

**Improving firm-farm relationship in maize production in Rwanda. Case study of maize farmers' cooperative of Gisagara District (KOJYAMUGI) and Mamba Maize Plant.**



**A Research Project Submitted to Van Hall Larenstein University of Applied Science in partial fulfilment of the requirements for the degree of Master in Management of Development with specialisation Rural Development and Food Security.**

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September, 2013

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**Dedication**

I'm dedicating my thesis to my lovely husband for his encouragements during my study, to my children whom I deprived of motherly care at their tender age by staying away from them during my study period.

## **Acknowledgements**

First of all, my gratitude goes to the Almighty God for allowing me this opportunity to carry out this study. I am also thankful to the government of the Netherlands for offering me a scholarship through the Nuffic, which made my study possible through the provision of funds.

I wish to convey my gratitude to the all lecturers of Van Hall Larenstein and fellow students for the assistance and encouragement during my studies.

I'm very grateful to my Supervisor and recently my course coordinator Dr Suzanne Nederlof for her valuable comments in indicating me the direction to take during writing this report. Without her this thesis would have not been produced up to this standard. I would also like to extend my sincere thanks to Mr Hesselink Eddy who was my course coordinator and to all Management of Development (MOD) staff for their valuable support and advises provided during my study at Van Hall Larenstein University of Applied Science.

My thanks go also to the Kicukiro District of Kigali city; my working organisation to have allowed me a one year study leave.

My thanks go also to the Centre Iwacu, Agri-ProFocus in collaboration with Agri-Hub Rwanda for supporting me financially and technically assistance during my data collection period. I finally express my thanks to farmers, particularly the Kojyamugi maize producers, to Mamba Maize Plant as located in Gisagara district for providing valuable information that constitute the backbone of this research.

It also gives me a lot of pleasure to thank all my family members for their enormous support during the whole study period. Finally; I give my thanks to different people whom prayed to me during this study period.

May God bless all of you abundantly!

**Umutoni Jeanne**

## **Abstract**

For its nutritional value, its relative conservation ease and its high productivity compared to the other grains traditionally grown and as an important source of income for farmers, maize sector has been the attention of agricultural authorities in Rwanda on which it take to accelerate sustainable agricultural and rural development. However, for the weaknesses and constraints of operation on some stages in the chain such maize production on the farm level (lack of inputs and credit access and price fluctuation) and processing at the plant level (irregular and insufficient supply), the local maize production cannot meet the strong demand in the growing trend of maize based products.

The search for a lasting solution should necessarily pass through effective and beneficial relationships evidenced by contract farming between farmers and processing units. This study is a part of an effort to identify potential sources of conflict between the maize plant and the maize producers' cooperative and the identification and evaluation of strategies to improve firm-farm relations in Gisagara District.

To achieve this goal a broad literature review was conducted on the maize sector functioning in Rwanda as well as on the relations firm-farm theory. The field work or primary data collection was done using 2-2 tango tool. Focus group discussion and a questionnaire survey were used for collecting primary data.

The results in general and on the majority of questions asked relating to the whole statements of the challenge area showed that farmers and the company do not have the same score as the absence of a compromise between them. According to the median scores for both sides, the level of agreements from the company is higher than the one from farmers on several challenge areas.

The most important actors in maize value chain in Gisagara District remains farmers grouped in Kojyamugi cooperative. The processor which is the new plant in the area, transporters who facilitate the transportation to maize to the different areas. The traders in rural area who buy small quantity of maize (dried or fresh) at the farm gate for selling it to the collectors, while collectors buy maize from different rural traders who can also play a role of wholesalers and finally consumers who buy maize flour, fresh or dried maize for home consumption.

The contractual issue which mainly affect the relationships between plant and Kojyamugi in Gisagara District is the lack of contract farming between the two actors. The farmers perceive the price as low, there is no negotiation in fixing of price in the area and this is the main reason why there are many local traders competing with the plant.

The maize is produced mainly on marshlands more than on the hillsides whereas the marshland is cultivated only in one agricultural season. Compared to the hillsides were farmers grow maize in two agricultural seasons. This affect maize production as well as the floods in the marshlands which affect the quality and quantity of maize produced. The intercropping of maize with other crops is an issue for farmers as they are not allowed by the District to mix the crops in the marshlands and farmers need other crop to meet their dietary requirements and to satisfy their needs.

Delays and irregularities in the availability and distribution of agricultural inputs further complicate the operation of maize farming in Gisagara District which is the mission of the co-operative if all these issues are addressed. The post-harvest handling is an issue especially the long distance between marshland where maize is cultivated, collection centre and the plant which is too long. The roads are not well maintained.

In the future, both farmers and the firm perceive the increase in maize production by growing on hillsides, through increased use of agricultural inputs and establishment of farmer field school in the rural area. On the other hand improving the marketing perspectives by accessing agricultural loans, establishment of modern threshers, signing of contracts and the improvement in partnership with others stakeholders in the rural area.

<b>Table of contents</b>	
<b>Dedication</b>	<b>ii</b>
<b>Acknowledgements</b>	<b>iii</b>
<b>Abstract</b>	<b>iv</b>
<b>Table of contents</b>	<b>vi</b>
<b>List of figures</b>	<b>viii</b>
<b>List of tables</b>	<b>ix</b>
<b>List of photos</b>	<b>ix</b>
<b>List of abbreviations and acronyms</b>	<b>x</b>
 <b>1- INTRODUCTION</b>	 <b>1</b>
1.1 Background of study	1
1.2 Problem statement	2
1.3 Research objective	3
1.4 Main research question	3
 <b>2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK</b>	 <b>5</b>
2.1. Conceptual frameworks	5
2.1.1 Firm-farm relationship framework	5
2.1.2. Rise framework model	6
2.2 Definition of terms	6
2.3 Background of maize production in rwanda	7
2.3.1 Overview of agriculture in rwanda	7
2.3.2 Current constraints to agricultural development and strategies	7
2.3.3 Maize sector functioning in rwanda	9
Maize production	9
the storage and processing of maize	9
The marketing processing of maize	10
2.4. Firm-farmers' relations	10
2.4.1 Introduction	10
2.4.2 Definition of contract farming	10
2.4.3 Firm-farm contract	10
History on firm- farm contract	10
Firm-farm partnership	11
2.5. Advantages and disadvantages in contract farming	12
2.5.1 Advantages firm-farm	12
2.5.2. Disadvantages firm-farm	12
2.6 Firm-farm relations and food security	12
2.7 Rights and obligations in firm-farm relationship	12
 <b>3- METHODOLOGY</b>	 <b>14</b>

<b>3.1 Study area: description of research area .....</b>	<b>14</b>
<b>3.2 Research methodology.....</b>	<b>14</b>
3.2.1 Desk study .....	14
3.2.2 Field study: primary data collection .....	15
<b>3.3 Interviews .....</b>	<b>15</b>
<b>3.4 Questionnaires.....</b>	<b>16</b>
<b>3.5 Data analysis .....</b>	<b>17</b>
<b>3.5 Debriefing and focus group discussion .....</b>	<b>18</b>
 <b>4- MAIZE VALUE CHAIN ANALYSIS AND BUSINESS CASE IN GISAGARA DISTRICT .....</b>	 <b>19</b>
<b>4.1. Description of value chain.....</b>	<b>19</b>
4.1.1 Input suppliers.....	19
4.1.2 Actors.....	19
4.1.3 Supporters .....	20
4.1.4 Influencers .....	20
<b>4.2. Business case description .....</b>	<b>21</b>
4.3.1 Functioning of mamba maize plant.....	21
4.3.2 Functioning of kojyamugi cooperative .....	23
4.3.3 Perspectives and swot analysis.....	24
4.3.4. Common challenges between mamba maize plant and kojyamugi.....	25
 <b>5- DATA PROCESSING AND FINDINGS .....</b>	 <b>27</b>
<b>5.1. Challenge areas.....</b>	<b>27</b>
5.1.1 Challenge area 1: productivity .....	27
5.1.2: Challenge area 2: production .....	29
5.1.3: Challenge area 3: post-harvest and logistical handling.....	30
5.1.4: Challenge area 4: functioning of kojyamugi cooperative.....	32
5.1.5: Challenge area 5: functioning of mamba maize plant .....	34
5.1.6: Challenge area 6: cost and benefit analysis .....	35
5.1.7: Challenge area 7: contracting and pricing .....	37
5.1.8: Challenge area 8: production perspectives.....	39
5.1.9: Challenge area 9: marketing perspectives.....	41
<b>5.2 Debriefing report.....</b>	<b>43</b>
 <b>6- DISCUSSION OF RESULTS .....</b>	 <b>46</b>
<b>6.1. Productivity .....</b>	<b>46</b>
<b>6.2. Production .....</b>	<b>46</b>
<b>6.3. Post-harvest and logistical handling .....</b>	<b>47</b>
<b>6.4. Functioning of the kojyamugi cooperative.....</b>	<b>47</b>
<b>6.5. Functioning of the mamba maize plant .....</b>	<b>48</b>
<b>6.6. Cost and benefit analysis .....</b>	<b>49</b>

6.7 Contracting and pricing .....	50
6.8 Perspectives .....	50
<b>7- CONCLUSION AND RECOMMENDATIONS .....</b>	<b>52</b>
7.1. Conclusion .....	52
7.2. Recommendations .....	53
Kojyamugi farmer's cooperative .....	53
Mamba maize plant.....	54
Agri-hub rwanda.....	54
<b>REFERENCES.....</b>	<b>55</b>
Annex 1- Checklist for the interview .....	58
Annex 2: Questionnaire self-assessment of mamba maize and kojyamugi .....	63



## List of figures

Figure 2. 1. Firm-farm relationship framework .....	5
Figure 2. 2. Rise framework, 2012 .....	6
Figure 2. 1. Evolution of farms by utilized agricultural area classes.....	8
Figure 3. 1. Rwanda and Gisagara District maps .....	14
Figure 3. 2. 2-2 Tango tool implementation context.....	15
Figure 4. 1. Maize value chain map.....	19
Figure 4. 2. Post-harvest pipeline for maize .....	21
Figure 5. 1. Scores on productivity .....	28
Figure 5. 2. Level of agreement on productivity .....	28
Figure 5. 3. Scores on production .....	29
Figure 5. 4. Level of agreement on production .....	30
Figure 5. 5. Scores on post-harvest and logistic handling .....	31
Figure 5. 6. . Level of agreement on post-harvest and logistics.....	31
Figure 5. 7. Scores on functioning of COJYAMUGI cooperative.....	33
Figure 5. 8. Level of agreement on functioning of KOJYAMUGI cooperative.....	33
Figure 5. 9. Scores on functioning of MAMBA Maize Plant .....	34
Figure 5. 10. Level of functioning of MAMBA cooperative .....	35
Figure 5. 11. Scores on cost and benefit analysis .....	36
Figure 5. 12. Level of agreement on cost and benefit analysis .....	37
Figure 5. 13. Scores on contract and pricing .....	38
Figure 5. 14. . Level of agreement on contract and pricing .....	39
Figure 5. 15. Scores on production perspectives.....	40
Figure 5. 16. Level of agreement on production perspectives .....	40
Figure 5. 17. Scores on market perspectives .....	42
Figure 5. 18. Level of agreement on market perspectives .....	42

## **List of tables**

Table 2. 1. Production of main crops in 2011 (Season 2011A + 2011B) in metric tons.....	8
Table 2. 2. Evolution of maize importance (%), cultivated area (ha), yield (kg/ha) and production (tons) in Rwanda.....	9
Table 4. 1. SWOT analysis of the business case in Maize crop between Mamba Maize Plant and Kojyamugi .....	25
Table 5. 1. Statements of productivity .....	27
Table 5. 2. Statements of production.....	29
Table 5. 3. Statements of post-harvest and logistics handling .....	30
Table 5. 4. Statements of functioning of KOJYAMUGI Cooperative .....	32
Table 5. 5. Statements of functioning of MAMBA Plant .....	34
Table 5. 6. Statements on cost and benefit analysis .....	35
Table 5. 7. Statements on contract and pricing .....	37
Table 5. 8. Statements production Perspectives .....	39
Table 5. 9. Statements on market Perspectives .....	41
Table 5. 10. Suggestions for improvement Kojyamugi and Mamba Maize Plant by challenge area. ....	43

## **List of Photos**

Photo 4. 1. Mamba Maize Plant .....	21
Photo 4. 2. Akanyaru marsh and Roads in rainy season .....	23
Photo 4. 3. Adequate storage and processing materials .....	23
Photo 4. 4. Natural drying system and Land of maize for Kojyamugi.....	24

## **List of abbreviations and acronyms**

APF	: AgriProfocus
BAIR	: Bureau d'Appui aux Initiatives Rurales
CCA	: Canadian Cooperative Association
CCOAIB	: Conseil de Concertation des Organisations d'Appui aux Initiatives de Base
CF	: Contract Farming
CIP	: Crop Intensification Programme
COAMV	: Coopérative des Agriculteurs de Maïs dans la région des Volcans
DRC	: Democratic Republic of Congo
DUHAMIC-ADRI	: Duharanire Amajyambere y'Icyaro (Association du Development Rural Intégré)
FAO	: Food and Agriculture Organisation of the United Nations
GDP	: Gross Domestic Product
ha:	: Hectare
ICCO	: Inter-Church Organisation for Development Cooperation
IPAR	: Institute of Policy Analysis and Research-Rwanda
IPER	: Initiative de Promotion de l'Entrepreneuriat Rural
KOJYAMUGI	: Kopetative Jyambere Muhinzi ya Gisagara
MFI's	: Microfinance Institutions
MINAGRI	: Ministry of Agriculture and Animal Resources
MINECOFIN	: Ministry of Finance and Economic Planning
MINIMEX	: Minoteries-Import-Export
MOD	: Management of Development
NGOs	: Non-Governmental Organisations
NISR	: National Institute of Statistics of Rwanda
PASAB	: Projet D'appui a la Securite Alimentaire au Bugesera
RAB	: Rwanda Agriculture Board
RADA	: Rwanda Agriculture Development Authority
RDI	: Rwanda Development Investment
RDO	: Rwanda Development Organisation
RSSP	
SACCO	: Saving Credit Cooperatives
SWOT	: Strengths, Weaknesses, Opportunities and Threats
UNDP	: United Nations Development Programme

UNICOOPAGI : Union des cooperatives Agricoles Integrées  
USAID : United States Agency for International Development  
USD : United States Dollars

# 1- INTRODUCTION

## 1.1 Background of study

Rwanda is located in East Africa, bordered by Uganda in the north, Burundi in the south, Tanzania in the east and the Democratic Republic of Congo (DRC) in the west. With a GDP per capita of 520 USD and over 65% of the population living on less than 1 USD per day. The poorest people in Rwanda live in rural areas and they depend mostly on agriculture (NISR, 2010).

Maize is the most important cereal and a widely distributed crops in Rwanda. As regards to cultivated area and production maize ranks third (14%) in Rwanda production following bean (21.2%) and banana (19.6%) MINAGRI (2009). Almost all agro-climatic zones of the country have great suitability in the production of maize NISR (2012). Grown by 62% of farm households for various purposes (direct human consumption, for sale on the local market, or dried and stored for a stock of food security), maize plays an important role in the socio-economic life of rural households (Terpend N. et al., 2007).

According to FAO (2010), maize presents the highest average grain yield (around 4.5 t/ha) as compared with major cereals grown in Rwanda such as wheat (2.1 t/ha) and rice (3/ha). However, the constraints to the development of this crop are many, including the decline in soil fertility, lack of agricultural credit, access to good quality seeds, late rains for planting and water control for producers. On the other hand, processing units have difficulty relating to irregular and insufficient supply in maize grain and the majority of them fail to reach 50% of their industrial capacity (Terpend N. et al., 2007 and MINAGRI, 2011).

The firm-farm contract is one of the ways to attempts to improve at least some of the problems on both sides for access to various agricultural inputs for farms on the one hand, and a supplying system to the processing plants on the other hand.

According to CCOAIB (2011) and Terpend N. *et al.* (2007), the contracts were awarded to cooperatives working in different areas. In these contracts, the company provided agricultural inputs and technical support to the cooperatives who were then supposed to sell in return the entire product to the processing plant at the time of harvest. Faced with the discontent of farmers, companies have made several attempts to improve the contracts that have all ended in failure (World Bank and MINECOFIN, 2010).

Maize was identified as a priority crop by the Government of Rwanda and through the Crop Intensification Program, the production of maize is currently holding the detailed attention of the Rwandan Ministry of Agriculture and Animal Resources (MINAGRI, 2009).

Maize is likely to contribute significantly to food security of Rwandans and to sustainable agricultural and rural development.

According to MINAGRI (2009), several reasons have led the Ministry of Agriculture to target maize among its priority agricultural sectors:

- (i) Its relative ease of conservation at the farm and its low spoilage compared with other crops.
- (ii) Its high food value in energy and proteins (food crop) and significant source of income (cash crop);
- (iii) The majority of the agro-bio-climatic zones of Rwanda present strong aptitudes for maize growing.

Following the increasing demand for maize flour, processing facilities have been initiated for example MINIMEX (*Minoteries-Import-Export*) in Kigali, COAMV (*Coopérative des Agriculteurs de Maïs dans la région des Volcans*) and Cyanika RDI (Rwanda Development Investment) in Umutara. The increased request for maize transformation has led to the emergence of cooperatives and to contract farming USAID (2010). Among the operational cooperatives, there is an example of KOJYAMUGI with a total of 4080 members located in Gisagara District.

Since the creation of processing facilities, more and more contracts between processing units seeking to secure their supply on one hand and producer cooperatives seeking to ensure their outlets on the other.

According to the World Bank (2007), several processing units have set up production contracts with different cooperatives even before they started to work in order to properly secure their supply. It is often stipulated in these contracts, that the companies provide inputs and technical assistance and in return producers must give them their entire maize production at the time of harvest. But the prices offered by the companies at the time the contract was signed were often lower than the prices at the market. As a result, the processors were hardly able to buy significant volumes (MINECOFIN, 2010).

Maize was particularly targeted by the District leaders as a priority crop in Gisagara District when they have signed the performance contract with the president of the Republic (Gisagara District, 2012).

The processing of maize into flour requires continuous supply of maize grain from farmers to processors. Unfortunately, the quantity of maize offered by farmers to processors remains very low in spite of financing of the local production through pre-established contracts ensuring farmers many benefits like assured market, income stability and access to agricultural inputs (USAID, 2010).

This study is part of an effort to diagnose potential sources of conflict between the Mamba maize plant and the producers of maize organised in the cooperative and the identification and evaluation of strategies to improve firm-farm relations.

## **1.2 Problem statement**

According to the Rwanda Development Board (RADA, 2011) and Mutijima (2006) maize production offers many advantages: it is a product that contributes to food security (eaten fresh and dry) and it can be cultivated for income generation. However, at farm level yields are often very low because its cultivation is mostly done without fertilizers. It is a product sensitive to climatic changes and especially to drought (MINAGRI, 2004).

Because of lack of access to agricultural inputs and agricultural credit, maize yields have remained low and mainly in cases there are no production contracts between the processing unit and producers MINAGRI (2009) and Michael (2008). Even though contracts are often seen as effective ways to improve and increase maize yields, such contracts have usually led to unsatisfactory results in terms of income to the farmer on one hand and stable supply to the processors on the other hand APF (2013). These problems certainly find origin in disagreement and little collaboration between the farmer and the processor. Mamba Maize Plant is the new processing unit operating in the Gisagara District and it intends to work closely with the KOJYAMUGI cooperative, which is the biggest maize producer in the area.

This research project will attempt to anticipate the difficulties that these two actors invited to be interdependent may face and consider the extent to which their relationship would be sustainable as well as evaluating the necessary strategies to strengthen their relationships.

AgriProfocus is a partnership, originating from the Netherlands with a mission to create spaces and opportunities for many stakeholders for learning in order to enhance entrepreneurship among organised farmers APF(2012). Therefore, to reach its mission, APF has asked Van Hall Larenstein among their master students who are interested in exploring the relationship between the company and farmers' cooperative. It is in this context that the Agri-Hub Rwanda which is in direct collaboration with the APF have chosen the case of maize growers of Gisagara District and the processor where I have to study the relations between two actors in order to show their current situation and give some recommendations where it is necessary.

Agri-Hub Rwanda started in 2009 with three main members: ICCO, Agriterro and Terafina, and together launched a new initiative: IPER (*Initiative de Promotion de l'Entrepreneuriat Rural*) APF (2012). The mission of the Agri-hub is to improve relationships between producers and processors, and to connect them to national and international markets.

According to the Mamba Maize Plant staff and farmers' cooperative, the central problem is that the farm-firm relationships are dominated by two sources of disagreement:

- (i) Low quantity and quality of maize from farmers to the firm
- (ii) Low maize price which is given by firm to the farmers

As stated by Devereux and Maxwell (2000, p.149), in this problematic situation farmers perceive crop prices as too low. This deserves attention as crop prices are a major factor governing incomes and cropping decisions. Farmers compare what they receive and what they produce and sell at the firms. This phenomenon is termed the food prices dilemma where they say "crop prices are too low, and food prices are too high" (Devereux and Maxwell 2000, p.149).

Identifying the blockages in the relations between Mamba Maize Plant and cooperative of farmers in Gisagara district (KOJYAMUGI) is the core of this research. This research aims at filling the information gap and create a base for assistance of solving different problems in the context of Gisagara District, which will be beneficial to Mamba maize factory, to create the good partnership with Kojyamugi and vice versa.

### **1.3 Research Objective**

To develop strategies for improved relations between maize farmers' cooperatives of Gisagara district (KOJYAMUGI) and Mamba Maize Plant through investigation of their current relationships.

### **1.4 Main research question**

What are the challenges in the relationship between KOJYAMUGI maize cooperative and Mamba maize Plant in Gisagara district?

### **Sub-questions**

1. Who are the important actors and their roles in the maize value chain in Gisagara District?
2. How are different actors in the value chain collaborating with each other?
3. What contractual issues are affecting the relationships between the Mamba maize factory and KOJYAMUGI farmers' cooperative in Gisagara District?
4. How do maize producers perceive the price decision making in Gisagara District?
5. What are the issues affecting quantity and quality of maize production in Gisagara District?
6. What benefits in maize production are perceived by Mamba maize Plant and KOJYAMUGI farmers' cooperative in Gisagara District?

7. What future perspectives are perceived by Mamba Maize Plant and Kojyamugi in Gisagara District?

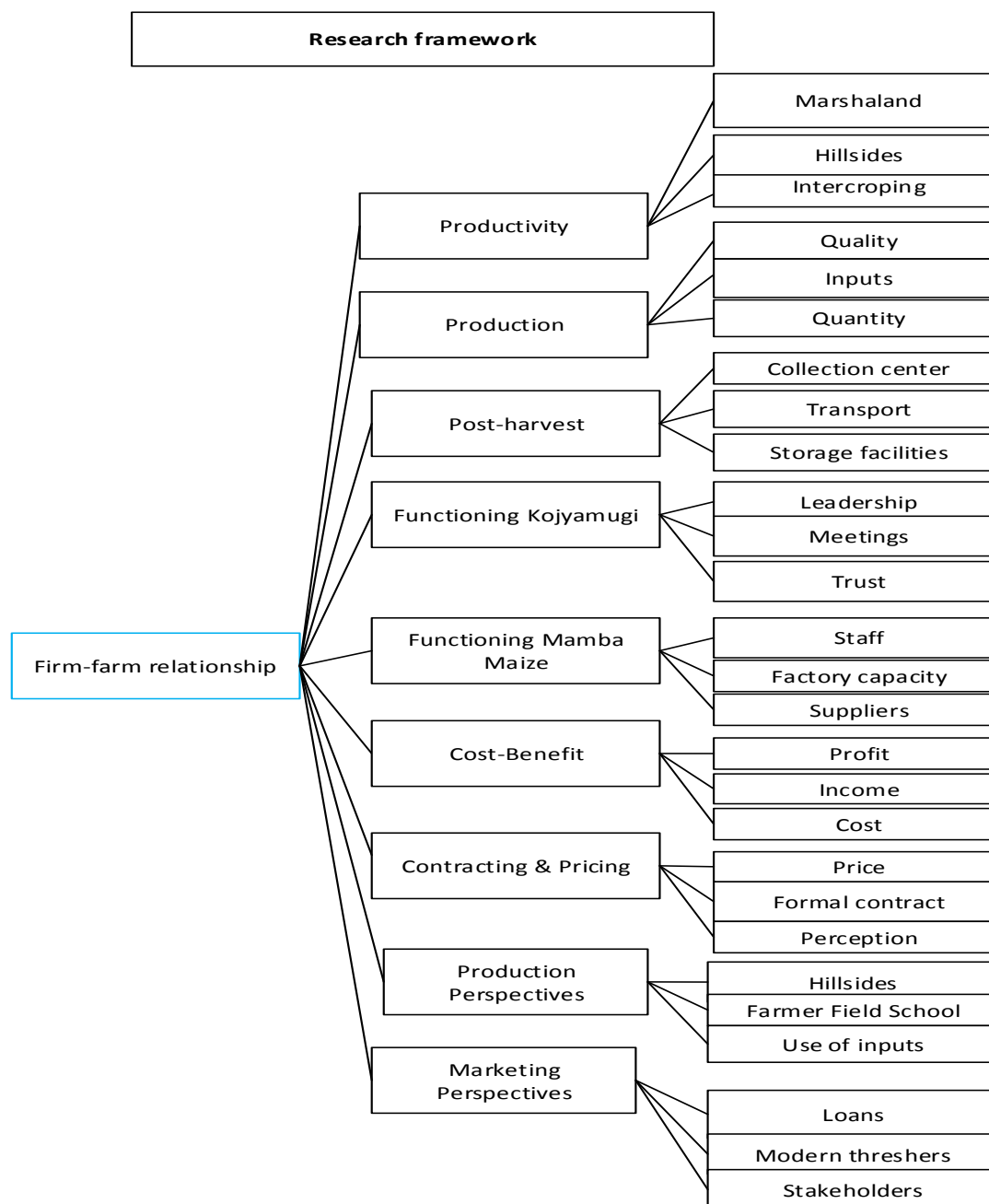


## 2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

### 2.1. Conceptual frameworks

#### 2.1.1 Firm-farm relationship framework

Figure 2. 1. Firm-farm relationship framework

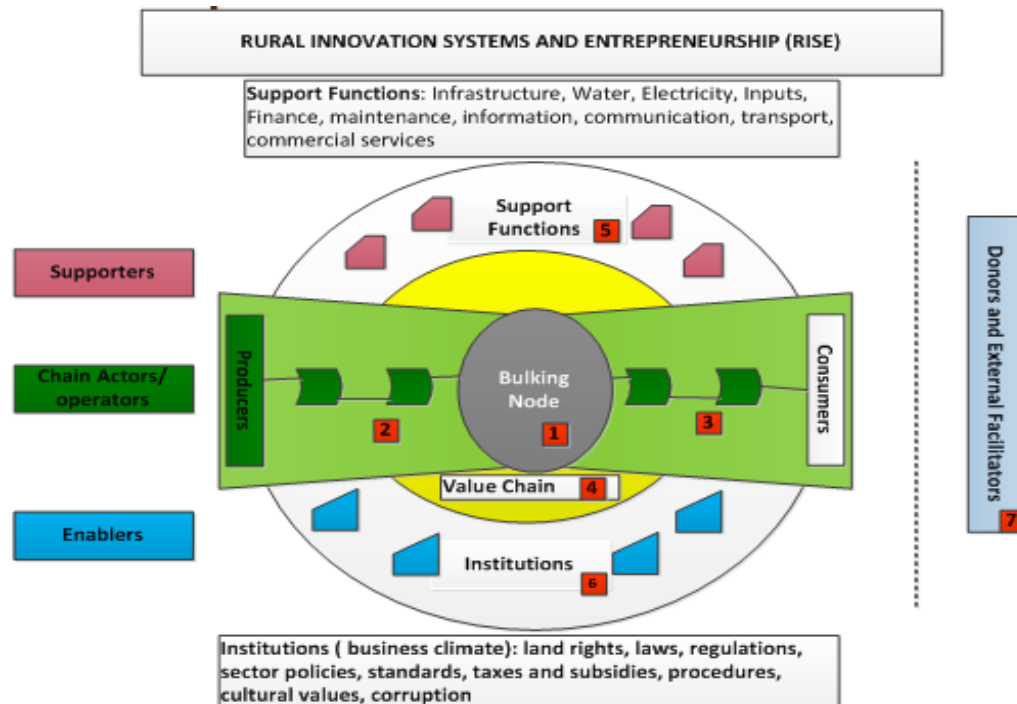


Source: Adapted from Designing a Research Project, 2013

### 2.1.2. Rise framework model

The RISE is a conceptual framework that combines approaches and concept of value chain development. It highlights the value chain components and emphasizes that different players need to interact in order to have a well-functioning agri-food market system, reduce transaction risks and costs and to arrive at competitive, sustainable and inclusive value chain development (Schrader, 2012).

**Figure 2. 2. Rise framework, 2012**



**Source:** Schrader, 2012

### 2.2 Definition of terms

**Firm:** is a person or group of people who turn inputs into outputs. Mostly firm buys raw materials to be converted into end products. In this research Centre IWACU is specified to be a firm (Balk, 2001, p. 4).

**Farmer:** is a person engaged in agriculture. The term usually applies to people who do some combination of raising field crop and livestock EU (2013, p.7). In this study maize farmer is a producer of maize, member of maize cooperative who sells his product to firm.

**Production:** production is determined by the yield gotten by the farmer after harvest. Here the production in maize is estimated after harvest in terms of quantity and quality (FAO, 2001, P.94).

**Relationship:** Partnership among different persons or different organizations, with a purpose of helping each other in their daily activity. This relationship can be guided by a written or an oral contract (Robert M.; Shelby D., 1994, P.21).

**Improving:** To raise to a more desirable or more excellent quality or condition; make better (FAO, 2001).

**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).

## **2.3 Background of maize production in Rwanda**

### **2.3.1 Overview of agriculture in Rwanda**

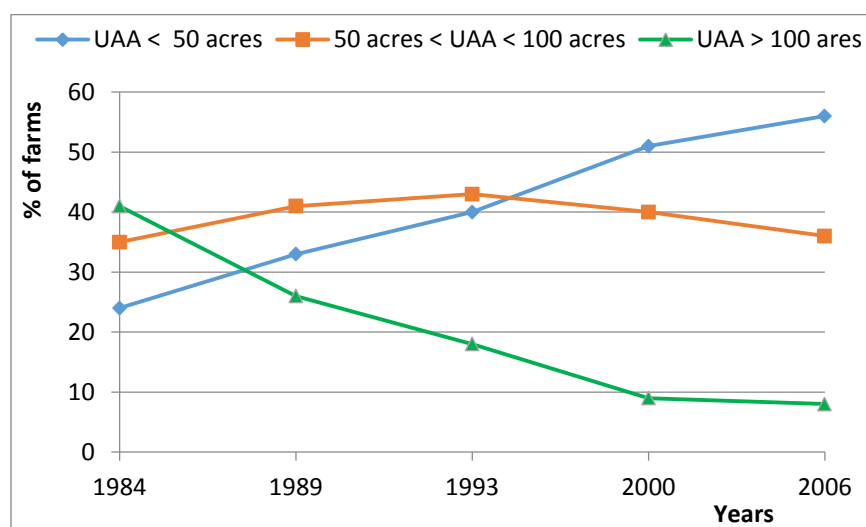
In Rwanda, the agricultural sector is considered by the government as a key element of economic growth. The reasons for this choice in the specific case of this country are numerous MINECOFIN (2002), mainly reasons are such the Rwandan economy is characterized by the predominance of the agricultural sector on the main economic variables, and the agricultural provides employment to 73.7% of the population and contributes to 47% of GDP and 71% of export earnings (NISR, 2012).

However, despite adaptability that Rwandan farmers and their production systems have shown that there are many indicators showing a worrying trend if a transformation is not engaged in time by NZISABIRA J. (2002). Therefore, it is understandable that in such a context, the strategy of poverty reduction in Rwanda gives the first place in importance to rural development including the transformation and modernization of the agricultural sector (MINECOFIN, 2002).

### **2.3.2 Current constraints to agricultural development and strategies**

Rwandan agriculture is facing many problems mainly dominated by an excessive fragmentation and miniaturization of farms (figure 1) from generation to generation. Coupled with high population densities of 430.64 inhabitants per square km in 2010 according to World Bank (2007). These problems eventually led to the overexploitation of land where natural regeneration of soil fertility is difficult in the current demographic context of the country.

**Figure 2. 1. Evolution of farms by utilized agricultural area classes**



**Source:** Adapted by the author from MINAGRI (2009).

The production of main crops in the four rural provinces of the country are described in the table 1 here after.

**Table 2. 1. Production of main crops in 2011 (Season 2011A + 2011B) in metric tons**

	Metric tons of maize	Metric tons of rice	Metric tons of beans	Metric tons of potatoes	Metric tons of fruits and vegetables
Rwanda	714,595	79,058	366,707	2,164,457	529,130
Eastern province	237,840	32,380	107,043	107,043	94,769
Northern province	171,452	-	95,751	804,909	145,928
Southern province	62,151	26,612	61,639	168,240	115,687
Western province	193,152	20,066	102,274	1,084,265	172,746
Gisagara District	4,983	10,264	7,801	10,874	11,930
% Gisagara District	0.97%	13.00%	2.13%	0.50%	2.25%

**Source:** NISR (2012).

This table shows that, Gisagara District is not performing well in all its components involved, except rice which provides 13% of national production volume.

### 2.3.3 Maize sector functioning in Rwanda

#### Maize production

In Rwanda, maize is grown on both hills and marshlands where it is usually associated with other food crops which are especially legumes such as beans. It is especially in monoculture (pure) on large farms generally held by farm cooperatives. As all marshes belong to the state, their operation is done under its permission through the local authority (MINAGRI, 2011).

For the exploitation of wetlands, priority is given by the District to the farmers 'cooperatives and associations that can occur over large areas especially crops recommended by MINAGRI, including maize crops. These cooperatives generally work with agricultural support and supervision of various specialized organizations. Maize cultivation in swamps is developed mainly in areas of medium and low altitudes (IPAR, 2009).

However, the use of agricultural inputs are very low and according to the NISR (2012) only 11% of farm households use improved seeds, 32% of sheep manure, 16% pesticides, 31% compost and 16% mineral fertilizers.

As summarized in the table 2 and according to NISR (2012) and MINAGRI (2011), the maize is experiencing a positive trend in all sizes: importance (%) compared to other crops, the cultivated area (ha) for two seasons, and the average yield per season (kg / ha) and the volume production in both seasons.

**Table 2. 2. Evolution of maize importance (%), cultivated area (ha), yield (kg/ha) and production (tons) in Rwanda**

	Periods (averages and/or sums on the 2 seasons A and B)						
	2005	2006	2007	2008	2009	2010	2011
Importance (%)	6.95%	7.05%	8.3%	8.5%	8,7%	13.7%	19.3%
Cultivated area (ha)	109,400	113,312	141,168	144,896	231,607	306,789	322,548
Yield (kg/ha)	761	766.5	722,8	915.75	1.198.6	1,794.8	2,215
Production (tons)	97,251	96,662	102,447	166,853	277,604	550,625	714,595

**Source:** NISR (2012) and MINAGRI (2011).

#### The storage and processing of maize

The storage and processing of maize in Rwanda can be analysed from the perspectives of individual farmers, farmer groups (cooperatives and association), industries, decentralized government structures and traders. Small scale farmers usually do not have surplus to store because the harvest is consumed fresh or dry (MINAGRI, 2004).

In some cases, the surplus of maize for consumption and maize seed is usually kept hanging on the edges of the roof to the outside of the house. Currently several cooperatives in the country have storage capabilities with warehouses financed and built for this purpose by NGOs (BAIR, World Vision, Care International) and agricultural development projects (PASAB, RSSP, RADA) who technically support them (Terpend N. et al., 2007).

According to USAID (2010), there exist also storage structures near local authorities particularly in the Eastern Province as well as with retailers across the country with storage capacities ranging from 50 to 5000 tons. But outside of this specialized unit, only industries (MINIMEX, Mukamira factory, DUHAMIC-ADRI, RDI-Umutara) have warehouses suitable for the storage of maize for a total capacity of about 10,000 tons.

For processing, maize is mainly transformed into flour intended primarily for human consumption. This transformation is carried out by artisanal craft and especially by three industrial units (MINIMEX, DUHAMIC-ADRI and Mukamira Maize Factory) USAID (2010). However, these three industries for the first constraints insufficient supply of raw materials especially MINIMEX which cannot even reach 30% of its industrial capacity materials (Mutijima, 2006; USAID, 2010).

## **The marketing processing of maize**

Maize is more profitable when sold fresh as compared to dry. Dry maize is often subject to problems of price fluctuations causing quite often an atmosphere of tension between maize producers (farmers & cooperatives) and buyers like artisanal and industrial processors European union (2009). However, to achieve this important offer, producers often taken credit for the period of production and the production itself (seed, fertilizer, labour) or to finance other needs of the family such school fees, etc... (MINECOFIN, 2007).

### **2.4. Firm-farmers' relations**

#### **2.4.1 Introduction**

Rural people in developing countries usually produce their own food. In addition to food, households also need money, to pay for clothes or school fees for their children (IFAD, 2001 quoted by Boselie and Kop (n.d), depending on agriculture for their livelihoods, it is clear that the domestic competitiveness of small farmers against globally and regionally sourced goods is of crucial importance.

As reported by MINAGRI (2009) and Michael *et al.* (2008), generally main agricultural challenges faced by small farmers in Rwanda are land scarcity, climatic hazards (flooding, drought in some area of country causing soil erosion), predominance of subsistence farming, weak connection to the market (limited market participation by producers) followed by lack of access to financial services, and low level of productivity mainly due to poor utilisation of intensification input.

Though marketing chains are changing, smallholder farmers in most developing countries are not yet able to meet the requirements of high-end markets (i.e. supermarkets) and, hence, the traditional markets still play a vital role in the agricultural marketing systems in sub-Saharan. High rate of post-harvest loss is also a key issue barrier for development (MINAGRI, 2011).

#### **2.4.2 Definition of contract farming**

Contract farming as explained by Prowse (2012), is a firm lending inputs such as seed, fertilizer, credit or extension services to a farmer or/and farmers' association or cooperative in exchange for exclusive purchasing rights over the specified crop. A contractual arrangement between farmers and other firms, whether oral or written, specifying one or more conditions of production, and one or more conditions of marketing, for an agricultural product, which is non-transferable.

#### **2.4.3 Firm-farm contract**

##### **History on Firm- farm contract**

Contract farming (CF) is a major agrarian institution that has been widely applied in developed and developing countries at different times for improved coordination and performance of the

agricultural market and for addressing different types of market failures in general (Eaton and Shepherd, 2001; Olomola, 2010 and Prowse, 2012).

According to Minot (2011), the contract farming is also named 'production contract' is defined as fixed-term arrangement between a farmer and a firm, which come before production begins, under which the farmer agrees to sell to the company a select crop in a specified manner and finally the company agrees to pay the farmer a price according to their agreement topics.

The contract farming started in terms of cash crops such as tea, coffee, pyrethrum and sugar cane and especially that contract was between farmers and government and international organizations intervene as a way of increasing and promoting crops. Farmers accept the contract as it is because they don't have the capacity to reduce the price. However, all those cash crops were for export, where government had interest on them in term of foreign money, reason why farmers were pushed to cultivate them without any information about the market FAO (2001).

As other developing countries, Rwanda has two types of contract farming as such informal model and intermediary model, respectively, where smaller firms or traders enter into annual agreements, often on a verbal basis, with a limited number of farmers, frequently for fruit and vegetables that require minimal processing, and where firm sub-contacts interaction with farmers to an intermediary, such as farming committee, cooperatives of farmers or a trader. The first model is more popular for farmers surrounding the urban area. The second model is likely observed in seed production for example maize crops (RADA, 2011).

### **Firm-farm partnership**

Producers and sellers in value chains are with time becoming inter-dependent actors. Improving market conditions and consumer demands need both to work closely with each other and make their activities complementary (FAO, 2011).

The firms and the small scale farmers share the same profit in producing and buying the same product (APF, 2013). At the other hand, it is difficult to maintain a good relation between them because companies and farmers also may have opposite interest when farmers perceive crop prices as too low. Farmers compare what they receive and what they produce and sell at the firms, and they want to sell their product at high price while the company wants to buy at the lowest price (Devereux and Maxwell, 2000).

Traditionally, small producers in developing countries have operated outside the formal sector, selling largely their surplus produce to local markets. However, the recent growing concentration in domestic agricultural food systems and the reversal of food chains from being supply driven to demand driven, have led to significant institutional and organizational changes that are affecting small-scale producers (KIT and IIRR, 2010; Boselie and Kop (n.d)).

To meet the products and transaction conditions of retailers and processors, farmers require technology, financial capital, human capital and organisation. The capacity of smallholders to implement these changes is determined in large part by their assets as stated here: natural, physical, financial, human and social capitals (Ellis, 2000).

## **2.5. Advantages and disadvantages in contract farming**

### **2.5.1 Advantages firm-farm**

According to Eaton and Shepherd (2001); Contract farming has significant benefits for both the farmers and firms. Inputs and production services are often supplied by the firms; this is usually done on credit through advances from the firms; contract farming often introduces new technology and also enables farmers to learn new skills; farmers' price risk is often reduced as many contracts specify prices in advance and contract farming can open up new markets which would otherwise be unavailable to small farmers.

The same author show the main advantages which are:

- Regularity of agricultural product supplies to the firm is ensured,
- Since contracts specify quality attributes and since most also allow control of farming technology processes, firms are in a better position to meet consumer requirements and mandatory quality and safety standards,
- Access to land is facilitated; input costs per unit are reduced and access to agricultural credit and eventual financial incentives and subsidies is facilitated.

### **2.5.2. Disadvantages firm-farm**

Reported by Silva (2005) and Wu (2006) some main disadvantages for firm-farm are:

- The rejection of products delivered, under pretext of non-conformity to quality regulations; firms might refuse to receive products as a strategy to transfer to farmers the financial losses arising from unexpected market turns,
- Firms might intentionally avoid transparency in the price determination mechanism of the contract, utilizing complex formulas or quantity and quality measurements not well understood by farmers,
- Firms also are facing different challenges as follow: marketing information, reliable source of low materials, lack of appropriate infrastructure, limited skills of employers, money infraction and fluctuation of price (Diao et al, 2010 ; Silva, 2005).

## **2.6 Firm-farm relations and food security**

According to FAO (2013); the firm which is engaged in contract farming can benefit from farmers and these have a guaranteed market which is their principal profit. This relationship regarding guaranteed supply of product to the firm and the stability of products supply from farmers meet their specifications regarding quality, quantity and timing of supply and payment in providing agricultural inputs such as seeds and fertilizers. Normally, there is no specific product which can be successful at a given contract because there are a lot of examples of contract farming measures for different crops (Eaton and Shepherd, 2001).

In supporting farmers to increase different crop production as source of income, the good firm-farm relations has a significant role in improving crop productivity in use of motivation of farmers using incentives and farmers' field visit in order to increase the production; security of market and stability of income, those factors led to ensure their food security (Nabahungu, 2012).

## **2.7 Rights and obligations in firm-farm relationship**

Reported by Veld (2004), farmers have to make agreements with the firm regarding payments. This way can prevent payment problems from arising. Make sure that pesticides and fertilisers supplied by the buyer are used wisely. These costs have to be paid back and using too much of these products can have a negative effect on production. Contract production offers security for a longer period, but a producer can thereby also be stuck for a longer period in a bad contract.





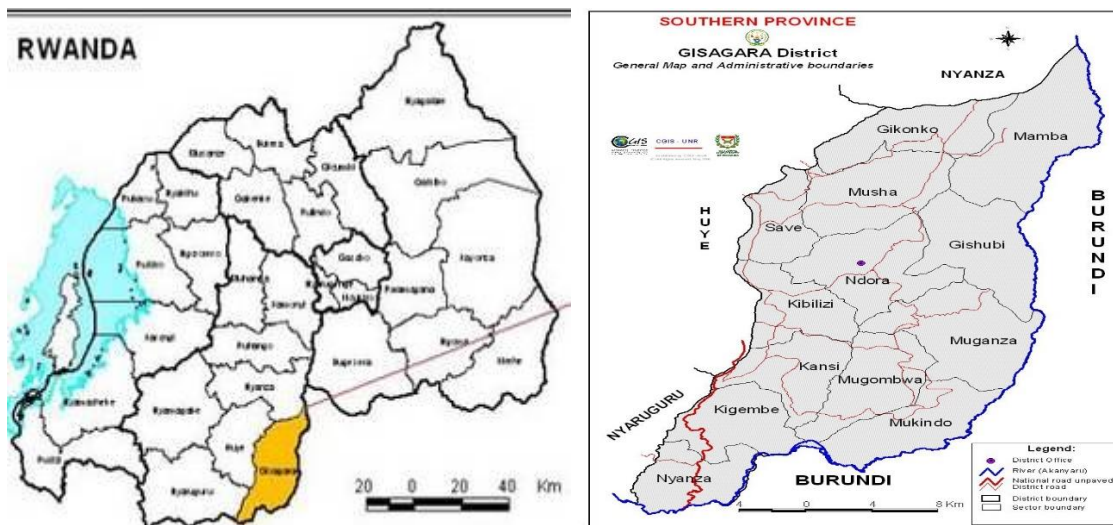
### 3- METHODOLOGY

#### 3.1 Study area: Description of research area

The district of Gisagara was created in 2005 by the law no 29/2005. This District is one of the 8 districts that make up the southern province. It is made up of 13 sectors, which are subdivided into 59 Cells and 524 Villages or “*imidugudu*” in local language. The District covers a surface area of 678 km<sup>2</sup>. It is located in the South-Eastern part of the country as it is shown on the map above. It is bordered in the South by the Republic of Burundi, in the North by Nyanza District, and in the West by Huye and Nyaruguru Districts (Gisagara district, 2012).

Average annual temperatures generally oscillate around 20<sup>0</sup>c with amplitudes changing between 15<sup>0</sup>c and 20<sup>0</sup>c and annual rainfalls of about 1200 mm.

**Figure 3. 1. Rwanda and Gisagara District maps**



**Source:** Gisagara District (2013).

The four main crops grown in Gisagara district are rice, coffee, maize, and cassava. Maize is grown near the big river of Akanyaru and most of farmers who have their maize plots are organised in KOJYAMUGI maize cooperative (Koperative Jyambere Muhinzi Gisagara) with 4,080 members (2080 men and 2000 women). To be a member, the payment of Rfw 20,000 for contribution is needed (KOJYAMUJYI, 2013).

#### 3.2 Research methodology

To gain answers to the research questions, this research was planned into two steps: The first one was a desk study and the second one was a data collection in the field. The desk study was meant to collect theoretical information, which was useful to understand concepts related to this study. The field study was meant to collect primary data.

##### 3.2.1 Desk study

The first step which is the desk study, was used to get data from existing literature. By reading and gathering information the research could be structured before starting the field work,

especially the information on background of agricultural production in general, maize production and firm-farm relationship. The following sources of information were used: Scientific books, PhD thesis, scientific journals, reports, unpublished documents from Rwandan Governmental Institutes and written materials from Internet as well as books from the digital library of Wageningen. The literature review was used to link the findings with existing information providing answer to the research questions.

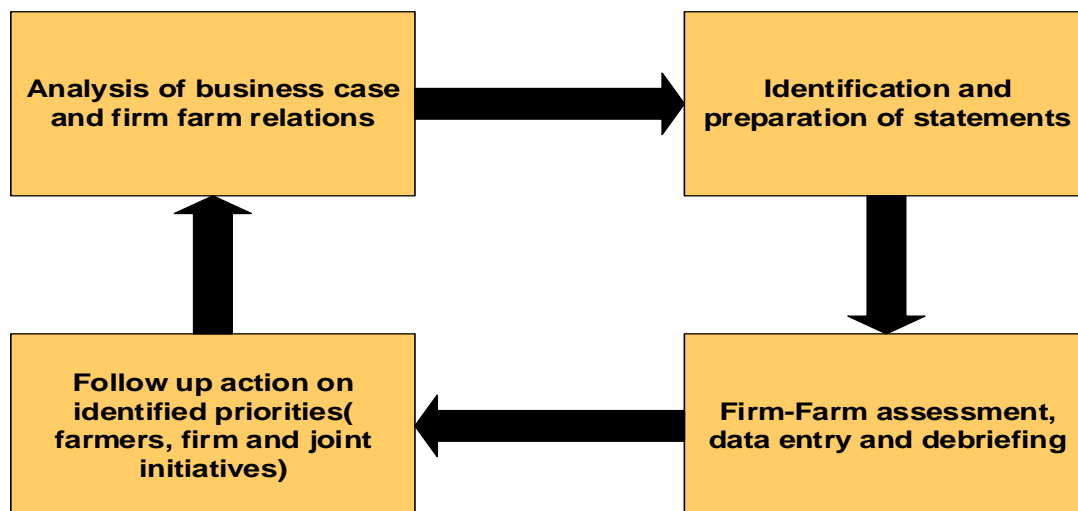
### 3.2.2 Field study: Primary data collection

The field study was done using the 2-2 tango tool (Schrader, 2012) in the following steps:

1. Business case analysis and identification of challenge areas
2. Formulation of statements
3. Firm and farmers scoring the statements
4. Data entry, processing and preparation of graphs (Excel)
5. Preparing debriefing report and meetings
6. Sharing and discussing self-assessment results
7. Conclusion and recommendations.

The following figure show the implementation of 2-2 Tango 'context

**Figure 3. 2. 2-2 Tango tool implementation context**



**Source:** Schrader, 2012.

### 3.3 Interviews

Focus group discussion were used during the business case analysis, the identification of challenge areas and the formulation of statements. The field work started with a short description of the business case, based on company documents followed by an interview with the staff from Mamba maize and farmers from Kojyamugi. The checklist with challenge areas (APF, 2013) was used for the interviews. The first analysis of the business case helps to identify the main challenges in order to know the overview of their business.

**Table 3. 1. Distribution of Respondents during the business case**

Type of respondent	Number of respondents	Function	Gender	
			Male	Female
Farmers from Kojyamugi cooperative	5	Producers	3	2
Staff from Mamba Maize Plant	3	Accountant, Manager and Agronomist	2	1
Technician from Centre Iwacu	1	Field facilitator	1	-
<b>Total</b>	<b>9</b>		<b>6</b>	<b>3</b>

**Source:** Author, 2013

Respondents from Mamba Maize Plant were selected depending on their direct contact with the farmers such as the accountant who is in charge of payment after farmers supplied their maize, the Manager who coordinates all activities of the company and the agronomist who is in charge of field activities.

Respondents from maize farmers were selected according to their role in the management of cooperative, one member from the board of directors, one from the executive committee and three farmers from which two were female farmers.

### **3.4 Questionnaires**

After identification of challenge areas, statements were formulated according to the business case, and those statements which have to be understood by all respondents were translated and written in local language which is Kinyarwanda. Before scoring, the statements were tested on 2 respondents to be more understandable and given some changes where it was necessary. Finally, the researcher explained very well the statements before scoring in order to be understandable by every respondent. Farmers and firm scored the same statements (refer to the annex). The collected quantitative data were from those respondents who scored the statement by marking the symbol where it was written strongly disagree, disagree, agree and strongly agree depending on their own opinions.

**Photo 3. 1. Researcher explained the statement and scoring statement by farmers**



**Source:** Researcher (2013).

**Table 3. 2. Repartition of Respondents for questionnaires**

Type of respondent	Number of respondents	Function	Gender	
			Male	Female
Farmers from Kojyamugi cooperative	50	Producers	29	21
Staff from Mamba Maize Plant	4	Manager, storekeeper, Agronomist and Accountant	3	1
<b>Total</b>	<b>54</b>		<b>32</b>	<b>22</b>

**Source:** author, 2013

Respondents from maize farmers were selected randomly depending on their sites, where 500 ha area of cooperative is subdivided into 5 sites with 10 respondents from each site, and 4 respondents from Mamba maize Plant in 9 permanent employees of this company and the selection was done according their direct contact with farmers.

For the film, the respondents are selected depending their direct contact with farmers such as manager who is the coordinator of all activities of plant from field to the plant, the agronomist who is in charge of field activities as well as quality control, the accountant who is in charge of payment after the supplying of product and the storekeeper who is in charge of keeping raw materials before entering in processing unit and after processing before selling the maize flour to the traders.

### **3.5 Data analysis**

A prepared Excel workbook was used for data entry and automatic generation of graphs. The 2 graphs have been used; one showing the median scores of each statement, another graph was showing the level of agreement between firm and farmers; those were done for each challenge area of this research. The median score is used instead of average score because median is more accurate than average where the precision is high.

The proposal for judging the scores with median is in following table:

**Table 3.3: Judgements on scores with median**

Median scores	Judging	Meaning
1 or lower	Very low score, caused by the totally disagreement of the respondents with the statements	There is an urgent for improvement or change
1.5	Low score, dissatisfaction of the respondents	The improvement is necessary to meet the needs and wishes of the respondents.
2	Positive score, the satisfaction of respondents is not optimal. They are agree	Improvement of the firm-farm performance is not obligatory, but advisable in order to increase satisfaction among members.
2.5	Strong satisfaction, satisfaction of respondents on performance	Adjustments could be made to lift the level of satisfactory to the final stage.
3	A very high score, with full agreement of respondent on the statement and indicates a high level of satisfaction	Change or improvement is not needed.

**Source:** Author, 2013

### **3.5 Debriefing and focus group discussion**

The graphs and tables were used for debriefing and focus discussion with the self-assessment results from questionnaire were shared with Mamba Maize Plant staff and Kojyamugi together. The research explained the meaning of low or high mark and agreement and both actors suggested the improvement needed for each challenge area. Data from focus group discussion and observations were used in supporting the interpretation of data from individual interview. Finally, the conclusion and recommendations on firm-farm relationship improvement were formulated.

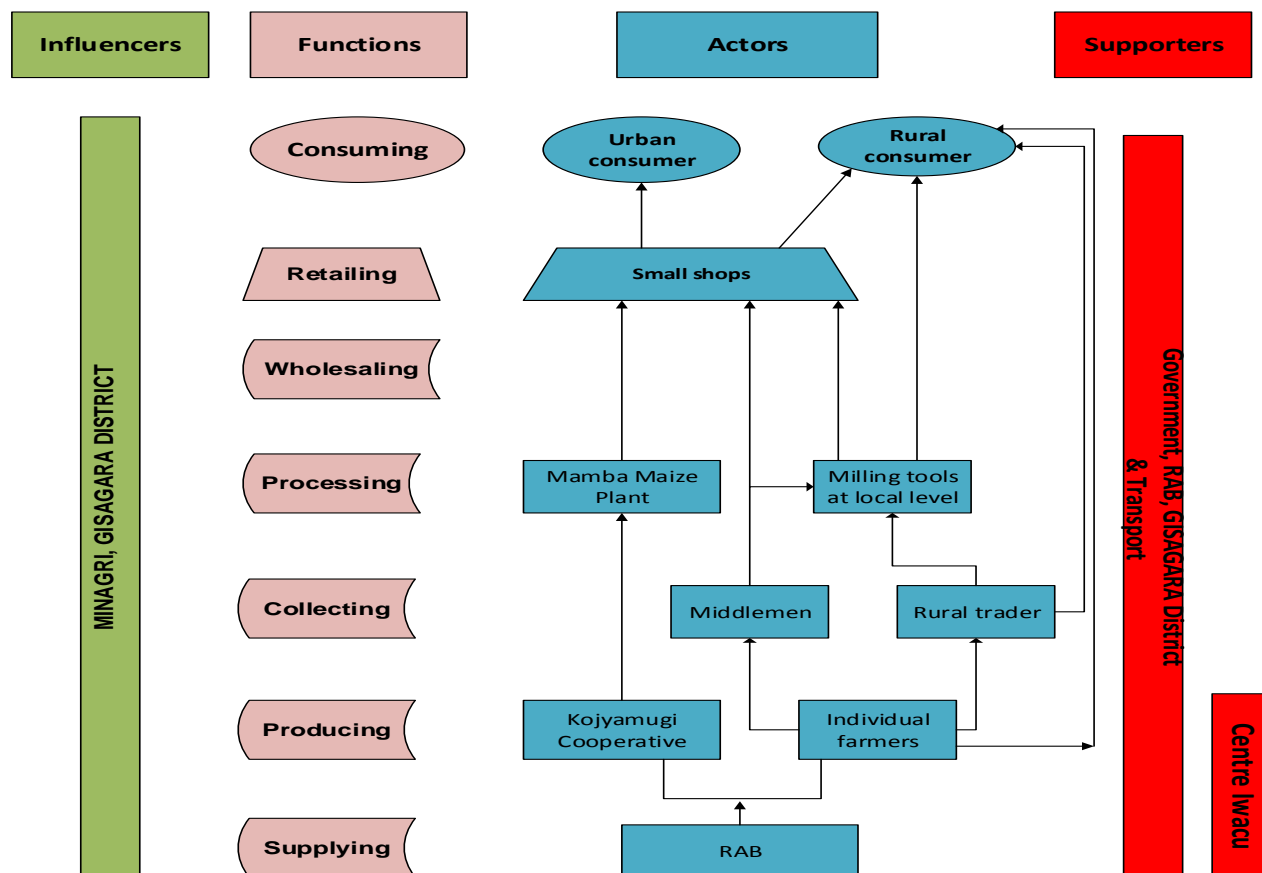
## 4- MAIZE VALUE CHAIN ANALYSIS AND BUSINESS CASE IN GISAGARA DISTRICT

### 4.1. Description of value chain

The main actors involved in maize value chain are input suppliers, actors, supporters and influencers.

The following figure shows the map of main actors in maize value chain in Gisagara District

**Figure 4. 1. Maize value chain map**



**Source:** Adopted by the author from data of USAID (2010).

#### 4.1.1 Input suppliers

Input in maize production is supplied by RAB (Rwanda Agricultural Board) in term of fertilizers, improved seeds and extension services in partnership with agricultural office of local government and local NGOs.

#### 4.1.2 Actors

**Producers:** Individual farmers or cooperative farmers as Kojyamugi, the main maize producer of in the Gisagara district. They supply dry maize to the Mamba Maize Plant.

**Rural traders:** This consists of rural traders in Gisagara District to purchase small quantities from farmers. They store maize produce waiting to supply large quantity when price is better.

**Middlemen:** Informal buyers who move from farm to farm and buy the maize produce at the low price sometimes before harvest in order to sell it to the other actors at the good price.

**Processors:** Mamba Maize Plant is the new modern processor dealing with maize farmers in Gisagara District.

**Retailers:** Mamba open market and small shops in the District

**Consumers:** Consumers are both rural farmers and urban people in Mamba sector and their neighbouring areas who buy dry grains and/or maize flour.

#### **4.1.3 Supporters**

**Gisagara District:** Provides agronomists at farms level to give technical advices during maize cultivation and post-harvest period.

**RAB:** Rwanda Agricultural Board as government institution which provide especially improved seeds and other new technologies after doing the research.

**Centre Iwacu:** which support farmers mainly by giving them trainings related to maize cultivation and help to work together in cooperative.

#### **4.1.4 Influencers**

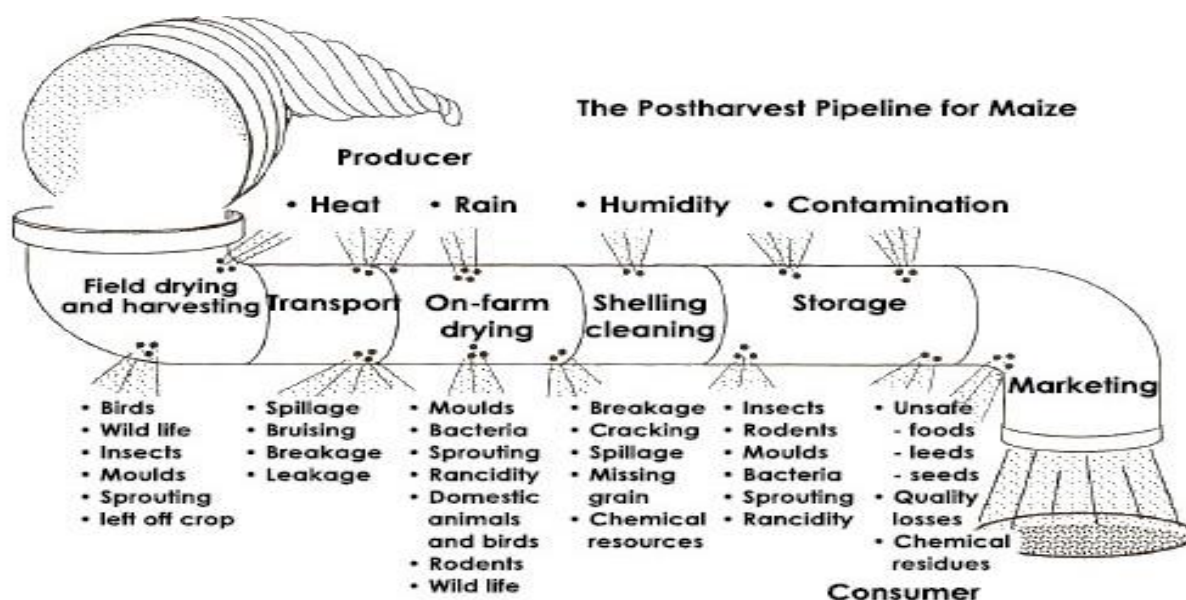
**MINAGRI:** Establishment of policies and regulations in maize value chain through CIP.

**Local government:** Gisagara District provides extension services to the farmers and through its agricultural department coordinate the inputs distribution.

The following figure illustrates types of quantitative post-harvest losses in the maize value chain from each actor and where the all actors have to reduce the maize losses in order to improve their business in the chain.



**Figure 4. 2. Post-harvest pipeline for maize**



Source: MINAGRI (2011)

## 4.2. Business case description

The business case description is meant to result in challenge areas. Here, it was a discussion with members of Kojyamugi cooperative, staff of Mamba Maize Plant and the representative of the Center Iwacu on the business of two actors in order to have insights on their challenges. These challenge areas have helped to formulation of statement for each challenge area.

### 4.3.1 Functioning of Mamba Maize Plant

Mamba Maize Plant has started in June 2013 with support from Centre Iwacu, UGAMA and Canadian Cooperative Association (CCA). As a service provider and involved in capacity building of cooperatives, Centre IWACU has intensively supported “*Koperative Jyambere Muhinzi Gisagara*” (in short KOJYAMUGI) since 2006. Supports included the promotion and value addition of maize production. This crop increased the production from 1, 5 t/ha to 4t/ha, reason why Centre IWACU began to think about how to work on other stages of the chain in terms of adding values: Production, Transportation, Post-harvest, Processing, Marketing and Consumption. It is in this way that IWACU develop a big project funded by CCA through UGAMA and built a factory; drying stations and storage facility for KOJYAMUGI. Mamba Maize Plant buy the maize produced by Kojyamugi farmers’ cooperative.

**Photo 4. 1. Mamba Maize Plant**



Source: Researcher (2013).

The objective of this factory, is to mill all maize produced by Kojyamugi, according to the Centre Iwacu coordinator ***“the idea to build this plant came after observation of high maize losses after harvest suffered by farmers of Kojyamugi because of lack of market”***.

The plant has nine permanent workers with one female and eight males, in addition to that, the company has five temporary workers depending on quantity to mill according to the command that factory obtained. The daily management of the company is commended by a plant manager engaged by agreement between the Kojyamugi Board of directors, Centre Iwacu and Gisagara District. The company consists of three parts which are processing and quality control of raw material, sales of maize flour and purchase of raw material and finally administration and accountancy.

The Mamba Maize plant is the new plant in the area which can produce 500 tons per day, it has an opportunity to have enough maize to mill, but it doesn't provide any services to kojyamugi such as extension services and provision of credit on inputs, because it is new. This affect the quantity supplied by farmers to the company due to other competitors in rural area who buy maize at the farm gate.

The farmers use the Akanyaru marshland to produce maize and this is taking time for plant to bring the maize yield from there to the factory. The Mamba Maize Agronomist says ***“it takes time to transport the production, especially during the rainy Season when the roads are damaged”***.

**Photo 4. 2. Akanyaru marsh and Roads in rainy season**



**Source:** Author, 2013

The company is owned the adequate storage facilities and material as it looks on the following pictures.

**Photo 4. 3. Adequate storage and processing materials**



**Source:** researcher (2013).

#### **4.3.2 Functioning of Kojyamugi cooperative**

The cooperative Jyambere Muhinzi Gisagara (Kojyamugi), is composed of 4080 members with 2080 men and 2000 women. The land used by Kojyamugi is located in Akanyaru marshes situated in Mamba sector, Gisagara District in South province of Rwanda. The cooperative began operations in 2006 and get the legal personality in 2010. Its objective are to increase maize production in the Akanyaru marshland from 1.5 tons to 4.5 tons, to professionalize its members to maize production.

The condition of being a member of KOJYAMUGI is to have willingness to work as a group, having a plot in Akanyaru marshland, and pay the share of Rwf 20,000, this contribution is paid



once. The internal regulations determine membership criteria for admission and exclusion as well as the rights and duties of members. Organs of Kojyamugi are following: general assembly is the supreme organ of the cooperative, the board of directors, and the executive committee, the two last organs are elected between the members and they have a duration of three years renewable.

**Photo 4. 4. Natural drying system and Land of maize for Kojyamugi**



**Source:** Researcher (2013)

As reported by different respondents from the cooperative and the company, there is no contract between two actors, this can influence the quantity of maize supplied to the Mamba plant if the local buyer give a good price than Mamba Maize, also the quality can be influenced sometimes. As explained by different respondents from Kojyamugi and Mamba maize Plant ***“we don’t have the signed contract which binds us with the company, but we know that it is necessary and we did a draft which will be shared soon before signing”***. Says board of directors’ member.

#### **4.3.3 Perspectives and SWOT analysis**

Mamba Maize Plant of Gisagara is new in the region and it is built to recover the loss of production which was in large quantities in this region. Especially the production from the Akanyaru marsh where Kojyamugi’ farmers grow maize. After two months of operation of the plant, some questions are already visible. The research has given more attention to the future (perspectives) to fight against any kind of risk that can occur over time.

Regarding the main objective of Kojyamugi cooperative which is to increase maize grown in Akanyaru marshland from 1.5 tons to 4.5 tons/ha, this is possible with the training of their members to be professional in maize production and agribusiness in general. This is possible when Kojyamugi thinks about the new strategy of growing maize on the slopes. And this projection can increase the number of agricultural seasons, when farmers use two rain seasons.

The use of agricultural inputs especially fertilizers can also help farmers to increase their production, and then the establishment of contract can improve the relationship between two actors.

In partnership with other stakeholders, the floods can be controlled in order to make the production in good condition. The major issue concerned both Kojyamugi and Mamba Maize Plant is to reduce the cost of producing one kg of dried maize.

**Table 4. 1. SWOT analysis of the business case in Maize crop between Mamba Maize Plant and Kojyamugi**

<b>Strength</b>	<b>Weakness</b>
<ul style="list-style-type: none"> <li>- Maize produce</li> <li>- The Plant at the local area</li> <li>- Adequate storage facilities</li> <li>- Well organized cooperative</li> </ul>	<ul style="list-style-type: none"> <li>- Low productivity</li> <li>- Good market of fresh maize influences the quantity of dried maize</li> <li>- Quality requirements of dried maize are difficult to meet by the farmers</li> <li>- Price fluctuation</li> <li>- High post-harvest losses</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>- Other stakeholders in maize production sector</li> <li>- Government support through C.I.P</li> <li>- Akanyaru marshland because</li> </ul>	<ul style="list-style-type: none"> <li>- Climate vulnerability</li> <li>- Other buyers in the rural area</li> <li>- Marshland need drainage sometimes</li> <li>- Long distance and inadequate roads</li> </ul>

Source: Author, 2013

#### **4.3.4. Common challenges between Mamba Maize Plant and Kojyamugi**

- **Productivity:** This challenge area is talking about yield, quality, agricultural seasons and land used for growing maize either in marshlands or/and on hillsides.
- **Production:** This challenge area is talking about production factors such as agricultural inputs (fertilisers, improved seeds and extension services) favourable for growing maize and access of farmers to the credit.
- **Post-harvest and logistical handling:** This challenge area is talking about the availability of infrastructure facilities; quality and quantity of post-harvest yield of maize delivered to the processing plant.
- **Functioning of Kojyamugi cooperative:** This challenge area is talking about leadership and administration issues, and availability of financial means inside the cooperative.
- **Functioning of Mamba Maize Plant:** This challenge area talking about staffing, administration issues and flow of command inside of the company in favour of the farmers.
- **Cost and Benefit analysis:** This challenge area is talking about profit earned, pricing, bargaining power and land coverage of source of investment in other crops or off-farm activities.
- **Contracting and pricing:** This challenge area is talking about contract between farmers and company and price negotiation.

- **Production perspectives:** This challenge area is talking about the future perspective on the improvement of maize in quality and quantity as a way of satisfying the needs for both sides.
- **Marketing perspectives:** This challenge area is talking about maize and by-products especially in terms of quality standards at market for increasing firm-farm relationship.

## 5- DATA PROCESSING AND FINDINGS

Data has been handled and offered according to the challenge areas revealed in business case description. The findings are as follows:

### 5.1. Challenge areas

#### 5.1.1 Challenge area 1: Productivity

The productivity is composed by 9 statements talking about maize lands and their cultivation. Either maize is cultivated in marshlands or/and on hillsides. The following figure shows scores of firm and farmers.

The numbers represent the following statements:

**Table 5. 1. Statements of productivity**

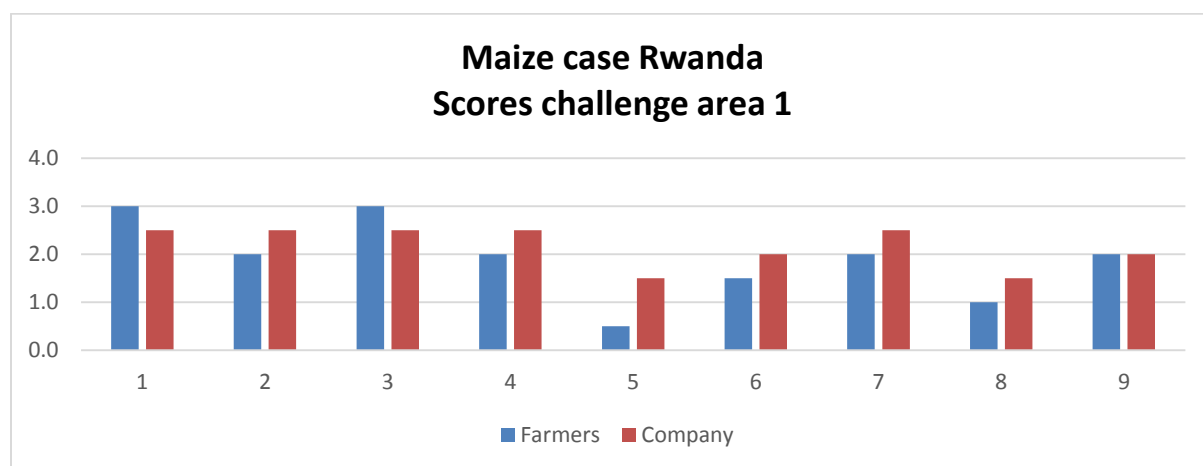
1. Productivity/statements	
1	Farmers have enough land to grow maize
2	Farmers' land is appropriate for maize production
3	Local maize is of a better quality than maize grown elsewhere
4	Farmers grow maize on hillsides
5	Farmers irrigate their maize on hillsides
6	Yields are increasing on hillsides as compared to the marshland
7	Seasons influence maize quality
8	KOJYAMUGI' farmers intercrop maize with other crops
9	The maize farms are located near the farmers

**Source:** Author, 2013

It is clearly comes out that the farmers are not positive about many statements mostly on statement 5, 6 and 8 with the low scores. The farmers give high score on statement 3 (quality of local maize compared to other maize grown elsewhere).

The company gives the lowest score for statement 8 (farmers intercrop maize with other crops) and high score on statement 1, 2 and 7.

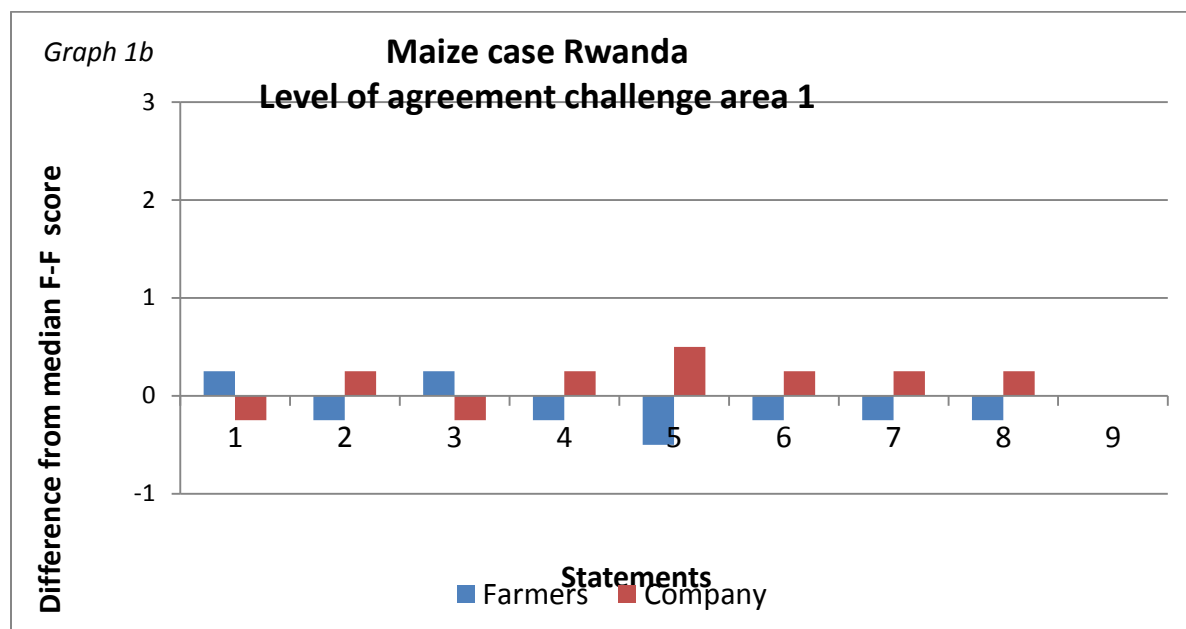
**Figure 5. 1. Scores on productivity**



**Source:** Survey, August 2013

Concerning the level of agreement, it can be observed that in this area the difference is not very high except statement 5 where level of difference is high compared to the median score. Many statements firm and farmers do not have common agreement, except on statement number 9 about the maize farms located near the farmers.

**Figure 5. 2. Level of agreement on productivity**



**Source:** Survey, August 2013



### 5.1.2: Challenge area 2: Production

The challenge area of production is composed of 9 statements talking about production factors like agricultural inputs (fertilisers, improved seeds and extension services) favourable on the increasing in maize production; the following figure shows scores of firm and statements on production issue.

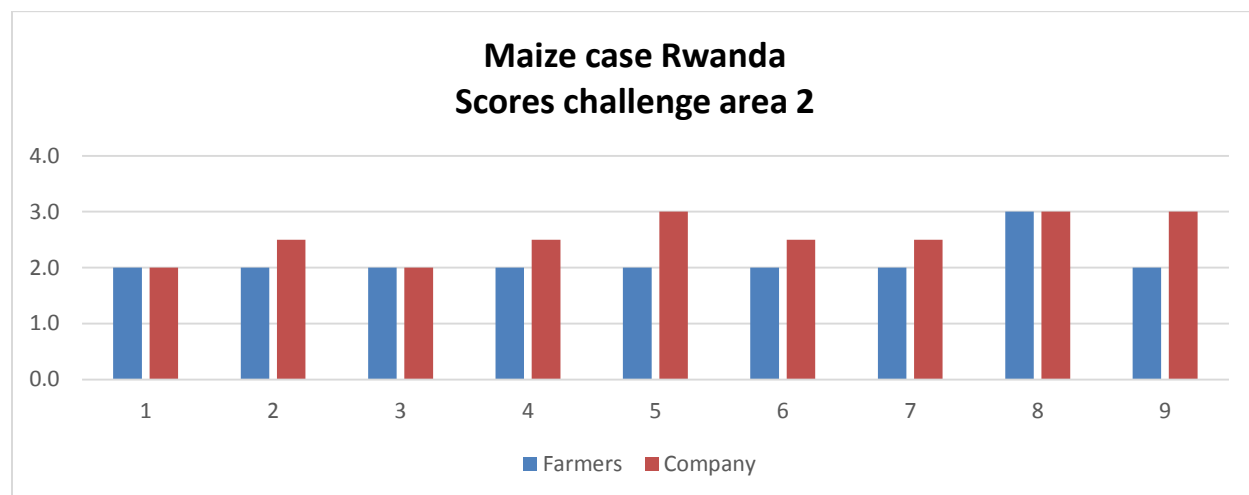
**Table 5. 2. Statements of production**

2. Production/statements	
1	Agricultural inputs are affordable to farmers
2	Agricultural inputs are available at the right time
3	Farmers know proper utilization of inputs
4	Pesticides are affordable
5	Farmers have high maize yields
6	Farmers grow the same maize varieties in marshland as they do on hills
7	Farmers use the inputs as recommended by agronomists
8	Farmers grow the best maize variety available
9	Farmers have access to credit to buy inputs

**Source:** Author, 2013

The farmers are not positive about many statements except statement 1 and 8. While the company gives the lowest score on statement 1 (affordability of inputs to farmers) and 3 (Farmers know proper utilization of inputs) and high score on statement 5, 8 and 9.

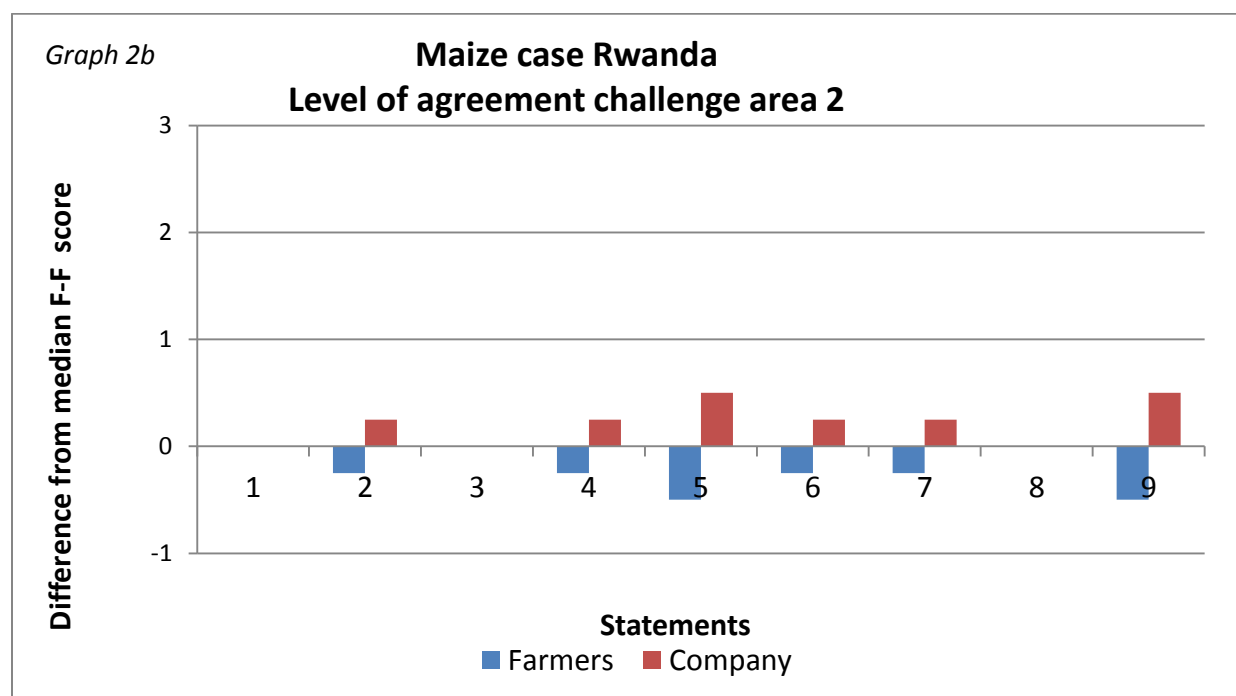
**Figure 5. 3. Scores on production**



**Source:** Survey, August 2013

It is seen that the difference is not very high except on statements 5 (Farmers have high maize yields) and statement 9 (farmers have access to credit to buy inputs). On statements 1, 3 and 8 both farmers and the firm have the common agreement.

**Figure 5. 4. Level of agreement on production**



**Source:** Survey, August 2013

### 5.1.3: Challenge area 3: Post-harvest and logistical handling

The challenge area of Post-harvest and logistical handling is assembled by 9 statements expressing about the availability of infrastructure facilities; quality and quantity of post-harvest yield of maize delivered to the processing plant.

The numbers represent the following statements:

**Table 5. 3. Statements of post-harvest and logistics handling**

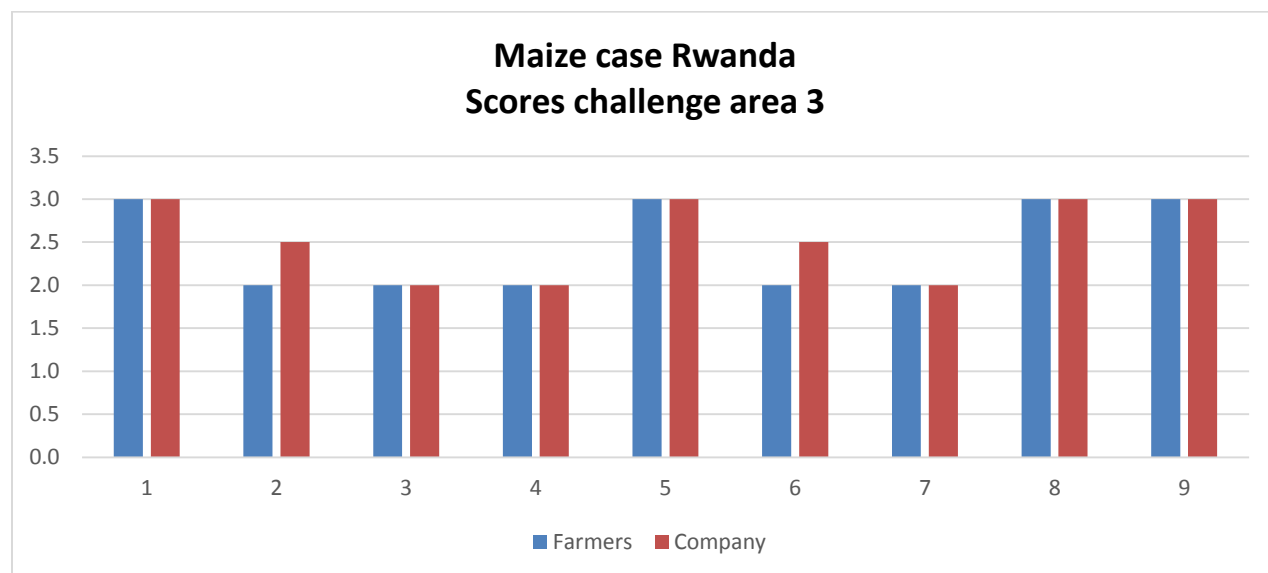
3. Post-harvest and logistical handling/statements	
1	Mamba Maize Plant is happy with the quality of maize received from farmers
2	Maize collection centers meet the standards
3	Maize collection centers are accessible by vehicles
4	Maize is delivered to maize collection centers on time
5	The maize delivered to maize collection centers meet required standards
6	Maize is delivered to Maize Mamba Plant on time from collection centers
7	The cost of transport for maize from the farm to the factory is affordable
8	The storage facility for Maize Mamba Plant meets required standards
9	Farmers know how to handle maize as required for Rwanda Bureau of Standards (RBS)' standard

**Source:** Author, 2013

In the challenge area “post-harvest and logistics handling”, it clearly comes out that the farmers are positive on statement 1 (about the quality of maize supplied by farmers to the company), 5

(the maize delivered to maize collection centers meet required standards) and statement 8 (The storage facility for Maize Mamba Plant meets required standards). The farmers give low score on all the other. The company give a high score on the statements as farmers. The lowest score are given on statement 3, 4 and 7.

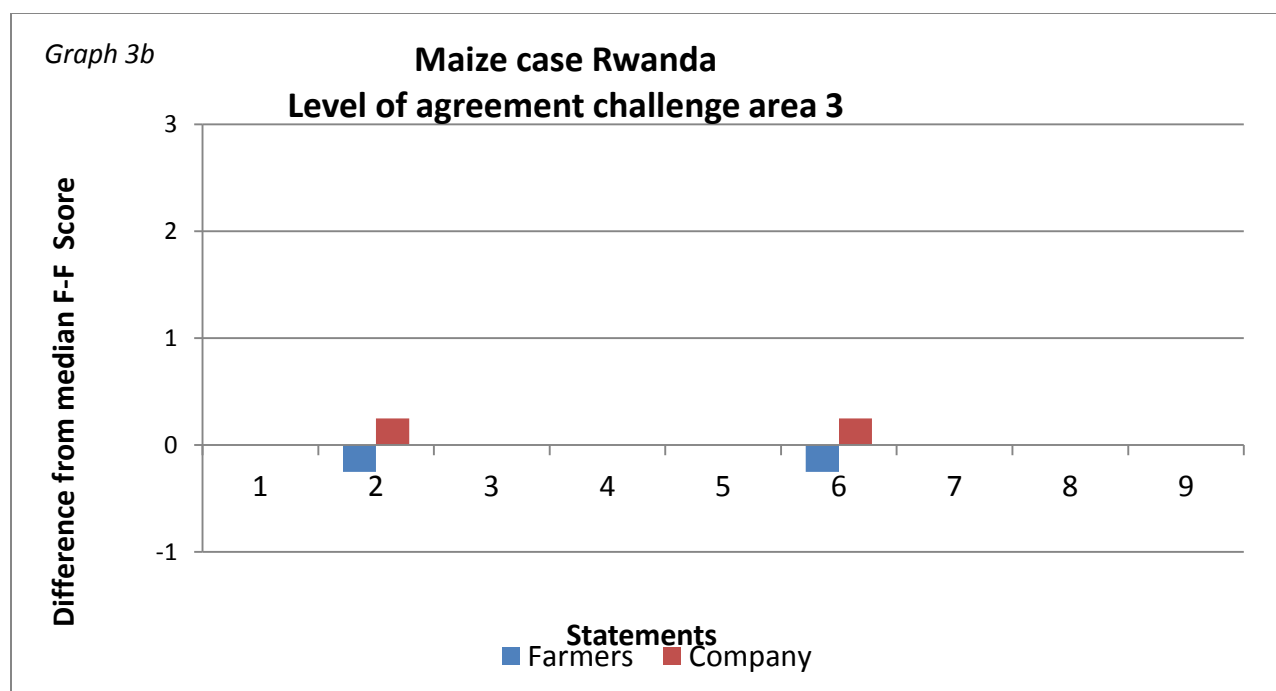
**Figure 5. 5. Scores on post-harvest and logistic handling**



**Source:** Survey, August 2013

Referring to the figure on level of agreement, it can be observed that, the level of agreement is high in general; where the high difference is on statement 2 (Maize collection centers meet the standards) and 6 (Maize is delivered to Maize Mamba Plant on time from collection centers).

**Figure 5. 6. . Level of agreement on post-harvest and logistics**



Source: Survey, August 2013

#### 5.1.4: Challenge area 4: Functioning of KOJYAMUGI cooperative

The functioning of KOJYAMUGI Cooperative is evaluated through 9 statements talking about leadership and administrative issues, and availability of financial means inside the cooperative with willingness to sell their production to the company.

The numbers represent the following statements:

**Table 5. 4. Statements of functioning of KOJYAMUGI Cooperative**

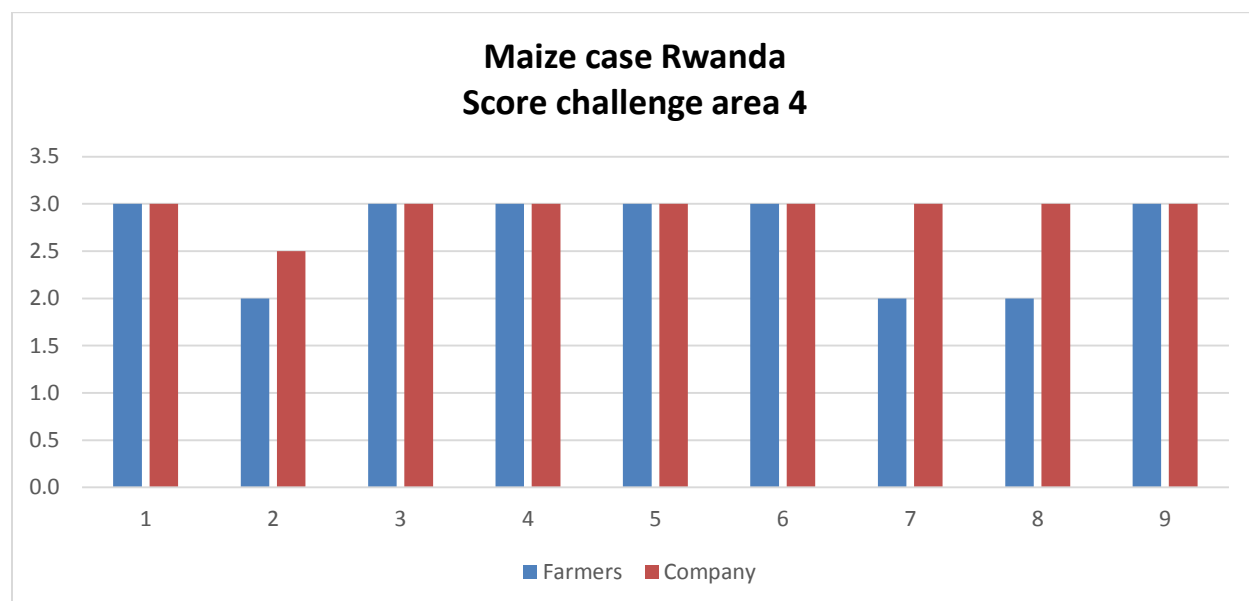
4. Functioning of KOJYAMUGI cooperative/statements	
1	Kojyamugi represents the interests of all members
2	Each member knows the financial status of the cooperative
3	The leadership of Kojyamugi is democratically elected in general assemblies
4	The leadership of Kojyamugi carefully handles any problem of each member
5	All meetings stipulated by the law are held regularly in Kojyamugi
6	Kojyamugi meetings are often fruitful
7	Kojyamugi's membership fee is affordable for local maize farmers
8	Kojyamugi helps farmers access bank loans
9	Farmers are happy to sell their maize in the cooperative rather than selling individually on their own

Source: Author, 2013

As seen in the challenge area “functioning of KOJYAMUGI cooperative”, it clearly comes out that the farmers are totally positive about most statements, low score on statement 2 (Each

member knows the financial status of the cooperative), 7 (Kojyamugi's membership fee is affordable by local maize farmers) and 8 (Kojyamugi helps farmers access bank loans).

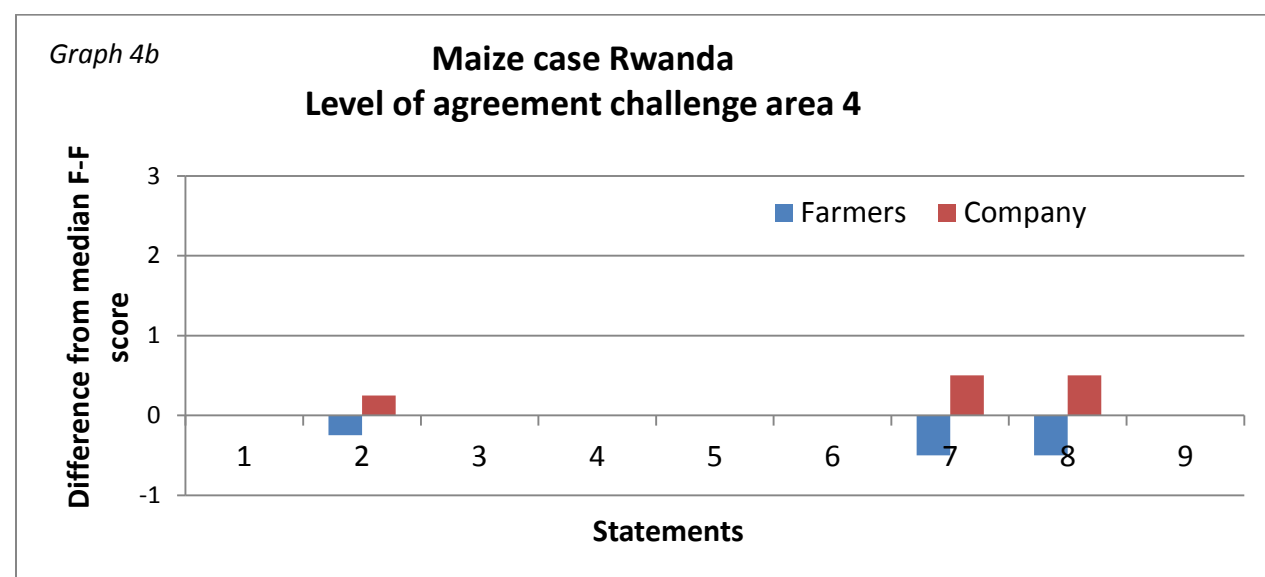
**Figure 5. 7. Scores on functioning of COJYAMUGI cooperative**



**Source:** Survey, August 2013

It is clear that in this area the level of agreement is high in general compared to the median. The highest difference is on the statements 7 (Kojyamugi membership fee is affordable by local maize farmers) and 8 (Kojyamugi helps farmers access bank loans), where farmers have a negative agreement on those statements. Most of statements firm and farmers have common agreement as seen on following figure.

**Figure 5. 8. Level of agreement on functioning of KOJYAMUGI cooperative**



### 5.1.5: Challenge area 5: Functioning of Mamba Maize plant

Challenge area of functioning of Mamba Maize plant is compiled by 9 statements talking about staffing and administration issues; flow of command in the Company in favour to the farmer's benefit. The following figure shows scores of firm and farmers and median of all statements in this challenge area. High scores than median show the positive agreement, while the low scores than median show the negative agreement on statements.

The numbers symbolize the following statements:

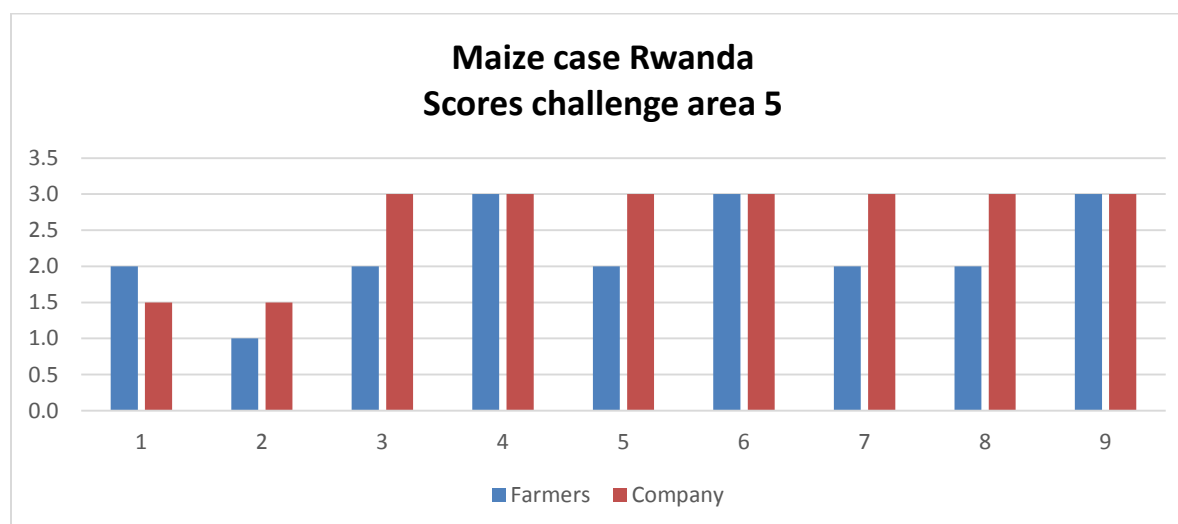
**Table 5. 5. Statements of functioning of MAMBA Plant**

5. Functioning of Mamba Maize plant/statements	
1	Maize Mamba Plant has enough staff
2	Maize Mamba Plant has enough maize to mill all year round
3	I have tested the flour produced by Maize Mamba Plant
4	Maize Mamba Plant flour is of higher quality than the one produced by other factories
5	I know who supplies corn to Maize Mamba Plant
6	The flour produced by Maize Mamba Plant is cheaper than the one produced elsewhere
7	I know where Maize Mamba Plant sells its flour
8	I am always aware of what is going on in the factory
9	I know who manages the factory

**Source:** Author, 2013

The functioning of Mamba Maize Plant shown that the company gave the high score on all statements except statements 1 (Maize Mamba Plant has enough staff) and 2 (Maize Mamba Plant has enough maize to mill all year round). The low score for farmers is on statement 2 (adequate stored maize that can be processed all year) and high score on statements 4 (Maize Mamba Plant flour is of higher quality than ones produced by others), 6 (price of maize flour from Mamba compared to others), and 9 (I know who manages the factory).

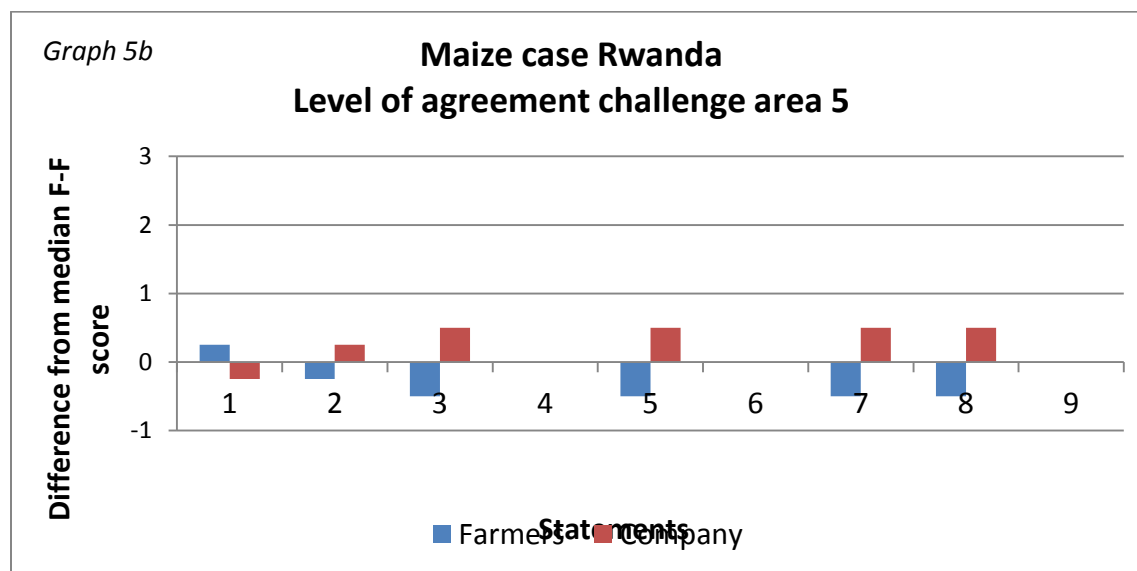
**Figure 5. 9. Scores on functioning of MAMBA Maize Plant**



**Source:** Survey, August 2013

As seen on following figure, the level is not high in general with high difference on most statements like 3 (testing the flour from Maize Mamba Plant) 5 (to know who supplies maize to Maize Mamba Plant), 7 (to know where Maize Mamba Plant sells its flour), and 8 (awareness about what is going on in the factory).

**Figure 5. 10. Level of functioning of MAMBA cooperative**



**Source:** Survey, August 2013

#### 5.1.6: Challenge area 6: Cost and benefit analysis

The challenge area of cost and benefit analysis is compiled by 9 statements talking about profit earned, pricing, bargaining power and land coverage of source of investment in other crops or off-farm activities.

The numbers represent the following statements:

**Table 5. 6. Statements on cost and benefit analysis**

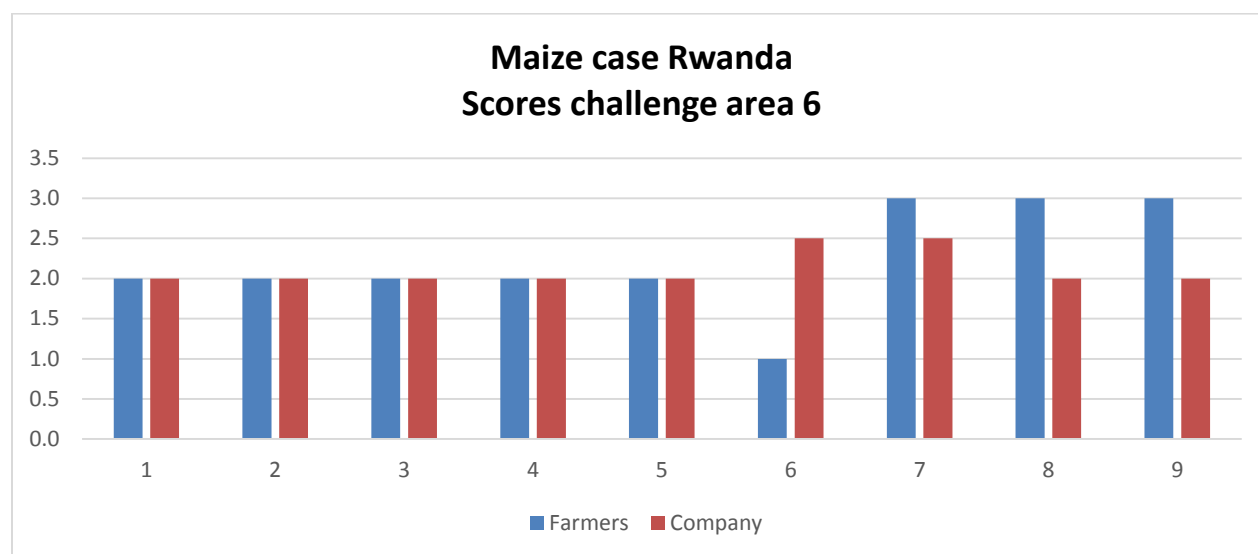
6. Cost and benefit analysis/statements	
1	Maize Mamba Plant is making profit
2	The price paid by Maize Mamba Plant to farmers covers the production cost and allows for a benefit
3	Maize revenues are invested in other crops
4	There are other maize buyers in Kojyamugi area
5	Maize Mamba Plant offers better prices than the competition
6	Maize Mamba Plant helps farmers access bank loans
7	Maize Mamba Plant works closer with farmers than other maize buyers
8	Maize Mamba Plant buys all maize produced by Kojyamugi members
9	The money from maize farming is the most important income for the farmers' households

**Source:** Author, 2013

In the challenge area of cost and benefit analysis, the figure clearly revealed that the company gives high scores on statements 6 (Maize Mamba Plant helps farmers access bank loans), and 7 (Maize Mamba Plant works closer with farmers than other maize buyers).

The low score on all other statements. The farmers give low score on statement 6 (Maize Mamba Plant helps farmers access bank loans) and high score on statement 7 (Maize Mamba Plant works closer with farmers than other maize buyers), 8 (Maize Mamba Plant buys all maize produced by Kojyamugi members) and 9 (The money from maize farming is the most important income for the farmers' households).

**Figure 5. 11. Scores on cost and benefit analysis**

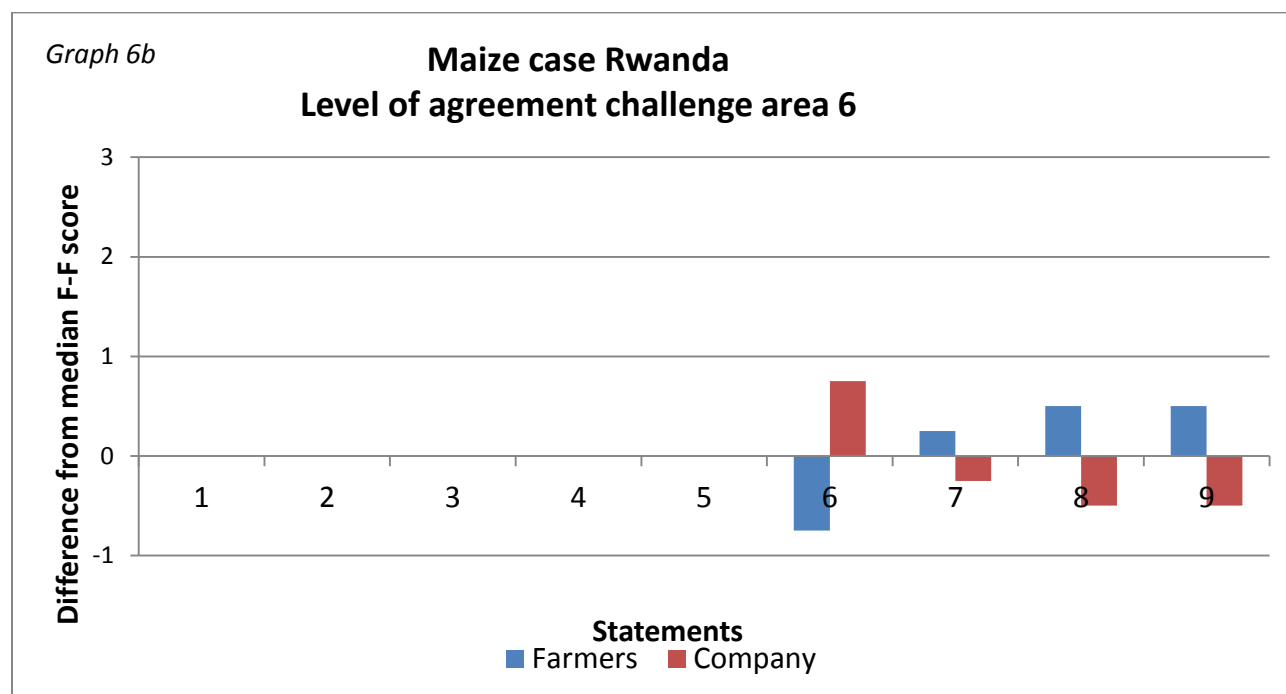


**Source:** Survey, August 2013

It can be observed that, the level of agreement is high in general. The high difference is on statement 6 (Maize Mamba Plant helps farmers access bank loans) and 8 (Maize Mamba Plant buys all maize produced by Kojyamugi members), and 9 (The money from maize farming is the most important income for the farmers' households). Most of statements firm and farmers have common agreement.



**Figure 5. 12. Level of agreement on cost and benefit analysis**



**Source:** Survey, August 2013

#### 5.1.7: Challenge area 7: Contracting and Pricing

The challenge area “contracting and pricing” is assessed through 9 statements talking about contract between farmers and company and price negotiation, the figure shows scores of company and farmers.

The numbers represent the following statements:

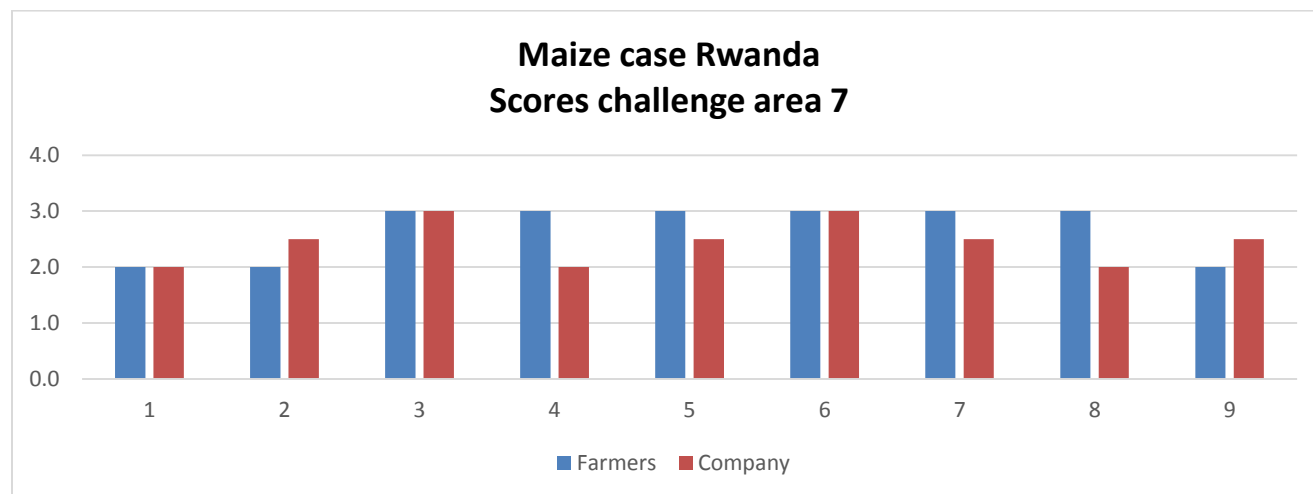
**Table 5. 7. Statements on contract and pricing**

7. Contracting and Pricing/statements	
1	There is a written contract between Kojyamugi members and Mamba Maize Plant
2	Maize Mamba Plant pays a higher price to Kojyamugi members than to non-members (other farmers)
3	Signing a contract between Maize Mamba Plant and farmers is beneficial to the farmers
4	Signing a contract between Maize Mamba Plant and farmers is beneficial to the factory
5	Maize Mamba Plant informs farmers on maize quality standards
6	Farmers comply with all quality requirements
7	The maize price offered by Maize Mamba Plant is negotiated between the factory and maize farmers
8	Both Farmers and the firm are happy about the relationship between them
9	Farmers know the production cost of 1kg of maize

**Source:** Author, 2013

In the challenge area “contract and pricing”, the figure clearly revealed that the company gives high scores on statements 3 and 6, and a low score on statement 1 (written contract between farmers and company), 4 (Signing a contract between Maize Mamba Plant and farmers is beneficial to the factory) and 8 (Mamba maize Plant is happy about the relationship with the farmers). The farmers give a high score on most of statements except for 1 (There is a written contract between Kojyamugi members and Mamba Maize Plant), 2 (Maize Mamba Plant pays a higher price to Kojyamugi members than others), and 9 (Farmers know the production cost of 1kg of maize).

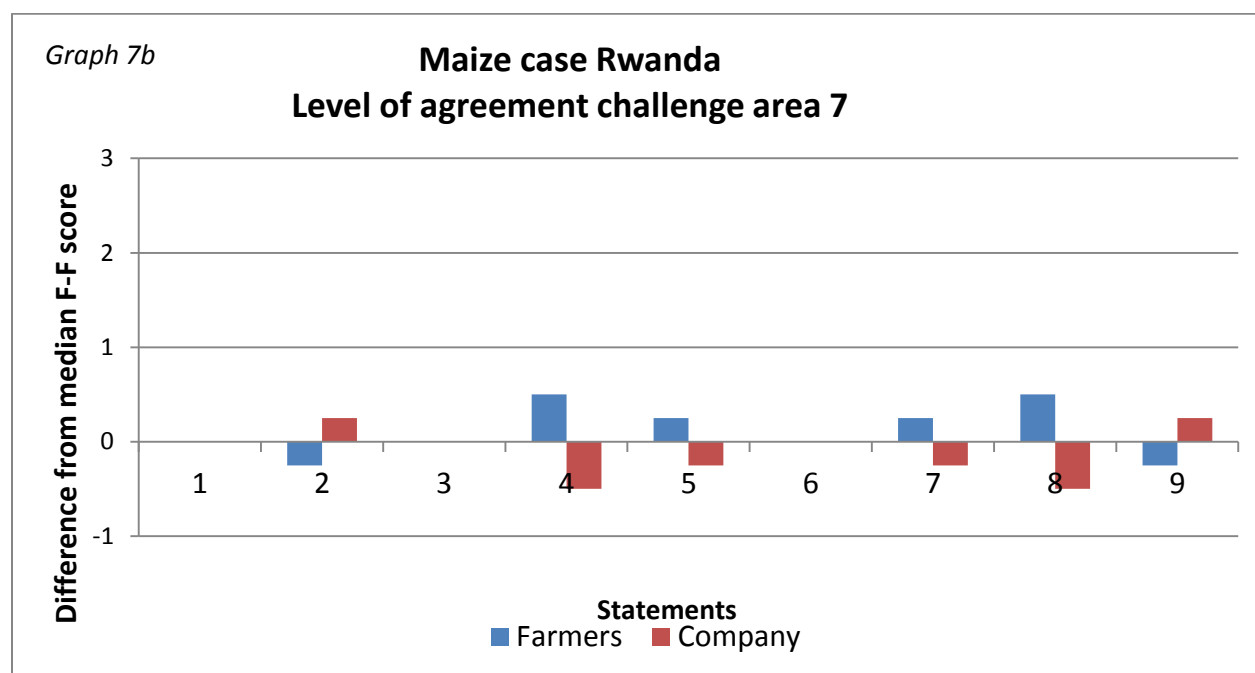
**Figure 5. 13. Scores on contract and pricing**



**Source:** Survey, August 2013

It can be observed that in this area, the level of agreement is not high in general. The high differences are there on most statements such as statement 2, 4, 5, 7, 8 ,9 with the most negative agreement from farmers as compared from the company. It is visible that most of all statements firm and farmers do not have common agreement.

**Figure 5. 14. . Level of agreement on contract and pricing**



**Source:** Survey, August 2013

#### 5.1.8: Challenge area 8: Production perspectives

The challenge area “production perspectives” is assessed through 9 statements talking about the future perspective on the improvement of maize in quality and quantity as a way of satisfying the needs for both farmers and the firm.

The numbers represent the following statements:

**Table 5. 8. Statements production Perspectives**

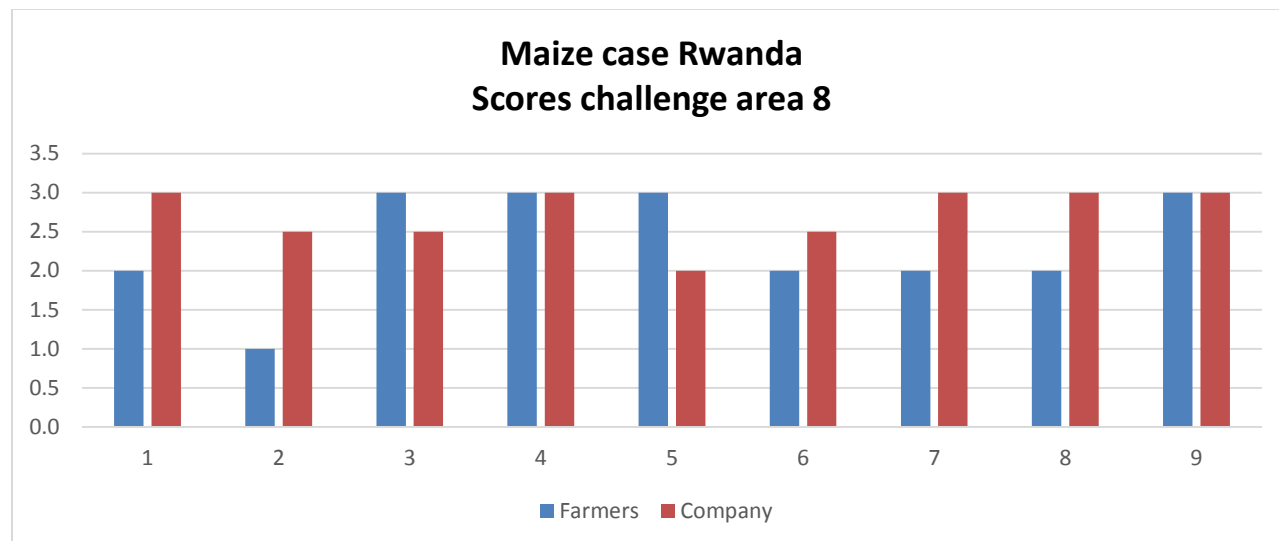
8. Production perspectives/statements	
1	Maize can be grown on hillsides
2	Floods can be contained
3	Maize yields can increase
4	Farmers can deliver better quality maize to the factory
5	Maize Mamba Plant can help farmers grow better quality maize
6	Maize Mamba Plant can help farmers access loans to buy inputs
7	Maize Mamba Plant can provide inputs to farmers to be paid on supplied maize
8	Maize Mamba Plant can help farmers grow more maize
9	Farmers Field Schools can improve the quality and quantity of maize

**Source:** Author, 2013

It can be observed that, the level of agreement is high for some statements and low for others. It is observed that the company give the positive score on all statements except statement 5 (Maize Mamba Plant can help farmers grow better quality maize). For farmers, they gave the

highest on almost all statements, except statement 2 (flood can be controlled). The high differences are there on most statements such as statement 1, 2, 3, 5, 6, 7, and 8 with most negative agreement from farmers than from the company.

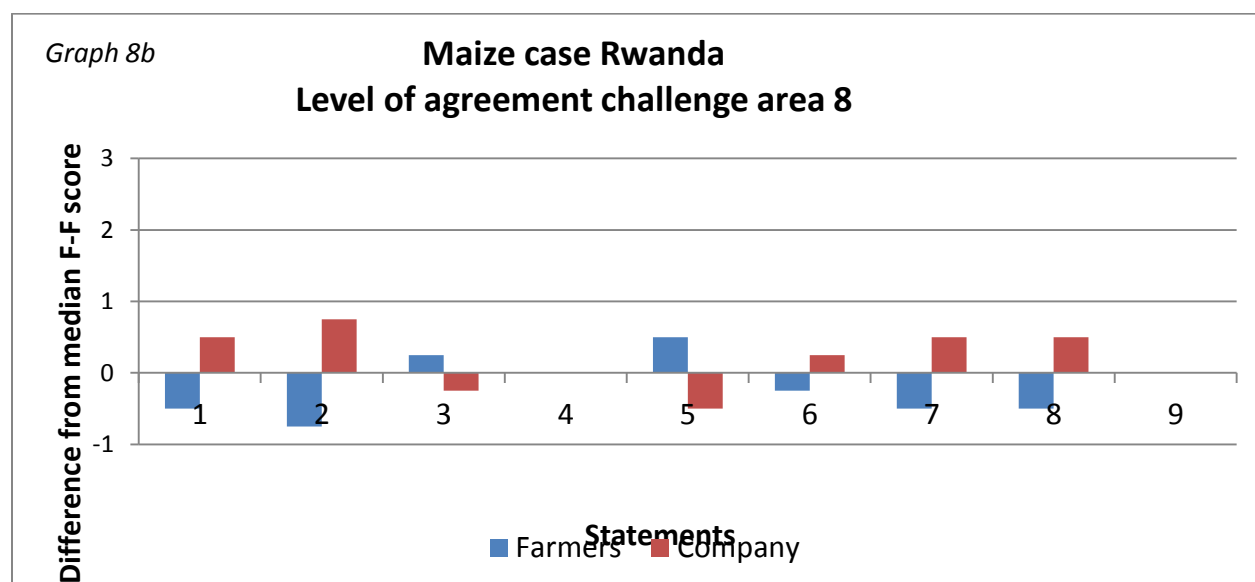
**Figure 5. 15. Scores on production perspectives**



**Source:** Survey, August 2013

Here on following figure it can be observed that, the level of agreement is low in general. The high difference is on statement 2 (Floods can be contained) and the common are on the statements 4 (Farmers can deliver better quality maize to the factory) and 9 (Farmer field schools can improve the quality and quantity of maize).

**Figure 5. 16. Level of agreement on production perspectives**



**Source:** Survey, August 2013

### 5.1.9: Challenge area 9: Marketing Perspectives

The challenge area “marketing perspectives” is assessed through 9 statements talking about maize products especially in terms of quality standards at the market for increasing relationship.

The numbers represent the following statements:

**Table 5. 9. Statements on market Perspectives**

9. Marketing Perspectives/statements	
1	Maize Mamba Plant can pay higher prices to farmers
2	The consumer price for Mamba Maize Plant flour can be reduced
3	Modern threshers and winnowers can improve maize quality
4	Improved storage and delayed selling can increase farmers' maize income
5	Farmers can sell their maize to other buyers if they are not happy with prices offered by the factory
6	The company can reject the maize supplied by farmers due to lack of required quality standards
7	Selling maize through cooperatives can increase the income of farmers
8	Once contracts are signed, they will be binding
9	Stakeholders in the maize sector can help improve the maize business

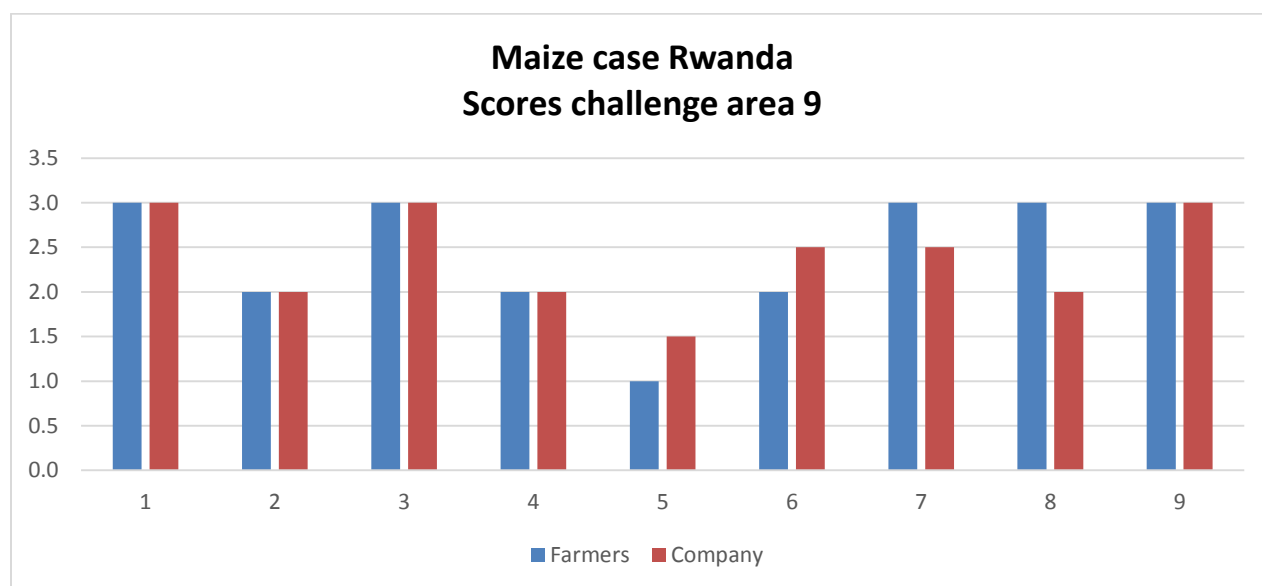
**Source:** Author, 2013

In the challenge area of market perspectives, it observed that the company gave the lowest score on 5 (farmers can sell their maize to other buyers if they are not happy with prices offered by the factory)

Both farmers and the company give high score on statement 1 (Maize Mamba Plant can pay higher prices to farmers), 3 (Modern threshers and winnowers can improve maize quality) and 9 (Stakeholders in the maize sector can help improve the maize business).

For farmers, they give the high score on the other statements which are 7 (Selling maize through cooperatives can increase the income of farmers), and (8 Once contracts are signed).

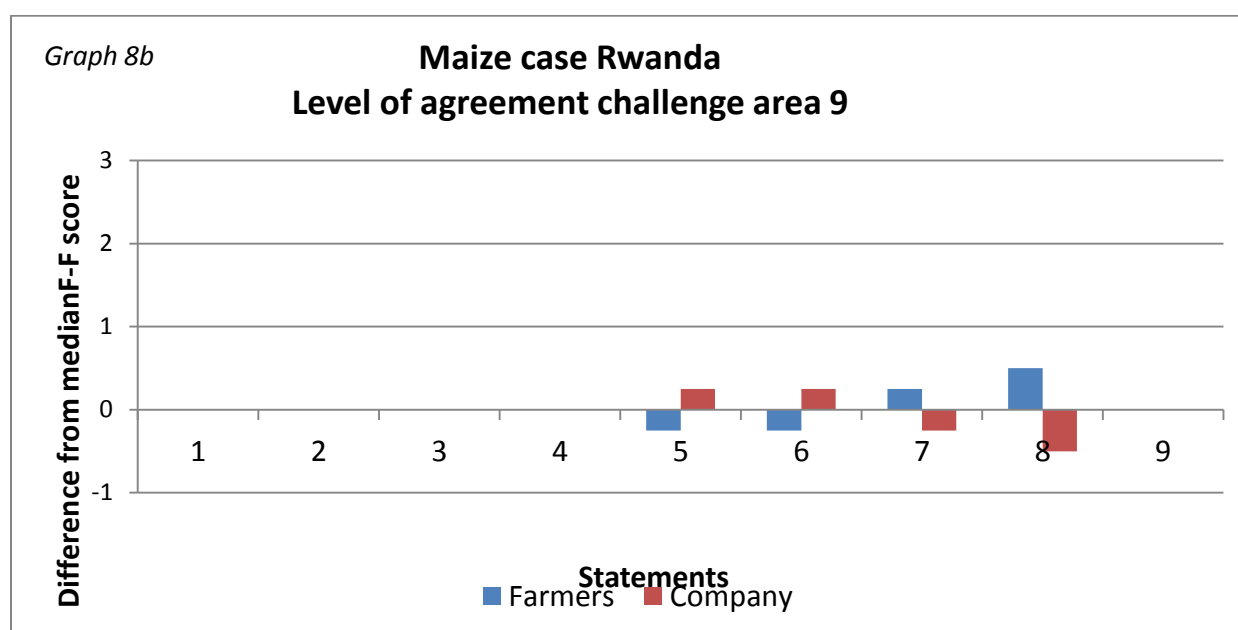
**Figure 5. 17. Scores on market perspectives**



**Source:** Survey, August 2013

Bring up from the following figure it can be observed that, the level of agreement is not high in general. There is a high difference on statement 8 (Once contracts are signed, they will be binding).

**Figure 5. 18. Level of agreement on market perspectives**



**Source:** Survey, August 2013

## 5.2 Debriefing report

The debriefing meetings were a discussion room for both company and farmers' cooperative to get their perceptions on the score that they have given to different statements in order to develop the recommendations either for company or for farmers for improving firm-farm relations. The following table shows the statements by challenge areas which were discussed about because of their low level of scoring or because of the high difference agreement between both farm and farm.

The debriefing meeting took place in the present of both farmers and the firm to get their collective perceptions on score that they have provided in order to develop a common recommendation. In the following table, it shown the statements where both farmers and firm had low scores and statements where both have shown a big difference in their scoring.

**Table 5. 10. Suggestions for improvement Kojyamugi and Mamba Maize Plant by challenge area.**

Challenge area	Statements	Suggestion for improvement of Mamba Maize Plant	Suggestion for improvement of Kojyamugi
<b>Productivity</b>	Farmers grow maize on hillsides	- Sensitization of farmers about cultivation of maize on hillsides - To pay farmers' maize supply on time	- Sensitization of farmers about cultivation of maize on hillsides
	Farmers irrigate their maize on hillsides	- Advocacy about irrigation	- Creation of erosion control in their fields - Digging ditches taking water
	Yields are increasing on hillsides	- To buy all maize of Kojyamugi members	-To sensitize about importance of the stable market in the Gisagara district
	The maize farms are located near the farmers	-	- To cultivate the fields that are close to their homes on the hills
<b>Production</b>	Farmers know proper utilization of inputs	-Advocacy on use of voucher system -Payment on time -Help farmers to access to loans	- Planning of next season about inputs
	Farmers grow same maize varieties in marshland and on hills	- To sensitize farmers to grow ZM on hillsides - Farmers field school	-Availability of seeds near the farmers at the right time
	Farmers have access to credit to buy inputs	- To buy inputs which can be paid before payment of maize supplied to the factory	- Help farmers to get the loans for buying inputs
<b>Post-harvest and logistical handling</b>	Maize collection centers are accessible by vehicles	-To buy their own vehicle for transport of dried maize from collection centers to the factory	- preparation of roads through community work in rural area
	Maize is delivered to maize collection centers on time	-To buy the vehicle	- post harvest activities at the right time
	The cost of transport for maize from the farm to the factory is affordable	-To buy the vehicle	- To cultivate the fields located near their homes on the hills
	Farmers know how to	- Training about how to handle	-Farmers follow the advices

	handle maize as required for RBS' standard	maize after harvest -To inform farmers about quality requirement	given by the people who are responsible of the quality required in the production
<b>Functioning of KOJYAMUGI cooperative</b>	Each member knows the financial status of the cooperative	-	- The financial report has to be presented during every general assembly meeting when there are one or more than one members who need some clarification on it.
	Kojyamugi's membership fee is affordable by local maize farmers	-	-Let know to all cooperative members that the money belongs to them
	Kojyamugi helps farmers access bank loans	- Collaboration with other stakeholders such as small business of micro-finance	- Collaboration with other stakeholders such as small business of micro-finance
<b>Functioning of Mamba Maize Plant</b>	I have tested the flour produced by Maize Mamba Plant Maize Mamba Plant	-Organizing the promotion of maize flour for all Kojyamugi members for testing	-
	I know who supplies corn to Maize Mamba Plant	-To inform Kojyamugi' farmers about other maize suppliers of Mamba Maize Plant	-
	I know where Maize Mamba Plant sells its flour	- Inform Kojyamugi' members where maize flour is sold	-
	I am always aware of what is going on in the factory	-Take the time once a quarter for example to show and to explain the farmers and other people who are in the vicinity of the plant what happens inside the plant	-
<b>Cost and benefit analysis</b>	The price paid by Maize Mamba Plant to farmers covers the production cost and allows for a benefit	-Increase of the price of the raw material	- Reducing production cost for farmers
	Maize revenues and invested in other crops	- Awareness about money management and saving - Training on small project management	-
	Maize Mamba Plant helps farmers access bank loans	-Mamba Maize plant help farmers to access to loans	-
	The money from maize farming is the most important income for the farmers' households	-	-saving
<b>Contracting and Pricing</b>	Maize Mamba Plant pays a higher price to Kojyamugi members than non-members (other farmers)	-Increasing of the price of the raw material according to other buyers	-



	Signing a contract between Maize Mamba Plant and farmers is beneficial to the factory	Written contract discussed by two actors where each part follow correctly what is inside	Written contract discussed by two actors where each part follow correctly what is inside
	Mamba maize Plant is happy about the relationship with the farmers	-Good services delivery	-
	Farmers know the production cost of 1kg of maize	-Advocacy and training on how calculate production cost	-To know each expense incurred in the crop production
<b>Production perspectives</b>	Maize can be grown on hillsides	- Field school	-Avoid the delay in cultivation
	Floods can be contained	- Advocacy on drainage of Akanyaru marshland	-
	Maize Mamba Plant can provide inputs to farmers to be paid on supplied maize	- Mamba Maize Plant to help farmers to access to loans	- Saving
	Maize Mamba Plant can help farmers grow more maize	-Sensitization about inputs use - Buying all the maize produced by farmers Kojyamugi	-
<b>Marketing Perspectives</b>	The consumer price for Mamba Maize Plant flour can be reduced	- Reducing expense on maize flour processing -Comparison of maize flour from Mamba Plant to the flour from other factories	-
	Improved storage and delayed selling can increase farmers' maize income	-Improvement of storage facilities	-
	The company can reject the maize supplied by farmers due to lack of required quality or standards	-	-Follow the quality requirements in production

## **DISCUSSION OF RESULTS**

This chapter presents discussion based on the results and the literature focusing on similarities on low scores and the differences in scoring for both farmers and the firm, in an attempt to improve the relationship between Mamba Maize Plant and Kojyamugi farmers' cooperative. The sources of information in this chapter are data processed and presented in the previous chapter, the literature review and the observations done during field work. The interpretation of results is going to concentrate on areas where both farmers and the firm had low scores and where farmers and company had high difference in their scores.

### **6.1. Productivity**

Productivity relates to the yield per unit of area. Most of the farmers in Kojyamugi co-operative produce on marshlands because they don't have the means to buy or to rent the land on hillsides. District leaders allocated marshy land to the cooperative for a period of 5 years renewable and for free to their members. However, farmers do not benefit much from the marshland because it can only be cultivated during the dry season. In the rainy seasons, the marshland cannot be utilised because of drainage poor resulting in floods.

The irrigation on the hillside is another issue for both company and cooperative, because Kojyamugi and company do not have enough means to irrigate the plots. The main reason behind is inadequate infrastructure and water during the dry season.

The intercropping of maize with other crops is also an issue according to both farmers and the company. The reason why farmers do not intercrop is that the land belongs to the District and so is not allowed to intercrop according to their by-laws. This is a big problem to the farmers because they need other crops as well. This is supported by MINAGRI (2009), who argues that because of land use consolidation and crop intensification, it is not allowed to mix the main crop with others, because the priority is given to monoculture.

### **6.2. Production**

The first issue is that, both farmers and the firm are not satisfied with the use of agricultural inputs. Farmers complain that the inputs are expensive and there are very few agro-dealers which are tendered to distribute inputs and so do not have the capacity to distribute inputs to all the farmers on time in the whole country. Besides, these agro-dealers or input providers do not have many competitors. In contrast the firm agrees that agricultural inputs are available on the market but it is not informed on time of the inputs distribution.

The second issue relates to yield where the firm and farmers have different views, here the farmers claim on low yield because they don't use fertilizers. The company agreed that the yield is sufficient, because since it began to operate in June 2013, it still had enough maize for milling bought from the last two seasons. The findings agree with literature about low maize yield which is the complaint from most farmers by FAO (2010) that the eastern and western provinces are in top positions in maize production on the large area but good maize yields were observed in the Northern Province as compared to the southern province where Gisagara district is located.

The third issue relates to the access to credit, the farm and firm don't have the same view. Farmers claim that they have no access to credit because they don't have a collateral, considering that the land is not their own property. As mentioned before the land belongs to the District and the banks need the collateral as their security before providing loans. The firm had the option that farmers can access loans through the co-operative.

### **6.3. Post-harvest and logistical handling**

Both farmers and the firm shared the same option on the difficult to reach the maize collection centres. This is mainly because of the long distance between the fields, collection centres and maize plant. Here, the marshlands are far from farmers because they are not allowed by the government to live near the wetlands. Moreover, the roads are not well maintained making the transportation of maize more difficult. Poor roads are the major reason for delay in the delivery of maize.

According to the firm, the transport cost are too high, because it is their responsibility to carry dried maize from field to the plant, this discourages the company because of long distance as well as bad roads. The company is discouraged by this issue as it was mentioned by the Mamba Maize Plant manager " ***sometimes roads are destroyed by high erosion and rainfall, also the long distance influences the delay of dried maize***".

### **6.4. Functioning of the Kojyamugi cooperative**

The functioning of the cooperative is affected by financial situation which is not known by members as it is shown in findings. Both farmers and the firm feel that co-operative members are not well informed about the financial situation. This is because farmers feel the presentation of finance information is not clear and easy to understand. And also many farmers do not attend the meetings when they don't have particular problems. As said by president of Kojyamugi during the debriefing meeting " ***when we have delay in payment, the meeting is attendance is high, but after the payment, the number of attendance is reduced***".

The firm explained why the financial situation is an issue to the farmers because they are not educated enough to understand the financial overview and statements very well, and they don't know their rights in the management of their cooperative.

The second issue relates to the membership fee, where farmers complain about that they pay a lot of money to be members (20,000 Rwf), every year, after each production. They contribute a total of 3,000 Rwf per year towards the cooperative fund. This is an issue for small farmers who have low production. It is not an issue for the firm as confirmed by Mamba Maize Plant staff that *"farmers can pay all membership fees because they are paid by the company after their deliveries to the firm"* according to the accountant of the Company during the debriefing report. This low scores from farmers regarding the membership fee which is not affordable for most of them is confirmed by (Ellis, 2000), who says that the capacity of smallholders to settle all its requirements is limited.

As mentioned in the paragraph on production, farmers and the firm have different views on the functioning of the cooperative. It is not easy to for the cooperative to help farmers to access to loans, because as they have explained before, lands belong to the District, and the cooperative does not have enough means to present to the microfinance institutes as a guarantee as the main reason why it is not easy to support their members. Whereas the firm believes that the cooperative can help members in getting loans because the cooperative is big and it has a large number of members that it can facilitate to access the loans. This is confirmed by MINAGRI (2009), that farmers have challenge on lack of access to financial services which affect the level of productivity.

#### **6.5. Functioning of the Mamba Maize Plant**

Both farmers and firm had the same view that the firm does not have adequate number of staff because the plant is new. Also the recruitment process of the company is very long and so engaging experienced staff takes time. For then plant to start, operations it had to recruit staff who are now involved directly in farmers 'services, others are working as a part time staff. According to the firm manager during the debriefing meeting" ***the number of employees is not enough because the recruitment is done when there is necessity and the procedure is long"***.

The farmers' view on low number of the staff is because of the novelty of the plant, according to them sometimes the delay in payments is because payments are done by one person at the firm. The second issue is that both farmers and firm feel that there will be no enough supply of maize to Mamba Plant during the coming months. This is because maize is only grown in one agricultural season in the area compared to the others which have two agricultural seasons.

This issue is supported by MINAGRI (2011) who highlighted that the maize has a positive trend in its production and is cultivated twice par year (two seasons) in the hillsides, and once per year in the marshland.

The third issue is that farmers and the firm don't have the same view about other suppliers of maize to the plant, as farmers do not know because they are not informed. But the firm agrees about that because they are permanently working in the factory and they are supposed to have all those information more than farmers.

#### **6.6. Cost and benefit analysis**

The first issue is the firm does not help farmers to access bank loans and so the farmers and firm have different view on that. Farmers complain that the plant doesn't help them to access to the loans because the plant is new in the business and is yet to collaborate with the banks. The Firm agreed on this statement that there will help farmers to access the bank loans because it already has plans as it has already started negotiating with the cooperative of microfinance of Mamba: SACCO "Saving and credit cooperative" to pay farmers through this microfinance. SACCO Mamba is the cooperative of microfinance which is established in each Sector (administrative entity) of Rwanda. Mamba Maize Plant in collaboration with Gisagara District have negotiated with SACCO Mamba to pay farmers through it. This will start with next agricultural season.

The second issue relates to the close collaboration between the farmers and the firm more than farmers and other buyers in the area. Here, the farmers and the firm have a different view. Farmers feel they had a good collaboration with firm because all their products are sold to the company compared to the previous agricultural seasons where their product stay for a long time in their stores and they are sure about stable payment than to sell their product to the individual rural traders.

The firm claim about the weak collaboration because of other buyers who buy the products at the farm gate at the high price and compete with firm and sometimes this issue reduces the quantity of raw material. And then there is no contract farming between the two actors.

The weak close collaboration between farmers and firm, is confirmed by APF, (2013) , said that it is difficult to maintain a good relation between them because companies and farmers may have opposite interest when farmers perceive crop prices as too low. Also farmers compare what they receive and what they produce and sold at the firms, and they want to sell their product at high price while company wants to buy at the lowest price. Devereux and Maxwell (2000).

The different view is shown again on the money from maize farming which is the most important income for the farmers' households. Farmers agree on this statement because they can do their planning based on income from maize which is certain and they are able to think about other crops they can invest in, to complement the maize production.

### **6.7 Contracting and Pricing**

On the issues of contracting and pricing, both farmers and the firm had the same view on the lack of contract farming that they don't have any written contract between the two parties. A written contract would help to work closely together, but because the firm is new in their business they are still in the progress of preparing it.

Both farmers and company are not satisfied with the price of dried maize given to the farmers because the firm acknowledged the existence of other buyers in the rural area who buy some fresh or dried maize at higher farm gate price. The firm needs to compete with them in giving the high price of dried maize because this has an influence on the quantity bought by the firm. And then, farmers claim that the price is low when they compare to the other buyers and they are not able to satisfy other needs like paying scholarship, medical insurance, clothes, etc...

There were differences in views between farmers and the firm on the production costs of 1kg of maize. Farmers claim they don't know the production cost because they are not informed about how to calculate the cost and they don't take into consideration opportunity costs of labour in the production. The firm agreed that they do not know this production cost as they are at a different level compared to the farmers because the firm is not involved much in production but concentrates on maize processing.

### **6.8 Perspectives**

Both sides are willing to improve their relationship in maize production, as it was indicated that the factory is new in the area, the future perspectives take a good place in improving firm-farm relationship between Kojyamugi and Mamba Maize Plant.

**Production perspectives:** Both farmers and firm have the same view on maintaining flood in the marshland. Farmers complain about that they cannot control the flood, while floods influence a lot their production. But the firm claims also about that, but at the different level compared to the farmers because they accept the possibility to control flood if there is a good other partnership with other stakeholders.

The firm claims about helping farmers to grow better quality of maize because they cannot make any effort without willingness from farmers and they don't have enough staff to help farmers as they have shown this problem in their management issues.

**Marketing perspectives:** First issue relates to the reduction of flour price, both farmers and the company complain about reduction of the flour price because according to the farmers this reduction can influence also the reduction on price of dried maize which is their product, and the firm cannot be able to continue processing without profit.

The second issue relates to the selling maize to the other buyers, both firm and farmers do not agree on that because firm require the permanent supply and farmers need the stable market and payment on time. This is supported by (FAO 2013); says that the relationship regarding guaranteed supply of product to the firm and the stability of products supply from farmers.

The last issue is on the farming contract where farmers and the firm have a different view. Firm claim about that because of a lot of small traders in the area, those traders are more experienced on the informal purchase and give high price than the company.

## **7- CONCLUSION AND RECOMMENDATIONS**

### **7.1. Conclusion**

From the business case description, questionnaires and debriefing report, it can be observed that the current relationship between Mamba Maize Plant and Kojyamugi was not sufficient as result of poor partnership in their business. The results in general and on the majority of questions asked relating to the whole statements of the challenge area showed that farmers and the company do not have the same score as the absence of a compromise between them.

The important actors in maize value chain in Gisagara District are the producers who are small individual small-scale maize farmers and maize producers who are members of Kojyamugi. The processor is the new plant in the area, transporters who facilitate the transportation to maize to the different areas. The rural traders who buy small quantity of maize( dried or fresh) at the farm gate for sell it to the collectors, the collectors buy maize form different rural traders who can also play a role of wholesalers and finally consumers who buy maize flour, fresh or dried maize for home consumption.

In Gisagara District, there is an issue of absence of contract farming which affect the relationships between Mamba Maize Plant and Kojyamugi. This encourage other buyers to pay more price than the plant and this reduces quantity of maize supplied to the Plant. On the other side the lack of contracts contributes to underutilisation of agricultural inputs, where normally, farmers need to receive it in advance for increasing their productivity and pay after harvest. Without contract farmers cannot be guaranteed by the firm to access bank loans and this hinders the development in agricultural business.

The farmers perceive the price as low, there is no negotiation in fixing of price in the area and this is the main reason why there are many local traders competing with the plant.

The maize is produced mainly on marshlands more than on the hillsides whereas the marshland is cultivated only in one agricultural season. Compared to the hillsides were farmers grow maize in two agricultural seasons. This affect maize production as well as the floods in the marshlands which affect the quality and quantity of maize produced. The intercropping of maize with other crops is an issue for farmers as they are not allowed by the District to mix the crops in the marshlands and farmers need other crop to meet their dietary requirements and to satisfy their needs.

The use, availability, affordability, delivery time of agricultural inputs affect maize productivity in Gisagara District which is the mission of the co-operative if all these issues are addressed. The



post-harvest handling is an issue especially the long distance between marshland where maize is cultivated, collection centre and the plant which is too long. The roads are not well maintained and this mainly affects deliveries during the rainy season as they are more inaccessible leading to delays. The collection centres do not meet the standard, this affect the quality of maize.

The plant perceive benefit in permanent supplying of dried maize as their raw material, and farmers perceive benefit in stable market and stable income from the plant.

In the future, both farmers and the firm perceive the increase in maize production by growing on hillsides, through increased use of agricultural inputs and establishment of farmer field school in the rural area. On the other hand improving the marketing perspectives by accessing agricultural loans, establishment of modern threshers, signing of contracts and the improvement in partnership with others stakeholders in the rural area.

## **7.2. Recommendations**

At the completion of this study and the results found out the main recommendation is that all the players in the maize sector must respect their commitments and be actively involved in carrying out their roles. This study is mostly focused on post-harvest agribusiness issues; not only farmers but also firm and facilitators such as Agri-Hub Rwanda, local government, the Centre IWACU and possibly other NGO's as well as the MFI's operating in the area. Indeed, the activities of maize farmers' cooperative and of Mamba Maize Plant are not isolated. They experience influences and effects of actions taken by other players within as outside the maize sector.

### **KOJYAMUGI farmer's cooperative**

- Develop and sign contract farming which promising a permanent production and a secured market and which could possibly take into account the volatility of market prices
- Help members to access to the agricultural inputs and loans; and sensitize them on saving
- Help farmers to get lands on hillsides and sensitize on use of agricultural inputs
- With other local people, maintaining their roads good especially during the rainy season
- Update cooperative members on financial situation of their cooperative
- Create good collaboration with Mamba Maize Plant by avoiding the informal maize selling.

## **Mamba Maize Plant**

- Sensitization of farmers about cultivation of maize on hillsides
- Advocacy on irrigation and drainage of marshland to the other partners
- Negotiation with farmers on price before harvest and payment on time
- Increase the price of the dried maize according to the competitors
- Cross checking on quality during harvesting steps.
- Helping farmers to access to loans and to buy agricultural inputs in advance
- Increase the number of staff
- Improving collaboration with other stakeholders in the area
- Signing a contract discussed by two actors and each part keep a copy
- Planning of trainings of farmers about post-harvest and production cost issues

## **Agri-Hub Rwanda**

For Agri-Hub Rwanda, some points are set apart to improve the relations which lie between two actors as follow:

- Organising visits for study to firms and farmers can visit where the relationship is good between firm and farmers.
- Providing trainings to the farmers and firm on small and median enterprises and for farmers on production cost.
- Encourage Kojyamugi and Mamba Maize plant to sign the farming contract as soon as possible.
- Providing monitoring and evaluation on firm-farm relationship where the research has done for sustaining their firm-farm businesses.

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## Annex 1- Checklist for the interview

1. Business Case Features; interview
2. Business case and respondents

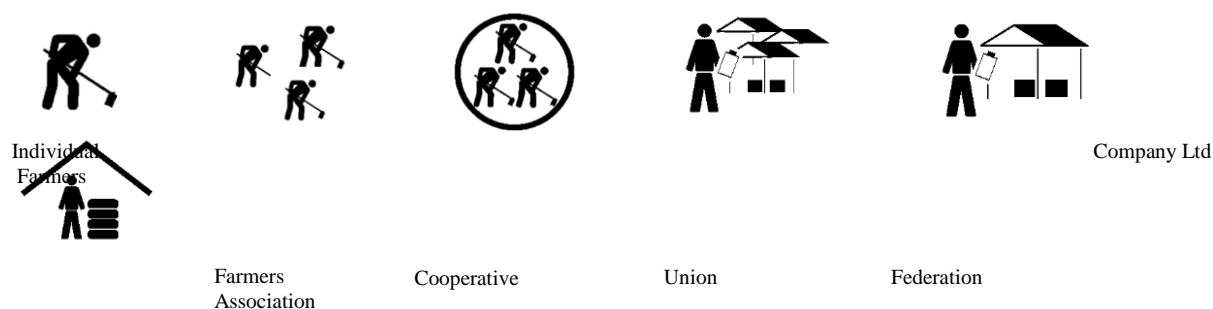
Country:	
Product:	
Name of farmers' organization:	
Name of firm(s)	

<i>Date of interview:</i>	
<i>Name of persons interviewed:</i>	
<i>Function of persons interviewed:</i>	

### 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?
  - o No, it is an informal entity
  - o Yes, it is a formal registered entity
- c. How has the trading entity been registered?
  - o NGO
  - o Cooperative (with right to be involved in economic activities)
  - o Union (with right to be involved in economic activities)
  - o Federation (with right to be involved in economic activities)
  - o Non-profit business
  - o Social business
  - o 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?

Observations:	
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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

Observations:	
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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:

- a. 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
- b. 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.



Observations:	
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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

Observations:	
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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

Observations:

## 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

Observations:

## 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)

Observations:

## 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

**Annex 2: Questionnaire self-assessment of Mamba maize and Kojyamugi**  
Statement list 2-2 Tango

**Statements for KOJYAMUGI maize farmers' cooperative**

For the researcher:

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

<b>Country:</b>	Rwanda
<b>Case:</b>	Relationships between KOJYAMUGI and Mamba Maize Plant
<b>Name researcher:</b>	Jeanne Umutoni
<b>Date:</b>	2-5 August 2013

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 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? .....
<b>Position respondent:</b>	What is your position in your farmer group / cooperative?  <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>	How long are you a part of this farmer group/coop?  .....  [If applicable:] Since when do you have this position in the board?

	.....
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We are now beginning with the statements. Please answer them to the best of your ability.  
Good luck!

Statements		Scores			
		0	1	2	3
		Strongly disagree	Disagree	Agree	Strongly agree
		☹☹	☹	☺	☺☺
<b>1 Productivity</b>					
1.1	Farmers have enough land to grow maize				
1.2	Farmers' land is appropriate for maize production				
1.3	Local maize is of a better quality than maize grown elsewhere				
1.4	Farmers grow maize on hillsides				
1.5	Farmers irrigate their maize on hillsides				
1.6	Yields are increasing on hillsides				
1.7	Seasons influence maize quality				
1.8	KOJYAMUGI' farmers intercrop maize with other crops				
1.9	The maize farms are located near the farmers				
<b>2 Production</b>					
2.1	Agricultural inputs are affordable to farmers				
2.2	Agricultural inputs are available at right time				
2.3	Farmers know proper utilization of inputs				
2.4	Pesticides are affordable				
2.5	Farmers have high maize yields				
2.6	Farmers grow same maize varieties in marshland and on hills				
2.7	Farmers use the inputs as recommended by agronomists				
2.8	Farmers grow the best maize variety available				
2.9	Farmers have access to credit to buy inputs				
<b>3 Post-harvest and logistical handling</b>					
3.1	Mamba Maize Plant is happy with the quality of maize from farmers				
3.2	Maize collection centers meet the standards				
3.3	Maize collection centers are accessible by vehicles				
3.4	Maize is delivered to maize collection centers on time				
3.5	The maize delivered to maize collection centers meet required standards				
3.6	Maize is delivered to Maize Mamba Plant on time from collection centers				
3.7	The cost of transport for maize from the farm to the factory is affordable				
3.8	The storage facility for Maize Mamba Plant meets required standards				
3.9	Farmers know how to handle maize as required for RBS' standard				

<b>4</b>	<b>Functioning of KOJYAMUGI cooperative</b>				
4.1	Kojyamugi represents the interests of all members				
4.2	Each member knows the financial status of the cooperative				
4.3	The leadership of Kojyamugi is democratically elected in general assemblies				
4.4	The leadership of Kojyamugi carefully handles any problem of each member				
4.5	All meetings stipulated by the law are held regularly in Kojyamugi				
4.6	Kojyamugi meetings are always fruitful				
4.7	Kojyamugi's membership fee is affordable by local maize farmers				
4.8	Kojyamugi helps farmers access bank loans				
4.9	Farmers are happy to sell their maize in the cooperative rather than selling individually on their own				
<b>5</b>	<b>Functioning of Mamba Maize Plant</b>				
5.1	Maize Mamba Plant has enough staff				
5.2	Maize Mamba Plant has enough maize to mill all year round				
5.3	I have tested the flour produced by Maize Mamba Plant				
5.4	Maize Mamba Plant flour is of higher quality than ones produced by other factories				
5.5	I know who supplies corn to Maize Mamba Plant				
5.6	The flour produced by Maize Mamba Plant is cheaper than ones produced elsewhere				
5.7	I know where Maize Mamba Plant sells its flour				
5.8	I am always aware of what is going on in the factory				
5.9	I know who manages the factory				
<b>6</b>	<b>Cost and benefit analysis</b>				
6.1	Maize Mamba Plant is making profit				
6.2	The price paid by Maize Mamba Plant to farmers covers the production cost and allows for a benefit				
6.3	Maize revenues and invested in other crops				
6.4	There are other maize buyers in Kojyamugi area				
6.5	Maize Mamba Plant offers better prices than the competition				
6.6	Maize Mamba Plant helps farmers access bank loans				
6.7	Maize Mamba Plant works closer with farmers than other maize buyers				
6.8	Maize Mamba Plant buys all maize produced by Kojyamugi members				
6.9	The money from maize farming is the most important income for the farmers' households				

Statements		Scores			
		0	1	2	3
		<i>Strongly disagree</i>	<i>Disagree</i>	<i>Agree</i>	<i>Strongly agree</i>
		☹☹	☹	☺	☺☺
<b>7 Contracting and Pricing</b>					
7.1	There is a written contract between Kojyamugi members and Mamba Maize Plant				
7.2	Maize Mamba Plant pays a higher price to Kojyamugi members than non-members (other farmers)				
7.3	Signing a contract between Maize Mamba Plant and farmers is beneficial to the farmers				
7.4	Signing a contract between Maize Mamba Plant and farmers is beneficial to the factory				
7.5	Maize Mamba Plant informs farmers on maize quality standards				
7.6	Farmers comply with all quality requirements				
7.7	The maize price offered by Maize Mamba Plant is negotiated between the factory and maize farmers				
7.8	Mamba maize Plant is happy about the relationship with the farmers				
7.9	Farmers know the production cost of 1kg of maize				
<b>8 Production perspectives</b>					
8.1	Maize can be grown on hillsides				
8.2	Floods can be contained				
8.3	Maize yields can increase				
8.4	Farmers can deliver better quality maize to the factory				
8.5	Maize Mamba Plant can help farmers grow better quality maize				
8.6	Maize Mamba Plant can help farmers access loans to buy inputs				
8.7	Maize Mamba Plant can provide inputs to farmers to be paid on supplied maize				
8.8	Maize Mamba Plant can help farmers grow more maize				
8.9	Farmer field schools can improve the quality and quantity of maize				
<b>9 Marketing Perspectives</b>					
9.1	Maize Mamba Plant can pay higher prices to farmers				
9.2	The consumer price for Mamba Maize Plant flour can be reduced				
9.3	Modern threshers and winnowers can improve maize quality				
9.4	Improved storage and delayed selling can increase farmers' maize income				
9.5	Farmers can sell their maize to other buyers if they are not happy with prices offered by the factory				
9.6	The company can reject the maize supplied by farmers due to lack of required quality or standards				
9.7	Selling maize through cooperatives can increase the income of farmers				

9.8	Once contracts are signed, they will be binding				
9.9	Stakeholders in the maize sector can help improve the maize business				