power between the buyer mostly a large company and the farmer can lead to an agreement unfavourable to the farmer and sometimes small farmers can be excluded from contract farming schemes, something that can result in greater income inequality and tensions in rural areas (Minot, 2011). As an advice Minot (2011) gives the goals on which the policy can stand to promote the small scale farmers from sub-Saharan Africa:

**Improve the investment climate:** It is good to have a policy that facilitates private investment for developing the private contract farming schemes. The climate can involve unnecessarily the reduction of high capital requirements to start new firms, streamlining registration procedures, limiting licensing requirements to sectors in which public health and safety pose problems like the use of pesticide, developing a fair and transparent tax code, fighting against corruption etc.

**Legalize direct firm-farm agreement:** The legalization of direct firm farm agreement requires the government to facilitate the contract farming and remove legal restrictions that prevent firms to buy directly from farmers because in some circumstances these kinds of regulations impose the use of an intermediate body or organization which can increase marketing costs. The government should ensure that both involved parties in the agreement understand and accept the terms.

**Development of effective grades and standards:** The setting of grades and standards that are quite easy to implement and that reflect requirements and attributes demanded by the consumers will facilitate communication and negotiation between farmers and buyers and among traders. This can also facilitate the establishment of the contract between the producer and the buyer given that quality standards, safety and grading are often issues in farmer-buyer relations. Moreover, the certification should also be regulated.

**Facilitations between farmer organizations and other intermediaries:** Sometimes contract farming involves large numbers of small farmers making use of intermediate organization like a cooperative, NGO or a large producer. In this case the policy sometimes expressed by local officials, extension agents can play a role in allowing the development of intermediary organizations and then the transaction costs of dealing with large number of small farmers can be reduced.

**Promotion of public –private partnerships in extension:** Extension services in traditional ways have concentrated on technical assistance in staple crops. Actually farmers diversify their activities into high value commercial crops. So, the extension services must adapt by providing assistance on a wider range of crops and by providing more marketing assistance. If extension services are flexible to provide services on behalf of the contracting firm and the incentives to serve small farmers, it will reduce the cost to the firm of working with small scale farmers.

**Promotion of competition:** The contract farming has mostly made the firms to have much of the market power and leverage than the farmers who bargain with them. This power should be limited by allowing competition among firms; Policymakers should avoid regional monopoly in agribusiness and recognize also that competition can facilitate farmers to obtain inputs and credits from one company and sell the harvest to another company by avoiding repayment of the loan. The repayment should be reinforced without stifling competition such as by using credits and forming professional bodies with codes of conduct.

**Provision of mediation:** Among the common problems in contract farming is the violation of the contract, for example if the market prices rise up farmers is attempted to sell to other buyers and by doing so. They may not repay back the input credits; and if the market prices fall, the buyer is tempted to buy the raw harvest on the open market; he may also apply quality standards more strictly and reduces his obligation to purchase from contracted farmers.

**Enforcement of the contract:** It should be in the duties of the government to explore the alternative approaches that are useful to enforce the contracts between farmers and buyers. The enforcement could be accomplished through courts and by providing better information about non-compliance with increasing the incentives for farmers and firms to comply and help each party avoid high risk business partners.

The contract farming is one component of agricultural strategy to raise incomes and reduce rural poverty that is why the policy measures can facilitate to increase the agriculture output that is processed.

#### **2.1.4. Challenges facing the contract farming**

While numerous studies talk about the gain of contract farmers from their participation, there are other studies that reveal frequently encountered problems while farming on contract. The most prominent example is seen in Kenya, a country with history of contract farming dating from the colonial period. Currently a high rate of failure of small scale farmer contracted is noticed (Ngigi and Minot, 2010). The following are the main challenges facing the contract farming:

**Legal restrictions:** Minot (2011) says that legal restrictions on direct contact between farmers and agribusiness firms are intended to protect the farmers from overexploitations by



large companies. The effect of this major has forced processors to rely on vertical integration production of their raw materials, purchase from large scale commercial farms or from cooperatives. The consequences like in Uganda as mentioned by Sejjaaka, (2004) have been the inefficiency and corruption of cooperatives as a result of political interference and the appointment of civil servants to management positions.

**Side selling:** Side selling is the sale of contracted output to other buyers. Farmers sell to other buyers when they want to take advantages of a market price that is higher than the contracted price, or when farmers want to avoid repayment of inputs they received on credit. The problem of unpaid credits has been exacerbated in some countries where credits are run by the government leading to the perception that such credits are acceptably non-repaid (Minot, 2011).

**Decreasing of prices:** When price fall below the contracted price, the buyer may attempt to purchase from other sources such as importation and/or open markets without respects of contract. And when the buyer is under pressure to respect the contract, he can make very strict the quality standards to avoid buying from them (Minot 2011).

**High cost of dealing with large number of dispersed contract farmers:** In the case where the buyer distributes inputs, gives credits and organizes the collection of the crop, Sartorius and Kirsten (2004) argue that this makes buyer to work with large scale farmers.

**Limitations of the contract to certain commodities:** while the contract farming could be a useful mechanism to help farmers diversify into high value crops such as tea and coffee, there are few successful examples of contract production in staple foods crops (Sartorius and Kirsten2004).

### **2.1.5 Advantages of the contract farming in firm farm relations**

It was mentioned by BIRTHAL (2008) that contract farming was considered more important in crop production than independent production. The main importance of contract is related to the fact that marketing and transaction costs are lower compared to their level in open markets.

**Good quality and quantity:** According to FAO (2011) firms using contracts can get in the specified ranges of quality and quantity of production from farmers.

**Provision of inputs and production services:** As mentioned by Prowse (2012), various contractual agreements allow farmers to get a significant support mostly combined with basic inputs such as improved seeds and fertilizers. The author said that in some cases the firms provide land preparation, cultivation and harvesting as well as the trainings and extension services.

**Introduction of technology and Skills:** The USAID (2011) quoted that private agribusiness is often willing to ensure better the transfer technology and skills than civil servants officers. This is justified by the fact that a direct economic interest in improving the production is

poured by the firms. Although new techniques are often required to upgrade agricultural commodities for markets that require high quality standards, new production skills are always necessary to improve the productivity as well as to ensure that the harvest meet the clients demands. However it was found that hesitation in adopting new skills for small farmers in order to avoid probable risks, although both firms and farmers are faced with similar risks, farmers feel more the suffering as their livelihood depends more on their harvest. According to FAO (2001) and Bidogeza (2009), farmers can make profit of the following skills through contract farming: efficient use of farm resources, good methods of applying chemical and fertilizers, application quality standards for demands and export markets, keeping the records, respecting strictly the time table for field visits(pest control, transplantation etc...) as it can be recommended by the extension officer, but the assured market is always there.

**Access to credits:** Particularly in developing world, where the restructuring of agricultural development banks and the end up of marketing boards, the majority of small producers experienced challenges related to the accessibility to credits. The past have been characterised by subsidising farmers with inputs and credits on contracts with Microfinance institutions and has decreased the impact of moneylender in the chain as expressed by RTI (2010).

**Availability of guaranteed markets and fixed prices:** The contract farming has avoided to its practitioners especially the small scale farmers to sell their produce to open markets on a prevailing price with their little ability of negotiating with buyers. Devereux and Maxwell (2011) stressed that on a contract firms indicate in advance the prices at which they will be provided with raw materials. However some other contracts may depend on non-fixed prices and buyers will always refer to market prices of the delivery time. USAID (2010) said that contract farming can offer significant advantages to farmers even where there are existing outlets for the same crops.

#### **2.1.6 Rights and obligations in firm-farm relationships**

According to Baumann (2000), the contract between firms and farmers are theoretically required to specify in details the rights and obligations as well as the penalties that shall undergo the person who will breach the contract. The following table is summarizes the important rights and obligations.

**Table 2: Rights and obligations in firm farm relationships**

	<b>Obligations</b>	<b>Rights</b>
<b>Firm</b>	Supply in puts	Recovering of payments for services provided to the farmers
	Facilitate the access to credits	Purchase the crops as the contract dictates
	Provide technical support	Impose the penalties to farmers defaults when required
	Maintenance of infrastructures	
	Purchase the total production of acceptable requirements	
	Pay the farmer as per the agreement	
	Maintain the accounts in acceptable forms	
<b>Farmers</b>	Use of land for contracted purposes	Timely reception of inputs
	Respect the production regulations as specified in the contract	Timely reception of services and payments
	Maintain internal roads and drains	Receive the Compensations when the firm falls under defaults
	Sell the crop to the contracting firm	
	Repay the loan accordingly	

Prowse (2012) stressed that the contract violation has higher frequency in small holders and expressed that the reasons for such failure include lack of acceptable quality, farmers selling to other buyers for higher price, complications of dealing with contract disputes as well as failure to respect the obligations and rights. Jianhua et al. (2005) compared the constraints that challenged contract farmers to those met by non-contract farmers and concluded that contract farmers are constrained with delay in payment, inaccessibility to credits, water scarcity for irrigation, water supply and highly set quality requirements while non-contract farmers are challenged with erratic power supply, inaccessibility of water for irrigation, lack of credits and lower price.

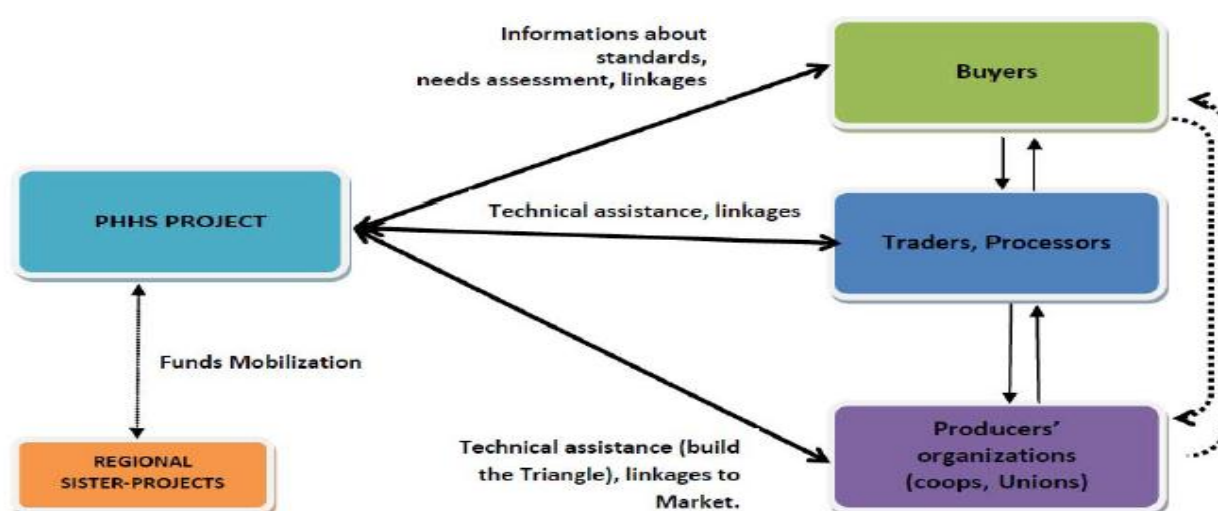
### **2.1.7 Use of farming contract in Rwanda**

The contract farming in Rwanda has been introduced with the cash crops namely tea, pyrethrum, sugar cane and coffee; the contract was agreed between farmers and the government organization or international agencies (FAO, 2001). The bargaining power of the farmers was very limited, because the contract was respected as expressed by the

company. Two models have been working in Rwanda; these are informal and intermediary model (USAID, 2010).

Songsak and Aree(2008) explained that in the informal contract farmers and firms most verbally agree annually on the quantity of fruits and vegetables to be produced and supplied for little processing. In the second form (intermediary contract), they say that the firm subcontracts the intermediate body like the cooperative, farming committee, or a trader.

In the case of Rwanda, RADA (2011) says that informal contract has been used for perishable crops (fruits and vegetables) in the areas surrounding the cities while the intermediate contract has been used in maize, wheat, coffee, pyrethrum and tea. The following figure details the model of a contract using a facilitator between firm and the farmer (USAID, 2011)



**Figure 4:** Contract model between firm and farmer with linkage facilitator  
**Source: USAID (2010)**

In the above mentioned figure, the linkage is provided by NGOs (SNV and Terraffina) in the Project of Post-Harvest, Handling and Storage (PHHS). The linkage consisted of technical assistance and trainings. This was done in production of rice in the marshland of Mukunguli where CSC UGAMA and CAF ISONGA acted respectively as a supporting organisation and a financial partner; in the Maize value chain for COAMANYA cooperative through the supporting of Centre IWACU and the financial partner of CAF ISONGA and in chain of wheat for COAGIMITA cooperative supported by CARITAS with RIM as a financial partner.

## 2.2. General overview of Cassava

### 2.2.1 Origin of cassava

Cassava as an important source of food has been recognized in the 16<sup>th</sup> century. Before the 16<sup>th</sup> century it was cultivated as a staple food in tropical America only. Currently cassava is

cultivated in many tropical countries between 30 degrees south and north the equator. The African farmers valued the crop after the drought of 1983-1985 which has affected cereals severely. In 1997 and 1998, cassava has confirmed its role as a food security crop when cereals faced shortages due to El Niño and La Niña in Asia and South America. However, cassava has been hindered by the following factors lack of institutional support, the direct competition between cassava and cereals in food consumption, feed and industrial uses.

## **2.2. 2. Cassava utilization**

IFAD and FAO (2000) mentioned that in 1994, the utilization of cassava increased from 130 millions tones to 162, food consumption alone was 58%, feed was 25%, processing was 2 to 3% and loss was around 19%. The IITA (2007) says that gari, flour, chips and pellets for animal feed, fufu, ethanol and starch are processed in Nigeria and they differ in processing cost. Here below there is different utilization of cassava:

**Consumption:** Both cassava roots and leaves are suitable for consumption; roots are rich in carbohydrates while leaves are rich in proteins and minerals. There are sweet and bitter cassava, sweet is preferred to be consumed as food while bitter varieties are fitted for industrial and feed purposes because of their high content in starch. So bitter cassava is unsafe for human consumption, unless properly treated. The primitive inhabitants of south America knew the toxicity and developed techniques to remove the cyanide from bitter cassava like pilling, grating and squeezing the root and then the cyanide free cassava was baked or dried and could be stored for several months.

**Cassava Feed:** The second most important use of cassava is the feed. Roots and leaves are used for feeding pigs; in producing areas either fresh or cut and dried cassava of preferably bitter varieties for their high concentration in starch. In 1994, about one fourth (39 millions of tons) of cassava worldwide production was estimated to be used as ingredient for pork, poultry, cattle and fish farming. Some wide differences occur within the regions, Africa and Asia use only 6%, while Latin America and Caribbean use 47%.

**Cassava Starches and other uses:** Starch is used as raw material for a wide range of food products and industrial goods including paper, cardboard, textile, plywood, glue and alcohol. Cassava is the fourth main source of starch after maize, wheat and potato.

## **2.3. Overview of Agriculture in Rwanda**

According to the nation agricultural survey (NISR, 2008); 85% of the population was farmers and out of that total 52% are women. The average size of the agricultural household is 4.9 persons and the active population constitutes the half. In the average terms an individual

farm has 0.76 ha distributed on approximately four blocks of land, like 80% of the total farms have the surface of around one hectare. The total arable land was 12,807kmsq. The whole Rwanda is subdivided into ten bio climatic zones: Cyangugu country side, Banks of lake Kivu, Cones and high volcanic planes, Congo Nile Ridge, Ridges and Plateau bordering the Savanah of the east, Buberuka highlands, Mayaga and Bugesera, Plains of Bugesera, Central plateau and Savannah of east and central Bugesera(Nyabyenda, 2009).

As located in the tropical regions, Rwanda allows the growth to various varieties of crops including cereals, tubers, vegetables, both food and cash crops. The period for cultivation is divided into the first cultivable season called A which goes from September to January; second season which extends from February to June and the third season called C extending from July to August (Bart, 1993). The agriculture in Rwanda is constrained by serious problems such as high density of population leading to the decreasing size of farms as more that 60% of the population owns less than one hectare (NISR, 2011), lack of consistent extension services, low productivity as a result of low use of inputs, low accessibility to markets, only to mention some (Takeuchi and Marara, 2000). Starting in 2000, the government of Rwanda launched a program of 20 years aiming at developing the country to a middle income level. The agriculture sector was given a pivot position in that program and the following are the major features to be achieved throughout the vision 2020: Professionalization of the agricultural sector, supporting the development of private sector in agriculture, intensification and development of sustainable production system and promoting the development of commodity chains (MINECOFIN, 2000). The following table shows the increasing production as a result of the above mentioned programs. In the same table, four major groups of crops are given such as Cereals, Pulses, Routes and tubers and bananas.

**Table 3:** Production of crops in tons from 2005 to 2011 in Rwanda

	2005	2006	2007	2008	2009	2010	2011
<b>Total crops</b>	<b>7, 290 ,502</b>	<b>7 ,178 ,575</b>	<b>7 074 813</b>	<b>8 234 188</b>	<b>9 254 763</b>	<b>10 139 259</b>	<b>11 212 264</b>
<b>Cereals</b>	<b>409 358</b>	<b>363 466</b>	<b>352 057</b>	<b>461 163</b>	<b>615 059</b>	<b>738 080</b>	<b>848 658</b>
Sorghum	227 972	187 380	164 406	144 418	174 553	161 229	151 754
Maize	97 251	96 662	101 659	166 853	286 946	432 404	525 679
Wheat	21 942	18 978	24 195	67 869	72 479	77 193	90 684
Paddy	62 193	60 446	61 797	82 025	81 081	67 253	80 541
<b>Pulses</b>	<b>252 303</b>	<b>352 166</b>	<b>402 346</b>	<b>392 305</b>	<b>431 139</b>	<b>436 954</b>	<b>421 257</b>
Beans	199 648	296 724	328 811	308 563	327 728	327 497	331 166
Groundnuts	15 105	9 020	9 921	11 122	15 353	14 369	14 756
Soya	16 355	28 779	44 163	50 931	54 203	57 089	37 426
Peas	21 195	17 643	19 450	21 689	33 855	37 999	37 909
<b>Roots &amp; tubers</b>	<b>3 118 050</b>	<b>2 946 700</b>	<b>2 738 133</b>	<b>3 815 126</b>	<b>4 264 961</b>	<b>5 192 652</b>	<b>5 783 263</b>
Irish potatoes	1 314 051	1 275 586	967 283	1 161 943	1 289 623	1 789 404	2 171 517
Sweet potatoes	885 467	776 640	841 079	826 440	803 228	840 072	845 099
Taro	136 894	129 275	150 356	144 919	152 369	185 964	187 248
Cassava	781 637	765 199	779 414	1 681 823	2 019 741	2 377 213	2 579 399
<b>Bananas</b>	<b>2 593 083</b>	<b>2 658 232</b>	<b>2 686 198</b>	<b>2 603 949</b>	<b>2 993 482</b>	<b>2 749 152</b>	<b>3 036 273</b>
<b>Vegetables &amp; fruits</b>	<b>917 709</b>	<b>858 010</b>	<b>896 080</b>	<b>961 645</b>	<b>950 122</b>	<b>1 022 421</b>	<b>1 122 814</b>

**Source: NISR, 2011**

However, major crops have benefited from a special program named Crop intensification program (CIP), those crops are Maize, Wheat, Rice, Irish potato, beans, and cassava. CIP started in 2007 and aims at significantly increasing the production of food crops across the country through the following approaches: facilitation of inputs, consolidation of land use, and provision of extension services and improvement of post-harvest handling and storage mechanisms (MINAGRI, 2011). The following are the major axis mentioned in PSTA 2 of the above mentioned improvement in crop production in Rwanda:

- Intensification and development of sustainable production systems: This involves demonstration to farmers and villagers the benefits of the soil fertility and technology to preserve soil.
- Support to the professionalization of the producers this involves strengthening the sector's social capital base, strengthens the entities in the sector charged with developing and disseminating new technologies and knowledge about the sector.
- Promotion of commodity chains and agribusiness development entails creating conducive environment for businesses and entrepreneurship with easy access to regional and international markets.
- Institutional development implies that the private sector will be the engine to drive the agricultural sector transformation; however the government should clearly define the framework in which the private sector should operate. The actions under this axis should involve crafting and incentives to induce the private sector to play important role in the agricultural development (MINAGRI, 2007).

### **2.3.1. Production of Cassava in Rwanda**

Cassava was introduced first in Rwanda by Belgians in 1930 (UNDP and FAO, 1992) during the colonial period. Since then cassava is produced for food crop and the surplus makes an important income to the farmers household and stakeholders.

Although cassava crop grows well in many of different agro ecological zones and even on poor soils, there are major zones more favorable to it. These are Imbo, Mayaga and Bugesera. Cassava is also grown in the zones of Kivu Lake borders, Impara, Central plateau, Eastern plateau and eastern savannah (Minagri, 2011). Cassava is cultivated in all seasons A, B and C but the season A is more appropriate to give good production. The harvest of cassava is also done in all seasons with good results in season C due to easy sun drying. Cassava is cultivated for its capacity of ensuring food security and income generation. Cassava tubers are rich in carbohydrates mainly starch and a major source of energy and rank the second after the sugar cane. Cassava leaves are used for human

consumption and animal feed (Grace, 2005). Cassava leaves (called isombe) are given much of importance in consumption, and have been taken the level of processing and commercialization, Mbwika (2001) says that 44.6 %of Rwandan use cassava leaves as vegetables. The table 4 shows the increase in cassava production. The decrease noticed around 2005 was due to the impact of CMD on the crop, while the increase of production afterwards was due to both the recovering from CMD and increase in cultivated area.

**Table 4:** Production and land for cassava

Year	Production in( tons)	Land in ha	percentage of land
1990	265,190	65,884	9.29
2005	781,637	57,847	7.14
2010	2,044,178	92,389	10.5

**Source : MINAGRI(2010)**

According to the national agricultural survey, (2008) 85% of households i.e. 1.67 million are farmers. Their agricultural activities are done on 51% of the total country area (26,380SQ). Normally cassava takes between 9 to 10% of the total cultivated land. Furthermore 42% (around 700 000 households) of the framers cultivate sweet or bitter cassava. Although cassava takes around 10% of the cultivated area, Mbwika (2001) stress cassava is flexible for accepting different farming systems, he said that 15% of farmers practice cassava under mono cropping, 46.9% under mixed cropping while 26.9% grow cassava under a combination of mono cropping and mixed cropping in different fields. The main crops grown with cassava are maize, beans, bananas, plantains, groundnuts or sweet potato.

Regarding the consumption and marketing, the NAS (National agriculture survey, 2008) says that 85% of the total production is consumed at home while only 15% of the total production is sold at different markets. Bitter cassava is sold as fresh tubers, chips or floor while sweet cassava is sold in the form of tubers. Apart from production of cassava on own farm and buying on markets for home consumption, food exchange, gifts from relatives, borrowings and food aid were also mentioned among the cassava procurement modes.

It is estimated by Schrader and Izamuhaye (2011), that until 2010 while around 90,000 ha were cropped with cassava and small farmers(<0.5ha) took up to 57% of the cassava farms, less than 50% of the small farmers were in adoption of the new varieties which could resist to pest and diseases. Seeing how the production was decreasing since 2004 due to the impact of CMD, MINAGRI through ISAR, RADA and other partners have worked in conjunction to face the situation (Mbabazi and Schrader, 2010). It is for that purpose that new varieties have been developed and introduced to farmers since 2006(Gashaka *et al*



2011). The newly introduced varieties are able to compete the productivity of the previous ones while others are more resistant to CMD. Another most important trait of the new varieties is that some are dual purpose; they can give flour or be cooked without other processing while sweet cassava is mostly cooked without any processing and bitter cassava is always processed to give flour for bread. The annex 2 describes the varieties of cassava in Rwanda.

With regard of the productivity and fertility, Twilingiyumukiza and Schrader (2011) say that the new varieties introduced since 2006 are able to give 30 to 40 tons per ha without fertilizers application. These yields are three times more productive than the old varieties. Although cassava can grow well on poor soils while other crops cannot, it has been revealed that 88.5% of the cassava growers fertilize their farms with manure while 37.5% use chemical fertilizers, however having an assumption that cassava grows well on poor soils makes suspicious the fertilization of cassava while other crops are not maximally fertilized (Schrader and Izamuhaye, 2011).

### **2.3.2 Cassava value chain**

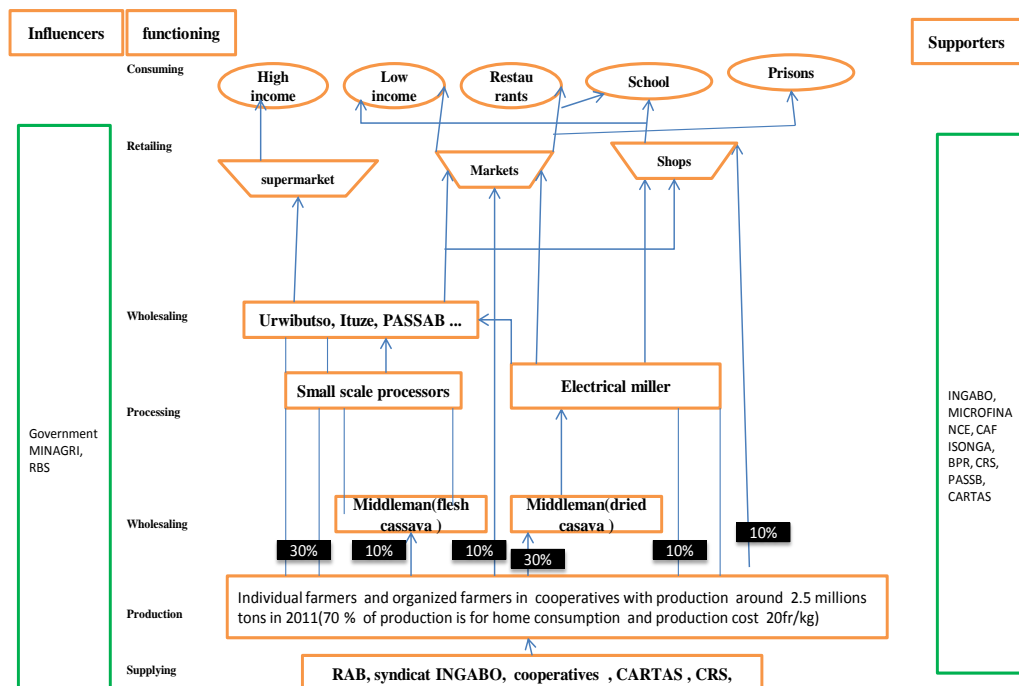
Although the average productivity of cassava is 12.5tons per hectare (FAO, 2010), it was noticed by RAB (2011) the most of the varieties have the potentialities of giving out 30 tons or more on one hectare.

The value chain (figure 5) shows how the total harvest diverge into various destinations. Around 90% is harvested by the household and of which 60% is consumed at home while the remaining 30% is sold at local markets and serves as gifts to relatives.

Around 6% is sold on farm to traders who process it and sell it to either cities or rural markets. The remaining 4% of the total production is sold to (semi) modern processors who sell it to traders or supermarkets for consumers of the cities. However the difficulties of value chains for cassava is that the majority of the produce is for home consumption.

Processing consists into two major phases; first after harvesting cassava is peeled, soaked and after an average of 5 days it is dried under sun. The second phase of processing is milling. Home processing is always done in traditional ways and consist of crashing dry cassava using a mortar. While there is also a less modern way of using electrical miller for dry tubers. Semi modern and modern ways consist of milling fresh cassava tubers and dry the flour under the sun. The processed cassava is appreciated by its clients on the colour, and moisture content level in cassava chips; and colour, texture and smell in cassava flour (Mbwika, 2001).

## Cassava Value chain map in Rwanda



**Source :** Adapted from Murasira *et al* (2011)

**Figure 5: cassava value chain in Rwanda**

Murasira (2011), says that the prices vary according to the markets and seasons; the price for one kg of fresh cassava varies between 60 to 110 Rwandan francs. The dry cassava costs between 160 to 200 rwandan francs for one kilograme while the price for flour is between 250 and 350 rwandan francs for one kg of the flour processed in traditional ways while it varies between 400 and 700 rwandan francs for semi and modern processed flour.

According to USAID (2010), the following are the main actors and stakeholders of the cassava value chains in Rwanda.

### Actors

**Input suppliers:** The main input is cassava cuttings. Normally the cuttings are provided by the farmers on their farms. However new varieties are given by ISAR to RAB for multiplication, and RAB passes the planting material to the second multipliers who can be model farmers or their organisation and from them the planting material will reach the final individual farmers or cooperatives. The cutting is paid for 7 rwandan francs to cover its production cost

**Producers:** There are two categories of cassava producers; individual farmers who may be small or large and groups who can be associations or cooperatives.

**Middlemen:** These are traders who buy at small price and collect cassava, they are very many in rural areas

**Traiders:** There are small and large traders,, they buy cassava and sell it in urban areas

**Transporters:** In rural areas some of the transports use human labour, bikes, and vans to transport cassava to collection centre or rural markets while the transport to regional and national markets is mostly done by truck.

**Storage:** CIP, ITUZE, MINAGRI

**Processing:** Processing at family level is done individually in traditional way mostly using mortar; Processing for commercial is done by millers. There is also a small scale processing mostly owned cooperative cooperatives or private sector. These are Urebutso, Ituze, Passab.

**Retailers:** Local markets, small shops and supermarkets have cassava flour at different prices depending on the selling point

Consumers; Most of the consumers are cassava growers, people of low and middle income in rural and urban areas, and schools.

## **Supporters**

**Research:** The Rwanda institute of agricultural sciences(ISAR) conducts various researches on cassava including research on adaptability of varieties, pest and diseases, soils.

**Services offer:** Most of the extension services and advocacy are accomplished by INGABO syndicat which is an organisation of farmers, Research Into Use and local government and farmers cooperatives

**Banks:** The Banque Populaire du Rwanda, CLECAM and CAF ISONGA are the major source of loans for cassava farmers but currently BRD has also started to give loans to cassava farmers approved by Kinazi Cassava Plant.

**Others:** Caritas Rwanda, CRS, are also other organisations that give support in terms of training and funds to the actors of cassava value chains.

## **Influencers**

The government through the ministry of agriculture is the main influencer in agriculture sector and cassava field specifically. Most of the influence is done in setting the policies like the land consolidation policy, and regionalization of crops policy, distribution of improved cassava cuttings policy.

Local government for example the districts have also the influence on cassava crop. The agriculture department at districts level coordinate the implementation of policies and monitor the roles played by different involved stakeholders.

Rwanda Bureau of standards set policies on safety to meet the standardization.

### **2.3.3 Swot analysis of cassava value chain map in Rwanda**

#### **Strengths of Cassava value chain in Rwanda:**

- Cassava is Drought resistant
- Cassava can be stored a long time in soil before harvesting
- Cassava gives abundant production of roots in south and eastern Rwanda
- Cassava grows well on poor soils
- Cassava has a dual purpose by giving income and ensuring food security

#### **Weaknesses of cassava value chain in Rwanda:**

- Rapid deterioration of roots after harvest and not quickly processed
- Cassava requires clean water and protected drying facilities
- Cassava gives chips with long shelf life not susceptible to rapid rotting
- The processing of cassava requires a lot of labor
- The mastery of artisanal processing of cassava to give flour of good quality is difficult

#### **Opportunities in Cassava value chain in Rwanda:**

- Abundant production in south and eastern of Rwanda
- Cassava processing plants are under construction in Rwanda
- Cassava is one among the six crops of main consideration in Rwanda
- Many products can be produced from cassava such as food for human consumption (tubers, flour used to make cassava bread “ubugari”, leaves as vegetables) and animal feeds. Cassava can be used as a source of pharmaceutical products and ethanol
- **Food product made from cassava:** Glucose and fructose from cassava are substitutes for sucrose in jams and canned fruits. Cassava based sweeteners are preferred in beverage for their improved processing characteristics and product enhancing properties

#### **Threats**

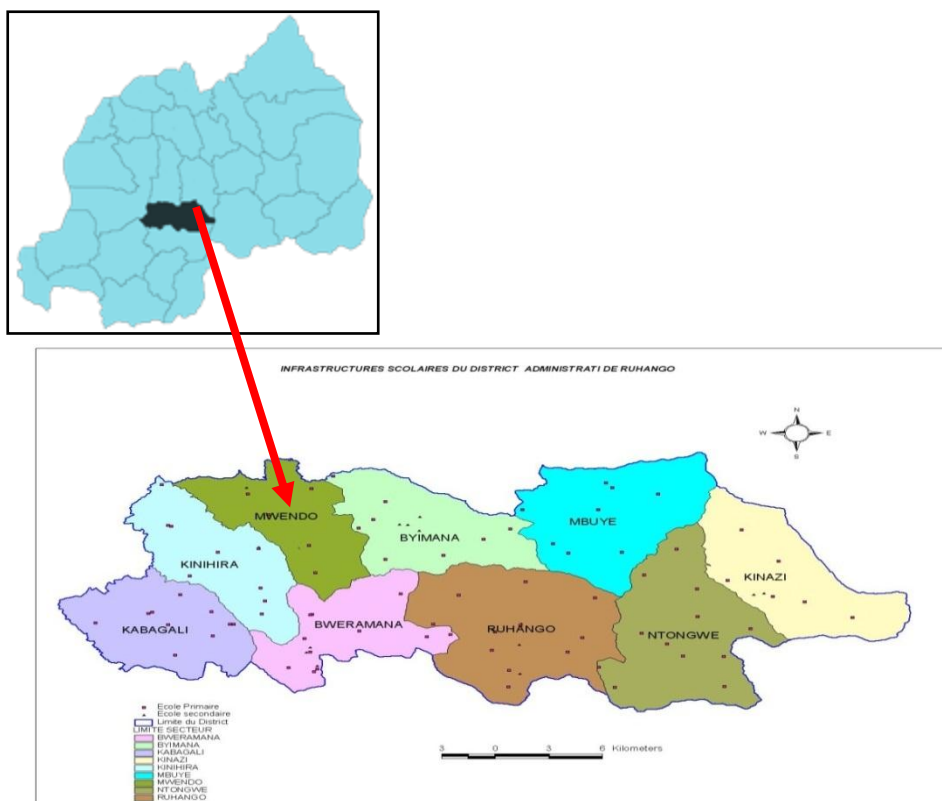
- There are diseases and pests that affect most of the varieties.

### **3. METHODOLOGY**

#### **3.1 Study area: Description of the study area**

The district of Ruhango was created in 2005 by the law no 29/2005. It spreads an area of 626.8sq km, and borders with the district of Muhanga in the North, the districts of Nyanza and Nyamagabe in the south, the districts of Kamonyi and Bugesera in the east and the district of Karongi in the west. It lies on an area of plateau and low hills of an average of 1500m. The district as well as the whole area of central plateau has a high average temperature of 22°C and an average rainfall of 900 mm per year. Most of the land is farmed in an extensive way with small and fragmented plots of land. The agriculture is the backbone of the economy of the district and the district possesses large marsh lands and benefit from the big rivers of Nyabarongo and Akanyaru.

The district of Ruhango is one among the eight districts making up the Southern Province. It is subdivided into 9 sectors, 59 cells and 533 villages. The district counts 271 807 people grouped into 60809 households; women are 143 046 and males are 128 761. The district covers an area of 626.8 sq km, i.e. 415 people per sq (Ruhango, 2011). The selection of this district as a study area was based on the following reasons: the economy of the district is based on the agricultural and pastoral activities. The major crops are cassava, beans, maize, rice, and coffee. The district has given a special consideration to cassava as a result of Crop Intensification program; the average land cropped with cassava is around 10 000ha out of 92389 ha of total land, which produce an average of 57 783 tones out of around 2 million tons of cassava per year (MINAGRI, 2010).



**Figure 6: Map of Ruhango district**  
**Source: Ruhango district (2012)**

### 3.2 Research methodology

In order to give answers to the research questions listed in section 1.7, research was designed into two steps: The first step was involved desk study and the second step was collection of data in the field. The desk study part was to collect theoretical information, which was been useful to understand concepts related to this study. The field study was to collect primary data.

#### 3.2.1 The desk study

The thesis work started by searching for secondary data and to achieve this, both hard and electronic books such as Scientific books, PhD thesis, scientific journals were used together with the reports and other unpublished documents from Rwanda Government's Institutions.

#### 3.2.2 Field data collection

The second phase was concerned with data collection from the field. Three consecutive steps were followed:

**The interview step:** A semi structured interview has been conducted to develop a business case description. This will help to get an overview of the relationships of farmers with Kinazi Cassava Plant. The interview used a checklist (annex 3) and an open ended questionnaire (annex 4). These two tools were developed by APF and translated and adapted to cassava crop by the researcher.

**The survey step:** A survey has been conducted using a questionnaire (annex 5). The statements of this questionnaire were developed from the business case description by the researcher. It is meant to support the business case by expanding on the number of respondents in order to get deeper information. The respondents were required to mark with a tick (✓) in a box corresponding to strongly disagree, disagree, agree and strongly agree.

**Focus group discussion step:** The results collected and processed for the survey were then presented to the respondents to get more clarification and find out why and how the situation could be improved.

In addition to the above mentioned tools and approaches, the observation was also used as a method of getting more information from the field. The use of these different data collection tools was a guarantee to ensure the triangulation in order to achieve more trustful and reliable information. The strategy is also in respect of the steps of the 2-2 tango methodology which is a tool for self-assessment of firm-farmer relations; it is practical and flexible, it can (must) be tailored to the specific business case at hand. First analysis of the business case is needed for identifying key challenges & indicators and preparing statements. The tool permits to have quick results, which can be visualized by easy to understand graphs. The self-assessment results facilitate communication between farmers and firm (CDI, 2012).

The tool uses the following steps:

1. Business case analysis and introduction of participatory self-assessment of firm farm relations
2. Identification of indicators and formulation of statements
3. Firm and farmers scoring of the statements
4. Data entry, processing and graph preparations using excel
5. Preparing debriefing reports and discussion meeting
6. Sharing and discussing self-assessment results
7. Conclusion and recommendations

### **3.3 Selection of respondents**

This research was shaped to investigate the information from two main groups of respondents; there are the employees of Kinazi Cassava Plant and the members of Mbakungahaze cassava farmers' cooperative. In addition to that, one key informant from district: agronomist in charge of cassava production was used.

The table below shows the repartition of the respondents, their source and roles:

**Table 5: Repartition of respondents according to their groups, positions and to the steps of the research**

Source	function	Steps of the research					
		Interview		Survey		Focus group discussion	
		Male	Female	Male	Female	Male	Female
<b>District</b>	<b>Expert</b>	1					
<b>Kinazi Cassava Plant</b>	<b>Employees</b>	2	1	7	2	1	
<b>Cooperative</b>	<b>Leaders</b>	1	1	3	3	1	2
	<b>Farmers</b>	1	1	25	7	4	2
<b>Total</b>		5	3	35	12	6	4
<b>Grand total</b>		<b>8</b>		<b>47</b>		<b>10</b>	

**Source: own field work, 2012**

### 3.4. Sampling procedure

#### Interview

The district cassava agronomist was sampled because he is the only person who monitors the cassava crop and also he has been organising farmers during the preparation of the establishment of the processing plant.

Respondents from the farmers' cooperative were sampled by giving equal chance to both men and women since men are more interested in cash generating crops while women take and keep the portion of harvest for home consumption before the remaining is sold.

Respondents from Kinazi Cassava Plant were sampled depending on their direct contact with the farmers or the cassava process: the agronomist works to ensure the procurement of fresh cassava to the processing plant. The production manager ensures the processing while the quality manager checks the quality of raw cassava and the given flour.

#### Survey

Respondents from Kinazi Cassava Plant were sampled due to their direct involvement in procurement and processing of cassava. Five are the agronomists assigned to ensure the procurement of fresh cassava. The following were director of finance who ensures the payment of farmers, production manager who follows the processing activities, one quality officer in charge of the quality of cassava and flour; followed by plant engineer assistant whose the information was necessary to ensure the schedules of operating the machines, respecting the norms of processing (conversion rate, humidity concentration, hygiene of the machines).



Respondents from the farmers group were sampled according to the following regards; ten females because women are involved in household management of food and cassava is a major source of food. Twenty eight men participated because men have a higher role of generating and managing the income from cassava. Respondents from the cooperative leaders were sampled in equal number.

### **Focus Group discussion**

Kinazi Cassava Plant was represented by one participant who is the chief agronomist. He is the main agent involved in dealing with farmers regarding the confirmation of harvesting, on farm payment of incurred money for labourer involved in harvesting and transportation of the harvest to the company and passing the communication to farmers.

Farmers were represented by nine participants; four women sampled for the role of women in household food management, they always take the part to feed the family before selling and five men sampled for their role in cassava selling.

### **3.5 Data processing and analysis**

A pre-developed Excel workbook was used for data entry and generation of graphs. For each challenge area two graphs and a table were obtained. One graph shows the scores in percentages of each statement and the average score of all statement. The second graph shows the level of agreement between firm and farmers for each challenge area and each statement. The table shows the average score for each challenge area.

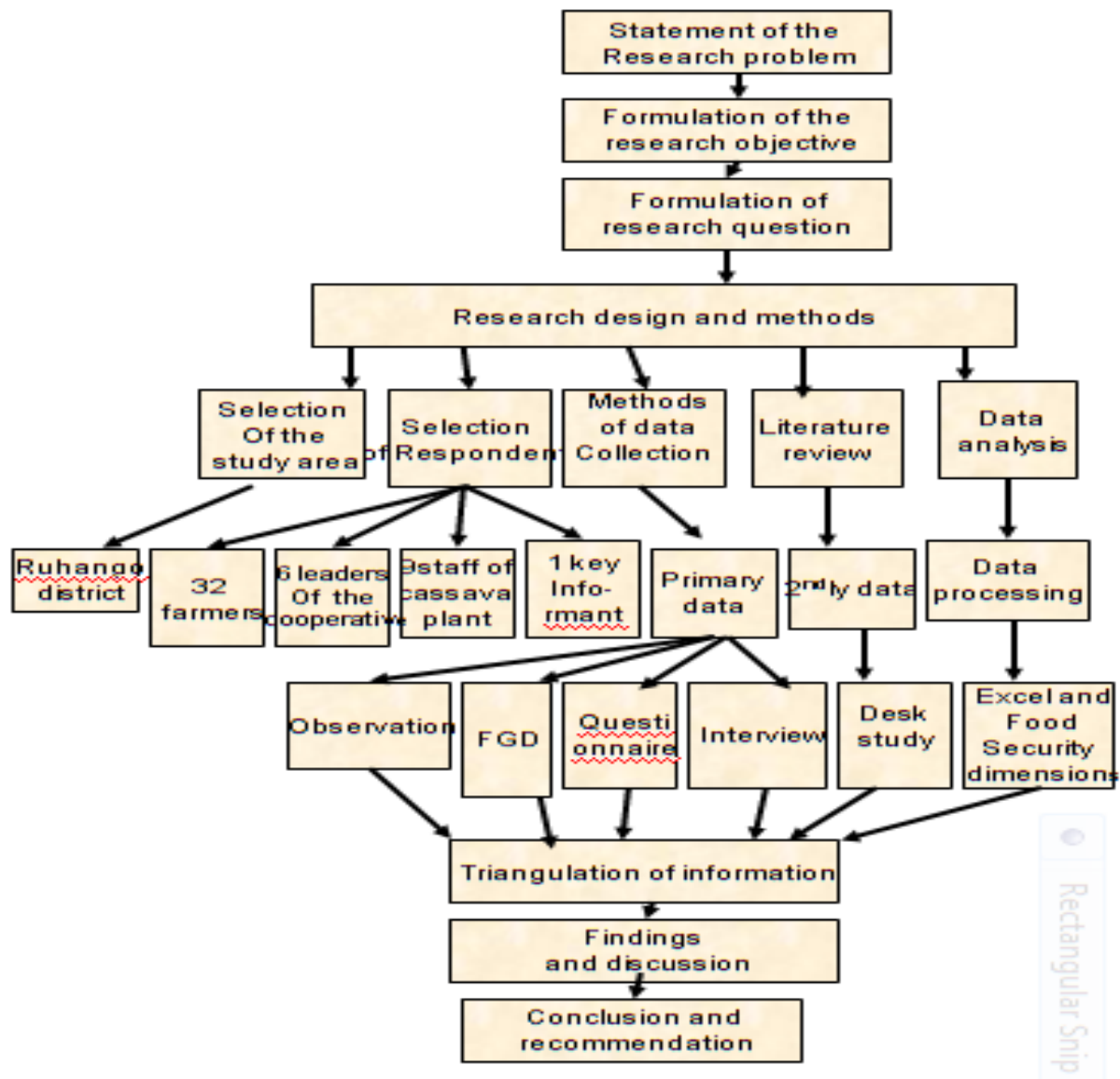
### **3.6 Debriefing and further discussion**

Automatically generated graphs and tables were used for a debriefing report. Debriefing was done in focus group discussion where the self-assessment results from the questionnaire were shared with Kinazi cassava staff and the farmers but separately. The researcher explained how the scores have been processed and the actors discussed the reasons that have contributed to low or high marks and suggested the required improvements.

The Data obtained through the focus group discussion and the observations were used to support the interpretation of information obtained during conducting the interviews. In the end conclusions and recommendations were drawn on enhancing firm farm relationships with the ways through which this can be achieved.

### 3.7 Research framework

The figure 7 is the research framework and was used to guide the research through all steps.



**Figure 7:** Research framework  
**Source:** Author, 2012

## 4. PRESENTATION OF FINDINGS

### 4.1. Business Case Description: Kinazi Cassava Plant and Mbakungahaze Cooperative

This business case was developed in order to describe the current relationships between Mbakungahaze cassava farmers' cooperative and Kinazi Cassava Plant. The information used was obtained by using the semi structured interview. This interview used two tools; a checklist (annex 3) in which the researcher filled in the information obtained from the respondents and an open end questionnaire (annex 4) in which farmers have filled in their answers. Four of the respondents came from "Mbakungahaze cassava farmers 'cooperative; three respondents came from Kinazi Cassava Plant while one is the district cassava agronomist. The results have been organized into eight sections called challenge areas as follows: Production and productivity, functioning of Mbakungahaze cassava farmers' cooperative, functioning of Kinazi Cassava Plant, markets and prices, possible benefits of farming agreements, communication, stakeholders' collaboration and network and perspectives. The additional resources of information were reports and recorded data to support the information obtained while conducting the interviews.

#### 4.1.1 Production and productivity

##### Access to inputs

Rwanda Agricultural Board in conjunction with Ingabo farmers Union are the major distributors of improved cassava varieties. One cassava cutting of 20 cm long costs 7 Rwandan francs. Major distribution have been done in 2006 and 2009 after the period during which CMD have devastated cassava throughout the country. The following ways of procurement of planting material are also still useful: to buy or get it for free from the neighborhood or producing it on the own farm. However these three methods are not always safe because the suspicion exists that they are responsible for the spread of diseases like CMD and CBSD as they destroyed many crops between 2004 and 2006. A woman who cultivated cassava said that ***"diseases have been very stressful in 2004 and 2005 but later they received good planting material, they multiplied and have sold to other farmers, one day she sold a lot of cuttings but to prepare them was a tough work so she sold her calf and paid laborer to cut the planting material. After she earned the money she bought another calf"***.

As stated by some respondents ***"some farmers may not in full have access to required planting material because they live in areas that are difficult to access or they do not have enough money to get it or because they don't adhere to the cooperatives as these facilitate the accessibility"*** . Although it is advised to fertilize cassava, the district agronomist as well as farmers stressed that mostly ***"they don't use fertilizer in cassava."***

***Only a little of manure can be used, and we get enough yields all the time***". According to the agronomist the ***"use of fertilization is constrained by the fact that cassava is cropped on relatively large farms, it is not easy to finance the fertilizers because they are expensive"***.

The extension services are very inadequate. Only there is one district agronomist in charge of cassava while the company agronomists work only on harvesting; however the chief agronomist of the Kinazi Cassava plant said that ***"they plan to start the extension services in the near future."*** The cooperatives do not have the extension officers.

On the credits one farmer expressed that ***"normally bigger farmers can access the credits because they have enough money on the account or have land, but smaller farmers cannot, they don't have collateral to give to the banks, so it depends on the individual capacity"***. She continued ***"we are also told that Kinazi Cassava Plant will help farmers to get credits in BRD"***. And this was later confirmed by the agronomist of the company that ***"until now eight farmers have been approved upon presentation of business plan to get the credit from BRD"***

### **Production and yields**

Both farmers and Kinazi Cassava Plant staff said ***"that the production varies between 10 and 20 tons per hectare"*** however the agronomist informed that the estimates of production are 12 tons per hectare.. Even if there are many varieties, the most predominant are the varieties introduced in 2006 and 2009 (annex 2).

According to the agronomist of Kinazi Cassava Plant, ***"the varieties of Mbakungahaze, Cyizere and Mavoka are the most preferred due their potentialities and the quality of their flour"***. It was also good to know the increasing of the production and it was mentioned by farmers ***"that they have good production as a result of increased land on which they grow cassava and that the production on one hectare remains around 12 tons"***. It was also mentioned by ***Zihinjishi M. that bitter and sweet varieties are being replaced by dual purpose varieties.***

The soils of Ruhango are also favorable as mentioned by one farmer during a field visit on his farm ***"because of their high fertility and high porosity even if they are poor in humus content"***, this was later confirmed by the district agronomist by adding that ***"cassava likes sandy soils"***. Cassava crop requires deep ploughing of soils with ridging. The farmers mentioned that ***"the cost of labourer involved in cassava farming and harvesting actually increases due to its scarce availability. On average one thousand Rwandan francs is paid for each working day per laborer"***. Most of the farmers

mentioned “*laborers are mainly men coming from other districts and cultivate and plant while women are more concerned with weeding and postharvest activities*”.

### **Cassava and other crops**

The rural livelihood of cassava farmers makes the crop to be flexible for intercropping. Two types of intercropping were observed and explained by the farmers together with the district agronomist.

- **The intercropping with food crops:** Some Cassava farms are intercropped with one or more crops. Picture (a) shows cassava with sweet potato, banana and yams. On the picture (b) cassava is intercropped with peanuts. It was also mentioned that depending on the season other crops are intercropped with cassava. Beans (bush and climbing) as well as soybeans are the most associated to cassava. The district agronomist explained that apart from benefiting from more than one crop, cassava itself can benefit from little fertilization used for intercropped crops especially during the three first months.



**a) Intercropping of cassava with sweet potato, Banana and yams**

**b) cassava and peanuts**

### **Photo 1: Cassava intercropping with food crops**

**Source: Author from filed (2012)**

- **The intercropping with nonfood plantations:** On the picture C and D, cassava is intercropped with eucalyptus plantations. This system was introduced by the local government in order to sustain the plantations or agroforestry it has contributed to increase of production since the size of farms have been expanded. The eucalyptus covered land was rented for free to farmers willing to cultivate cassava.



**c) Cassava with eucalyptus trees**



**d) Cassava with eucalyptus**

**Photo 2 :** Cassava intercropped with non-food trees  
**Source:** Author from filed (2012)

Farmers explain that “intercropping facilitates them to grow other crops especially legumes”, the agronomist on a field visit added that “Ruhango is a good soil because cassava can grow with non-food trees like eucalyptus on the plots rented by the district to farmers”.

#### **4.1.2.Functioning of Mbakungahaze Cooperative**

##### **Description of the” Mbakungahaze cassava farmers Cooperative”**

The”Mbakungahaze cassava farmers Cooperative” started in 2007 its status was ratified latter on October 13<sup>th</sup> 2010 by the Rwanda Cooperative Agency (RCA). The total number of its members is 72 of which 20 are females and 52 are males. Among the females two are widows. The members of”Mbakungahaze cassava farmers Cooperative” come mainly from Ruhango district, but there others from Nyanza and Muhanga districts. The physical address is located in Kinazi sector Ruhango district. All the members are cassava producers.

The”Mbakungahaze cassava farmers Cooperative” is managed by an executive board, an internal auditing committee and a general assembly (the highest organ of the cooperative). Moreover, the cooperative has a permanent accountant. There are also three signatory members. ***The participants in different committees are democratically elected by the general assembly*** as mentioned by all the respondents. The accountant is recruited upon an examination.

##### **Functions of the committees**

The general assembly is the highest organ of the cooperative and seats two times a year. Among its main functions are elections and admission of new members, adoption of the budget, examination and approval of the accounts and appoints the external auditor as well as the consultant when necessary.



The executive board seats on average once a month and is responsible of the administrative management of the cooperative. It is accountable to the general assembly. The internal auditing committee of 'Mbakungahaze cassava farmers Cooperativ' plays a big role in controlling the management of the cooperative and ensures the transparency in funds management. It is also accountable to the general assembly and submits the monthly reports to the executive committee. The permanent accountant follows day to day the operations and reports to the executive committee. There are also three signatory members who authorize the withdrawal of money from the bank account. During the interviews, one respondent from Kinazi Cassava Plant said that ***“cooperative(s) do not work accordingly; they are only a group of people who serve political interests rather than economical interest to the cooperative”***. Another said that ***“cooperative(s) seem to be divided into two groups, farmers who work on their land and cooperative leaders who work as cassava traders because they get individual profits from commissioning for the selling the harvests of their members”***.

### **Finances of the cooperative**

"Mbakungahaze Cassava Farmers Cooperative" owns a warehouse given through partnership with SNV, it was constructed to be used for bulking the fresh cassava, but since their small scale processing unit does not work, the ware house is occasionally used for dry cassava. The cooperative owns also 7 hectares of land used to grow cassava and a small scale processing plant which has never been used. Each member owns his land and the total size of all land owned by the cooperative members is 402 hectares. While some members own less than one hectare, there is a member who owns 35 hectares. The moment this study was conducted, a hired consultant was preparing a business plan for the cooperative. The major sources of the income of the cooperative are the new members' registration fee, the annual contributions of all members, the service fee charged to members and from the sales of cassava production on cooperative owned land. The members stressed that ***“the income of the cooperative is well managed and all members are informed on the finances issues in the general assembly”***.

### **Perceptions of farmers and Kinazi Cassava Plant**

Although there is no contract for supplying fresh cassava to the Kinazi Cassava Plant, individual cooperative members sell their harvest to the company. ***The current relationships are based on individual willingness to sell their harvest***, this was confirmed by the all respondents from Kinazi Cassava Plant. However all the respondents expressed that a meeting between the leaders of the cooperatives, and the staff of the company has been held and more meetings will take place to discuss the establishment of

formal relations. ***The consequence of lack of the agreement is the continuation of processing cassava in traditional ways and selling through informal markets*** as mentioned by one of the cooperative members.

Picture e and f show the local inhabitants peeling the fresh tubers. After harvesting, they prefer to bring the harvest to a location near the house and peel them. It takes time as it can become harder due to easy loss of water after harvest. Women and children play an important role in peeling



**e) Peeling**



**f) Peeled cassava (b)**

**Photo 3:** Peeling of cassava

**Source:** Author from filed (2012)

The photo e shows the soaking phase, it is done in the pond of water. This phase is very suspicious to lack of safety due to the use of unclean water and incomplete removal of cyanide. The picture d shows the drying phase, and it is done under open air and takes time. Sun drying is also unsafe due to the conditions in which it is handled.



**g) Soaking of Cassava**  
**photo 4:** Soaking and drying



**h) Drying of cassava**



#### 4.1.3 Functioning of Kinazi Cassava Plant

The “Kinazi Cassava Plant” is a private company that opened its doors in April 16<sup>th</sup> 2012. It is totally owned by BRD. The company has an objective of covering the whole chain of cassava from developing the farmer’s capacity to selling cassava flour at different levels. To achieve that mission, day-to-day activities are managed by a number of around 40 staff of different experiences including administrative managers, engineers, food scientists, agronomists, security officers, drivers etc... Among the mentioned figure five are graduated agronomists, two university graduated in food sciences, one university graduated in accountability, one university graduated in administrative management, two university graduated engineers and other staff qualified according to their positions. Kinazi Cassava Plant has opened due to the request made by local inhabitants to the president of the republic when he was on an official visit.

**“Only the average of 15 tons is produced every day”** according to records of the production services. The company operates at the primitive stage because it is still creating strong the relationships between the farmers and their cooperatives. As mentioned by both sides of respondents, preliminary meetings were held in order to look at future strategies of cooperation.



i) Kinazi Cassava Plant  
Photo 5: Kinazi Cassava Plant



j) Akanyaru valley

Until now the day to day processing of Kinazi Cassava Plant depends on few quantities of cassava that are received from farmers. **“The farmers who are willing to sell their harvest to the company make an appointment with the agronomists of the company; the agronomist visits the farms in order to know the location and estimates the quantity that could be harvested from that field. The morning after the sale formalities are concluded, the agronomist comes back with a truck to collect the harvested fresh cassava tubers and take it to the company** as mentioned by respondents of both sides

and observed by the researcher. Each lorry has a capacity of transporting seven tons. There are 5 agronomists, and each of them takes a truck and a balance. The picture k shows two agronomists (one in black another in white shirts) on the farm together with the farmer (in T shirt). In the picture i and m, the weights are taken before packing and transport (picture m).



**k)Visit on farm**



**i)Taking the weights**



**m)Bulking and Transporting**

#### **Photo 6: Buying fresh cassava**

While conducting the interview, it was mentioned by the agronomist that when they are from the same transport area, small farmers can sell their harvest to the company individually or in groups. After taking and recording the weights, farmers are given a receipt to confirm their sale. The payment is done mainly through a bank account between 3 and 5 days. The labourer involved in those activities is paid immediately after the work has been accomplished.

#### **Quality in processing**

Kinazi Cassava Plant acts in compliance with the ISO22000:2005 for food safety management system. This compliance covers the certification for system and the certification for product. At the national level the Kinazi Cassava Plant fulfils the standards recommended by RBS which include the specification for cassava flour, Labeling and packaging, and good hygiene practices. Among the specific quality factors are as explained by both the production and quality managers are:

- **The moisture content which is generally kept between 10.5 and 11.5%, however, other limits should be availed for certain destinations in relation to the climate, duration of transport and storage. Lack of drying to the maximum is susceptible to growth of mycotoxins, and other human health hazards.**

- Cyanide is kept below 10 mg per kg of flour while it is between 18 to 20 in traditional processing
- Contaminants, mycotoxins and hygiene are also controlled
- Waste water treatment is currently handled in natural ways with addition of lime.

One of the current bottlenecks of the processing is that the Kinazi Cassava Plant buys all of the production of the farmers, does not select out only the good tubers from and. This was said by the production manager and later confirmed by farmers. The director of the company added that “ ***in the coming days the selection will take into account some factors which currently have a negative influence on the income of the company like the water content in tubers, fibers, variety, age of fresh tubers, soil kept on the tubers***”. He made a reference to cassava processing in Brazil where a discount of 5 to 10 % is applied to cassava because of kept soils on tubers, peels and fibers.

#### 4.1.4 Market and Prices

Kinazi Cassava Plant represents the biggest market of cassava in Ruhango, with its capacity of processing the total production of the district. However it actually processes on average 45 tons per day which represents 30% of the total production. Of the remainder 50% is consumed at home while 20% goes to other markets which are mainly the city markets.

Kinazi Cassava Plant buys fresh cassava of all varieties at the same price, there is no discount for impurities like high water content, fibers, peels or old fresh tubers; this is due to the fact that after the farmers harvest the cassava it takes too much time before the company starts the processing. Farmers accept and appreciate the weights recorded by the company, although there is no formal agreement of buying cassava, all farmers are aware that the company will buy their harvest. Due to lack of formal agreement, farmers hesitate to sell to the company because they get higher price from other buyers. In the beginning the company paid 45 Rwandan francs for each kg of fresh cassava. While this study was being conducted, an increase of 10 Rwandan francs was added. The rapid increase of this price created a hope in the farmers' mind that one day it will reach the level that they wish. However this was used to motivate them to supply their cassava to the company. The Price is fixed by the company without consulting the farmers. “This made farmers unhappy as mentioned by most of the respondents and even one farmer mentioned that “why those people want our cassava while they don't want us? Why are they keeping themselves away from us?” Moreover another respondent from the staff of Kinazi Cassava plant also mentioned that ***although the price for fresh cassava is not low he doesn't also know how it was set***. Another respondent said “***the only way of farmers to negotiate the price***

*is to refuse the current one and then it will go up*". Some respondents from farmers as well as from the processing plant said that *"higher price should be given to farmers who supply fresh cassava of higher quality in order to motivate others"*. Among the qualities are the age, less content of fibers, low water content, high dry matter and high content of starch as quoted by the Processing plant agronomist.

Farmers are paid through bank accounts within three to five days after the sale, farmers said that this period is long and sometimes it can take longer, as observed one supplier came to the company to claim that she didn't receive due payment in the given time and was still waiting, but the director of finance explained her that the delay was probably due to transfer of money from Banque de Kigali (BK) to "Banque Populaire du Rwanda" where the farmer owns the account. A cheque can also be used when the farmer expresses an urgent need. The laborer involved in harvesting is paid immediately after harvesting and packing.

The table below shows the value share of cassava and flour from the farmer to the final retailer according to farmers and Kinazi cassava Plant staff.

**Table 6:** Value share from cassava chain

Actors	Variable cost (RWF)	Selling price (RWF)	Margin(RWF)	Share value in %
Farmers	20	50	30	3.8
Harvesters	50	55	5	0.6
Kinazi Cassava Plant	55	500	445	57.05
Retailers(shops, markets)	500	600	100	12.8
Retailers(supermarkets)	500	700	200	25.6

Kinazi Cassava Plant takes high margin value because it ensures the increase of the value for cassava (processing cost) even as the operation cost. Shops and supermarkets pay high taxes and give high services.

It was also interesting to hear about the price offered by other buyers, but it was not easy to check and confirm the received information. The interviewed farmers said that *"60 Rwandan francs is paid on farm for fresh cassava tubers before harvesting, 110 per kg when the farmers pay the harvesting laborer and 160 Rwandan francs per kg for dried cassava called cassava chips. Other buyers include traders, wholesalers, neighborhood and schools"*

#### 4.1.5 Benefits of Farming Agreement

During the interviews all the respondents mentioned that ***“there is no contract between the farmers or the cooperative and Kinazi Cassava Plant but they added that each cassava producer who wants to sell his produce to the company can sell it”***. This kind of relationships represent an ensured market for farmers hence an informal contract is used. The benefits from this kind of relationships are still unfavorable to farmers because they have no possibility of bargaining for the price however they can negotiate with other buyers for whom they are not sure of the availability of the market. Kinazi cassava Plant does not also benefit much from this kind of agreement since it works at low capacity due to lack of required quantity of fresh cassava.

Among other possible benefits are the credits for increasing the production, extension service, and participation of farmers in calculation of the price. Credit is offered by BRD which is the owner of Kinazi Cassava Plant upon a presentation of a business plan certified by Kinazi Cassava Plant. While conducting this research it was mentioned by the agronomist of Kinazi cassava plant that ***“eight farmers from other cooperatives than Mbakungahaze were given credit”***. However it was also mentioned by the president of Mbakungahaze that ***“a business plan for the members of their cooperative was being prepared in order to apply for the credit”***. This facilitated to know that credit will be a bridge for the company to get fresh cassava. Lack of a formal agreement prevents the price to be calculated in relation to the cost. It is simply fixed by the company.

#### 4.1.6 Communication between the Kinazi Cassava Plant and Farmers

The communication between farmers and Kinazi Cassava Plant is mostly done in informal ways. Farmers complain ***“for not having the way to express their views to the company”***. Even if farmers receive the communication from the company, ***“the company sends communication to farmers when the local government has meetings with the farmers or when farmers are assembled for the common work (umuganda) which takes place once a month and pass their information to the farmers. .***

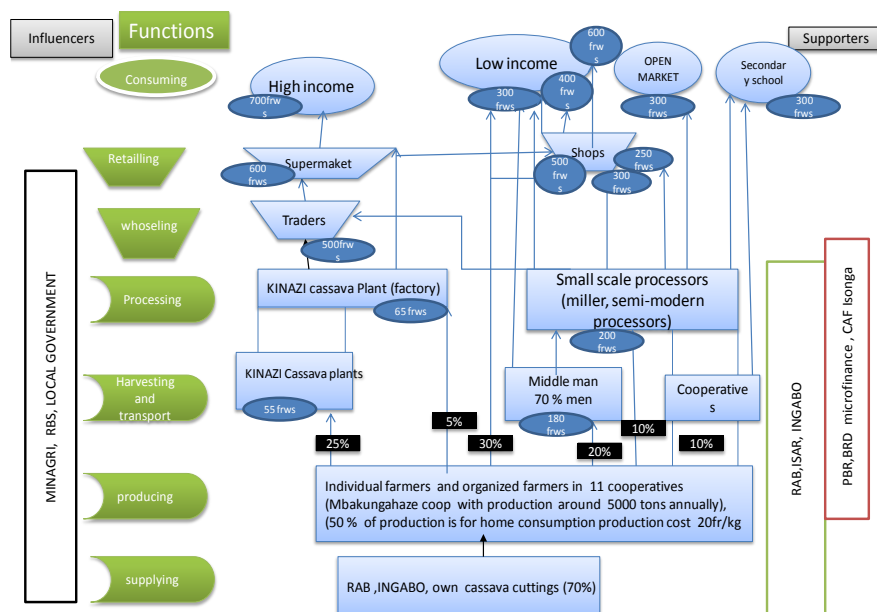
***“When the farmer wishes to supply his cassava to the company he must call the agronomist on his telephone or asks him while passing on the way. He can also take a little bit of his time and go to the company to make a request”***, this was said by the company agronomist. It was made clear that it is not easy for a small farmer who does not own a mobile telephone and lives very far from the company to negotiate the market. It takes also time, because the agronomist must first go and makes an estimation of how much the harvest will be and if necessary interest the neighboring farmers in order to get the quantity that can at least fit the lorry. The absence of extension officers who could link regularly the

company to farmers is the major complication of the communication issue. One respondent from Kinazi cassava Plant said that ***“meetings of farmers will be held to give more information and even it was proposed that at least one meeting every three months can take place at the company between farmers and the management of the processing plant”***

#### 4.1.7 Cassava Agribusiness System

The following value chain was developed to show mainly the quantity of fresh cassava that is bought by Kinazi Cassava Plant.

#### Value chain of cassava Mbakungahaze cassava farmers and Kinazi Cassava Plant



**Figure 8: Cassava value chain between Mbakungahaze cassava farmers’ cooperative and Kinazi Cassava Plant**

Kinazi Cassava Plant takes around 30% of the total production, while 20% is bought by traders and around 50% is processed and consumed at home. Compared to the value chain map Figure 5, small scale appears in both chain, the middle men play an important role in supplying cassava to small scale processors. However Kinazi Cassava Plant gets into contact with farmers without middle man. The price paid to the farmers is different: Kinazi cassava Plant pays little price while other buyers pay high price. Concerning the SWOT analysis a little difference is observed from the figure 8: Home consumption of cassava and side selling are the new threats between Kinazi Cassava Plant and Mbakungahaze cooperative. Furthermore similar operators are in both chains.

#### **4.1.8 Perspectives between Kinazi Cassava Plant and Mbakungahaze cooperative**

During the interviews it was noticed that farmers and Kinazi cassava Plant have perspectives that shall improve their relations once they are developed in the future.

The introduction of formal agreement just a contract is an aspect that both sides talked on as well as the content of it. Farmers and the company quoted that ***“a day will come that a contract will be developed and the views from both sides will be considered as well as the way breaches of the contract shall be punished”***, the agronomist of the company added that ***“it is a process to reach the contract, it cannot be done in short time, trust can also work”***.

Bulking and supplying are the points that cooperative complained that could not be accomplished by the company. The farmers said ***“it’s our cassava, it’s up to us to take it to the processing plant, and we can find vehicles or hire them from the company if they want”***.

Farmers have willingness to negotiate the price instead of working on the fixed price. The use of fertilization in the future was also raised; farmers as well as the staff of Kinazi Cassava Plant know that fertilizing cassava contribute to high yields from which both can benefit.

It was also in the mind of Kinazi cassava managers that privatization of Kinazi Cassava Plant and allowing farmers and their cooperatives to have shares will contribute to the sustainability of the company because of the feeling of ownership that will arise from the farmers. However, privatization could not be talked in the near future because the company still needs to establish itself efficiently and covers the loss due low rate processing.

## 4.2 Data processing and findings

The scores given in the questionnaire were entered in a excel workbook. Based on these scores one table and two graphs for each challenge area was made. The produced table shows the averages for each statement and for each challenge area and other processed data useful to understand the scores given. The produced graphs show respectively the level of scores in percentages and level of agreement for each statement for every challenge area. In addition, for each challenge area another table was given to recall the content of the challenge areas.

### 4.2.1 Production and Productivity

Six out of nine scores of the scores of the farmers are below the average and seven are below the scores of the company. For the company only three are below the average while only one is below the farmers score. Furthermore, both sides scored equally and above the average on the increasing of yields.

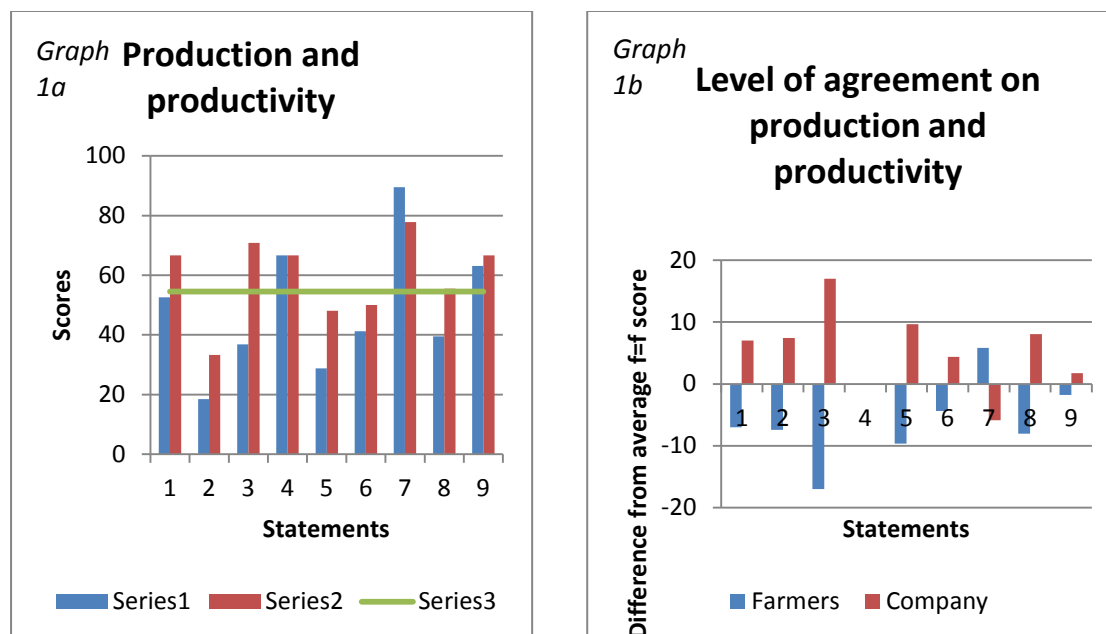
**Table 7: Statements for production and productivity**

1	Production and productivity	Observations
1.1	Farmers have sufficient planting material	High scores for both sides
1.2	Farmers use fertilizers	Low scores for both sides
1.3	Farmers are provided with sufficient know how on cassava production	Low score by the farmers and high scores for the company
1.4	Farmers yields are increasing	high and equal scores
1.5	Farmers know the production cost for one kg of fresh cassava	Low scores but the company scored higher
1.6	The size of fields for cassava is sufficient	Low scored for both but the company scored higher
1.7	The farmers fields are suitable for the cassava crop	High scores for both sides
1.8	Farmers are able to afford the inputs	Low score for farmers and high for the company
1.9	Farmers have good planting material	High scores for both sides

The average of farmers score is 48.8 while it is 60.3 for the company. The average for both is 54.6. The low scores correspond to the use of fertilizers, the calculation of production cost, sufficiency of cassava land and the affordability of inputs and the availability of extension services.



The level of agreement is mostly low except for statement four where the scores are equal and in the ninth statement where the gap is smaller.



a) scores

b) level of agreement

Figure 9: Production and productivity

#### 4.2.2 Functioning of the 'Mbakungahaze Cassava Farmers Cooperative'

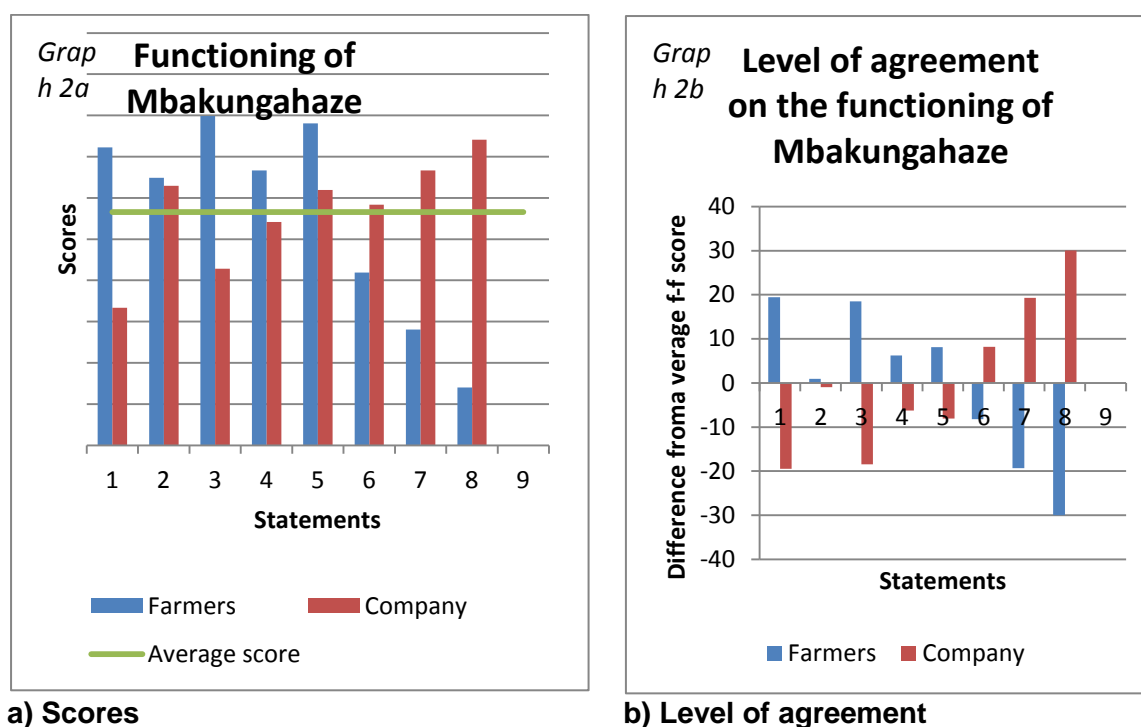
For the first five statements, farmers scored higher above the average while the 'Kinazi Cassava Plant' scored five statements above the average and three below the average.

Table 8: Functioning of the cooperative: statements

2	Functioning of farmers cooperatives	Observations
2.1	Functioning of cooperatives is satisfying	High score for farmers and low for the company
2.2	Farmers know the importance of joining each other into cooperatives	High scores for both sides
2.3	Elected farmers 'cooperatives leaders fulfil their duties as provided by the laws	High score for farmers and low for the company
2.4	The meetings of the cooperative members are effective	Both high but the farmers score is higher
2.5	The cooperative members are aware of financial issues	Higher scores for both sides
2.6	Farmers follow good agricultural practice	Low score for farmers and high for the company
2.7	The farmers keep records for cassava delivered to the company	Low score for farmers and high for the company
2.8	Farmers are happy of the functioning of the company	Low score for farmers and high for the company

The average score for farmers is 55.6 while for the company it is 57.6. The average for both is 56.6. Farmers scored very low on the statement 4 and 7 while the company scored low in the statement 1 and 3.

The level of agreement is small for almost all statements except in the second statement where both sides have a slight difference. Likewise their scores are above the average.



**Figure 10: Functioning of 'Mbakungahaze Cassava Farmers Cooperative'**

#### 4.2.3 Functioning of 'Kinazi Cassava Plant'

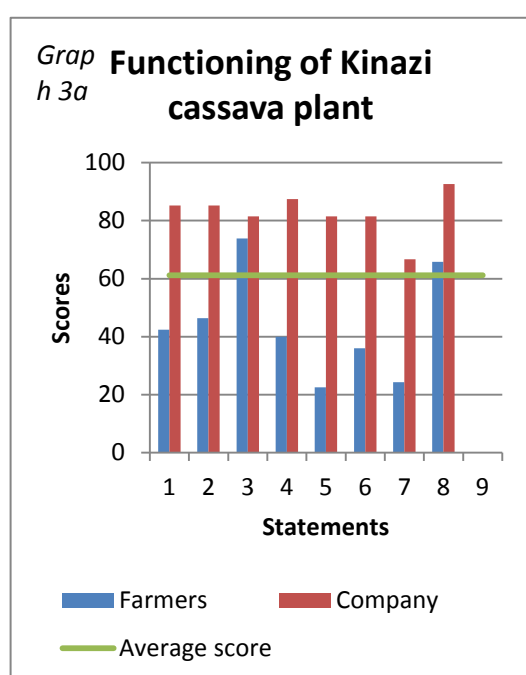
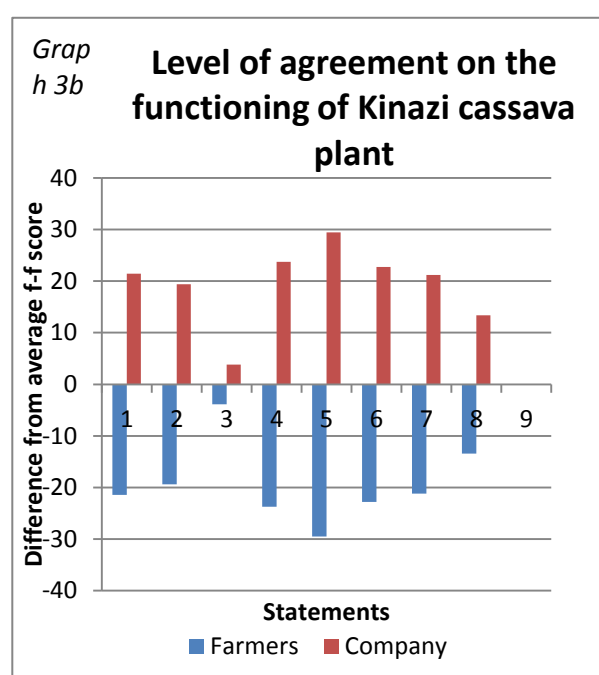
In this challenge area, farmers scored below the average in six statements and below the scores of the company in all statements. All the scores of the company are above the average.

**Table 9: Functioning of ‘Kinazi Cassava Plant’: statements**

3	Functioning of ‘Kinazi cassava plant’	Observations
3.1	The company is happy to work with cooperatives	Low score of farmers and high score of the company
3.2	The company has adequate number of staff	Low score of farmers and high score of the company
3.3	The company is able to buy all the produce of the cassava farmers	High score for both sides
3.4	I know how the company selects farmers for whom to buy the produce	Low score of farmers and high score of the company
3.5	The company considers important the views of the farmers	Low score of farmers and high score of the company
3.6	The company understands well the ways in which the company works	Low score of farmers and high score of the company
3.7	The company has instituted the channel of communication through which farmers Can pass their ideas to the company	Low score of farmers and high score of the company
3.8	The cassava processed by the company tastes better than the flour Processed in traditional ways	High score for both sides

The average score for farmers is 39.8 while it is 82.6 for the company. The overall average is 61.2. Farmers scored low in most all statements except the statement 3 and 8. The company scored high for all statements.

Regarding the level of agreement, the gap is very big in all areas except in the third statement (‘Kinazi Cassava Plant’ is capable for buying the whole production) where the difference between the scores of both sides is 7.7%.

**a) scores****b) Level of agreement****Figure 11: Functioning of ‘Kinazi Cassava Plant’**

#### 4.2.4 Markets and prices

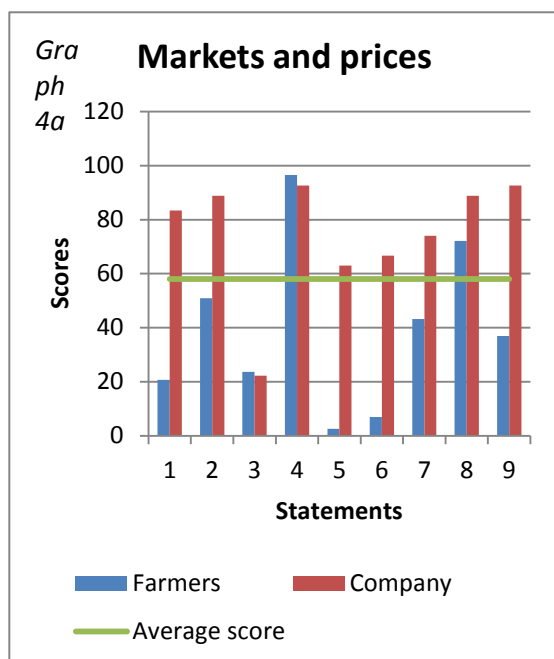
For this challenge area, farmers scored below the average in seven statements and below the company's score in eight out statements. Eight scores of the company are above the average and only one is below the farmers score.

**Table 10: Market and prices: statements**

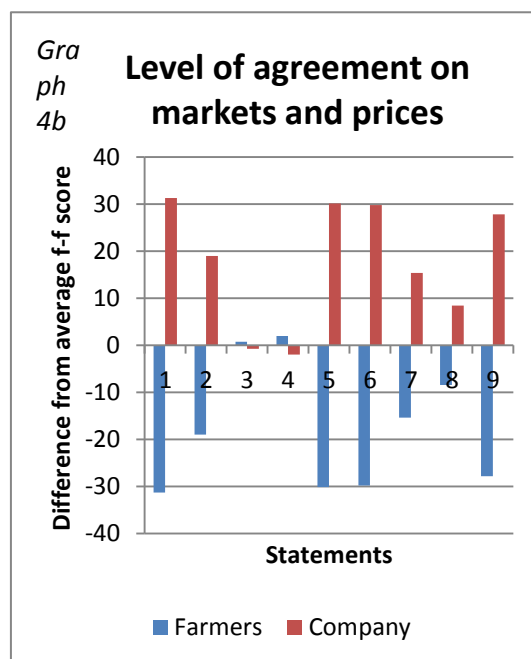
<b>4</b>	<b>Markets and prices</b>	<b>Observations</b>
4.1	I know the production cost incurred by the company to get one kg of processed flour	Low score for farmers and high score of the company
4.2	Farmers know the price at which the company sells the flour	Low score for farmers and high score of the company
4.3	The quantity of Cassava consumed in farmers households is much more than the sold quantity	Low score for both sides
4.4	There are other cassava buyers at market	High score for both sides
4.5	Farmers participate in price setting	Low score for farmers and high score of the company
4.6	The price offered by the company makes farmers happy	Low score for farmers and high score of the company
4.7	The company pays farmers on schedule/without delay	Low score for farmers and high score of the company
4.8	All Farmers are paid at the same price	High scores for both sides
4.9	Farmers have trust in the company's weighing balances	Low score for farmers and high score of the company

The average score for farmers is 39.2 while it is 76.8 for the company. The overall average is 58.0. Farmers scores are low in the statements 1, 2, 3, 5, 6, 7 and 8. The low score for 'Kinazi Cassava Plant' corresponds with the statement number 2.

The level of agreement is higher in two statements, the third and the fourth successively scored below the average another above the average while for others the level of agreement is low.



a) scores



b) Level of agreement

Figure 12: Markets and prices

#### 4.2.5 Benefits of farming agreements

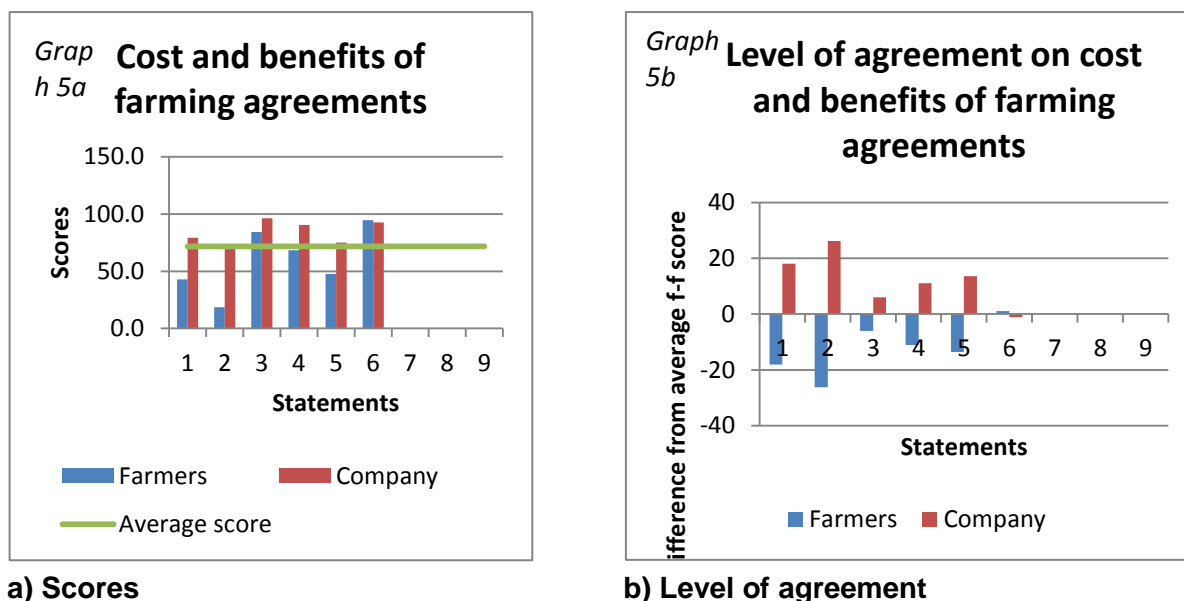
This challenge area has six statements and intends to look into the understanding of respondents on farming agreement. For this challenge area, farmers scored four statements below the average and five below the score of the company. The company scored on all the statements above the average and only one below the farmers score.

Table 11: Benefits of agreement: statements

5	Benefits of farming agreements	Observations
5.1	Cassava farming provides farmers with a steady income	Low score for farmers and high score of the company
5.2	Kinazi Cassava Plant advises farmers on cassava farming	Low score for farmers and high score of the company
5.3	Each individual farmer is accepted to sell his produce to the company	High scores for both sides
5.4	The income made from cassava can be invested in other income generating activities	High scores for both sides
5.5	The cassava farmers gets loans to invest in their farming activities	Low score for farmers and high score of the company
5.6	Farmers are happy for the guaranteed market for their cassava produce	High scores for both sides

The average score for farmers is 59.5, while it is 84.1 for the company. The overall average is 71.8. The low scores for farmers are for the statements number 1, 2 and 5. The scores of the company are always higher.

The level of agreement is higher in the third and sixth statements, while it is low in all other statements.



**Figure 13: Benefits of the agreement**

#### 4.2.6 Communication

This challenge area has eight statements and the objective is to get information on how farmers receive the information from the 'Kinazi Cassava Plant'. For this challenge area, the farmers scored below the average in seven statements out of nine and the company scored all the statements above the average.

**Table 12: Communication: statements**

6	Communication	Observations
6.1	Cassava farmers are regularly kept informed on the company issues	Low score for farmers and High scores for the company
6.2	Farmers have the information tools(mobile phones	High scores for both sides
6.3	Farmers have visited the company in order to understand the functioning of the company	Low score for farmers and High scores for the company
6.4	The company gives answers to all questions asked by the farmers on the cassava farming	Low score for farmers and High scores for the company
6.5	the farmers know the quality of cassava needed by the company)	Low score for farmers and High scores for the company
6.6	The company is clear about the quantity it needs to buy from farmers	Low score for farmers and High scores for the company
6.7	Farmers know the needs of the clients of the company	Low score for farmers and High scores for the company
6.8	I know the quantity of needed fresh cassava tubers to give one kg of flour	Low score for farmers and High scores for the company

The average score for farmers is 32.9 while it is 80.3 for the company. The average for both is 56.6. Farmers scored lower than the average in the statements 1, 3, 4, 5, 6, 7, and 8. The Company scored higher in all statements.

The highest level of agreement is on the challenge number two and lowest level is on the eighth statement.

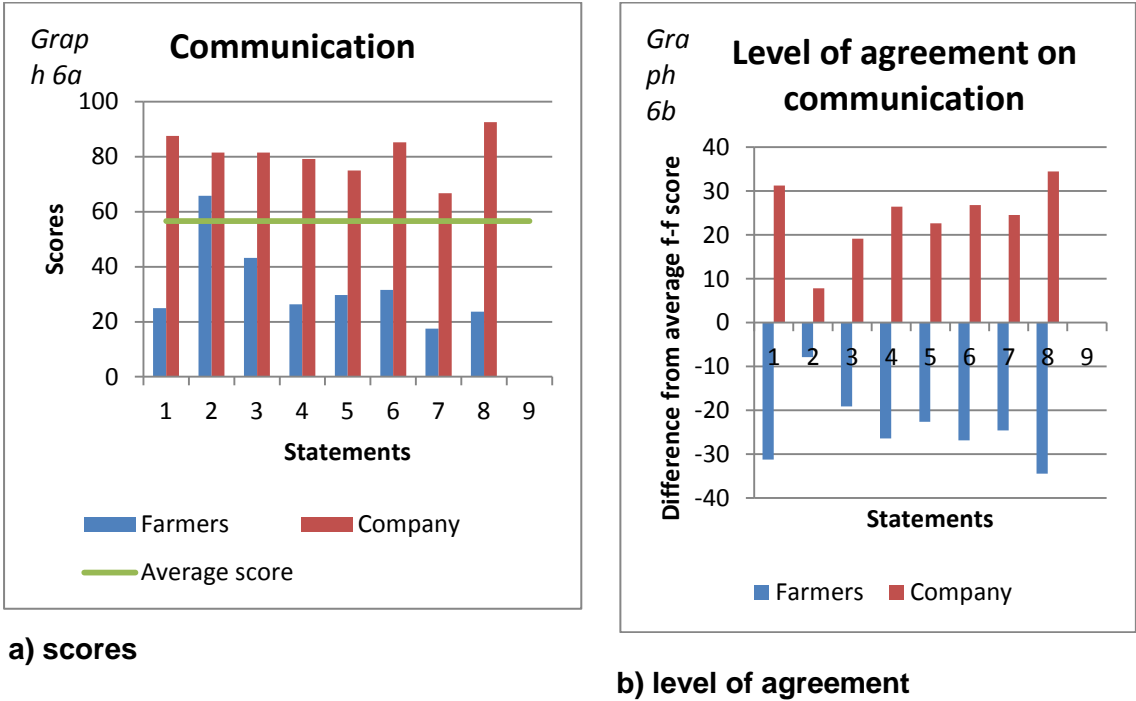


Figure 14: Communication

#### 4.2.7: Stakeholders network and collaboration

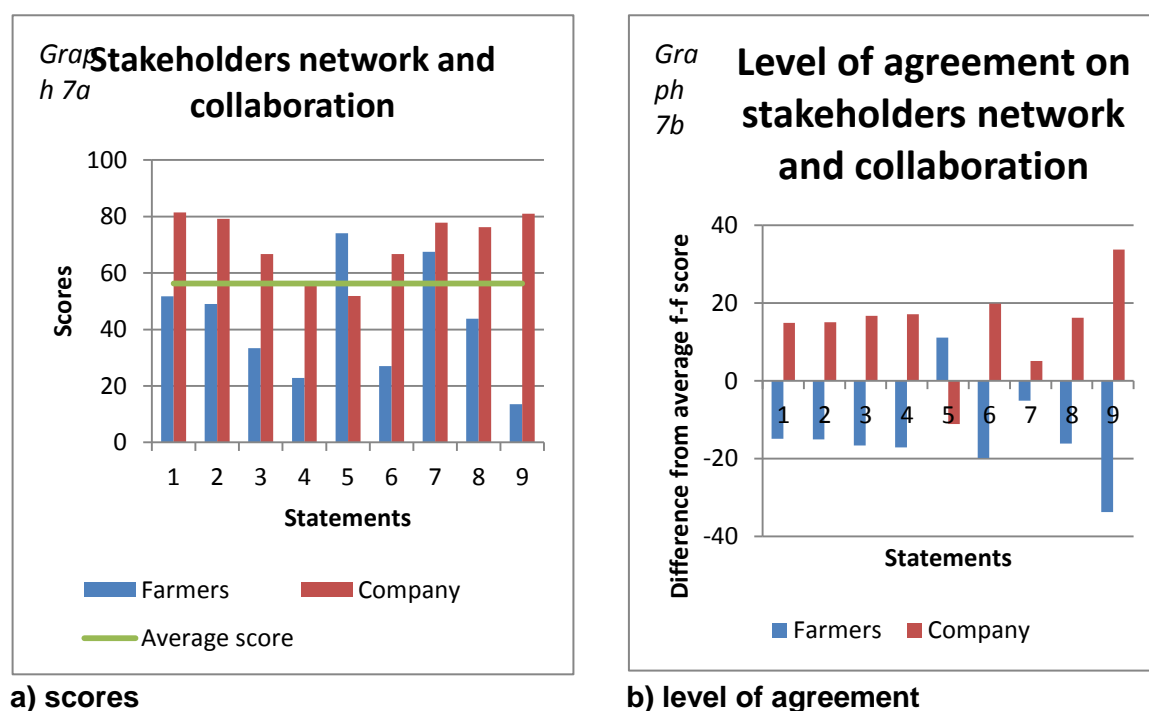
In this challenge area, there are nine statements; farmers scored seven below the average and eight below the company score. The company scored eight above the average and only one below the farmers 'scoring level.

**Table 13: Stakeholders network and collaboration: statements**

7	Stakeholders network and collaboration	Observations
7.1	I know the stakeholders in cassava crop	Low score for farmers and High scores for the company
7.2	Farmers are given consideration/free room in the meetings of cassava stakeholders	Low score for farmers and High scores for the company
7.3	Stakeholders fulfil their duties and responsibilities as required	Low score for farmers and High scores for the company
7.4	There is a formal platform of cassava stakeholders	Low score for farmers and High scores for the company
7.5	Stakeholders consider more important cassava business rather than cassava production	High score for the farmers and low for the company
7.6	RAB gives enough advices to cassava farmers	Low score for farmers and High scores for the company
7.7	Cassava is given room of priority in Ruhango district	High scores for both sides
7.8	Bank institutions are willing to provide loans to cassava farmers	Low score for farmers and High scores for the company
7.9	Governmental agronomists facilitate the understanding between farmers and the company	Low score for farmers and High scores for the company

The average score for farmers is 42.7 while it is 69.9 for the company; the average for both is 56.3. The lower scores for farmers correspond to the statements number 2, 3, 4, 6, and 8. The company scored almost high in all statements except in the statement number five.

The level of agreement is higher in the statement number seven and smaller in number nine.

**Figure 15: Stakeholders network and collaboration**



#### 4.2.8: Perspectives

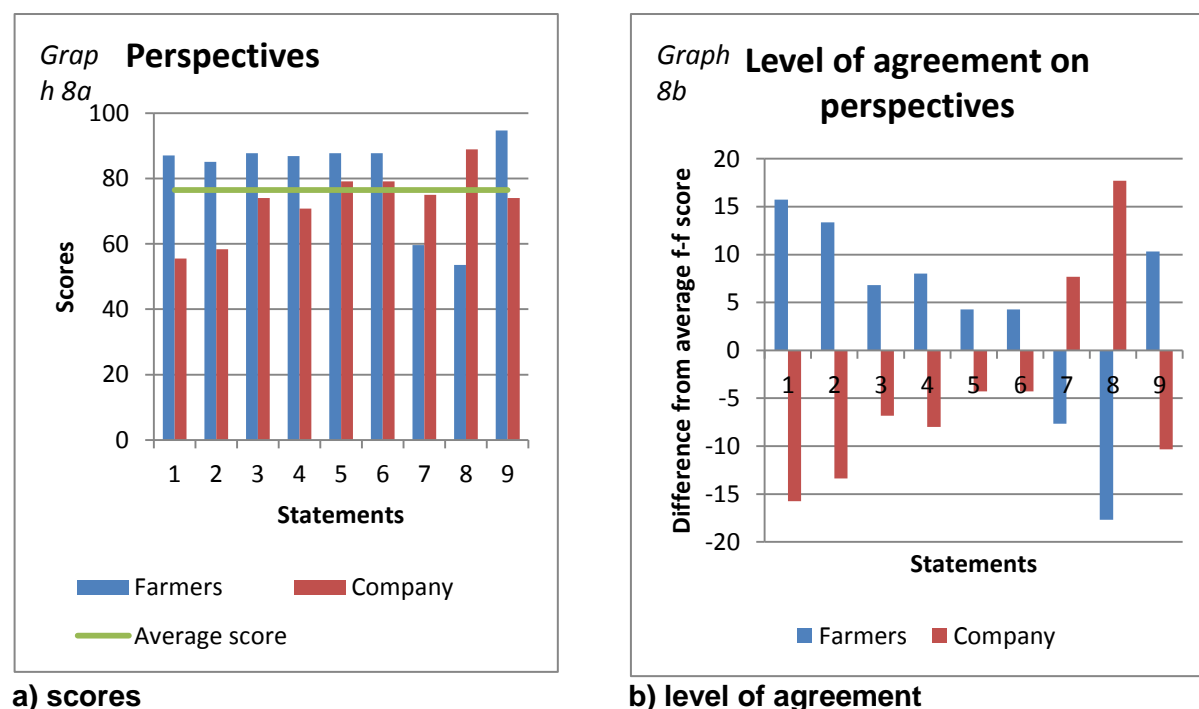
There are nine statements. Farmers scored seven above the average of scores of the company. The company scored three above the average and two above the farmers score.

**Table 14: Perspectives: statements**

8	Perspectives	Observations
8.1	Farmers/cooperatives can make bulking of their cassava produce	High score for both sides
8.2	The company can reject the production supplied due to lack of required quality/ standards	High score for both sides
8.3	I wish the company and farmers should establish a contract for buying cassava produce	High score for both sides
8.4	The company and the farmers should prepare the contract together	High score for both sides
8.5	The contract should be followed without bypassing any portion)	High score for both sides
8.6	Non respect of contract should be punished by laws (competent authorities)	High score for both sides
8.7	It is good that farmers could hold shares within the company	High score for both sides
8.8	It is important that the company starts the farmer field school	High score for both sides
8.9	Selling cassava through cooperatives should increase the income of farmers	High score for both sides

The average score for farmers is 81.1 while it is 71.9 for the company and the overall average is 76.5. Scores are almost high for both sides.

The level of agreement is generally small; the lower levels are on the statements number one, two eight and nine while higher levels of agreement are in five and six statements.



**Figure 16: Perspectives**

### 4.3 Results of Focus group discussion

After the data processing of the questionnaires a debriefing meeting was held to discuss the results of the self-assessment. The views of both farmers and 'Kinazi Cassava Plant' are summarized in the next table.

**Table 15: Results of Focus group discussion**

SW	Challenge area	Areas of low or high scores	Views and propositions of farmers	Views and propositions of the company
01	<b>Production and productivity</b>	<p>Availability of planting material</p> <p>Quality of planting material</p> <p>Use of fertilizers and their affordability</p> <p>Provision of Extension services</p> <p>Calculation of production cost</p>	<p>Increase the availability of varieties on farm and circulation in the neighborhood</p> <p>Continue to subsidize farmers of low capacity of buying new varieties</p> <p>Possible if the funds were available or if prices were increased, it will require very high cost. The government should subsidize fertilizers as it does for other crops</p> <p>The available agronomists can improve their working way</p> <p>To be given trainings</p>	<p>Farmers can borrow from the neighbors or use credits</p> <p>The current varieties are good but still need to have a variety of high content of drying matter</p> <p>Farmers should prepare the business plan and get credits to use from BRD or other banks</p> <p>In the near future the company shall start its own program of extension services.</p> <p>Cooperatives should train farmers</p>

02	<b>Functioning of the cooperative</b>	<p>The functioning of the cooperative is satisfying</p> <p>Elected cooperative leaders respect the constitution and laws</p> <p>Farmers respect good agricultural practices</p> <p>The farmers keep records for cassava delivered to the company</p>	<p>Mostly farmers are happy</p> <p>Farmers think their representative fulfills their duties</p> <p>Farmers seem to know most of the practices and mentioned that when they are not followed, is due to individual reasons</p> <p>they think the documents become less valued after getting the payment, so improvement will be done</p>	<p>Cooperative should work as producers and not as traders and more some cooperative leaders are suspected to try making profit over their members.</p> <p>Trainings need to be given</p> <p>Farmers need to improve this behavior</p>
03	<b>Functioning of the company</b>	<p>The company is happy to work with cooperatives</p> <p>The staff of the company are sufficient</p>	<p>Farmers say that the company keeps itself away from farmers, since it does not accept any proposition from them.</p> <p>Farmers explained that if maybe they were sufficient, the extension services</p>	<p>The company said we do agree to work with them, but they need to improve their functioning.</p> <p>The company said that farmers want the company staff to do other duties</p>

		<p>I know how the company selects the farmer from whom to buy the harvest</p> <p>The company respects the farmers' views.</p> <p>The company understands the way farmers work.</p> <p>The company has established the communication channel</p>	<p>would be provided</p> <p>Although the score is low, they said that all farmers are allowed to sell.</p> <p>To explain their low score, farmers only emphasized on the price, which is low for them</p> <p>Farmers say that the company does not know that farmers are not able to handle properly their business while they are cassava entrepreneurs.</p> <p>Farmers see the company staying away from them while it wants their cassava, it requires to seat together</p>	<p>that should belong to other stakeholders</p> <p>The company said that if the farmers do not want to sell his harvest to the company may be due to the price, some other prejudices may be advanced.</p> <p>There are ideas that cannot be respected at the beginning like bulking and transport of fresh cassava because the organizations of farmers are not yet effective</p> <p>The company differentiates farmers from cooperatives' managers</p> <p>The company thought communication to negotiate market was enough</p>
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04	<b>Markets and prices</b>	<p>I know the processing cost paid for one kg of cassava by the company</p> <p>Farmers participate in price setting</p> <p>The price for cassava makes farmers happy</p>	<p>The company can explain to farmers</p> <p>Bargaining is needed</p> <p>The price is low compared to the cost</p>	<p>Still looking at the feasibility of introducing farmers to the whole company</p> <p>The price is set after evaluating many parameters ignored by farmers</p> <p>Farmers do not calculate the costs for other activities which contribute to increasing the price from other buyers</p>
05	<b>Benefits of the farming agreement</b>	<p>Cassava farming provides farmers with a steady income</p> <p>Kinazi cassava plant advises farmers on cassava farming.</p> <p>The cassava farmers gets loans to invest in their farming activities</p>	<p>The score were done in general, not considering selling to the company</p> <p>Farmers use their own knowledge and rarely are coached by the governmental agronomists.</p> <p>The credits are negotiated outside the company</p>	<p>Farmers sell in segments and not in one round</p> <p>Still looking at the feasibility</p> <p>Farmers need to fulfill the requirements of BRD</p>

06	<b>Communication</b>	<p>Cassava farmers are regularly kept informed on the company issues</p> <p>The company gives answers to all questions asked by the farmers on the cassava farming</p> <p>The farmers know the quality of cassava needed by the company</p> <p>The company is clear about the quantity it needs to buy from farmers</p> <p>Farmers know the needs of the clients of the company</p> <p>I know the quantity of needed</p>	<p>Need of a communication channel</p> <p>They only answer to the questions related to the request of selling cassava</p> <p>They buy fresh cassava of any quality</p> <p>The quantity is not known</p> <p>There is no special requirements for fresh cassava</p>	<p>Our best is done to reach them, however we shall use the extension officers</p> <p>Only questions in our capacity are answered</p> <p>Any quality of fresh cassava is bought as a way of compensating for the time farmers have been waiting the company to start. This will change later and requirements will be set.</p> <p>The whole produce can be bought actually</p> <p>Farmers will be informed after identification of clients possible clients, the process is still on</p>
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		fresh cassava tubers to give one kg of flour	Mostly not known by farmers, the company should tell us	They will be informed
07	<b>Stakeholders network and collaboration</b>	<p>Stakeholders fulfil their duties and responsibilities as required.</p> <p>There is a formal platform of cassava stakeholders.</p> <p>Governmental agronomists facilitate the understanding between farmers and the company</p>	<p>Empowering of farmers is low, need to increase the access to credits and inputs</p> <p>The platform for cassava stakeholders and the union should start</p> <p>They do not link farmers to the company, the cooperative leaders can try</p>	<p>There are some who don't work according to their agenda, increase the efficiency</p> <p>Farmers need to be organized, but if necessary the platform should be started</p> <p>Government agronomists and other staff working closer to farmers should tell them the reality on the business of the company not only pleasant promises</p>
08	<b>Perspectives</b>	All statements	All scores are high because the ideas are propositions for the future, if the company has requirements, they will be followed but our ideas should also be considered	Actually it still the beginning, we are still thinking about the contract and other possible options. If farmers change their current way of working, things will be brighter

## CHAPTER 5      DISCUSSION OF RESULTS

### 5.1      Discussion focusing on challenge areas

The chapter of discussion aims to present the interpretation of the findings of this research in relation to the research questions administered. These research questions have kept the investigator on the line of coming up with the areas of possible enhancement in cassava firm and farm relationships between ‘Kinazi Cassava Plant’ and farmers from Mbakungahaze Cooperative. To answer the research questions the analysis focuses on the challenge areas: production and productivity, functioning of the farmers cooperative, functioning of the company, markets and prices, benefits of farming agreement, communication, stakeholders networking and collaboration and perspectives. The analysis will take into consideration the areas of improvement for each challenge area.

#### 5.1.1      Current relationships between ‘Mbakungahaze cassava farmers cooperative’ and ‘Kinazi Cassava Plant’ in production and productivity

The current situation of relationships needs to be demonstrated by the roles played by both actors in the value chain of cassava. Firm farm relationships are characterized by partnership in production activities, having and respecting the agreement and the market assurance as quoted by CDI (2012).

During the focus group discussion farmers quoted that ***“they get planting material from their own farm or buy it from the multipliers or other farmers”***. The company said that ***“the required planting material should answer to the need of a variety of high dry matter content”***. It is then possible to think that some farmers are not able to access the planting material either because they are very far from the distribution areas or due to the price because one cassava cutting of 20 cm costs 7 Rwandan francs while it was 10 at the beginning of distribution in 2006 and 2009 (Mbabazi and Mushimire, 2010). The multiplication and distribution of new planting material (table 4.1) was done after a big loss of crop due to the spreading of CMD as reported by Gashaka (2011). In firm farm relationships the accessibility to planting material should be supported by firms to ensure the success (Prowse, 2012). The spread of disease should also be controlled since it can go from farm to farm through this informal accessibility of the planting material. Kinazi cassava plant should play an important role in availing the required planting



material which answers to their needs. Varieties of planting material have been improving since the introduction of cassava in Rwanda as the annex 2 shows it.

On the use of fertilizers to increase the production and productivity, both respondents mentioned that ***“they don’t fertilize cassava except very little manure that can be used. However they increased the land size for cassava”***, this was also mentioned by the district agronomist. However most farmers know that manure, Urea and NPK are used for cassava. Twiringiyumukiza and Schrader, (2011) after their experience quoted ***“that fertilization of cassava leads to at least doubling the production while the cost at 40%”***. The reasons why farmers do not use fertilizers are related to different conditions. Some farmers mentioned that ***they are not able to pay the fertilizers; others said that their farms give them enough harvest without any additional fertilizers while others are totally ignorant of fertilizing cassava crop***. It was observed by MINAGRI (2010) that where fertilizers have been distributed like in maize, wheat to farmers good production has been obtained. Until now cassava does not benefit from subsidy or provision of fertilization like other crops of priority while accessibility to fertilizers is one among the major aims of CIP (MINAGRI, 2011).

On the availability of the extension services Farmers quoted that ***“they are not available”*** as confirmed by the respondents from Kinazi Cassava Plant and by adding also that ***“in future Kinazi Cassava Plant will start the extension services”***. According to Pedro, Maffiol and Ubfal(2009) the extension services contribute 40% to increasing production and should be proceeded by either the government, cooperatives, firms or can be totally private. It was mentioned by Baumann (2000) that producers can benefit fertilizers and chemicals through the agreement. It is then possible to think that some farmers may be lacking techniques as the district agronomist mentioned that the ***“productivity of cassava is much influenced by the way farming skills are applied”***.

The availability of credits is not also adequate since farmers explained that ***“only large producers can manage to get loans in Banque Populaire while small farmers are not able to get collateral to access to credits”***. Kinazi Cassava Plant said that ***“BRD the owner of the processing plant has started to give credits to farmers who fulfill the requirements, it was mentioned that among the requirements are the business plan”***. The preparation of business plan requires skills that may be lacking from farmers. However the cooperative is trying to answer to this need by using a consultant.

### 5.1.2 Functioning of Mbakungahaze cassava farmers cooperative

While the farmers mentioned that their cooperative functions well, the respondents from the company emphasized that ***“there are a lot of issues that make the cooperatives not achieving their activities”***.

Although farmers said that ***“they are happy of the functioning of their cooperative”***, the interview and debriefing meeting clarified that farmers were not aware of the key principles and values of a cooperative, among them are: access to education, training and information, self responsibility, solidarity and honesty, openness, socio-responsibility and caring for others (RCA, 2011). It was also noticed based on the interview results (annex 4) that the cooperative lacks horizontal structure (cooperation with other cooperatives) and vertical integration (hierarchical organizations of the cooperative movements like unions, federations and confederations) as described in ILO (2007). In the functioning of this cooperative it was also found the cooperative gives much of importance to commercialisation of cassava, although it is good, the production needs also to be improved through the cooperative promotion (ILO, 2007). Lack of extension services, advocacy are ones among the major constraints of the functioning of Mbakungahaze Cassava farmers' cooperative. According to ILO (2007), the cooperatives can also assist their members in getting some facilities like inputs. It is then wise that the management of the cooperative should take into account the cohesion among the members.

### 5.1.3 Functioning of Kinazi Cassava Plant

Farmers have stressed that ***“Kinazi Cassava Plant have not a willingness to work with cooperatives as well as the number of the staff are not sufficient”***. The respondents from Kinazi Cassava Plant said that ***“they will work closely to the farmers; they added also that actually the company works in primitive conditions that's ways some activities are not well established”***. This corresponds with the findings of Barefoot (1997) where the pioneering organisation is characterised by an informal atmosphere which lacks policies and procedures.

Farmers mentioned also that they ***“don't know how farmers conclude the supplying conditions with Kinazi Cassava Plant”***, while Kinazi Cassava Plant said that ***“any supply of fresh cassava is bought without any special consideration”*** this disagree with Songsak and Aree (2008) when quoting that competition characterises firms in high demand crops and that monopoly of a firm should be a condition for success. These working conditions disagree also with the theory of farming agreements where actors should steak on the terms of agreement (Prowse, 2012).

Although Kinazi Cassava Plant has a high capacity of buying a lot of production, the way they get connected to the farmers affects much the relationships of Mbakungahaze Cassava farmers cooperative, and these effects could be the main causes of getting little cassava for processing, because farmers would not break down their relations with other buyers.

#### 5.1.4 Markets and prices

During the self assessment the majority of farmers confirmed that “**Kinazi Cassava Plant can buy all the produce of the farmers**”, to stress this be either the farmers or Kinazi Cassava Plant respondents added that “**all farmers are allowed to sell their produce to the processing plant**”. However the value chain map informs that **only around 30% of the production is bought**. Although cassava is mostly consumed at home all respondents quoted that “**other buyers are very important for the farmers, only because they give higher price than Kinazi Cassava Plant**” (Figure 8), this agrees with Schrader (2011), who quoted that Ruhango “**is an important supplier of cassava to city markets**” as well as NISR (2008) by saying “**cassava from Ruhango district is informally traded to DRC**”. However it was also mentioned that although Kinazi Cassava Plant gives lower price than other buyers, it is an assured market and buys only fresh cassava while other buyers take mostly dry tubers called chips. The cassava chips are obtained after undergoing three major steps of processing (peeling, soaking and drying).

The price between Kinazi Cassava Plant and Mbakungahaze cassava farmers’ cooperative as well as other producers is fixed in confident conditions. Farmers said that “**they don’t have any role in pricing their produce**” and some said “**we cannot sell our production like that**”. One of them during the debriefing meeting expressed that “**she calculated what she got after selling his produce and saw that she has been losing 3 Rwandan francs per kg compared to the production cost**”. It was also surprising to hear one staff of the processing plant quoting “**although the price is not low for farmers, I don’t know how and by whom the price was fixed**”. It was then made clear the price is fixed instead of passing through calculation, negotiation or depending on the quality. This disagrees with Songsak and Aree (2008) who states that firms should look for possible tactics to encourage farmers to bring their produce to the firm. It is in this regard that farmers should offer their produce to other buyers in avoiding low and fixed price which lacks additional incentives.

### 5.1.5 Benefits of cassava farming agreement

Farmers showed an interest of producing on contract, they mentioned that **“if the contract were there, we would be benefiting from it”** and among the benefits they mentioned **“the steady income, the credits from bank and the facilitation to inputs”**. Songsang and Aree (2008) and Prowse (2012) proposed six models of farming agreement those are intermediary and multipartite model, formal model, partly informal model, informal model, centralized model and nucleus model. They advise that the construction of a contract depends on the type of crop, the objectives and resources of the contractor, and the experience of the farmer. The research showed that both parties are aware of what is farming agreement. And also they know what should be given and received through the farming agreement, Songsak and Aree (2008) say that the agreement used in Thailand specified the incentives of farmers like seeds, fertilizers, loans and tractor services. Still discussing on the agreement farmers said that **“they have right to sell to any buyer since there is no agreement obliging them to sell to the company”**. The company is still looking about the practicability of how they can liaise permanently with farmers. The chief agronomist said, **“you see there are very many farmers, and also we need a lot of fresh cassava; it will not be easy to sign the contract with individual farmers since the supervision of respecting the contract would not be easy”**. Prowse (2012) and Songsang and Aree (2008), describe the intermediate contract as very useful in such situations where a large number of producers is willing to sign the contract. The use of intermediate body like a committee of farmers, a cooperative facilitates in controlling farmers for applying the contract as the company is located at a long distance. However when the company needs a huge amount of raw material, trust and understanding can be effective means to build relationships. As mentioned in the debriefing meeting the following elements should be part of the contract: engagement of parties, price, quantity of fresh cassava, access to inputs as well as the decisions to agreement breaches.

Moreover other benefits than selling like the increase in the accessibility to credits or other inputs would help the company to convince the farmers. It is possible that large farmers do not have problem of accessing credits because they appear as true entrepreneurs in some banks like “Banque populaire du Rwanda” while small farmers cannot because their farms are very small and their production in addition of being consumed mostly at home, is sold through in transient conditions to meet the household demands.

### 5.1.6 Communication

***“No possibility of exchanging information and the processing plant keeps away from us”*** this has been expressed by one farmer during the debriefing meeting. It was also mentioned by the processing plant agronomist that ***“communication makes a constraint between both sides”***. Although many farmers are grouped into cooperatives, the way each side works was not attractive to the other, this makes the communication difficult. Giving also official communication was not enough due to the fact that the information follows one direction. There is no feedback from farmers as they claim the discussion of elements (price, bulking, transport, harvesting schedule to mention few) of their stake together with the processing plant. The success of firm farm relationships is based on the satisfaction of both sides (Songsak and Aree, 2008). The scores made by farmers do not confirm that they are reached by the information from the company, however the use of modern technology can be effective since most of farmers own the communication means. The fact that the company does not have extension services which can meet with farmers on a regular schedule impacts also on the communication. Even though farmers ***“confirmed that farmers own communication means”***, it does not imply that the means are used in agriculture. If farmers do not know the requirements of what the company wants from them, it will be difficult to reach their capacity of processing. This study revealed also that improvement of communication is not enough to enhance the relations, there are a lot of farmers as well as buyers. Producer should speak to any of the buyer depending on the relations they have developed between them, that's why the contract should first be developed in understandable terms where farmers are able to understanding the requirements (Songsak and Aree, 2008).

### 5.1.7 Stakeholders network and Collaboration

As explained by farmers, ***“the stakeholders and their plan of actions in cassava crop are less known”***. This was latter confirmed by the chief agronomist of Kinazi Cassava Plant when saying that ***“there are a lot of things like networking, accessibility to credits, improving the communication that should be achieved through partnership with other stakeholders”***. Evaton and Shepherd (2001) argue that the value chain development is based on the formal or informal linkages among the chain operators, however setting the targets and reaching the beneficiary is a key factor for networking and collaboration. The findings revealed that the linkages between Mbakungahaze Cassava farmer's cooperative, Kinazi Cassava Plant as well as other actors and operators are very low, each works individually. Mbakungahaze cassava farmers

cooperative relates to Kinazi Cassava Plant through individual choice and decision of selling cassava to the processing plant while the role of local government is almost absent.

#### 5.1.8 Perspectives

Both Mbakungahaze Cassava farmers' cooperative and Kinazi cassava Plant have a good will of improving their relationships. They scored all statements with an average of 76.5% which is a promising score for their future. Some steps have already started as both actors have in mind the awareness on contract farming; some farmers have started to apply for credits through the approval of Kinazi Cassava plant.

The following elements have been, mentioned by both sides as very sensitive to the future, these are ***using fertilization in cassava crop, introduction of the contract, starting the model farms of cassava farms, selling cassava through farmers cooperatives.***

### 5.2 Firm farm relationships and food security

Part of the course relates to food security. This chapter is focusing on the dimensions of food security. Cassava is one of the major staple food crops in Ruhango district as well as in Rwanda. Around 50% of the whole production is consumed at home. Kinazi cassava plant process actually 30% of the production although its full capacity can absorb the whole production. It was revealed by the agronomist of Kinazi Cassava Plant that ***“farmers will continue to have right and accessibility on fresh cassava to be consumed at home. To support this he added that the processing company will buy also fresh cassava from neighboring districts. And also the produced flour is affordable by farmers”***. This was confirmed by the farmers who said that ***“the flour made by Kinazi cassava plant is better than the flour processed in traditional ways”***. Cassava is most frequently consumed by low and middle classes but different qualities of flour including high quality flour are available for the better of. The farmer said ***“with the introduction of dual purpose varieties, we are not know obliged of having to plots, one for sweet cassava, another for better cassava”***.

From the observation on field and the discussion here above, the following table was made to describe at which level Kinazi cassava plant and its suppliers can contribute to the enhancement of food security situation in Rwanda.

**Table 16:** Cassava Food security analysis for farmers

	Dimensions	Observations and indicators
1	Food availability	<p><b><i>Inputs and production:</i></b></p> <ul style="list-style-type: none"> <li>-Cassava cuttings are produced on farm and sometimes bought at 7Rwandan francs</li> <li>-No use of fertilizers</li> <li>-Accepts intercropping with food and non food crops</li> </ul> <p><b><i>Processing:</i></b></p> <ul style="list-style-type: none"> <li>-Kinazi cassava plant use at most 1/3 of its total capacity</li> <li>- High production from farms, little processing in modern ways, much consumed at home</li> <li>- Single form of product, only flour</li> <li>-Increased shelf life</li> </ul> <p><b><i>Location:</i></b></p> <ul style="list-style-type: none"> <li>-The flour is met in both rural and urban areas</li> </ul>
2	Food accessibility	<ul style="list-style-type: none"> <li>-Cassava constitutes basic and staple food</li> <li>-Accessible at markets, shops and supermarkets</li> <li>-The price is high for people with low income, at least middle income class can afford the price</li> <li>-Accepted by all members of the household</li> </ul>
3	Food utilization	<ul style="list-style-type: none"> <li>-Kinazi Cassava Plant abide the ISO 22000 regulations</li> <li>-produced under RBS for food quality control</li> <li>-Stored in a warehouse</li> <li>-Consumed under different forms</li> <li>- Easy to prepare</li> <li>-No prohibitions related to age, religions, regions, or other cultural practices</li> </ul>
4	Food stability	<ul style="list-style-type: none"> <li>-Although the quantity is not high; the production is done everyday</li> <li>- No high fluctuations of prices</li> <li>-The quality is stable and always controlled by the quality manager</li> <li>-Mostly attacked by CMD,</li> <li>-cassava is resistant to other diseases, drought and tolerant to poor soils.</li> </ul>

## **CHAPTER 6: CONCLUSION AND RECOMMENDATIONS**

### **6.1. Conclusion**

Kinazi Cassava Plant is one of the major opportunities to increase and improve the value of cassava, hence to rise up the national food security.

The objective of this study was to contribute to the promotion of cassava by investigating the relationships between Mbakungahaze Cassava farmers cooperative and Kinazi Cassava Plant in order to increase the quantity to produce and process. The findings of this research are the factors that affect the relationships between the cooperative and the processing plant. Also the findings contributed to the achievement of the objective. The 2-2 tango methodology and its tools have been very efficient in the achievement of these results. Working with the two to Tango tools showed how these tools are efficient in conducting interviews, survey and discussion. Olivier (2010) states that the methodology should establish clearly that it can generate sufficient knowledge to satisfy the aims. It is in this regard that the two to Tango tools have helped to go deeper and gave up pitfalls and strengths of the relations as the views of both sides were always considered. However the two to tango tools combine both the case study and survey as strategies. It takes time to analyze and discuss the results, but still it makes the difference of engaging respondents.

After developing the business case description and analysing the data from self assessment and debriefing report, the research can inform that relationships between Mbakungahaze Cassava farmers' cooperative and Kinazi Cassava Plant are very weak in cassava agribusiness as they are based only on individual choice of selling cassava. Market linkage is mostly influenced by the production and productivity as a contribution of cassava farmers who need the market and Kinazi Cassava Plant which needs fresh cassava.

Based on the sub question of current relationships between both sides in production and productivity, the role of Mbakungahaze Cassava farmers cooperative is to ensure the farm activities of production and productivity are successively done. These are availing the in quantity and quality the planting material as well as preparing land. The role of Kinazi Cassava Plant is quasi inexistent, it is only limited to approving the application for some few farmers who wish to apply for a loan in BRD



Regarding the functioning of Mbakungahaze Cassava Farmers cooperative it can be concluded that little awareness of management principles of the cooperative, lack of cooperation and integration of the cooperative and giving much of importance to commercialisation activities of cassava rather than production activities are the major constraints in the functioning of Mbakungahaze Cassava farmers cooperative.

Kinazi Cassava Plant is also affected by the weakness of the relationships. Its activities are dependent on very little quantity of cassava supplied by very few farmers for their own choice as a consequence of not finding immediate other buyers. Kinazi Cassava Plant does not understand the functioning of Mbakungahaze cassava farmers cooperative as it is not involved in production of raw material. However first steps are being done to develop a partnership between the cooperative and the processing plant. The availability of extension officers can be a solution for both the cooperative and the processing plant to improve their communication. Inadequate use of manure as well as lack of fertilization of cassava can be also improved.

Based on the effects of functioning of Kinazi Cassava Plant, it can be concluded that although farmers consider having the market that can provide steady income is an advantage, lack of a contract that should make a guarantee of the quantity and quality that should be supplied, the price to be given and the accessibility to other inputs affect the relationships between Kinazi Cassava Plant and Mbakungahaze cassava farmers cooperative. Similarly Kinazi cassava Plant does not have a reliable source of fresh cassava even if Ruhango district is a major producer and all farmers are accepted to sell their produce to the processing plant without any competition. As a consequence of the inexistence of the contract farmers continue to process their produce and sell it through informal ways to traders and buyers who are willing to offer good price, while Kinazi Cassava Plant continue to work at low rate of its capacity.

Based on the findings of the effects of the functioning of Kinazi Cassava Plant, it can be concluded that little cooperation with Mbakungahaze Cassava Farmers cooperative, lack of offering extension service activities and competition as consequences of primitive conditions of Kinazi Cassava Plant are the major factors that affect the relationships between both sides.

It can be concluded, based on the findings on the collaboration in setting the price for fresh cassava that Kinazi Cassava Plant is an assured market which can take the whole produce from farmers. However the fixation of the price instead of calculating it based on the production cost, not involving farmers in price setting, delay in payments and lack of encouragement to farmers affect the relationships between Mbakungahaze Cassava Farmers and Kinazi Cassava Plant.

Based on the findings on the existence of farming agreements between Kinazi Cassava Plant and Mbakungahaze Cassava farmers Cooperative, it can be concluded that both the agreement or trust can contribute to effective relationships, however the absence of both affect negatively the relationships. Within the absence of the agreement, farmers especially the smaller cannot easily access to inputs and credits. However both sides have willingness of contributing to the establishment of the agreement.

Based on the findings on opportunities and constraints in communication, it can be concluded that there is an opportunity of making useful the mobile telephones owned by farmers. However lack of full exchange of information and regular meetings between Mbakungahaze Cassava farmers cooperative and Kinazi Cassava Plant contribute negatively to the relationships between both sides.

Based on the findings on perspectives it can be concluded Mbakungahaze Cassava Farmers Cooperative and Kinazi Cassava Plant have willingness to improve their relationships. Both sides keep on raising the similar issues such as the introduction of contract, use of quality standards in supplying the fresh cassava, responsibility of supplying, starting farmer and model field schools and selling shares of the company to farmers. If these issues were put into action, their future would much improved

On the stakeholders' network and collaboration, it can be concluded that farmers don't know all stakeholders involved in cassava crop due to the fact that they work individually with minimum share of information. The linkage between Kinazi Cassava Plant and Mbakungahaze cassava farmers cooperative should be also a future potential for improvement. There is very little linkage between Agrihub Kinazi Cassava Plant and Mbakungahaze cassava farmers cooperative.

Finally it can be concluded that the status of relationships between Kinazi Cassava Plant and Mbakungahaze Cassava farmers' cooperative are influenced by their respective roles in production and productivity, their functioning, the way price is set, the farming agreement, communication and the collaboration with stakeholders.

## **6.2. Recommendations**

Enhancing and reaching the food security situation will succeed in promoting food and cash crops. Cassava is one among the major crops that enhance food security and increase the income of the farmers also cassava by taking considerable part of the cultivated land, and practiced by considerable percentage of farmers should be promoted to make it more beneficial to both farmers and firms. The following are the recommendation to all categories of stakeholders:

### **To the cooperative**

- Develop a working together spirit as a way of increasing their voice and power by using regular meetings
- To improve the functioning of the cooperative by making action and business plans for economic activities
- Discuss with Kinazi Cassava Plant the impeding issues such as the price as well as the introduction of farming agreement
- To provide study tours for their farmers within and outside the country in order to learn from other farmers cooperatives
- Find out various partners for their farmers to facilitate the access to credits and improvement of the communication
- To start up the cassava farmers union in order to increase their voice, power and accessibility to required resources
- Identify and promote bulking centres, which can facilitate all farmers especially the smaller and those located at long distance to access the market
- Increase fertilization of farms by associating animal rearing to agriculture and animals can feed on the remains of cassava

### **To Kinazi Cassava Plant**

- Establish a formal and reliable communication channel which can link them to farmers and cooperatives, telephones can be used in supplying scheduling and message can be sent to them when required
- Introduce the agreement in cassava farming which can facilitate the company to get raw material in consistent ways while the farmers can be ensured of the market and hence benefiting the access to credits using that agreement

- Provide extension services which will help farmers to meet the requirement, increase production, improve communication and strengthen their relationships
- Provide training for farmers in cooperative functioning and post harvest handling activities
- Improve relationships with farmers as well as with other stakeholders involved in cassava
- Get involved in planting material improvement and multiplication as a way of avoiding temporal pests and diseases, meeting the needed variety and availing it to their farmers
- Establish the requirements for fresh cassava needed by the company and set incentives to farmers meeting the requirements in order to motivate farmers
- Accept the farmers to discuss and negotiate the price for their product by comparing the cost of production and what they get from the company and from other buyers

### **To Agrihub**

- The advocacy can be ensured to various institutions that can provide a support to the relations between Mbakungahaze Cassava Farmers' cooperative and Kinazi cassava Plant
- Promote trainings on firm farm partnerships, cooperatives and firm management in order to increase their efficiency in functioning
- Provide a financial and technical support to the cooperative for their production activities
- Encourage the early introduction of contract between Mbakungahaze farmers' cooperative and Kinazi Cassava Plant
- Contribute to the provision of credit and accessibility to financial institutions
- Conduct other and additional large scale researches in cassava firm farm relationships using the 2-2 tango methodology a way of getting more insights on the development of agricultural businesses, and which can contribute to the development of new national value chain of cassava integrating Kinazi Cassava Plant

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## Annex 1: Realised plan

This working schedule details the plan of activities from July to September 2012.

Week	Dates	Activities	Venue
1	2July to 6July	External documents review	VHL
2	9 July 13 July	External document review	VHL
	14 July	Departure and Arrival	To Kigali
3	16 July	Fixing contacts	Home
	17 July	Workplace: request for logistical support	KHI
	18 July	Visit to Kinazi cassava hub	Kinazi hub
	19 July	Translation and adaptation of the questionnaire	Firm location
	20 July	Interview with the district agronomist	Firm location
4	23 July	Interview with firm respondents and farms visit	Kinazi
	24 July	Interview with cooperatives managers	Kinazi
	25 July	Interview with farmers and farms visits	kinazi
	26 July	Write up of Kinazi case description	Agrihub
	27 July	Write up of Kinazi case description	Agrihub
5	30 July	Generation of statements	Office
	31 July	Generation of statements	Office
	1 August	Generation of statement	Agrihub
	2 August	Generation of statement with	Agrihub
	3 August	Data collection: questionnaire with the company	Kinazi
6	6 August	Data collection: questionnaire with the farmers	Kinazi
	7 August	Data collection: questionnaire with farmers	Ntongwe
	8 August	Data entry and processing	office
	9 August	Preparation of the focus group discussion	Office
	10 August	Focus group discussion with company	Kinazi
7	13 August	Analysis and write up of the discussion results	Office
	14 August	Focus group with farmers	Kinazi
	15 August	Working out	Home
	16 August	Working out	Home
	17 August	Closing the fieldwork	Rwanda
	18 August	Travel back	-

	19 August	Travel back	-
8	20 to 24 August	Writing the report	VHL
9	27 to 31 August	Writing the report	VHL
10	3 to 7 September	Writing the report	VHL
11	10 to 14September	Writing and submission of the report	VHL

## Annex 2: Catalog of principle varieties of cassava cultivated in Rwanda

Local name	Code	Year of introduction	Zone	Taste	Vegetative cycle, months	Potentialities, tons/ha	CMD characteristics
Gitaminsa	Eala 07	1975	LA&AA	bitter	18–24	40	sensitive
Rutanihisha	Creolinha	1985	LA&AA	bitter	15–18	40 - 45	low sensitive
Mulundi	Locale	1985	AA	Sweet	12–15	55	sensitive
Kiryumukwe	Locale	1985	LA	sweet	10–15	25	tolerant
Maguruyinkware	Locale	1985	LA&AA	both	12–15	25 - 30	sensitive
Karama 1	PYT Bul 1977/69	1985	LA&	bitter	15	35	resistant
Gakiza	UYT Bulk 1977/11	1985	LA&AA	both	15	35	Resistant
Kibombwe	Kibombwe/14	1985	LA&AA	sweet	12–15	15 -25	Sensitive
Ndamirabana	TME 14	2006	LA&AA	sweet	10–2	40	Resistant
Cyizere	I92/0057	2006	LA&AA	both	15	40 - 45	resistant
Mbakungahaze	95/NA/00063	2006	LA&AA	bitter	12	45	Resistant
Mbagarumbise	MH95/0414	2006	LA&AA	both	12–15	30 – 35	tolerant
Rwizihiza	MM96/3920	2009	LA&AA	sweet	12	30 - 35	resistant
Seruruseke	MM96/5280	2009	LA&AA	sweet	12	25 - 30	resistant
Mavoka	MM96/0287	2009	LA&AA	sweet	10-12	35 -40	tolerant
Garukunsubire	MM96/7204	2009	LA&AA	sweet	12	30 - 35	resistant

**LA:** Low Altitude <1500m; **AA:** Average altitude=1500-2000m; (source: RAB, 2011)

### Annex 3: Checklist topics for interviews

F-F challenge areas	Experiences, examples /Views and comments	Importance
<b>Context:</b> power distribution, level playing field, trust between farmers and companies, transaction risks and costs, previous experiences, project orientation,		
<b>Local service provision :</b> research, extension, input supply, credit, transport,		
<b>Crop / produce:</b> export market, bulk product for local market, ... alternative crops, alternative market outlets		
<b>Production risks:</b> climate, pests and diseases, GAP, ... distribution of risks over producers and company, insurance, likelihood of producing contracted volumes		
<b>Farmers:</b> resource endowment, food & livelihood security, level of specialization, economic orientation, modalities for selecting farmers		

F-F challenge areas	Experiences, examples / Views and comments	Importance
<b>Company:</b> resource endowment, 'open door policy', credibility and transparency, qualified staff,		
<b>Farmer group functioning:</b> leadership, accountability to members, internal communication and transparency, internal control on compliance (GAP, quality, delivery), record keeping and financial administration, autonomy of organizational costs...		

<b>Prices and price setting modalities :</b> min-max prices, dealing with market price, fluctuations (reference market prices), differential prices for quality (1 <sup>st</sup> and 2 <sup>nd</sup> grade), bonus for higher volumes or quality.		
<b>Embedded services:</b> inputs, credit, training, farmers credit discipline and risks of side use, company default on service provision, ...		
<b>Contract :</b> language, terminology, explanation, understanding, transparency, elements covered, signatories		
<b>Delivery :</b> timeliness, volume, quality and grading, traceability and administration		

<b>F-F challenge areas</b>	<b>Experiences, examples / Views and comments</b>	<b>Importance</b>
<b>Side selling :</b> farmers' respect of contract, new entrants, predatory purchasing, horizontal coordination (code of conduct with other buyers), vertical coordination (relations and goodwill with farmers)		
<b>Payment modalities :</b> cash/bank account, timeliness of payment, company default on payment, group/individual payment, ...		
<b>Institutional environment:</b> legal system, witnesses, informal and formal contract enforcement and dispute settlement, bureaucracy, corruption, ....		
<b>Standards:</b> International and sector specific standards, food safety, certification and traceability, ...		

## Annex 4: Questionnaire for the interview to farmers

### Business Case Features; interview with farmer organization

#### 1. Business case and respondents

Country:	
Product:	
Name of farmers' organization:	
Name of firm(s)	

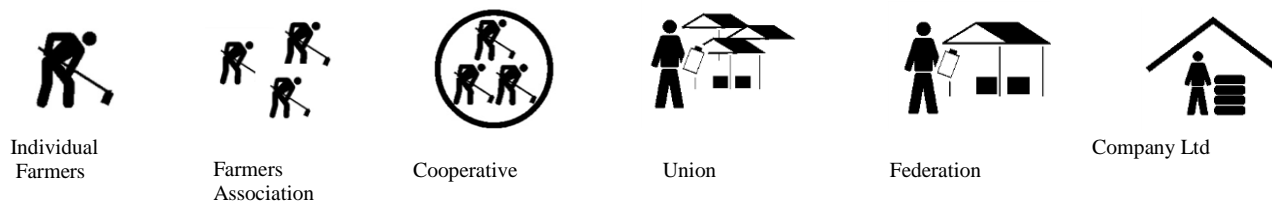
Date of interview:	
Name of persons interviewed:	
Function of persons interviewed:	

#### 1. Farmers' organization

Type of Organization:	
Year of establishment:	
Number of organized farmers (total, men, women) :	

a. How and to which level are the farmers organized?

- Circle the entities applicable and cross out the entities not applicable.



b. Has the trading entity, owned by the farmer, been registered?

- No, it is an informal entity
- Yes, it is a formal registered entity

c. How has the trading entity been registered?

- NGO
- Cooperative (with right to be involved in economic activities)
- Union (with right to be involved in economic activities)
- Federation (with right to be involved in economic activities)

- Non-profit business
- Social business
- Fully commercial business

<i>Observations:</i>	
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## 2. Product:

Does the business / farmer organization offer:

- one product or
- several products
  
- a perishable product or
- a non-perishable product
  
- a standard product or
- a tailor made product
  
- a seasonal product or
- year-round-production?

<i>Observations:</i>	
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## 3. Production

- a. Which functions are performed in ownership by the farmers?
  - Planting/sowing
  - Harvesting
  - Bulking
  - 1<sup>st</sup> processing stage (for instance: cleaning / grading)
  - Intermediate processing
  - Final processing
  - Packaging
- b. Hygiene and food safety certificates required?
  - Yes
  - No

<i>Observations:</i>	
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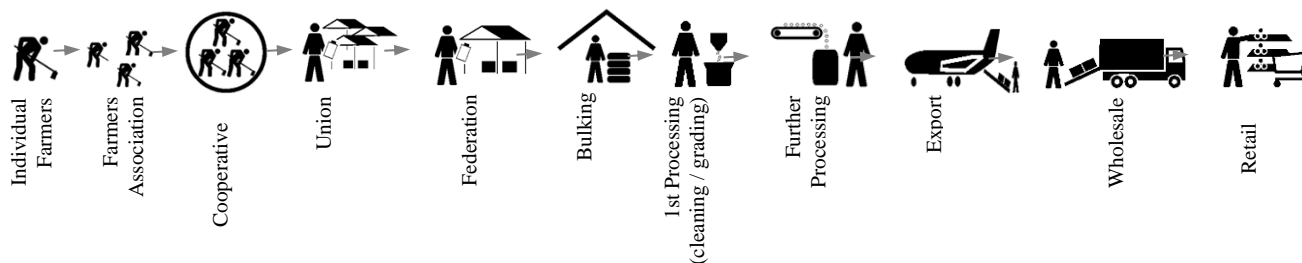
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#### 4. Quantitative data

Average production volume of farmers' organization per season (if possible details for different seasons) :	
Average production volume per farmer (or household) per season:	
Average acreage per farmer (or household) per season (ha):	
Total volume of product before processing:	
Total volume of product after processing (when applicable):	
Observations:	

#### 5. Voice:

- Does decision making take place in a democratic way (through elected decision makers) or through a business hierarchy (decision making power linked to function in company).
  - Democratic structure
  - Business hierarchy
- Until which point in the chain does the farmer have decision making power?
  - Circle entities in which the farmer has decision making power (through democratic structure). Cross out those entities in which the farmer does not have decision making power.



<i>Observations:</i>	
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## 6. Product branding

- a. Is the product specifically branded?
  - ☐ Organic Certified
  - ☐ Conventional, generic (no specific brand)
  - ☐ Socially certified (Fair Trade, UTZ, etc)
- b. Is the product sold to the customer under the specific brand name of the business/producer organization?
  - ☐ Yes
  - ☐ No

<i>Observations:</i>	
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## 7. Customer / Market:

- a. How many customers does the business/farmer organization serve?
  - ☐ one
  - ☐ several
- b. Categorize the direct customer(s)
  - ☐ trader,
  - ☐ exporter,
  - ☐ processor,
  - ☐ wholesale,
  - ☐ retail,
  - ☐ end-user
- c. Which market does the business/farmer organization serve?
  - ☐ the mass market (bulk market)
  - ☐ a niche market
- d. Is the direct customer a local or an international customer?
  - ☐ Local
  - ☐ International
- e. Is the end-market (end-consumer) a local or international market?

- Local end-market
- International end-market

<i>Observations:</i>	
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## 8. Revenue model:

Does the business / producer organization earn its income through:

- the sale of a physical product,
- the sale of a service
- lending/renting/leasing the use of a physical product

<i>Observations:</i>	
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## 9. Pricing

a. Which pricing mechanism is used:

- List price: predefined fixed prices
- Price depends on the quality of the product
- Price depends on the type and characteristic of the direct customer
- Price is determined as a function of the quantity purchased
- Price is negotiated between two or more partners depending on negotiation power and/or negotiation skills
- Price depends on inventory and time of purchase
- Price is established dynamically based on supply and demand
- Price is determined by outcome of competitive bidding

b. Is the business / farmer organization cost driven or value driven?

- Cost-driven (cheap)
- Value driven (high quality)

<i>Observations:</i>	
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## 10. Trade Contracts

Indicate with lines between which parties trade-contracts are signed.

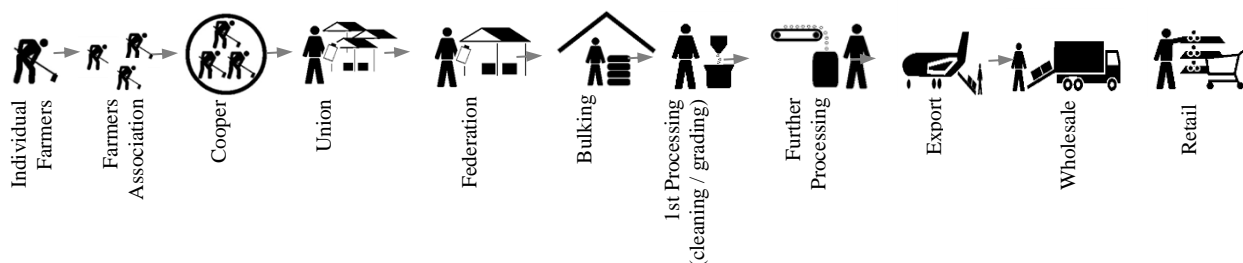


Observations:

### 11. Risk:

- a. Which risks does the business / farmer organization bare? Up until which point in the value chain does the business/farmer organization run this risk?

Draw a line behind in risk from which point in the value chain until which point in the value chain the business/farmer organization runs this risk



Climate Risk
Input misuse risk
Pest & diseases
Side-selling risk
Timeliness
Volume Risk
Quality Risk
Processing Risk
Financial Risk
Storage Risk
Transport Risk
Certification Risk
Marketing Risk
Reputational Risk

**Example: The farmer remains owner of the product up until delivery after export. Therefore transport risk is their risk until that point:**

<b>Transport risk</b> 
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<i>Observations:</i>	
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**12. Financial data**

	2009	2010	2011
Turn-over			
Cost of Production			
Operational Costs			
Overhead Costs			
Profit / Loss			
Break Even Point (expected to be) reached in year:			
<i>Observations:</i>			

## Annex 5: Questionnaire for self assessment

### **“Mbakungahaze Cassava Farmers cooperative” and “Kinazi Cassava Plant”**

For the researcher:

*Please fill in the following information about the case:*

<b>Country:</b>	
<b>Case:</b>	
<b>Name researcher:</b>	
<b>Date:</b>	

For the respondent:

*Please fill in the following information:*

<b>Name respondent:</b>	What is your name? .....
<b>Gender respondent:</b>	What is your gender? (please tick) <input type="checkbox"/> Male <input type="checkbox"/> Female
<b>Age respondent:</b>	What is your age? ..... years

For **company** employees:

*If you work for a company, please fill in the following questions. If you are finished you can start answering the statements on the next page. Thank you for your cooperation!*

<b>Characteristic respondent:</b>	What is the name of the company that you work for? .....
<b>Position respondent:</b>	What is your position in the company? .....
<b>Duration participation:</b>	How long do you work for this company? .....

For members of the **farmer group/cooperative**:

*If you are a member of the farmer group/cooperative, please fill in the following questions. If you are finished you can start answering the statements on the next page. Thank you for your cooperation!*

<b>Characteristic respondent:</b>	What is the name of your farmer group / cooperative? .....
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<b>Position respondent:</b>	<i>What is your position in your farmer group / cooperative?</i> <input type="checkbox"/> I am a farmer and sell my products through this farmer group <input type="checkbox"/> I am a board member / member of core group <input type="checkbox"/> My position is: .....
<b>Duration participation:</b>	<i>How long are you a part of this farmer group/coop?</i> ..... [If applicable:] <i>Since when do you have this position in the board?</i> .....

Statements		Use (√) to score each statement appropriately			
		0	1	2	3
		Strongly disagree	Disagree	agree	Strongly agree
		☹☹	☹	☺	☺☺
<b>1 Production and productivity</b>					
1.1	Farmers have sufficient planting material				
1.2	Farmers use fertilizers				
1.3	Farmers are provided with sufficient know how on cassava production				
1.4	Farmers' yields are increasing				
1.5	Farmers know the production cost for one kg of fresh cassava				
1.6	The size of fields for cassava is sufficient				
1.7	The farmers fields are suitable for the cassava crop				
1.8	Farmers are able to afford the inputs				
1.9	Farmers have good planting material				

<b>2      <i>Functioning of farmers cooperatives</i></b>					
2.1	Functioning of cooperatives is satisfying				
2.2	Farmers know the importance of joining each other into cooperatives				
2.3	Elected farmers 'cooperatives leaders fulfil their duties as provided by the laws				
2.4	The meetings of the cooperative members are effective				
2.5	The cooperative members are aware of financial issues				
2.6	Farmers follow good agricultural practice				
2.7	The farmers keep records for cassava delivered to the company				
2.8	Farmers are happy of the functioning of the company				
<b>3. <i>Functioning of Kinazi cassava plant</i></b>					
3.1	The company is happy to work with cooperatives				
3.2	The staff of the company are enough				
3.3	The company is able to buy all the produce of all cassava farmers				
3.4	I know how the company select farmers for whom the produce is bought				
3.5	The company considers important the views/ideas of farmers				
3.6	The company understands the way farmers work				
3.7	The company has instituted the communication channel through which the farmers can send their ideas				
3.8	The cassava flour processed by the company tastes better than the flour traditionally processed				
<b>4. <i>Markets and prices</i></b>					
4.1	I know the production cost incurred by the company to get one kg of processed flour				
4.2	Farmers know the price at which the company sells the flour				



4.3	The quantity of Cassava consumed in farmers households is much more than the sold quantity				
4.4	There are other cassava buyers at market				
4.5	Farmers participate in price setting				
4.6	The price offered by the company makes farmers happy				
4.7	The company pays farmers on schedule/without delay				
4.8	All Farmers are paid at the same price				
4.9	Farmers have trust in the company's weighing balance				
<b>5 Benefits of farming agreement</b>					
5.1	Cassava farming provides farmers with a steady income)				
5.2	Kinazi cassava plant advises farmers on cassava farming				
5.3	Each individual farmer is accepted to sell his produce to the company				
5.4	The income made from cassava can be invested in other income generating activities				
5.5	The cassava farmers gets loans to invest in their farming activities				
5.6	Farmers are happy for the guaranteed market for their cassava produce				
<b>6 Communication</b>					
6.1	Cassava farmers are regularly kept informed on the company issues				
6.2	Farmers have the information and communication means(mobile phones)				
6.3	Farmers have visited the company in order to understand the functioning of the company				
6.4	The company gives answers to all questions asked by the farmers on the cassava farming				
6.5	The farmers know the quality of cassava needed by the company)				
6.6	The company is clear about the quantity it needs to buy from farmers				

6.7	Farmers know the needs of the clients of the company				
6.8	I know the quantity of needed fresh cassava tubers to give one kg of flour				

<b>7. Agribusiness system (stakeholders)</b>					
7.1	I know the stakeholders in cassava crop				
7.2	Farmers are given consideration/free room in the meetings of cassava stakeholders				
7.3	Stakeholders fulfill their duties and responsibilities as required				
7.4	There is a formal platform of cassava stakeholders				
7.5	Stakeholders consider more important cassava business rather than cassava production				
7.6	RAB gives enough advices to cassava farmers				
7.7	Cassava is given room of priority in Ruhango district				
7.8	Bank institutions are willing to provide loans to cassava farmers				
7.9	Governmental agronomists facilitate the understanding between farmers and the company				
<b>8. Perspectives</b>					
8.1	Farmers/cooperatives can make bulking of their cassava produce				
8.2	The company can reject the production supplied due to lack of required quality/ standards				
8.3	I wish the company and farmers should establish a contract for buying cassava produce				
8.4	The company and the farmers should prepare the contract together				
8.5	The contract should be followed without bypassing any portion)				
8.6	Non respect of contract should be punished by laws (competent authorities)				
8.7	It is good that farmers could hold shares within the company				

8.8	It is important that the company starts the farmer field school				
8.9	Selling cassava through cooperatives should increase the income of farmers				