

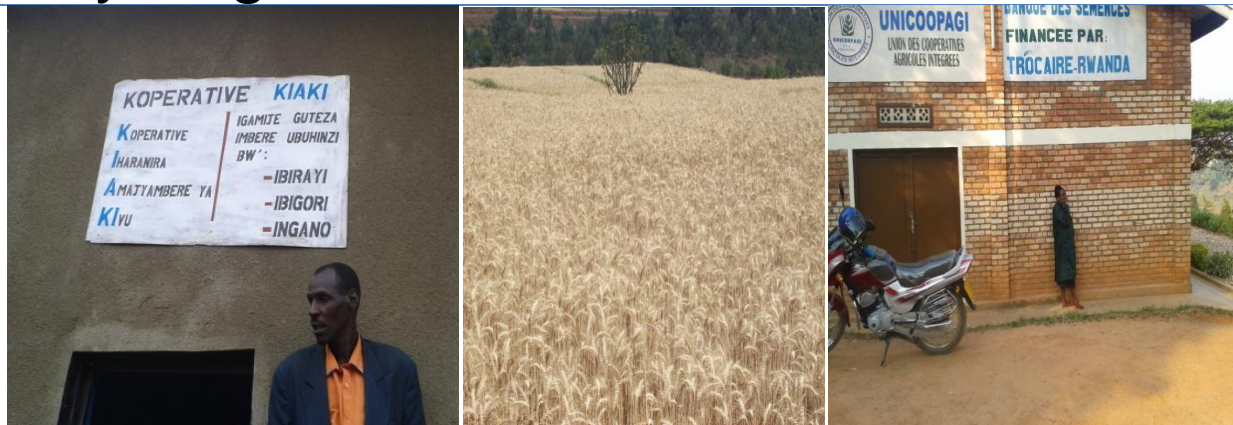
University of Applied Sciences



**VAN HALL
LARENSTEIN**

PART OF WAGENINGEN UR

Improving firm–farm relationship in wheat production in Rwanda: Case of wheat farmers cooperatives of Nyaruguru District and UNICOOPAGI



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

By

Nelson Muhayimana

September 2012

Wageningen, the Netherlands

© Copyright Nelson Muhayimana, 2012 All rights reserved

ACKNOWLEDGEMENTS

First of all, I would like to thank God for allowing me this opportunity to carry out this study. Likewise, I give thanks to Nuffic, which made my study possible through the provision of funds.

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

I would also like to express my sincere thanks to my course coordinator Mr Hesselink Eddy and all Management of Development (MOD) staff for the role they undertook in the whole course. I'm very grateful to my Supervisor Mr Marco Verschuur for his commitment in guiding during the writing of this report. Without him this thesis would have not been produced up to this standard.

My thanks go to the district of Nyaruguru; my working organisation for supporting me technically and financially during my data collection period. My thanks go also to CID and Agriprofocus specifically Agriprofocus Rwanda for their financial and technical assistances in my field work. I finally convey my thanks to wheat farmers of KIAKI and staff of UNICOOPAGI, for providing valuable information that constitute the backbone of this research.

It also gives me a lot of pleasure to thank my entire family for their enormous close support during the whole study period. Thanks so much may God bless all of you abundantly.

DEDICATION

To my Wife

To my Kids

I dedicate my thesis

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
DEDICATION.....	ii
TABLE OF CONTENTS	iii
LIST OF TABLES.....	vi
LIST OF FIGURES	vii
LIST OF MAPS	vii
LIST OF PHOTOS	vii
ABBREVIATIONS	viii
ABSTRACT	x
1. INTRODUCTION	1
1.1. Background	1
1.2. Problem statement	3
1.3. Justification of study	4
1.4. Research Objective	5
1.5. Research question.....	5
1.6. Limitation of the study	6
1.7. Conceptual framework.....	6
1.8. Concepts definition	7
2. LITERATURE REVIEW.....	8
2.1. Firm-farm contract and production	8
2.2. Firm-farm and food security	9
2.3. Different types of contracts	9
2.4. Contract challenges.....	10
2.5. Firm -farm contract in Rwanda.....	13
2.6. Wheat sector in Rwanda.....	14

2.6.1. General overview of Agriculture in Rwanda.....	14
2.6.2. Wheat production in Rwanda	15
2.6.3. Wheat competitiveness with other crops and its price	16
2.6.4. Wheat Stakeholders in Rwanda	17
2.5.5. Constraints and opportunities in wheat production in Rwanda.....	20
3. METHODOLOGY.....	22
3.1 .Study area	22
3.2. Description of the research area.....	22
3.3. Research strategy	23
3.4. Methodology to collect data	23
3.4. 1. Methodology to collect secondary data.....	23
3.4.2. Methodology to collect primary data	23
4. UNICOOPAGI AND KIAKI COOPERATIVE	26
4. 1. Business case description	27
4.1.1. Access to inputs	27
4.1.2. Production and yield.....	27
4.1.3. Functioning of cooperative (KIAKI).....	28
4.1.4. Functioning of UNICOOPAGI.....	29
4.1.5. Contract between UNICOOPAGI and KIAKI.....	30
4.1.6. Post- harvest facilities and quality management.....	31
4.1.7. Commercial relations	32
4.1.8. Stakeholder network and collaboration.....	34
4.1.9. Perspectives and SWOT analysis between UNICOOPAGI and KIAKI.....	36
4. 2. Survey results.....	38
4.2.1. Access to inputs	38
4.2.2. Production and yield.....	40

4.2.3. Functioning of KIAKI (cooperative)	42
4.2.4. Functioning of UNICOOPAGI	43
4.2.5. Contract between UNICOOPAGI and KIAKI.....	45
4.2.6. Post-harvest facilities and quality management.....	47
4.2.7. Commercial relations	50
4.2.8. Stakeholder network and collaboration.....	52
4.2.9. Perspectives	54
4.3. Debriefing results.....	56
5. DISCUSSION AND INTERPRETATION OF RESULTS	62
5.1. Access to inputs	62
5.2. Production and yields	63
5.3. Functioning of KIAKI cooperative.....	64
5.4. Functioning of UNICOOPAGI	65
5.5. Contract between UNICOOPAGI and KIAKI	66
5.6. Post- harvest facilities and quality management	67
5.7. Commercial relations.....	68
5.8. Stakeholder network and collaborations	69
5.9. Perspectives.....	70
5.10. Firm–farm relationships and food security	71
5.11. Main indicators of the strong relationships between UNICOOPAGI and KIAKI	71
5.12: Remarks on 2-2 tango tool.....	72
6. CONCLUSION AND RECOMMENDATION	73
6.1. Conclusion.....	73
6.2. Recommendations.....	75
References	78
Annex 1: Business Case Features; interview with farmer organization.....	81

Annex2: questionnaire	88
-----------------------------	----

LIST OF TABLES

Table 2.1: Rights and obligations of farmers and firms in smallholder contracts.....	11
Table 2.2: Different productions of crops in tons from 2005-2011in Rwanda.....	155
Table 3.4.1: Number respondent by activity in field work.....	24
Table 4 4.1: Value share of wheat chain	Error! Bookmark not defined. 3
Table 4.1.2: SWOT analysis of the business case between UNICOOPAGI and KIAKI.....	377
Table 4.2.1: Statements in accessibility to inputs	38
Table 4.2.2: Statements in production and yield.....	40
Table 4.2.3: Statements in functioning of KIAKI	42
Table 4.2.4: Statements in the functioning of UNICOOPAGI	44
Table 4.2.5: Statements in contract between UNICOOPAGI and KIAKI	46
Table 4.2.6: Statements in post-harvest activities and quality management.....	48
Table 4.2.7: Statements in commercial relations	50
Table 4.2.8: Statements in stakeholders' network and collaboration	52
Table 4.2.9: Statements in perspectives.....	54
Table 4.3.1: Action for improving firm farm relationships between KIAKI and UNICOOPAGI	56
Table 5.1 Main indicators of strong relationships between UNICOOPAGI and KIAKI	723

LIST OF FIGURES

Figure 1.1: Causal diagram firm farm relationships in wheat production	4
Figure 1. 2: Operationalization of the concepts	6
Figure 2.1: Areas covered by different crops in Rwanda from 2000-2010	166
Figure 2.2: Wheat value chain map in RWANDA	199
Figure 3.3.1: Research framework	266
Figure 4.1.1: Wheat value chain UNICOOPAGI and KIAKI	366
Figure 4.2.1: Average score per statement on accessibility to inputs	39
Figure 4.2.2: Level of agreement on accessibility to inputs	39
Figure 4.2.3: Average score by statements on production and yield.....	41
Figure 4.2.4: Level of agreement on production and yields	41
Figure 4.2.5: Average score per statement on functioning of KIAKI cooperative	43
Figure 4.2.6: Level of agreement on the functioning KIAKI.....	43
Figure 4.2.7: Average score per statement on functioning of UNICOOAGAI.	44
Figure 4.2.8: Level of agreement on the functioning of UNICOOAGAI.	45
Figure 4.2.9: Average score per statement contact between KIAKI and UNICOOPAGI	46
Figure 4.2.10: Level of agreement on contract between KIAKI and UNICOOPAGI	47
Figure 4.2.11: Average score per statement on post harvest activities and quality management	48
Figure 4.2.12: Level of agreement per statement on past harvest facilities and quality management.....	49
Figure 4.2.13. Average score per statement on commercial relations	51
Figure 4.2.14: Level of agreement in commercial relations	51
Figure 4.2.15: Average score per statement in stakeholders' network and collaboration	53
Figure 4.2.16: Level of agreement in stakeholder network and collaboration	53
Figure 4.2.17: Average score per statement on perspectives.....	55
Figure 4.2.18: Level of agreement on perspectives.....	55

LIST OF MAPS

Map 3.1: Nyaruguru District Map	22
---------------------------------------	----

LIST OF PHOTOS

Photo 4.1.1: Traditional post-harvest facilities and modern thresher and winnower	32
Photos 4.1 2: Adequate storage and testing the quality by eyes at wheat selling point	32

ABBREVIATIONS

ACDI/VOCA:	Agricultural Cooperatives Development International/Volunteers in Overseas Cooperative Assistance
ADENYA:	Association pour le Developement de Nyabimata
CIP:	Crop Intensification Program
COPROVAB:	Cooperative pour la Promotion et la Valorisation du Ble
DRC:	Democratic Republic of Congo
FAO:	Food and Agriculture Organisation
GDP:	Gross Domestic Product
Ha:	Hectare
IFDC CATALIST:	International Center for Soil Fertility and Agriculture Development Catalyse
INEAC:	Institut National d'Etudes Agronomiques du Congo).
ISAR:	Rwanda Agricultural Research Institute
KIAKI:	<i>Koperative Iharanira Amajyambere ya Kivu</i>
KOAGMITA:	<i>Koperative y'Abahinzi no Gukusanya imisaruro yo muri Tare</i>
MINAGRI:	Ministry of Agriculture and Livestock
MINICOFIN:	Ministry of Finance
NISR:	National Institute of statistic of Rwanda
PH:	Potential Hydrogen
PSTA II:	Plan Strategic de Transformation de l'Agriculture II
RAB:	Rwanda Agricultural Board
RADA:	Rwanda Agricultural Development Authority

RIM:	Reseau Indocesain de Microfinance
RIU:	Research into Use
ROPORWA:	Reseaux des Organisation Paysans
RSSP:	Rural Sector Support Project
SACCO:	Saving Credit Cooperatives
SOPAV:	Société de Production d’Aliments de Vegetaux
UNICOOBLE:	Union Cooperatives de Ble
UNICOOPAGI:	Union des cooperatives Agricoles Integrées
USAID:	United States Agency for International Development
USD:	United States Dollars

ABSTRACT

Wheat is one of main source of energy in Nyaruguru district where it is daily consumed in different ways by households. It is actually promoted in ten districts where it constitutes a major staple food. Individual and organized farmers in cooperatives and union are involved in wheat production, processing and selling. Despite subsidy provided by Government, the supply is still low and cannot meet the demand.

The objective of this study was to contribute to an improvement of cooperation between wheat farmers' cooperatives and UNICOOPAGI through investigation of their current relationships in order to increase the quality and quantity of wheat produced. The research question was "How can the relationship between wheat cooperative farmers and UNICOOPAGI be improved for more wheat production and sales in Nyaruguru district?" Eight sub-questions were formulated in line with the main question. To answer this question, 2-2 tango tool was used to collect and analyse data. This tool involved three steps: business case description, survey and debriefing meeting. Eight respondents were interviewed from KIAKI and UNICOOPAGI in developing a business case, 31 from both sides were respondents in survey and 16 were participants in debriefing meeting.

The results indicate poor relationships between KIAKI and UNICOOPAGI in accessibility to inputs and post-harvest facilities. Lime, fertilizers, improved seeds are not available in the area and its prices are not affordable to farmers. Farmers are still practicing traditional ways in post-harvest activities and quality management which lead to low quality of wheat. Wheat production was low and few stakeholders involved in wheat production have moderate relationships between UNICOOPAGI and wheat farmers. KIAKI cooperative and UNICOOPAGI are well-functioning and respect their contracts of buying farmers' produce at negotiated price. Wheat revenues are invested income generating activities which contribute to a sustainable food security in households.

KIAKI's members and UNICOOPAGI plans to improve their relationships by putting in place a shop for input agricultural especially lime and also renovate their stock shed. Farmers are willing to apply the recommended agricultural practices in order to multiply and conserve improved seeds. KIAKI and UNICOOPAGI together want to improve their relationships in post-harvest facilities by using modern thresher and winnowers and installation of small milling factory in the area.

1. INTRODUCTION

1.1. Background

Rwanda is situated in East Africa, surrounded by Tanzania to the east, Democratic Republic of Congo (DRC) to the west, Burundi to the south, and Uganda to the north. It is 26,336 square kilometres, its population is estimated at 11 million people, and the density is about 395 persons per square kilometre (MINALOC, 2011). Growth rate is 2.8% per annual and the population is expected to increase to about 12 million by 2015 (NISR, 2011). Rwanda ranks among the poorest countries worldwide with 34% undernourished, and over 65% of the population living from less than one USD per day, (FAO, 2010). The Rwandan economy is strongly based on agriculture which provides 87% of jobs and 80 % of all exports (MINIGRI, 2009). The available arable land for agriculture is 2,294,380 hectares but around 1,750,000 hectares are actually exploited (NISR, 2011).

According to the Ministry of Agriculture (2010), agriculture is indeed considered as the backbone of the Rwandan economy and contributes 41% of GDP, while employing over 75% of the population engaged in mainly subsistence agriculture. Before 2007, crops were produced especially for home consumption; less quantity reached the market due to lack of improved seed and fertilisers, insufficient technical assistance in cropping system, soil highly degraded by erosion and lack of adequate policies in Agriculture. To overcome the above problems the government of Rwanda has developed different national policy:

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

In Agriculture, different policies and strategies were developed such as policies on fertilizers distributions, on seeds improvement such distribution of new varieties, on erosion control such bench terraces, on post-harvest and on agribusiness. The development and implementation of these policies are done through different programs such as Crop Intensification Program (CIP). The latter is an agricultural development project launched by MINAGRI in 2007, as a pilot program with the main goals of increasing agricultural productivity in high-potential food crops and ensuring food security for all and self-sufficiency (MINAGRI, 2007). Wheat one of the focus of CIP, had its production multiplied by 3.7 from 2007 to 2011 and at the same time wheat

plantation area also multiplied by 3. However the productivity was still low (1.1t/ha) compare to 3,5t/ha expected (NISR, 2011). Despite the efforts done of the Rwandan government in increasing wheat production, it is still low and cannot satisfy the demand of the market. The import of wheat is still high for instance: 10,288 tons of wheat was imported in 2011 and a large quantity of wheat estimated at 71,396 tons was reported by MINAGRI (2011) as deficit to meet the market demand. As the growth rate of the population is 2.8 % by annual, the need of wheat will continuously increase in the future.

Wheat is produced generally by individuals farmers or by groups, associations and cooperatives of farmers and about 25000 farmers are organised in wheat cooperatives. These farmers actually cultivate 10% of arable land favourable to wheat in Rwanda estimated at 501200 hectares (MINAGRI, 2011). Some wheat farmers have contracts with Rwanda Agriculture Board Authority (RAB) in wheat seed production, while others produce for processors and traders most of the time with informal contract. One of the companies involved in wheat production and working closely with CIP program is UNICOOPAGI (Union des Cooperatives Agricoles Integrees).

The latter had got contract with RADA for providing technical support, distributing fertilizer, seeds and at the same time buying wheat produced by 15000 farmers organized in different cooperatives located in Nyaruguru and Nyamagabe district (Mutijima, 2007). The UNICOOPAGI provides credits to wheat farmers via its microfinance called Twizigamire and buy wheat farmers' produces. In 2011 the UNICOOPAGI reported that less than 150 tons of wheat has been bought on 300 tons of wheat planned to be bought (Nyaruguru, 2011).

On the other hand the government through the Ministry of Trade and Industry promote the agribusiness in Rwanda by introducing facilities to new investors in different sectors especially in Agriculture. Small and large firm processors have emerged recently in wheat processing and trading such as PEMBE, BATHRESA with milling of capacity 400 and 200 tons a day respectively. These firms started their activities in Gicumbi district and in Kigali town but still work below their capacity (MINICOM, 2011).

Most of wheat grain used by these enterprises is imported from outside the country because of the low volume and low quality of wheat produced in Rwanda. Processors and traders almost use only imported grain or wheat flour at high price which lead them to work below their capacity estimated at 30% and cannot satisfy the market demand (MINAGRI, 2011). Different organizations such as Agriprofucus Rwanda among others had started to diagnose the

feasibility of entrepreneurship for both farmers and different companies involved in cultivation, processing and selling for different crops in Rwanda with the objective of linking farmers with firms and taking them to improved market of their produce.

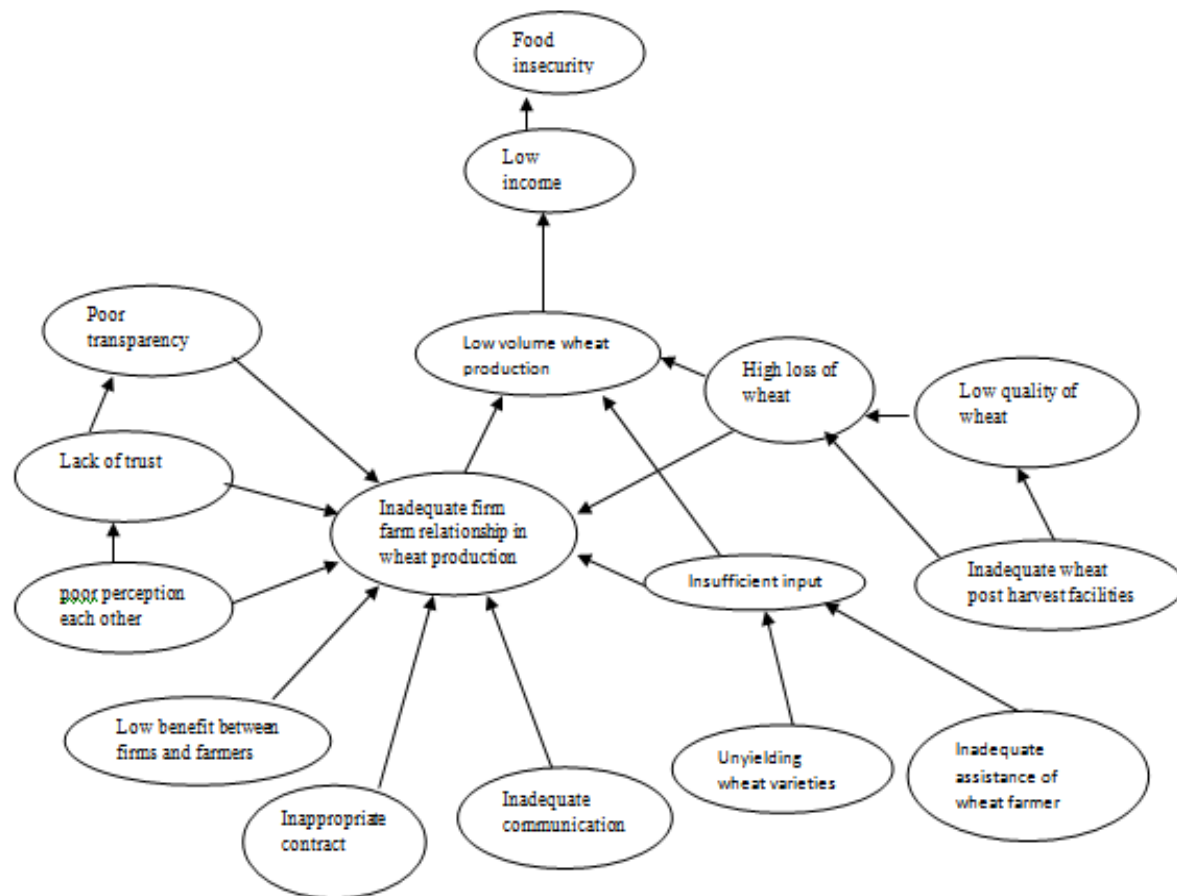
1.2. Problem statement

The agreement between farmers and firms is most of time based on quantity, standard quality and the price. The price is often fixed before production of the crops and meeting these requirements has been always a challenge to farmers. Wheat cooperative farmers of Nyaruguru district are facing a big challenge of low quantity and quality of wheat produced and do not meet the requirement of the UNICOOPAGI due to inadequate use of input, inadequate conducive climate and high loss in post-harvest activities. About 14, 5% of production is lost in threshing, winnowing and drying because they still practice the traditional facilities (Terpend, Kayumba and Ntaganda, 2007).

The unfavourable relationship between wheat cooperative farmers of Nyaruguru district and UNICOOPAGI especially in price making is also a challenge (USAID, 2010). Because of this, wheat farmers are unmotivated by the low price offered by UNICOOPAGI and some of them decide to sell their products to local market with a high transaction cost. At the same time UNICOOPAGI complains that wheat cooperative farmers mix varieties and low volume of wheat delivered by farmers contains a high level of impurities and is insufficient dried with a high moisture contents of 17-18 % (MINAGRI, 2011).

The strong cooperation between wheat cooperative farmers of Nyaruguru district and UNICOOPAGI can be one of the solutions which can contribute to an increase of quantity and quality of wheat in Rwanda. There are only few studies being done regarding firm- farm relationships in wheat production in Rwanda, hence there is low volume and quality of wheat production among other cereals in Rwanda. Therefore there is a need for Agriprofocus Rwanda to conduct an investigation of firm-farm relationship in wheat production in order to come up with mitigating recommendations to reverse the trends.

Figure 1.1: Causal diagram firm farm relationships in wheat production



1.3. Justification of study

Good production depends on different factors including; inputs, post harvest system and appropriate relationship with actors in the chain. Despite the efforts of the government of Rwanda in delivering input and post-harvest facilities through its program of CIP in promoting wheat production still the volume of wheat production has not meet the demand. As explained above the inefficient collaboration between processing firms and farmers is one of the major factors slows down the improvement of wheat production. Therefore this aspect needs more focus in term research.

This study of firm-farm relationship in wheat production will be useful for Nyaruguru district and others farmers in the rest of Rwanda who produce wheat. It will also useful for different firms involved in production, processing or selling wheat to make decisions in regard to wheat, to

creating conducive environment between firms and farmers in formulating appropriate strategies for wheat production sector. This study helps also the development of 2-2 tango tool which is used in collecting, processing and analysing data. Besides, it will be a beneficial reference for researchers and other people interested in the same area of study.

1.4. Research Objective

The overall objective of this research is to contribute to an improvement of cooperation between wheat farmers cooperatives and UNICOOPAGI through investigation of their current relationships in order to increase the quality and quantity of wheat produced.

1.5. Research question

How can the relationship between wheat cooperative farmers and UNICOOPAGI be improved for more wheat production and sales in Nyaruguru district?

Sub-questions

1. What are the roles played by wheat cooperatives and UNICOOPAGI in wheat production in Nyaruguru District?
2. Do farmers understand the functioning of their wheat cooperatives in Nyaruguru District?
3. Do farmers and staff of UNICOOPAGI understand the functioning of the union?
4. Do UNICOOPAGI and wheat cooperatives farmers have a common understanding in implementation of their contract on wheat production?
5. What are the commercial relations of wheat between UNICOOPAGI and wheat cooperative farmers?
6. What are the facilitations given to wheat farmers by UNICOOPAGI in post-harvest of wheat in Nyaruguru district?
7. Do wheat farmers' cooperatives and UNICOOPAGI collaborate with others stakeholders involved in wheat production in Nyaruguru District?
8. What are the perspectives for UNICOOPAGI and wheat farmers cooperatives for improving their relationship

1.6. Limitation of the study

Even if the government of Rwanda is putting emphasis on wheat production, this crop was abandoned and reappeared recently in production. Wheat is also limited to few districts because of its requirement for specific in climatic conditions for growth. This has led to limited number of research studies done on this crop hence few information available on it in Rwanda, especially in the subject of firm-farm relationship. Moreover two large factories involved in wheat processing Nyungwe mill and SOTIRU have recently closed leading to more loss of information.

1.7. Conceptual framework

The research revolves around theories of value chain management, the relationship between wheat farmer and firm needs for strong relations of all actors involved wheat value chains production sector. There is also a component of multi-stakeholder approach that will be taken in the research as in today's complex and highly interconnected world, development requires collaboration between different stakeholders.

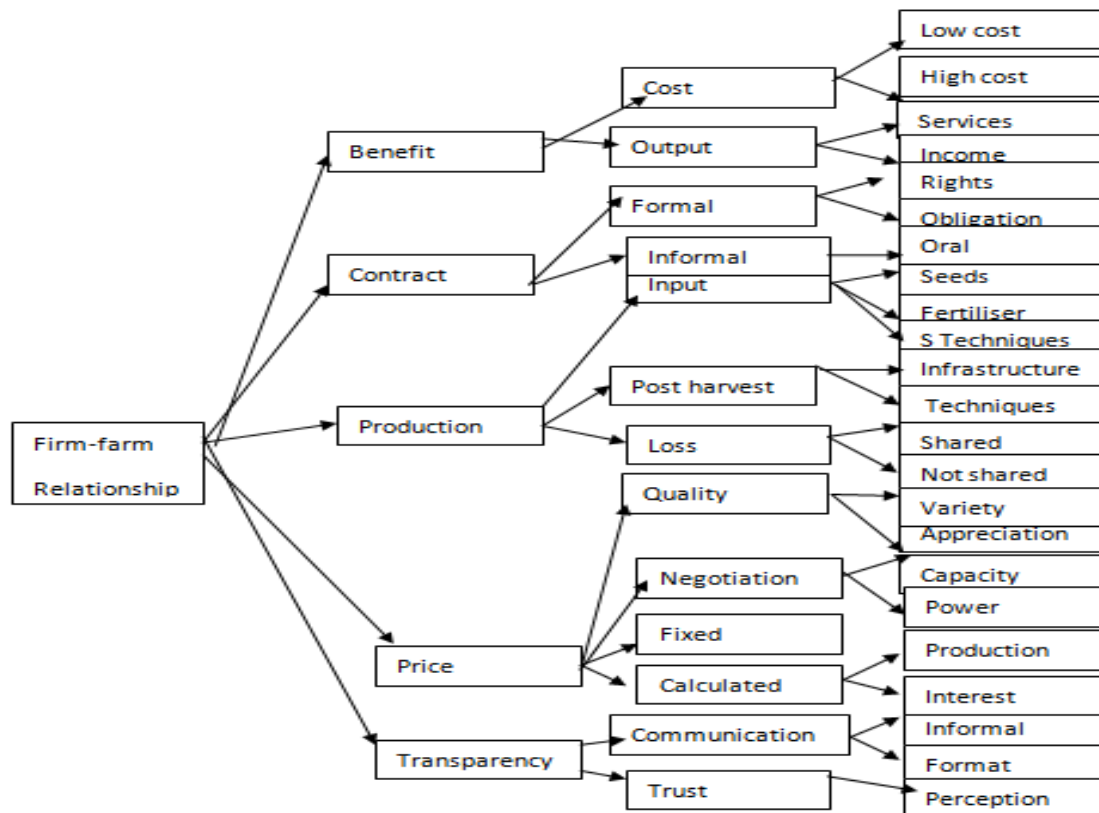


Figure 1.2: Operationalization of the concept

1.8. Concepts definition

Firm: For the purpose of this study a firm is a private company or government organization (cooperatives, processors, sellers) who that buys farmers' wheat.

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

Farmer: In this study wheat farmer is a producer of wheat, member of wheat cooperative who sells his product to firm with a formal contract or informal contract

Relationships: For the purpose of this study, relationships means the way in which firms and farmers get connected, feel and behave towards each other in relation with their business.

Contract: *"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"* (Prowse, 2012).

Perception: Opinion of wheat farmers or firms toward each other about their relationships in wheat production and selling.

Transparency: In this study it refers to how wheat farmers and firms share financial activities, openness without secrets in income repartition in wheat production and the trust and honest between each other.

Informal contract: It refers to an oral arrangement which wheat farmers sell their product to firm and the purchase also is done by trust between each other.

Production: The production is the process of either of growing or processing wheat in small scale and large quantities.

Market: It refers to the total quantity of wheat that a farmer delivers to sell to the company

Price: For the purpose of this paper is the amount of money that the farmer receives for one kg of grain wheat at home gate or at firm gate.

Quality standards: This is a level of good characteristics of wheat that are agreed on and acceptable between farmer and the firm.

Benefits: it means the advantages for farmers or firm that are drawn from wheat produced and sold.

2. LITERATURE REVIEW

2.1. Firm-farm contract and production

Different literature understood the firm-farm relationships by contract farming between farm and firm. Some authors trace the principles of contract farming back to the 19th century, when the mechanism was used in the United States for processing crops such as sugar beets and peaches, and in Taiwan, for sugar production under the Japanese colonial rule (Runsten and Key, 1996; Rehber, 1998; Warning and Hoo, 2000). Contract farming is more common in developed countries and The United States Department of Agriculture revealed in a recent report that contracts now govern 36% of the value of US agriculture production, and tends to be established in developing countries (Da Silva, 2005).

Prowse (2012) mentions that there are significant reasons of instauration of contract farming in developing countries; greater urbanization, higher incomes and changing food preferences (towards higher protein and more expensive products) have all played a role in changing demand for agricultural products, continuous increase of populations. On the supply side, there are changes in transport and logistics, biotechnology, liberalisation of national and international markets, improvements in information and communication technology, greater concentration within agricultural supply chains, the increasing importance of standards and the traceability of products, have all contributed to the greater prevalence of contracts.

Vellema (2002) argues that contract farming in tropical regions like sub Sahara in Africa can be seen as an institutionally innovative arrangement; wherein growers' competence to deal with new financial, organisational and technological conditions importantly affects whether a scheme is going to yield improved income and productivity or not. (Ashok, Kavery and Maurice , 2008) emphasize the above argument by saying that contract farming has offered higher profits and lower costs to the contract farmers compared with non-contract farmers. In addition to the assured markets and stable prices afforded farmers, the backward linkages help control transaction and marketing costs, yielding higher returns to contract farmers. Furthermore, the proposed firm-farm contract approach involves an examination of co-ordination of productive practices, conditions for profit sharing, concurrent management styles, division of tasks, handling of risks and uncertainties in production, and efficacy of prescribed technologies and available expertise.

2.2. Firm-farm and food security

Well-managed contract farming is an effective way to coordinate and promote production and marketing in agriculture. Contract farming approach had increased the benefit for both farm and farm in different countries. A study of the project of tomatoes in India done by Eaton and Shepherd (2001) confirmed that production yields and farmers' incomes increased as a result of the use of hybrid seeds and the availability of an assured market. An analysis of the yields and incomes of the contracted farmers compared with farmers who grew tomatoes for the open market showed that yields of the farmers under contract were 64 percent higher than those outside the project.

Prowse (2012) highlights the improvement of production in developing countries; especially in Southern-Africa, Uganda, Kenya, Tanzania and Zambia where contract farming occupied 21% of agriculture and increased the availability, accessibility and sustainability of staple food like maize in Zambia and income from cash crops like coffee and tea in Uganda and Kenya. This had contributed to food security of rural household. As proposed by Vellema (2002) an adequate contract farming, is a key important in food security and the profitability refers to types of contract and the capacity of each contractors in price negotiation and also the power for contractors.

2.3. Different types of contracts

Different types of contracts were defined by many authors and can differ by size of company, the types of crops, types of organization (government or private), numbers of stakeholders involved in contract, direct contract and indirect contract and the quantity and quality to produce in contract. Da Silva (2001) and Prowse (2012) outline five different "types" or models of contract farming and classify them as follow:

Centralized model, where a firm (often a large processor) contracts a large number of farmers, with strict quality requirements and quantity targets, normally applied for large farm and large firm.

Nucleus-estate model, where the firm (again, often a processor) enters the production node through an estate or plantation but also contracts with independent producers (for greater volumes, or for seed), this model is preferable for perennial crops.

Tripartite model, where a joint venture (between a public entity and a private firm) enters into a contract with farmers.

Informal model, 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.

Intermediary model, where the firm sub-contracts interaction with the farmers to an intermediary, such as a farming committee or a trader. This type of contract is popular and Hongdong, Robert and Jianhua. (2005) raise it as the most accepted by farmers and show that “Firm+Cooperative+Farm” appears to be the most desirable way to maintain contracts even though middlemen and direct “Firm+Farm” contracting are the most common types at present. Marketing contracts are more common than production contracts for both firms and growers. Oral contracts are most commonly used by middlemen because of strong social capital and networks in rural areas.

2.4. Contract challenges

As reported by FAO (2001) the advantages, disadvantages and problems arising from contract farming will vary according to the physical, social and market environments. More specifically, the distribution of risks will depend on such factors as the nature of the markets for both the raw material and the processed product, the availability of alternative earning opportunities for farmers, and the extent to which relevant technical information is provided to the contracted farmers. Contracts should in theory specify in detail the rights and obligations between the out growers and the contracts, including the penalties for breach of contract by either side. Baumann (2000) outlines in the following table typical rights and obligations in smallholder contact.

Table 2.1: Rights and obligations of farmers and firms in smallholder contracts

Farmer Obligations	Firm obligation
Use of land for purposes in contract	Supply credit and input
Follow production regulations specified in contract	Provide technical and managerial support
Maintain internal roads and drains	Maintain infrastructure
Sell crop to the firm	Purchase all production of acceptable quality
Repay loan	Pay farmer according to agreed formula
	Maintain accounts in comprehensible form
Farmers rights	Firm rights
Timely receipt of services and payments specified as obligations of firm	Timely recovery of payment for services provided to farmers
Compensations in the events of default authorities on any of its obligations	Purchase of crop as specified in contract and imposition of penalties in the events of defaults

The reasons for contract failure include unacceptable delivery quality and contractors selling products to other parties for a higher bid price; not doing well the obligation and rights of each individual in contact and resolution of contract disputes is difficult. Contract violation is more common with small size farms (Prowse, 2012).

Lack of trust and transparency has been found by Hongdong, Robert and Jianhua (2005) as significant source of contract failure. Delayed payment for crop produce, lack of credit for crop production, scarcity of water for irrigation, erratic power supply and difficulty in meeting quality requirements have been found to be the major constraints faced by contract farmers, whereas, scarcity of water for irrigation, erratic power supply, lack of credit for crop production and lower price for crop produce are the major constraints expressed by non-contract farmers.

The major constraints expressed by contracting agencies are violation of terms and conditions by farmers, lack of proper management by the company, frequent price fluctuations in

international markets and scarcity of transport vehicles during peak periods in the way of expansion of contract farming (Jagdish and Prakash, 2008).

FAO (2001) groups different challenges faced by farmers in contract farming in six categories; increased risk, Unsuitable technology and crop incompatibility; manipulation of quotas and quality specifications, corruptions, domination by monopolies and indebtedness and overreliance on advance. The problems faced by firm or companies have been classified also in land availability constraints, social and cultural constraints farmers discontent; an extra-contractual market and input diversion.

Increased risks: Farmers entering new contract farming ventures should be prepared to balance the prospect of higher returns with the possibility of greater risk. Such risk is more likely when the agribusiness venture is introducing a new crop to the area. There may be production risks, particularly where prior field tests are inadequate, resulting in lower-than-expected yields for the farmers. Market risks may occur when the company's forecasts of market size or price levels are not accurate. Considerable problems can result if farmers perceive that the company is unwilling to share any of the risk, even if partly responsible for the losses (Maxwell and Devereux, 2001; FOA, 2001)

Unsuitable technology and crop incompatibility: The introduction of a new crop to be grown under conditions rigorously controlled by the companies or firms can cause disruption to the existing farming system. Innovation should consider the social life of the community and the practicality or adaptation of farmers. For example a sophisticated machine may affect local employment in developing countries and overcapitalisation of the contracted farmers. In Europe the introduction of potato became successful when wheat production became insufficient to feed a rising population in the pre-industrial period (Den Hartog, Van Staveren and Brouwer, 2006).

Manipulation of quotas and quality specifications: Lack of proper management by the company may lead to production exceeding original targets. Companies may have unrealistic expectations of the market for their product or the market may collapse unexpectedly owing to transport problems, civil unrest, change in government policy or the arrival of a competitor. Such occurrences can lead managers to reduce farmers' quotas.

In some situations management may be tempted to manipulate quality standards in order to reduce purchases while appearing to honour the contract (FAO, 2001; Jagdish and Prakash, 2008).

Domination by Monopolies: Prowse (2012) argues that a monopoly of a single crop by a sponsor can have a negative effect. Allowing only one purchaser encourages monopolistic tendencies, particularly where farmers are locked into a fairly sizeable investment, such as with tree crops, and cannot easily change to other crops. The greatest abuses do tend to occur when there are public monopolies, where buying prices are set by the government, or where farmers have made long-term investments in perennial crops.

In 1999 the Kenya Tea Development Authority experienced serious unrest amongst its growers, reportedly because of the Authority's inefficient extension services and alleged "manipulation" of farmers. There was also discontent in Kenya among sugar farmers because the price set by the government did not change between 1997 and 1999 (FAO, 2001).

Indebtedness and overreliance on advances

Most of the time farmers are attracted by the availability of credit provided either directly by the company or through other partners. But farmers can face considerable indebtedness if they are confronted with production problems, if the company provides poor technical advice, if there are significant changes in the market conditions or if the company fails to honour the contract. In one venture "compassionate" advances for school fees, weddings and even alimony resulted in many farmers receiving no payments at the end of the season. Dropout rates for farmers in that particular project were high, as they thought contract farming did not pay (Prowse, 2012).

2.5. Firm -farm contract in Rwanda

FAO (2001) mentioned that contract farming started in Rwanda in cash crops especially tea, coffee, pyrethrum and sugar cane and mostly between farmers and government organization and international agencies. Farmers accepted the contract as it was and had no capacity to bargain the price. The fact that all those cash crops were for export in which government gained devises; farmers were pushed to cultivate them without any information about the market.

USAID (2010) reports two types of contract farming in Rwanda: informal model, 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. The second is an intermediary model is agreement, 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 cities, mostly done between fruit and vegetables farmers and middlemen. The second model is likely observed in seed production for example maize, wheat and cash crops like tea and coffee (RADA, 2011).

2.6. Wheat sector in Rwanda

2.6.1. General overview of Agriculture in Rwanda

Agriculture is a pillar of livelihood of most households in Rwanda. Different crops such cash crops such as coffee and tea are more grown among others and food crops like cassava, wheat, beans, maize, Irish potatoes, and rice also cultivated in three crop seasons A, B and C by year (GoR, 2011). Agriculture faces many challenges; Smallness of farms due to high population pressure and more than 60% farmers cultivate less than 0.7 ha, 50 % cultivate less than 0.5 ha and more 25% cultivate less than 0.25 ha (MINIGRI, 2009); low productivity of lands resulting from excessive use of land and low application of inputs including fertilizers, improved seeds and pesticides; low level of commercial exchanges in agriculture; absence of well-defined extension system with clear orientations and suitable for the Country; lack of awareness about market dynamics by the farmer; difficulties to get access to agricultural credit because of lack collateral in agriculture; too little academic research whose findings are not extended to the population(MINAGRI, 2004). Farmers are still using traditional methods and materials in exploitation of their land which is continuously degraded by erosion from high rainfall observed especially in high mountainous and hilly area characterising the country.

Different programs were implemented in line of the vision 2020; which is a government strategic program of 20 years started in 2000 with aim to raise Rwanda among others countries of average income by 2020. Agriculture has a fundamental place in that vision. In implementation of that vision 2020 the country to develop some specific program in agriculture sector such as land use consolidation in reducing the individual plots in exploitation, land conservation for mitigating high erosion and crops intensification in promoting the selected crops adapted in specific regions (U.S Government, 2011). As reported by MINAGRI(2011) the implementation of these programs had improved the agriculture sector from years 2000-2011 in using fertilizer from 0.5 kg to 30 kg/ha/annum, practicing modern agriculture from 3% up to 20 % and soil erosion protection from 20% to 87.3%. These programs had increased the production of different crops as presented in table 2.2

Table 2.2: Different productions of crops in tons from 2005-2011 in Rwanda

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

Source: NISR, 2011

2.6.2. Wheat production in Rwanda

Wheat (*Triticum aestivum* L.) was introduced in Rwanda in 1920s by INEAC (*Institut National d'Etudes Agronomiques du Congo*). However, in 1950s the crop was totally abandoned due to the absence of market and unsuitable varieties for Rwandan environments. It reappeared after and currently, it is cultivated in ten districts (Nyaruguru, Nyamagabe, Nyamasheke, Karongi, Rutsiro, Gicumbi, Ngororero, Gicumbi, Rulindo, Musanze) of Congo-Nile Crest, volcanic soils and Buberuka highlands at altitudes superior to 1900 m where it constitutes a major staple food for farmers. Wheat is cultivated twice year in crop season A and B and season B is more appropriate and gives more production (ISAR, 2008). The harvest of wheat in season B is more important for farmers because it helps to them to cope with season C normally a dry season in Rwanda and season A when they wait for its harvest.

Wheat is one of the mains crops actually promoted in Rwanda. USAID (2010) described wheat as high source of energy (around 2500 kcal/kg) and protein (around 80 grammas /kg). Wheat is daily consumed in rural area as grain cooked, dough, porridge and traditional beer while urban area consume it as bread, dough and porridge. Every year an important amount of wheat is imported and cost a lot of money. From the years 2005 to 2010 the informal trade in food crop used 319,702,648 Rwandan francs in wheat importation (MINAGRI, 2011). Wheat is classified in hunger fighter food products because of its high content protein and calories, its capability to be conserved for long time in storage, transportation easier and consumed in different ways by all people (USAID, 2010).

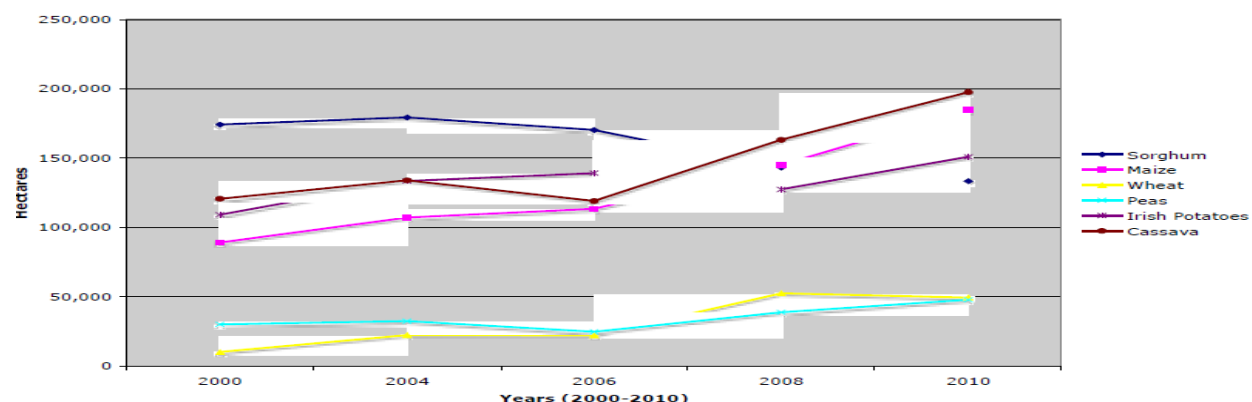
2.6.3. Wheat competitiveness with other crops and its price

Wheat is a crop for rotation in Rwanda especially in Nyaruguru district. It is normally in cultivated in season B in rotation with Irish potatoes and maize. Wheat is in competition with maize as reported by Terpend, Kayumba and Ntaganda (2007) and can take more than 70 % of the area cultivated in season B and 25 % in season A. Even though wheat gives low production farmers like it because of its capacity of resistance on acid soil and also its capacity to be stored long time than Irish potatoes in household.

Before 2000 the price of wheat was less than 120 Rwandan francs and after it promotion in 2007 the price fluctuated in range of 280-320 Rwandan francs because of its importance in home consumption. At harvest the price most of the time is low and is determined by the market in north part of the country. However in southern ex-province Gikongoro (Nyamagabe and Nyaruguru district) the price is made in consultation with local government, traders, and cooperative representatives wheat cooperatives farmers and Union of cooperatives such as UNICCOOPAGI, UNICOOBLE. Most of the time, the price is high after three months because of its high demand in market (Mutijimana, 2004).

Rwanda imports grain wheat and flour done by wheat processor and traders at cheap price. The alternative use of wheat in preparation of wheat beer from Rwandan wheat also makes it very important especially in rural area where it can replace the sorghum beer. As presented in figure 2.1, the areas covered by wheat increased slowly but its extension is possible due to its high market demand and the fact that farmers still use 10 percent of the available arable land for wheat (MINAGRI, 2011).

Figure 2.1.: Areas covered by different crops in Rwanda from 2000-2010



Source: MINAGRI, 2011

2.6.4. Wheat Stakeholders in Rwanda

As observed by USAID (2010) three groups of stakeholders are involved in wheat value chain in Rwanda: actors, supporters and influencers. The actors are those who actively involved in wheat value chain, the supporters are those who provide different supports like loan technical support among others to the chain actors and the influencers create enabling environment to all stakeholders of wheat value chain by providing all regulations in wheat production, infrastructure, market, price and monitoring .

Actors

Suppliers of input: Rwanda Agricultural Board (RAB) supplies and distributes improved seed to farmers at the same time this organization coordinates the distribution of fertilizers through SOPAV (Société de Production d'Aliments de Végétaux) Company. The later gets a contract with RAB to sell and to distribute subsidized fertilizers to farmers who are able to grow wheat on at least ½ hectares.

Producers: Large, small, individual and cooperatives of farmers are observed in wheat production in Rwanda. As reported by Mutijima (2004) more than 60% of wheat producers are individual farmers and cultivate on small plots less than 0.5 ha using their own seeds. Terpend, Kayumba and Ntaganda (2007) found that more 25000 farmers are grouped in cooperatives and had stated the consolidation of their land in wheat production and use improved seeds.

Collectors, dryers and traders: Different cooperatives (COPROVAB, UNICOOPAGI, UNICOBLE, and KOAGMITA) facilitate the collection wheat. These cooperatives have been united in unions like UNICOOPAGI (Union des Cooperatives Agricoles de Gikongoro) which actually buys, collects wheat farmers' production, dry it at 14% of moisture content, package and store the production in its appropriate stores(RAB,2011).

Middle men: Many buyers informally buy at low price from farmer gates especially from male farmers; even before the harvest of wheat and sell it to other actors in chain at a good price.

Processors: BATHRESA and PEMBE are the large millers with capacity respectively of 200 and 400 tons a day working in Rwanda. Small scale processors produce wheat floor by electrical machines without any transformation, most women are involved in wheat small scale

processing and sell the product in local market. Recently two wheat millers closed the processing activities because of various problems in their management (MINICOM, 2011).

Retailers: Many buyers and sellers are involved in wheat value chain. They buy grain wheat and wheat flour from wheat miller, from wholesalers, wheat cooperative or individual farmers. Most wheat millers have contract with supermarket and different shops in different cities of Rwanda. Retailers sell their product at different price depending on the selling point and the consumers (CIMMYT, 2000).

Consumers: Three types of consumers are observed. High income consumers in urban area who buy the first quality of wheat flour in supermarkets at high price. Low income consumers who buy low quality of wheat flour, or wheat grain at cheap price in shops or local markets. Some small processors had signed contracts with secondary schools to supply wheat flour for students' consumption (NISR, 2011).

Supporters

Research: The *Institut des Sciences Agronomiques du Rwanda (ISAR)* does different researches: testing adaptability of new varieties, pest and diseases control in wheat value chain Rwanda.

Services providers: Some unions of wheat cooperatives such as UNICOOPAGI, UNICOBLE, and COPROVAB operate in wheat value chain as actors and supporters. They provide extension services to wheat farmers and do also advocacy of farmers (U.S. Government, 2011).

BANKS: RIU (Research Into Use), RIM (Reaseau Indiocesain de Microfinance), Microfinance, SACCO (Saving credit Cooperatives), Banque Populaire du Rwanda provide loans to wheat farmers to buy inputs (fertilisers and seeds) or to wheat cooperatives and small scale processors to buy production of farmers at harvest or to process grain wheat in wheat flour at low price affordable by low income consumers.

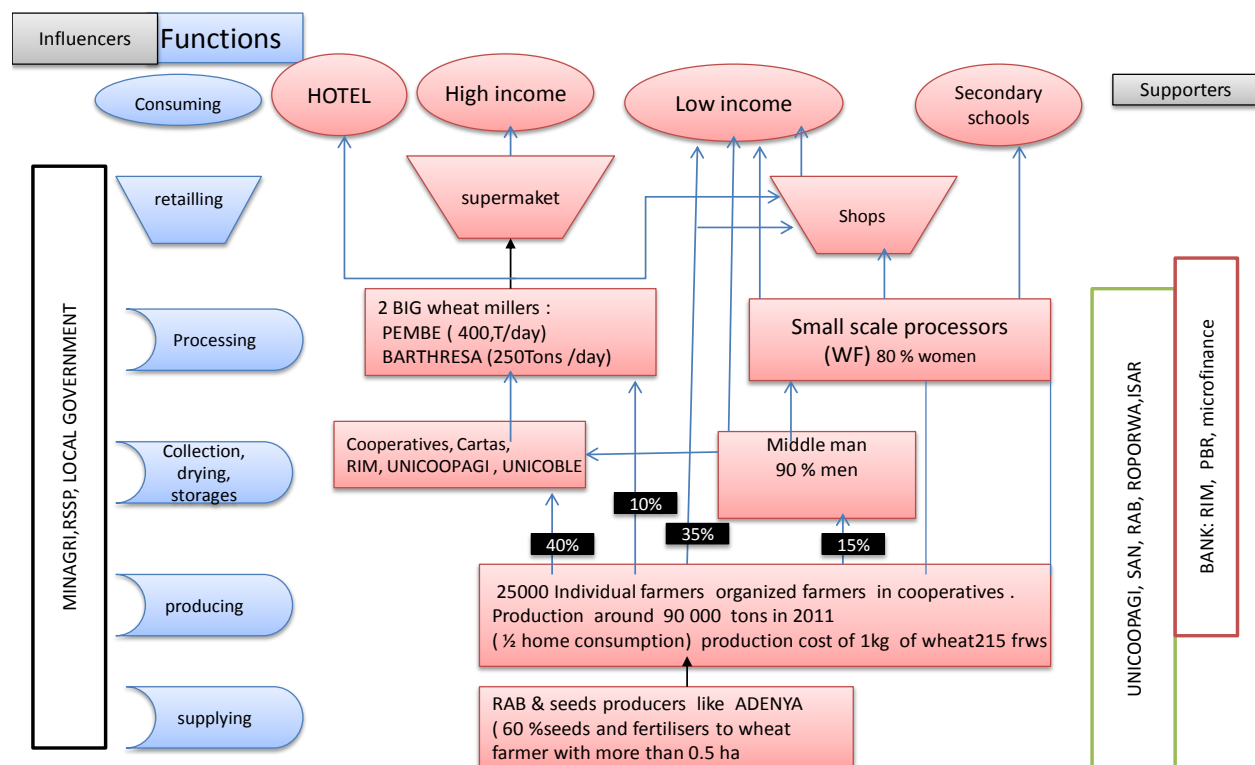
Government Projects: Rural Sectors Support Project (RSSP) and ACDI VOCA provide funds to qualified projects in wheat value chain and SAN project (Projet de Securite Alimentaire de Nyaruguru) provide extension services through Integrated Pest Management.

Influencers

Government: The MINAGRI establishes regulations in wheat value chain especially policies (laws in fertilizer, varieties needed). Actually there is a policy on intensive agriculture implemented through a program of Crop Intensification.

Local government: The ten above cited districts through its agriculture departments coordinate the distribution of seed, and fertilizers, monitor and evaluate all stakeholders in wheat value chain. They also determine the price of wheat grain in collaboration with all stakeholders and produce a report on wheat value chain. Different stakeholders in wheat production and their position are presented in figure 2.2 below, the value chain map.

Figure 2.2: Wheat value chain map in RWANDA



Source: Adopted from USAID, 2010 and MINAGRI, 2011

2.5.5. Constraints and opportunities in wheat production in Rwanda

Opportunities:

As reported by USAID (2010) wheat production in Rwanda has strengths and opportunities; this crop is highly appreciated by consumers at different levels because of its diversification in preparation in consumption and its demand in Rwanda far exceeds supply. Strong cooperatives are organized around wheat production sales and some cooperatives have appropriate storages facilities and high capacity of storage. Small and large processors are operating in the country. Others such as BARTHRESA stimulated by good policies in agriculture that facilitate the new investors have started milling activities in Rwanda.

Through different trainings provided by some projects like Integrated Pest Management project some wheat producers were trained in integrated pest management of wheat rust and could reduce losses in production. The appropriate technology in threshing and winnowing had been identified by Terpend, Kayumba and Ntaganda (2007) in improving the quality of wheat. Wheat has also an opportunity to be used in other forms of consumption such as porridge and this alternative could mitigate the problem of high moisture rendering the Rwandan wheat unsuitable to flour. The climate in Rwanda is favourable for farmers to produce wheat in two seasons by year (A and B) (RAB, 2011).

Constraints:

The production of wheat in Rwanda has a lot of weaknesses and threats; a very low volume of Rwandan wheat is produced with very low quality compromised by high contents of impurities incurred during the threshing, winnowing and drying because of use of traditional facilities. The inability of most farmers to dry down to required moisture level (14%) in most production locations especially in the area of high altitude (Cantore, 2012).

Variety grown by farmers is inappropriate for wheat millers. Most cooperatives lack adequate drying and storage facilities and as a results great losses are incurred in post-harvest. The price fluctuates during the year and the MINAGRI (2011) reported that the price offered by wheat millers is most of the time lower than what is paid at local market and this reduces collaboration with famers. Another issue observed is poor management of wheat millers which led to the closure of some milling factories such as SOTIRU and Nyungwe Mill.

Most of wheat millers use imported wheat with better quality and available in quality required by flour mills. This competes with the Rwandan wheat production and as a result poor relationships are observed between producers and wheat millers and these discourage wheat producers. Many cooperatives were strongly assisted by projects such as ACDI VOCA and SAN among others in providing technical and financial support and actually as these projects ended their supports, they suffer in management term. Even if the climate in Rwanda is favourable for wheat production, it is also favourable to different pests and diseases, which affect wheat production and storage. Wheat rust is common disease and birds destroy the crop causing losses in wheat production. The special characteristics of slope and high rainfall of Rwanda facilitates, the flooding in the area of production of wheat and the occasional rapid change to drought affects the production of wheat (CIP, 2011).

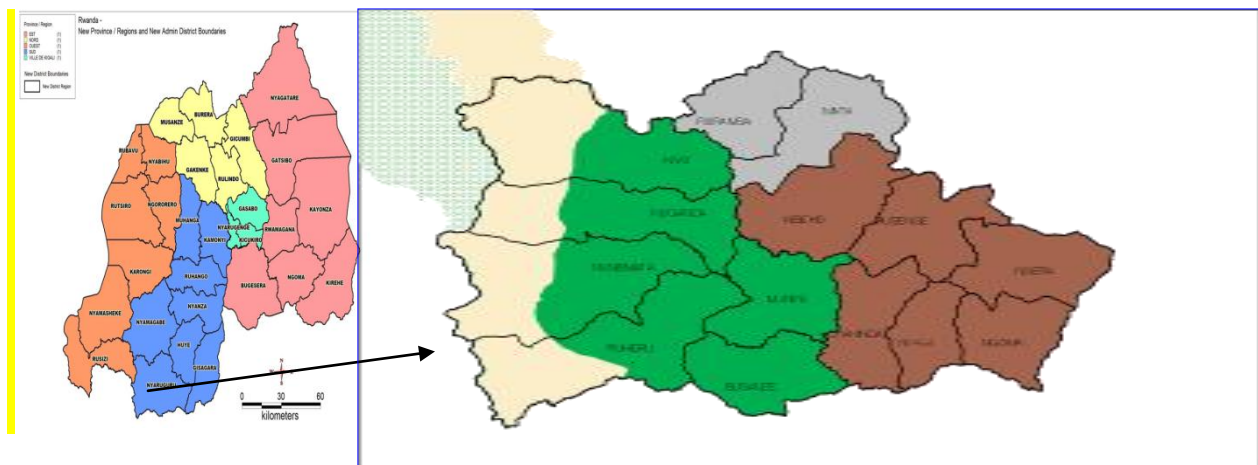
3. METHODOLOGY

3.1 .Study area

The district of Nyaruguru is one of 10 districts in which wheat is grown in Rwanda and situated in Southern part of the country. It is divided in 14 sectors made of 72 cells 332 villages. This district has been chosen as the study area. This is because wheat constitutes a major crop of this population and consumed at 8kg/year /persons (Mutijima, 2004). About 30% of wheat farmers of the country are organised in cooperatives and individual farmers involved in wheat seeds production and wheat production are located in that district and collaborate with different stakeholders (Terpend, Kayumba and Ntaganda, 2007). For this reason data collected in this area can be used to represent a generalised case to the whole country. UNICOOPAGI and KIAKI cooperative have been proposed by Agriprofocus to be a research company (firm) and wheat farmers cooperative and operate in Nyaruguru district. This district was also the working organisation of the researcher so it was easy to reach the area as well as respondents as long as the researcher was familiar with local situation.

3.2. Description of the research area

Nyaruguru district has 1100 square kilometres. The population district is 286,737 with 59,772 households where only 25,974 own a cow and about 44,840 have at least one breed. Considering the relief and soil types, Nyaruguru can be categorized as: humid with more rainfall (1100-1200mm/year), acid soil (4, 9-6 PH) and mountainous in range of 1900 - 2300 meters of altitudes. The western region is suitable for Irish potatoes, wheat, maize and tea. The eastern region is suitable for Cassava, climbing beans and coffee productions and its marshland suitable for various vegetables. The following map shows the location of the field work area.



Map 3.1: Nyaruguru District Map

3.3. Research strategy

To achieve the objective of this research two, steps were involved; collection of primary data and collection of secondary data. The collection of primary data was done in three steps:

- 1) Developing a business case description between UNICOOPAGI and KIAKI cooperative with semi-structured interview (checklist and open questions).
- 2) Survey used pre-structured questions (statement were formulated and scored by both farmers' cooperative and staff of UNICOOPAGI).
- 3) Debriefing meeting with farmers and staff of KIAKI.

Collection of secondary data used desk study: internet, book, journals, and official rapport for the government. The processing of data used an excel sheet and data was analysed through a value chain analysis with food security lens.

3.4. Methodology to collect data

This research has used a desk study to collect secondary data, field work to collect primary data and observation to concretise the field work.

3.4. 1. Methodology to collect secondary data

Desk study: The first step of this study involved a reading and gathering different information about the research objective especially on wheat production and firm-farm relationship. This information summarised have been used in data analysis and interpretation of findings. Reading was more focus on different research publications, articles, reports from government or government institutions or international organisations and PhD thesis. Information based on desk study was collected through electronic search using library books of digital library of Wageningen, as well as reliable Internet source related to the research topic.

3.4.2. Methodology to collect primary data

Business case selection respondents

In selecting respondents more focus was on farmers and staff of UNICOOPAGI mostly involved in wheat production.

Farmers: The selection has been done from wheat farmers of KIAKI who sold their production to UNICOOPAGI through their cooperatives and who took that product as an important business for household. All selected respondents were literates.

Firm Staff: Staff respondents were selected according the interaction they have with wheat production and the following list was interviewed: agronomist, market officer, quality controller and the coordinator of UNICOOPAGI.

Survey selection respondents

Farmers capable of writing and reading were selected from members of KIAKI cooperative. Respondent were producers of wheat and who sold wheat to UNICOOPAGI. Some of them have been interviewed in development of business case. Depending on their function in wheat production, the following staff scored the questionnaire; President of UNICOOPAGI, Coordinator of UNICOOPAGI, cooperatives officer, market officer, quality controller and agronomist.

Debriefing selection respondents: Two debriefing meetings have been done: with wheat farmers of KIAKI cooperative and with staff of UNICOOPAGI. The debriefing meeting with farmers was attended by 10 participants who were respondent survey. The debriefing meeting with UNICOOPAGI was attended by the same staffs that were respondent to the survey. Depending on the importance of women in wheat production in Rwanda, they were represented at 50% in every activity. The following table 3.4.1 illustrated the number of respondents by steps in field work.

Table 3 .4.1: Number respondent by activity in field work

Steps	number of respondents		Motivation of selection
	KIAKI	UNICOOPAGI	
Business case Development	4	4	Selected from wheat cooperatives farmers and staff of UNICOOPAGI, involved in wheat production
survey respondents	25	6	Selected from of wheat cooperatives farmers (KIAKI) and staff of the UNICOOPAGI, involved in wheat production.
Group focus/ debriefing	10	6	Selected from wheat cooperative farmers and staff from UNICOOPAGI who have been respondents in survey.

Field work: Field work used 2-2 tango tool developed by Agriprofocus. The tool facilitates quick investigation on relationships between firms and farmers in their business. It is tool for self –assessment of firm –farmer relations; it is practical and flexible and it can be toiled to the specific case at hand. First an analysis of a business case is needed for identifying key

challenges and indicators and preparing statements. The tool allows having quick results, which can be visualised by easy to understand graphs. The self-assessment results facilitate communication between farmers and firm. The tool is of potential interest of external facilitators, which seek (or are asked to facilitate the firm- farmers' relations. The tool is transferrable to farmer' organisation, firms and facilitators and can be applied by private organization staff, company staff and young professional (Agriprofocus, 2012).

Using this tool the followings steps were taken to collect primary data:

1) Business case description between KIAKI cooperative and UNICOOPAGI: In this step wheat farmers and UNICOOPAGI' staff have been interviewed with a checklist (cfr annex 1); qualitative data was extracted and analysed to get clear problems insight UNICOOPAGI and KIAKI cooperative and its interactions in wheat production. A business case was elaborated to present different challenges areas and all partners of UNICOOPAGI and KIAKI involved in wheat production.

2) Identifying indicators and formulating statements: depending on the business case, clear indicators or challenge areas were selected in regard to firm-farmer relation. Based on this, clear and applicable to both wheat farmers and staff firm, questionnaires or statements have been formulated (cfr annex 2).

3) Firm and farmers scoring the statements: Quantitative data was collected in field using questionnaire from respondents. Researcher collected quantitative data from respondents who scored a statement by marking in box a X where it was written strongly disagree, disagree, agree and strongly agree. Women and men were targeted in order to collect different point of view in firm -farm relationships in wheat production by sex.

4) Data entry and processing and preparation of graphs (Excel): using Excel sheet, quantitative data collected from field was entered and processed in excel workbook. From this the researcher produced different graphs which illustrated a picture of tendency by statement of staff for UNICOOPAGI and wheat farmers for KIAKI

5) Preparing a debriefing report and meeting(s): depending on indicators and how respondents scored different statements, a report analysis was prepared and shared in a debriefing KIAKI' members and staff for UNICOOPAGI

6) Sharing and discussing self-assessment results: The group focus helped to collect more information from different points of view of participants and sometimes a consensus on same conclusion. The discussion has been focused on issues raised in report and actions to take for improving their relationships.

Observation will ensure the availability and accessibility of the production, infrastructure facilities, contact, record keeping and interpretation of body language of interviewee.

3.5. Data processing and analysis

Data collected have been entered in excel sheet developed by CID which automatically gave two graph on average score and level of agreement by challenge area. The analysis of data used the value chain analysis and food security dimensions. Data was discussed by a triangulation and confrontation of the three source of information; primary data, secondary data and observation.

3.6. Research framework

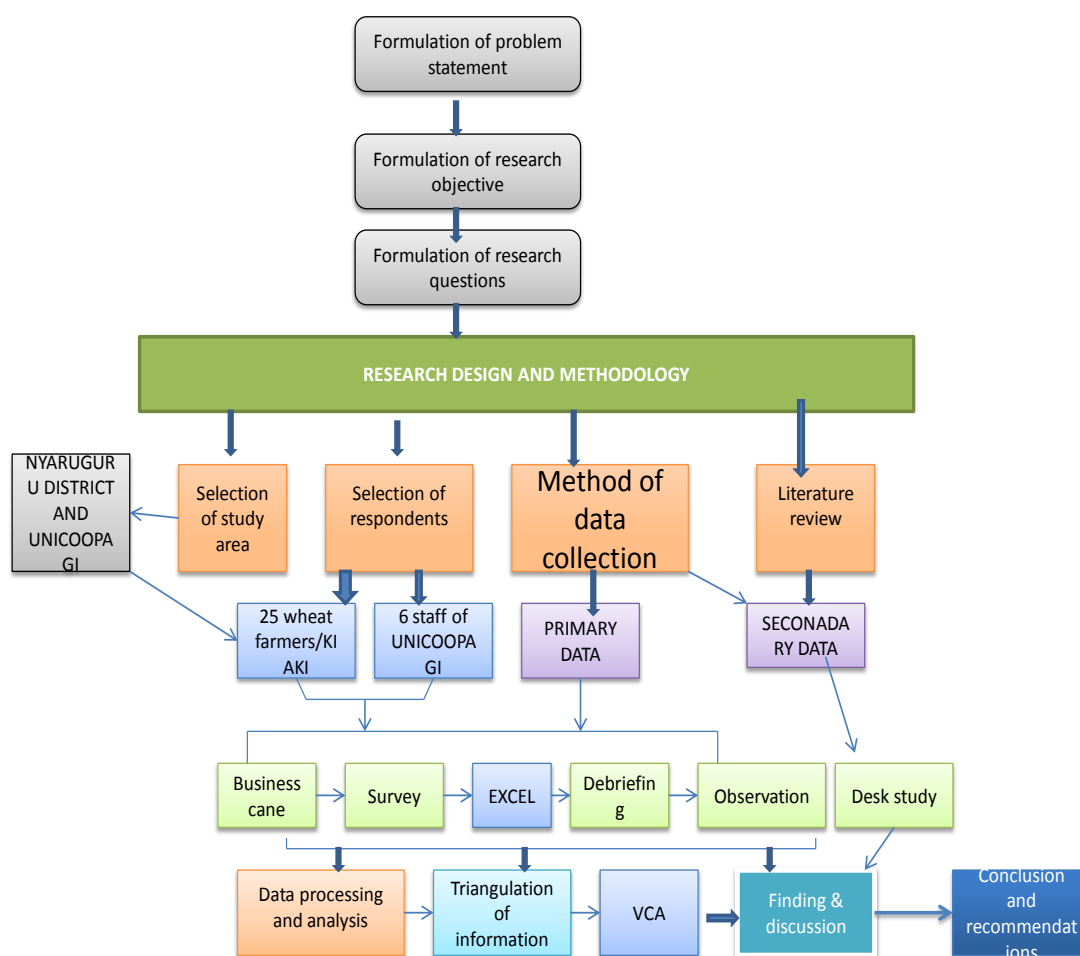


Figure 3. 1: Research framework

4. UNICOOPAGI AND KIAKI COOPERATIVE

In this chapter results are presented in three parts: Business case description, results from survey and debriefing results between UNICOOPAGI and KIAKI cooperative

4. 1. Business case description

This business case is described with input from interview with members of KIAKI cooperative and staff of UNICOOPAGI.

4.1.1. Access to inputs

Different improved seeds varieties of wheat and fertilizers are provided by the government through its agency RAB. Fertilisers of wheat are subsidised at 50% and wheat seeds distributed to farmers at loan which have to be repaid at harvest. These inputs have benefitted wheat farmers or to the group of wheat farmers who cultivate wheat at 0.5 hectare. Pesticides are also provided by RAB and distributed by local government in collaboration with UNICOOPAGI who concluded a contract with RAB for playing a role of providing extension services to farmers. UNICOOPAGI provides extension services, facilitates the accessibility of farmer to input especially cereals fertilizers. KIAKI's famers said ***“we know UNICOOPAGI in distributing wheat inputs but most of the time the delay in distribution affects our production”***. Lime is hardly available to farmers. It is supplied from northern part of the country by private companies and the later don't have a selling point of lime in the area.

The accessibility to credit stressed famers and said ***“it is not easy to access the credit in agriculture because of lack of collateral, lack of capacity in credits managing and lack of banks in the area”***

4.1.2. Production and yield

Depending on different varieties of wheat, different yield levels are observed. In season B for every year, wheat is cultivated at around 70% of total cultivated area and constitutes the major source of income for households. *Musama* is the variety with low yields ranging between 1 and 2 tons per hectare. Comparatively to other varieties, it is more tolerant to various factors (soil acidity, drought, poor fertility of soil) but easily affected by winds and not appreciated by processors. Two other varieties, *Ks-Mwamba* and *161* varieties provide high yields 2.5 to 5 tons per hectare, highly appreciated by processor but too exigent in production. Wheat farmers in KIAKI cooperative are responsible to all activities necessary in wheat production, including land preparation, sowing, weeding, transporting and applying the organic manure. The KIAKI production committee mobilizes members for the wheat production on the cooperative's own plantation and on individual plots. An interviewed wheat farmer revealed some challenges in

applying fertilisers according to agronomists' recommendations: misuse or application of small quantity fertiliser as required, the challenge in measuring their farms and harvested quantities as well as an unwillingness of some farmers in applying good agricultural practices.

The production of this cooperative (farmers' individual plots included) is around 90 tons by season and the production by household is around 500kg. The estimation of total production of wheat in the operation area of UNICOOPAGI is around 16,000 tons per year. Subsidies of fertilizers and seeds had facilitated an improvement observed in wheat production. Some farmers attest the insufficiency of improved seeds and lime and said ***“if improved seeds and lime could be available and affordable they can obtain far higher yields of wheat in their area”***.

Wheat is affected by different factors. ***“The fluctuation of climate conditions as high rainfall and resulting erosion sweeps away rich soil, resulting in production losses that can reach as high as 40 % of total expected production”*** said the agronomist of UNICOOAPAGI. Pests (*black aphids*) and diseases (*rust*) are also observed with less impact on production but when there is a delay in application of pesticides and chemicals, losses can be massive. The soil is highly acidic and needs much lime for acidity correction which involves high costs because of its limited availability in the area and high transport costs. All these costs are supported by farmers and the union is not sharing any of risks with farmers even when it delayed the supply of inputs. The only thing done by UNICOOPAGI is the reporting to RAB on the gravity of diseases and pests attack.

4.1.3. Functioning of cooperative (KIAKI)

KIAKI is member of the UNICOOPAGI; it is engaged in wheat production in two sectors (Kivu and Muganza) of Nyaruguru district. It has 85 women members and 54 men involved in wheat, maize and Irish potatoes production

KIAKI cooperative has an executive committee, a general assembly, an internal audit committee and a production committee. Every committee has responsibility to enhance the production and selling of wheat produced by farmers. The internal auditing committee of KIAKI cooperative facilitates the control in management of the cooperative the only challenge mentioned by farmers is the capacity for this committee to fully understand accounting formats and adapt them to monitoring activities of the executive committee. There is moderate transparency between UNICOOPAGI and KIAKI in sharing capacity and information regarding the monitoring of activities.

KIAKI cooperative operates in a democratic manner. Wheat farmers elect democratically all different committees as described above, without any outside interference. The executive committee is accountable to the general assembly three times per year. With an accountant, KIAKI has facilitated its members in getting more information about the use of their income and keeping records and cost justifications of the cooperative.

KIAKI's members and the coordinator of UNICOOPAGI witness the improvement in functioning of the cooperative because of changes done last year in different committees but there are signs of lack of information for some members. As testified by an interviewee, wheat is the main crop and highly commercial for the cooperative and members' households, it was cultivated at 80 % of the total area of plantation per household in season 2011 B. Wheat is source of income of the households and facilitate the families to pay the school fees, buying necessities for the family and investing in other income generating activities.

“Looking at our progress in wheat production new wheat farmers are soliciting to join our cooperative but they first have to pay contribution and their membership has to be approved by the general assembly of KIAKI cooperative” said the president of KIAKI cooperative. New wheat cooperatives are rising but still professionally working at a relatively lower level.

In the previous year's UNICOOPAGI used to trust this cooperative by providing credit on seed and fertiliser without formal contract but it had lost its credibility in returning back the loan. Farmers' representatives use to present wrong production of the crop and difficulties experienced in production in order to escape the repayment. Currently, UNICOOPAGI selects credible wheat farmers' members of the cooperative and signs with them a contract in the name of the cooperative to collect and buy the wheat produce.

4.1.4. Functioning of UNICOOPAGI

UNICOOPAGI is a union of twenty five cooperatives involved in production of wheat, maize and Irish potatoes in Nyamagabe and Nyaruguru Districts of the Southern Province of Rwanda. Around 70 percent of the 6000 members of these cooperatives are women. UNICOOPAGI started its activities in 1991 and its office is located in Nyamagabe District. The union has seventeen permanent and qualified staff plus thirteen temporally workers. There is a transparent mechanism between UNICOOPAGI's staff and KIAKI members. The planning activities especially at the beginning and end of the season are done together with representatives of wheat farmers and the UNICOOPAGI but as regretted by the coordinator of UNICOOPAGI, the

monitoring and evaluation is still a challenge for this collaboration. The internal and external audit is done in UNICOOPAGI and the report presented to the general assembly but the format reporting is not well understood by farmers.

As mentioned by the coordinator of UNICOOPAGI, its objectives are to provide extension services to cooperative members, to facilitate the distribution of inputs (seeds and fertilizers), to play a role of advocacy of these cooperatives, facilitate the accessibility to credit (seeds and finance), to buy the production of these cooperatives and assist also in finding other market outlets for the remaining production. “By its COOPEC TWIZIGAMIRE the union also facilitates wheat farmers’ members of their cooperatives to get loans but with high interest” said the account of KIAKI. One farmer mentioned that ***“some farmers learned a lot from this organisation through different seminars in credit management and study tours but the selection criteria are not clearly indicated or communicated to farmers”***.

As mentioned by the in charge of cooperatives in UNICOOPAGI, the union does its best all the time to communicate necessary information to farmers in regular face-to-face meetings and planning of activities with cooperatives presidents, official letters, on telephone calls, communication through extension services but they can’t monitor if this information reaches the farmers precisely. ***“We still have a communication problem said the coordinator of UNICOOPAGI”***. The union uses field school approach to demonstrate to farmers the use of fertilizer and different varieties of wheat in operation areas of KIAKI cooperative

Farmers claim to lack information on the productive quantity needed from the beginning of the season, the price setting mechanisms and the price for UNICOOPAGI to his client. The producers indicate that they had all the time requested the facilitation in selling of lime but still they don’t have any answer. They think that UNICOOPAGI has many partners so that it could help in availing lime and organic manure.

4.1.5. Contract between UNICOOPAGI and KIAKI

The contract in wheat production between KIAKI and UNICOOPAGI has been oral for long times. Currently, the formal contracts are signed in wheat seed multiplication of the new variety 161 as well as collecting and buying the production of wheat by some cooperatives and individual farmers. These contracts are elaborated by UNICOOPAGI and signed by the two contactors. Wheat farmers claim the participation in contact preparation which is most of the time in favour of UNICOOPAGI.

These contracts elaborated in local language lack explanation to farmers and mostly signed by the executive committee of the cooperative. ***“We do not know the content of our contract said the interviewee but I’m sure our executive committee knows it.”*** The contract in collecting and buying wheat produce is not properly observed by UNICOOPAGI because it buys less quantity than collected by farmers. ***“Many times our contracts are kept by UNICOOPAGI in their office and we don’t have any copy”*** said a farmer. Most of the times UNICOOPAGI does not respect the contract signed with farmers in buying their produce not because of low quality but because of the financial capacity as mentioned by the marketing manager of UNICOOPAGI.

The price of wheat is set in collaboration with local government from sector level to district level, the representatives of wheat producing cooperatives, the representatives of progressive farmers, the UNICOOPAGI and CARITAS as buyers. Together they calculate the production cost of one kilogramme of wheat and then apply 20% on it as benefit. The high estimation of farmers in input investment creates all the time the misunderstanding in price negotiation and farmers complain that the UNICOOPAGI as the biggest market outlet for their produce uses this negotiation power to impose the price even if some of them know how the price is set. Price making is still a challenge for both wheat farmers and UNICOOPAGI.

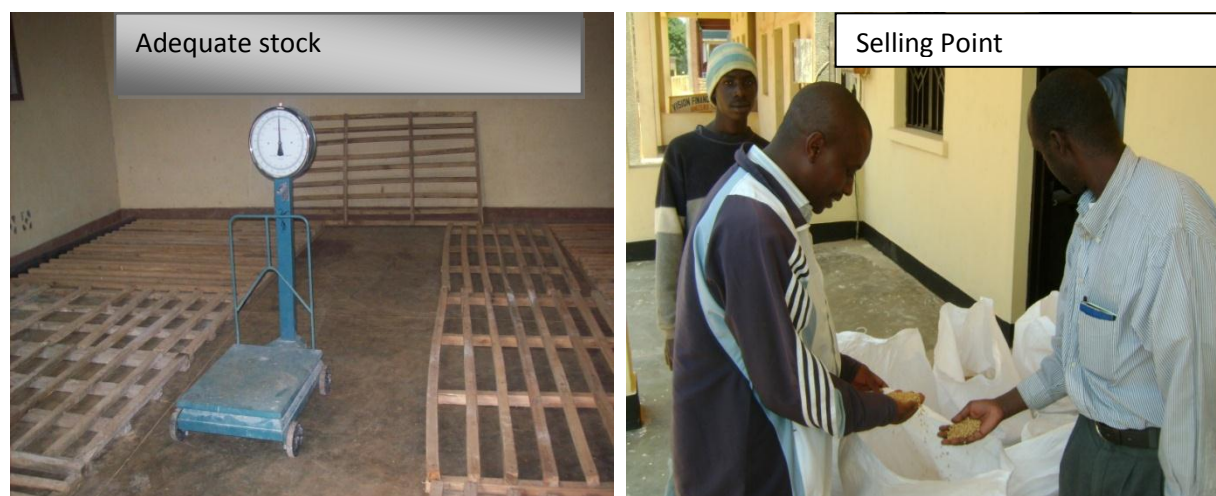
4.1.6. Post- harvest facilities and quality management

The harvesting is done normally from mid-July to August. This period corresponds with the dry season and facilitates the drying of wheat. The lack of adequate post harvest facilities decreases the production because currently the losses during the threshing, winnowing, drying and storage stages are high. The marketing manager of UNICOOPAGI attests that around 14% of the wheat production is lost in different activities of traditional harvest and post harvesting compared with modern threshers and winnowers. UNICOOPAGI has two threshers and two winnowers which are yet to be operational. They are expected to be used during this 2012B season.



Photo 4.1.1: Traditional post-harvest facilities and modern thresher and winnower

The transport of input and production is a challenge in the area. UNICOOPAGI sometimes facilitates the transport of fertilizers to KIAKI's office. Transportation by head is a challenge and discourages farmers. The roads serving the area are not well maintained and the transport cost by trucks is too high. The KIAKI cooperative has a small warehouse with a capacity of 30 tons and not appropriate to store wheat, while UNICOOPAGI has benefited from adequate storage facility of a 60 tons capacity plus a truck through a donor (TROCAIRE Rwanda).



Photos 4.1 2: Adequate storage and testing the quality by eyes at wheat selling point

4.1.7. Commercial relations

The only big market of wheat in Nyaruguru and Nyamagabe districts is the UNICOOPAGI but it buys around 20% of the total production and it works as monopoly in these districts. The remaining production is sold to different buyers such as at local market, middlemen and Caritas.

According to agronomists' estimates, 40% of the production is consumed in households. The bought wheat by UNICOOPAGI is high quality graded, dried with 14% of moisture content, without any impurities and separated in different varieties by farmers using the traditional methods. The testing of the required quality of wheat is done by eyes and teeth of farmer and most of times with inaccuracy to meet required standards. The same method is used by UNICOOPAGI in testing the quality of wheat at selling point. The appreciation of the quality of wheat in this method depends on appreciation of individual buyer and the wheat can be refused not because of low quality but because the capacity of appreciation or friendship and relationships between the buyer and the farmer or cooperative.

At selling point, farmers appreciate the weighing for UNICOOPAGI than the one done by other buyers. Farmers are claiming an alternative market to absorb the rest of produced wheat. Farmers appreciate the way of payment by cash which help them to get quickly to their needs but they regret also the use of that money in unplanned activities. Farmers accuse the UNICOOPAGI to be not clear about the quantity it wants to buy from the farmers 'cooperative. This lack of information affects their plan in wheat production

As said by KIAKI members and confirmed by the marketing officer of UNICOOPAGI, ***the price changed last year after two months of harvesting and fluctuated in range of 270 to 400 Rwandan francs but the UNICOOPAGI continued to buy at negotiated price.*** In interview with farmers it appeared that farmers don't know the market of UNICOOPAGI and its price and this makes them think that it might be earning a lot of money from their produce.

Table 4.1.1: Value share of wheat chain

Chain actors	Variable costs(FRW)	Selling price(FRW)	Gross Margin(FRW)	Share value (%)
Farmers	210	280	70	24.1
Collectors	280	290	10	3,5
UNICOOPAGI	290	400	110	37.9
RAB, WHOLESALERS	400	500	100	34.5

From table 4.1.1 the gross margin is not relatively different. Collectors and traders earn 3.5% of the market value as a cost of the services because they don't invest in wheat production. UNICOOPAGI and RAB seem to have a big share but they try to add a value to the product.

4.1.8. Stakeholder network and collaboration

Different stakeholders are involved in wheat production and selling in collaboration with KIAKI and UNICOOPAGI. These stakeholders can be categorised in three groups; actors or operators, influencers and supporters and described below.

Actors

Suppliers of input: Rwanda Agricultural Board (RAB) supplies and distributes improved seed to farmers and at the same time coordinates the distribution of fertilizers through SOPAV (Société de Production d'Aliments de Végétaux) Company.

Producers: Large, small, individual and cooperatives of farmers are observed in wheat production in Nyaruguru and Nyamagabe district.

Collectors and dryers: Different cooperatives and individual facilitate the collection wheat at selling point from where UNICOOPAGI comes to buy it. The price for one kg of wheat collected is 10 Rwandan francs at selling point.

Traders and buyer: UNICOOPAGI and CARITAS buy wheat farmer' produce, dry at 14% of moisture content, package and sell it to RAB and to wholesaler.

Middle men: Many buyers informally buy at low price from farmer gates even before the harvest of wheat and sell it to other actors in chain at a good price.

Retailers: Many buyers and sellers are involved in wheat value chain. They buy grain wheat from UNICOOPAGI, from wheat cooperatives or from individual farmers. They sell their product at different price depending on the selling point and the consumers.

Consumers: Low income consumers who buy low quality of wheat flour, or wheat grain at cheap price in shops or local markets.

Supporters

Research: The *Institut des Sciences Agronomiques du Rwanda (ISAR)* does different researches: testing adaptability of new varieties, pest and diseases control in wheat value chain in the area.

Services providers: The unions of cooperatives such as UNICOOPAGI and UNICOBLE operate in wheat production as actors and supporters. They provide extension services to wheat farmers buy wheat product and do also advocacy for farmers.

BANKS:), RIM (Reaseau Indiocesain de Microfinance), CAPEC for UNICOOPAGI (TWIZIGAMIRE), SACCO (Saving credit Cooperatives), Banque Populaire du Rwanda provides loans to wheat farmers to buy input (fertilisers and seeds) or to wheat cooperatives and small scale processors to buy production of farmers at harvest or to process grain wheat in wheat flour at low price affordable by low income consumers.

Government Projects: Rural Sectors Support Project (RSSP) provides funds to qualified projects in wheat seed multiplication and production and SAN project (*Projet de Securite Alimentaire de Nyaruguru*) provides also extension services through Integrated Pest Management. KIAKI had benefited funds from RSSP in wheat production and capacity building for his members.

Non-Government Organisation: RIU (Research Into Use), TROCAIRE and IFDC Catalyst provide extension services support and test in use of fertiliser.

Influencers

Government: The MINAGRI establishes regulations in wheat value chain especially policies (laws in fertilizer, varieties needed). Actually there is a policy on intensive agriculture implemented through a program of Crop Intensification. These policies facilitate farmers to access to fertilizers and improved seeds

Local government: The two districts Nyamagabe and Nyaruguru through its agriculture departments and field workers coordinate the distribution of seed, and fertilizers, monitors and evaluate all stakeholders in wheat value chain and sometime participate in price setting of wheat grain in collaboration with all stakeholders and produce a report on wheat value chain. In addition to this, KIAKI cooperative has the roles in mobilising its members in wheat production in collaboration with agronomists from local government and extension officers from UNICOOPAGI.

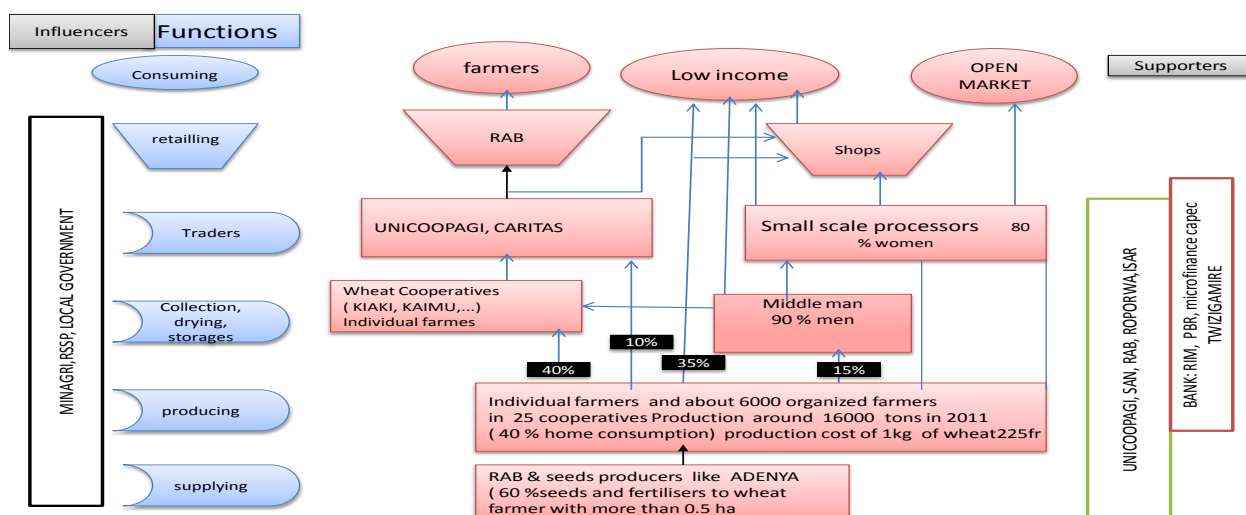


Figure 4. 1.1: Wheat value chain UNICOOPAGI and KIAKI

4.1.9. Perspectives and SWOT analysis between UNICOOPAGI and KIAKI

Perspectives

Regarding the possibility of maximisation of production of wheat in Nyaruguru district the KIAKI cooperative has new orientation in facilitating the production organic manure by providing small livestock to every member. The purpose of KIAKI is to increase the productivity of wheat by encouraging its members to use recommended fertilisers and technical practices. The use of modern threshers and winnowers for reducing loss in post harvest and increase the quality of wheat is major concern for KIAKI cooperative as said the vice president of the cooperative. As proposed the president of KIAKI the plan of commercialisation of lime is also the priority of the cooperative.

The UNICOOPAGI has started the feasibility study of installation of small factory of wheat which can help in processing and also facilitate in maximisation in buying of all produce of farmers. In collaboration with its partners the union plans to renovate different storage facilities of its cooperatives in order to delay the time of selling wheat so they can increase farmer's income from wheat. The formal contract with UNICOOPAGI is planned to be collateral for KIAKI in bank for accessing to loans and this facilitate the payment of wheat farmers through bank transfers. The major concern for both UNICOOPAGI and KIAKI is to reduce the production cost of one kg

of grain wheat by applying different techniques in wheat production and using the high yielding seeds.

SWOT analysis

The following table presents the SWOT analysis of the business case.

Table 4.1.2: SWOT analysis of the business case between UNICOOPAGI and KIAKI

<p><u>Strengths</u></p> <ul style="list-style-type: none"> . Demand far exceeds supply in the area . Some cooperatives are well organized and have storage facilities . Good policies in wheat production . Many stakeholders involved in wheat production 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> . Very low volumes and low productivity of wheat . Inability to dry down to required moisture level (14%) for most farmers . Wheat considered lower quality by wheat millers . Quality further compromised by high content of impurities incurred during threshing, winnowing and drying. . Price setting challenges both farmer and UNICOOPAGI. . Price fluctuates during the year . Lack of adequate drying and storage facilities . Lack of lime for soil acidity correction . Threshing and winnowing mostly manual . Closure of some wheat mill such as Nyungwe mill. . Poor coordination of stakeholder in wheat production.
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> . Training of wheat producers in integrated pest management of wheat rust could reduce losses . Appropriate technology such as threshers and winnowers could improve quality . Other uses of wheat, such as porridge could increase demand and market 	<p><u>Threats</u></p> <ul style="list-style-type: none"> . Imported wheat of better quality and available in quantities required by flour mills . inadequate relationships between producers and UNICOOPAGI discourages wheat producers . Strong assistance to cooperatives provided by donors and project which currently ended its subsidies . UNICOOPAGI is one big market wheat

. Climate favourable for producing wheat twice in year (season A and B). . wheat is a staple food for household in the area	. lack of alternative strong buyers who can buy all production at good price
--	--

4. 2. Survey results

Data from scored questionnaire were entered in excel work book which gave one table and two graphs per challenge area. Produced graphs indicate the average score and level agreement on each statement per challenge area between farmers and UNICOOPAGI.

4.2.1. Access to inputs

The following table 4.2.1 presents all statements scored by wheat farmers and UNICOOPAGI in accessibility to inputs. The results score for every statement are shown in figure 4.2.1 and 4.2.2.

Table 4.2.1: Statements in accessibility to inputs

1	Access to inputs/statements	Remarks
1.1	Seeds of different wheat varieties are available to farmers	Highly scored for both sides
1.2	The cost of improved seeds is affordable to farmers	High score for UNICOOPAGI, low score for KIAKI's farmers.
1.3	Sufficient lime is available to farmers	Lowly scored for both sides
1.4	The cost of lime is affordable to farmers	High score for UNICOOPAGI, low score for the farmers
1.5	The cost of fertilizer is affordable to farmers	Very lowly scored for both sides but farmers very far less than UNICOOPAGI
1.6	Adequate pesticides are available in the wheat growing areas	Very lowly scored for both sides but farmers very far less than UNICOOPAGI
1.7	The cost of pesticides is affordable to farmers	Highly scored by UNICOOPAGI and lowly scored by farmers
1.8	Farmers have access to credit to buy inputs	Highly scored by UNICOOPAGI and lowly scored by farmers
1.9	Banks are interested to provide loans for production	low scored for both sides

It can be observed in the figure below that farmers and UNICOOPAGI present almost the same score to insufficient lime and its high cost to farmer. There is a big difference in scoring “farmers have access to credits to buy input” and “banks are interested to provide loans for wheat production”. Farmers and UNICOOPAGI scored these statements respectively at 32% and 66.7%. Both sides gave very low scores on affordability to the cost of fertilizers and availability to adequate pesticides to farmer. The average score for all statements for both sides is lower at 45.5%.

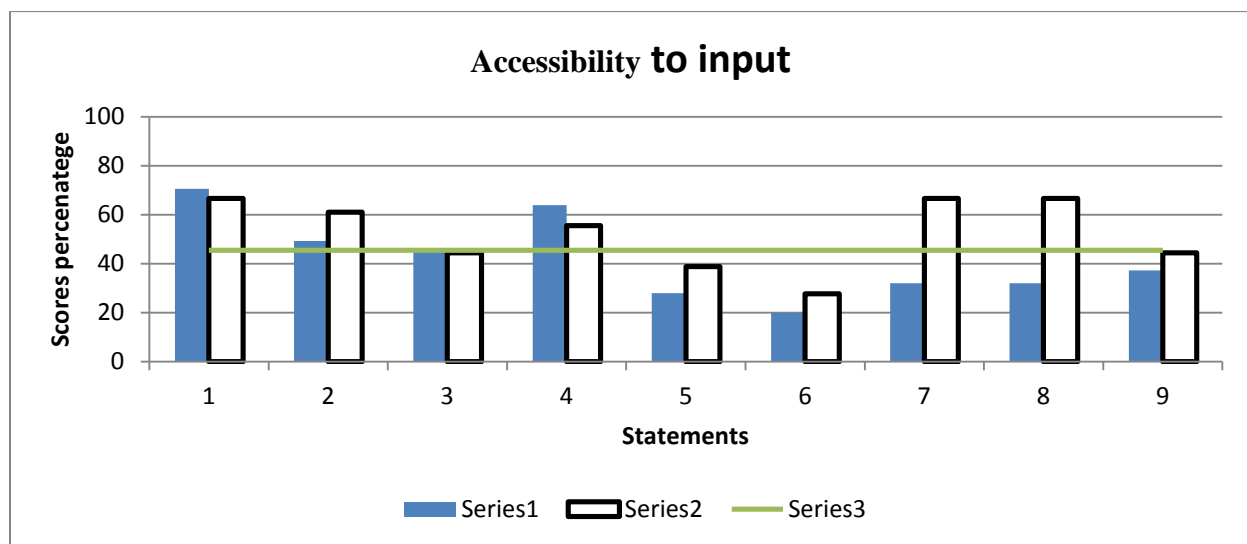


Figure 4.2.1: Average score per statement on accessibility to inputs

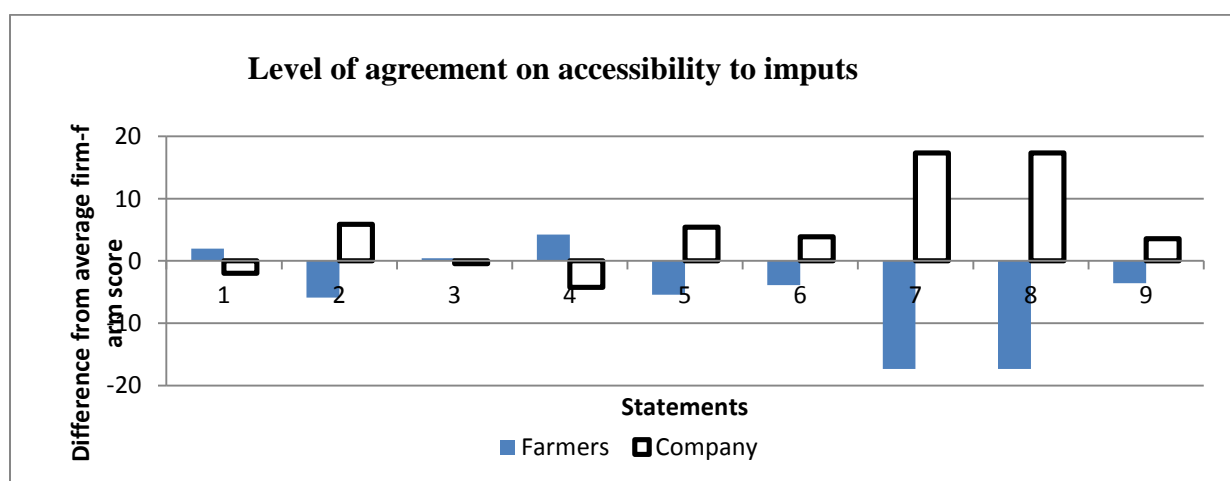


Figure 4.2.2: Level of agreement on accessibility to inputs

There is big difference on level of agreement on “farmers have access to credits to buy input” and “banks are interested to provide loans for wheat production”. Whilst for the statement 3 famers and UNICOOPAGI agree to insufficient lime to farmers.

4.2.2. Production and yield

The following table 4.2.2 presents all statements scored in production and yield. The results score for every statement in production and yield are shown in figure 4.2.3 and 4.2.4.

Table 4.2.2: statements in production and yield

2	<i>Production and yield /statements</i>	<i>Remarks</i>
2.1	Farmers use the best wheat varieties	Very high scores for farmers, lowly scored by UNICOOPAGI
2.2	Farmers rotate wheat with other crops	High score for both sides but farmers have less scores than UNICOOPAGI
2.3	Farmers use fertilizer as recommended by agronomists	Highly scored by the union , low score for farmers
2.4	Farmers optimize the use of farmyard manure	High score for farmers , low score for union
2.5	Also without government subsidy, farmers would use fertilizers	High score for farmers , low score for union
2.6	Farmers apply enough lime to address the issue of acid soils	Low score for both sides
2.7	Farmers apply pesticides in time to protect their wheat	Lowly scored for both side but the union has very less score than farmers
2.8	Farmers apply erosion control measures	Very lowly scored for both sides
2.9	Wheat production in Nyaruguru is increasing	Very high score for the union , high score for farmers
2.10	Individual farmers' yields are increasing	High score for union low score for famers

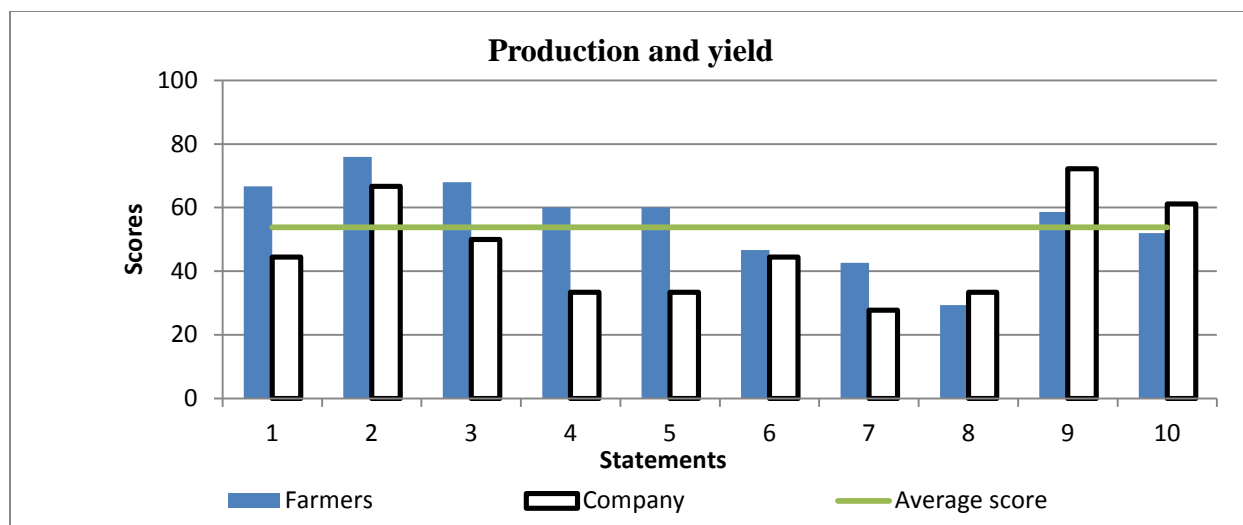


Figure 4.2.3: Average score by statements on production and yield

The average score firm-farmer for the challenge area on production and yield is high at 53.8%. The farmers scored all statement at 57.1 % high than the scores of UNICOOPAGI observed at 50.6 %. The highest score for farmers is 76.0 % for rotation of wheat with others crops whilst the highest for UNICOOPAGI is scored at 72% for an increase of wheat production in Nyaruguru district. On statements 5 and 6 lowly scored by UNICOOPAGI at almost 50% less than farmers.

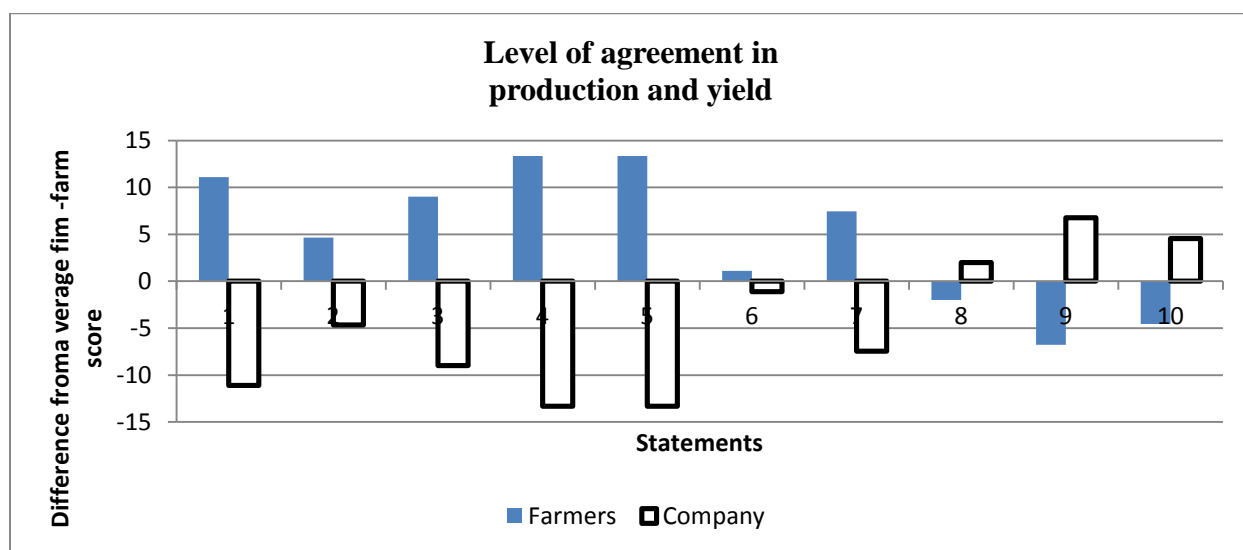


Figure 4.2.2: Level of agreement on production and yield

From the above graph both farmers and UNICOOPAGI almost agree on the statement 6 and 8 respectively on applying insufficient lime to address the issue of acid soil and insufficient erosion

control measures. The high difference in agreement between KIAKI and UNICOOPAGI is observed on statements 1, 3, 4 and 5.

4.2.3. Functioning of KIAKI (cooperative)

The following table 4.2.3 presents all statements scored by wheat farmers and UNICOOPAGI. The results score for every statement are shown in figure 4.2.5 and 4.2.6.

Table 4.2.3: Statements in functioning of KIAKI

3	<i>Functioning of cooperative(KIAKI)/statements</i>	<i>Remarks</i>
3.1	KIAKI operates democratically according to its constitution and by-laws	Highly scored by both sides
3.2	Decisions of KIAKI meetings are well implemented	Same score by both sides
3.3	The KIAKI production committee functions very well	High score by both sides
3.4	All members are informed about cooperative financial issues	UNICOOPAGI has high score
3.5	KIAKI always repays contracted loans	High score for both sides
3.6	KIAKI organizes wheat collection very well	High score for both sides
3.7	UNICOOPAGI is happy with the way the wheat farmers cooperative is managed	High score for both sides
3.8	KIAKI cooperative leaders always represent the interests of the members	High score for both sides
3.9	All members of the family benefit from the sales of wheat	High score for both sides
3.10	Wheat revenues are invested in other crops and activities	Highly scored for both sides

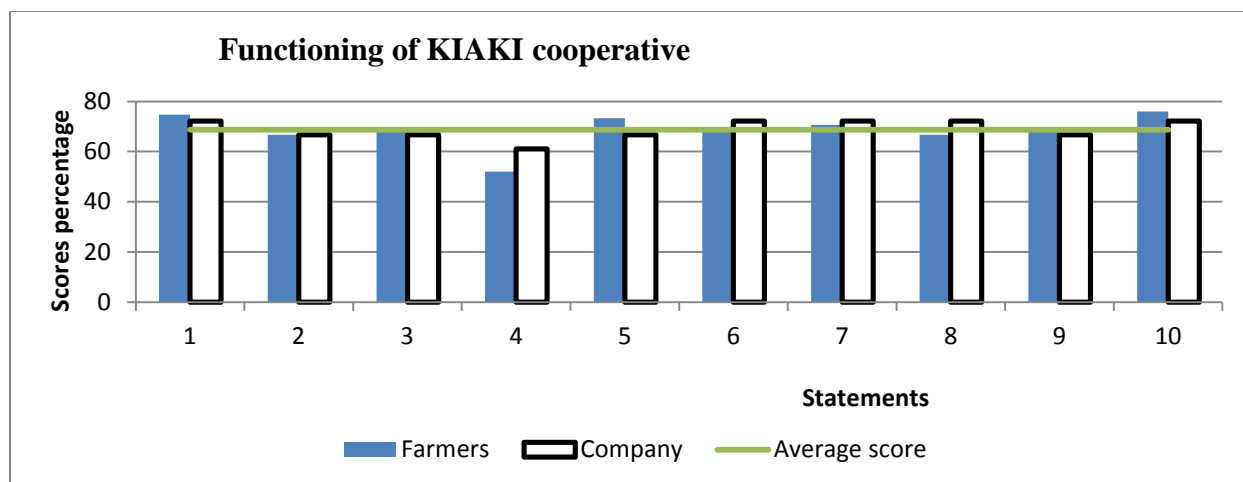


Figure 4.2.5: Average score per statement on functioning of KIAKI cooperative

The average firm-farmers statement score for all statements in functioning of KIAKI cooperative is high at 68.7%. On the statement 2 farmers and UNICOOPAGI have the same score. Two statements 4 and 5 looks like having difference in scoring. For others statements there are no significant difference in scoring for both sides. It can be observed from the graph that all statements were highly scored by both farmers and UNICOOPAGI

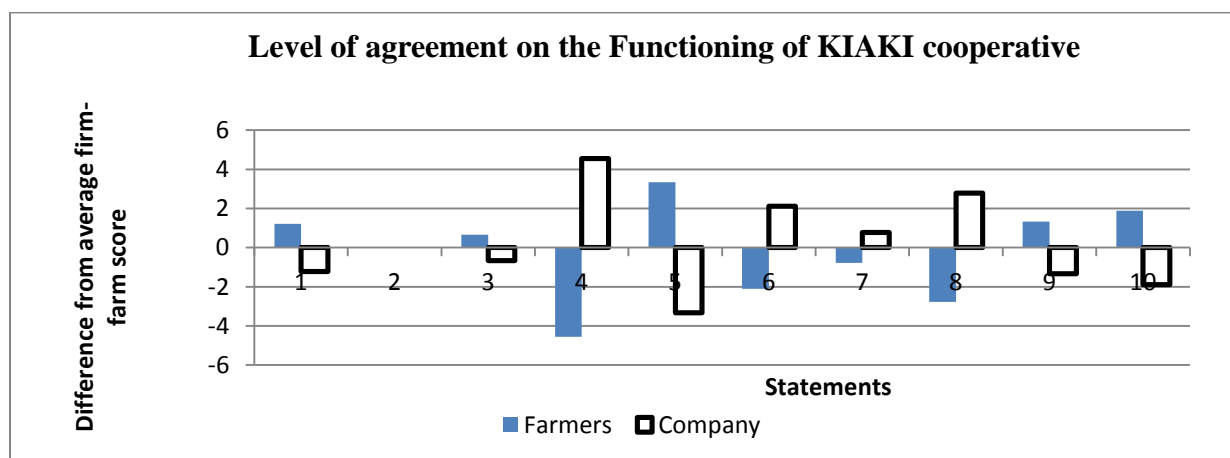


Figure 4.2.6: Level of agreement on functioning of KIAKI cooperative

On statements 4 and 5 the level of agreement presents differences which are not very high.

4.2.4. Functioning of UNICOOPAGI

The following table 4.2.4 presents all statements in functioning of UNICOOPAGI. The average results score per statement are shown in figures 4.2.7 and 4.2.8.

Table 4.2.4: Statements in functioning of UNICOOPAGI

4	Functioning UNICOOPAGI statements	Remarks
4.1	UNICOOPAGI distributes wheat inputs very well	High score for both side but farmers have high score than union
4.2	Farmers learn a lot on the farmer field schools of UNICOOPAGI	Very low score for farmers, high score for the union
4.3	UNICOOPAGI has provided farmers sufficient know-how on wheat production	Low score for farmers, high score for UNICOOPAGI
4.4	I know the criteria for the selection of farmers for training	Lowly scored by famers highly scored by UNICOOPAGI
4.5	KIAKI and other cooperatives define what services UNICOOPAGI should provide	Highly scored by both side
4.6	Benefits of UNICOOPAGI wheat trading are redistributed to farmers	High score for UNICOOPAGI, low score farmers
4.7	UNICOOPAGI facilitates wheat farmers to get bank loans	Highly scored by both side
4.8	Farmers are happy with the services offered by the UNICOOPAGI	Highly scored by both sides

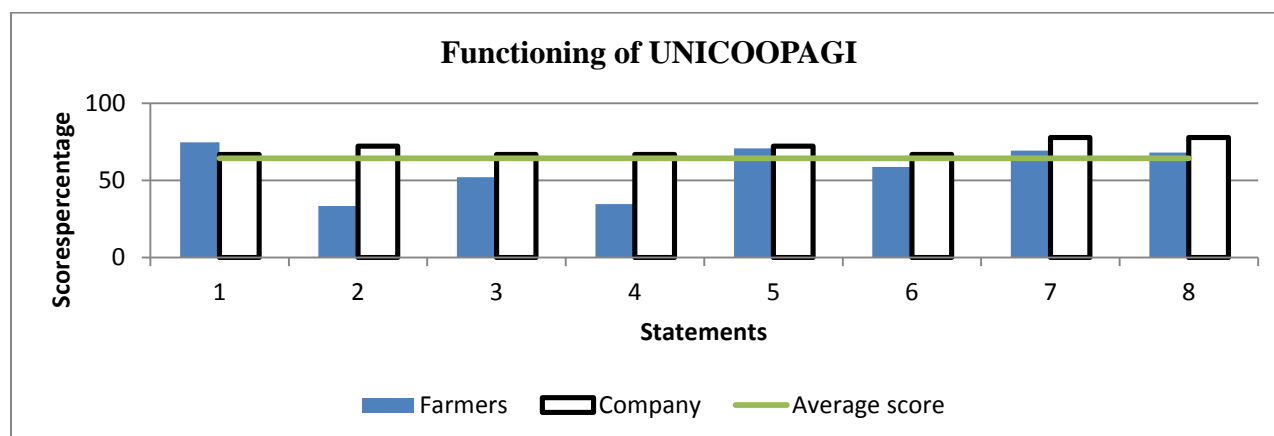


Figure 4.2.7: Average score per statement on the functioning of UNICOOPAGI

The average score of farmers for all statement on the functioning of UNICOOPAGI is 57.7% whilst the average for UNICOOPAGI for its functioning is 70.8%. There are big differences in

scoring for the statement 2 and 4 where farmers' scores are very low than UNICOOPAGI' scores. The highest score for farmers is done on distribution of input by UNICOOPAGI at 74.7%. For UNICOOPAGI two statements (7 and 8) were given a same highest score at 77.8%. The average firm-farmer statement score is high at 64.2%%.

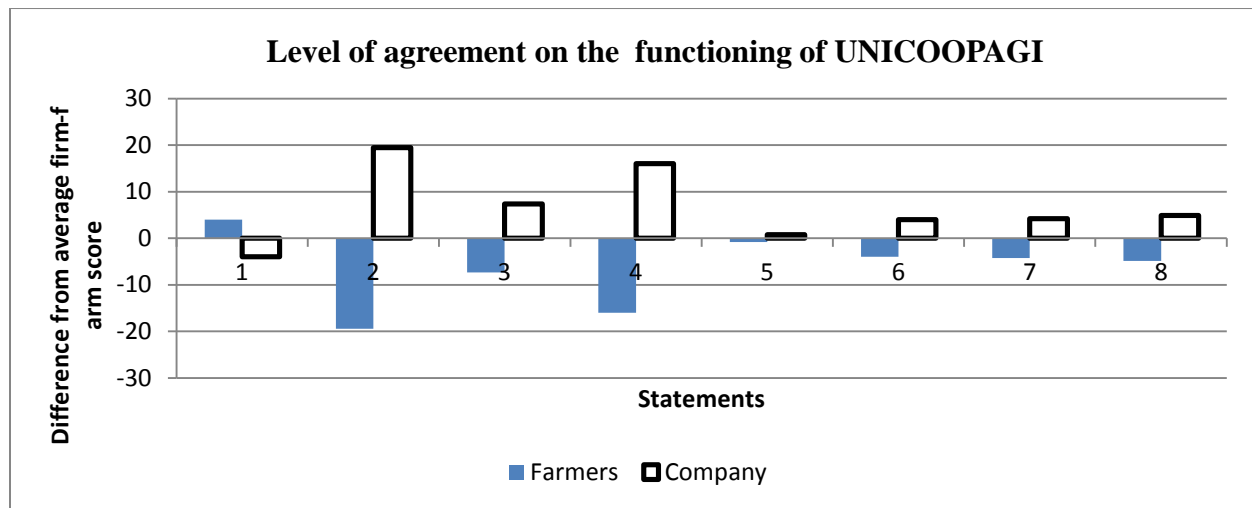


Figure 4.2.8: Level of agreement on the functioning of UNICOOPAGI.

From the above graph it can be observed big difference on level agreement in scoring 2, 3, and 4 statements. For other statement there are no significant differences in level of agreement or scoring.

4.2.5. Contract between UNICOOPAGI and KIAKI

The following table presents all statements scored by both Farmers and UNICOOPAGI. The percentage of average score and level of agreement in contract between KIAKI and UNICOOPAGI are illustrated respectively in figure 4.5.9 and 4.5.10.

Table 4.2.5: Statements in contract between UNICOOPAGI and KIAKI

5	Contract between UNICOOPAGI and KIAKI	Remarks
5.1	I understand the content of the contract between UNICOOPAGI and KIAKI	Lowly scored by famers, highly scored by the union.
5.2	KIAKI and UNICOOPAGI jointly elaborate the contract	High score for farmers, low score for UNICOOPAGI,
5.3	Both contractors (UNICOOPAGI and KIAKI) keep copies of the contract	High score for both sides
5.4	I know the production cost of 1kg of wheat	Highly scored by the union and lowly scored by famers
5.5	The wheat price stipulated in the contract was negotiated between UNICOOPAGI and the wheat farmers	low score for famers, high score for UNICOOPAGI
5.6	UNICOOPAGI is happy about the relationship with the farmers	High scores for both sides
5.7	The price paid to farmers covers the production cost and allows for a benefit	Low score for farmers high scores for UNICOOPAGI
5.8	The farmer cooperative follows the rules laid down in the Contract)	High score for famers, low score for UNICOOPAGI
5.9	UNICOOPAGI follows the rules laid down in the contract	High score for famers, low score for UNICOOPAGI

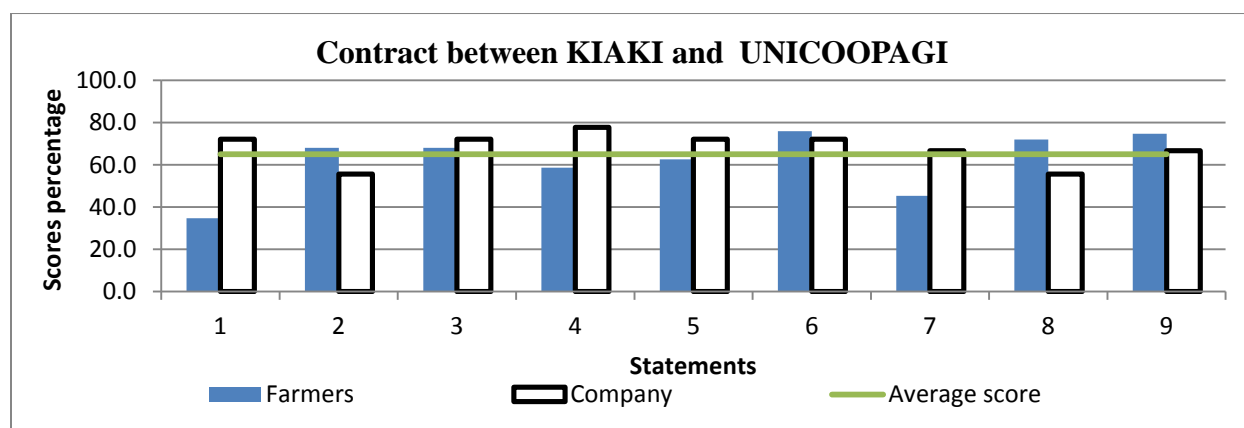


Figure 4.2.9: Average score per statement on contract between KIAKI and UNICOOPAGI

High significant difference in scoring is observed on the first statement. Farmers scored this statement at 34.7 whilst the union scored it at 72.2%. There are also significant scores on 2, 4, 7 and 8 statements. The average scores for farmers and UNICOOPAGI for all statement are respectively high at 62.2% and 67.9%. The average firm-farmers statement score on this challenge area is high at 65.1%

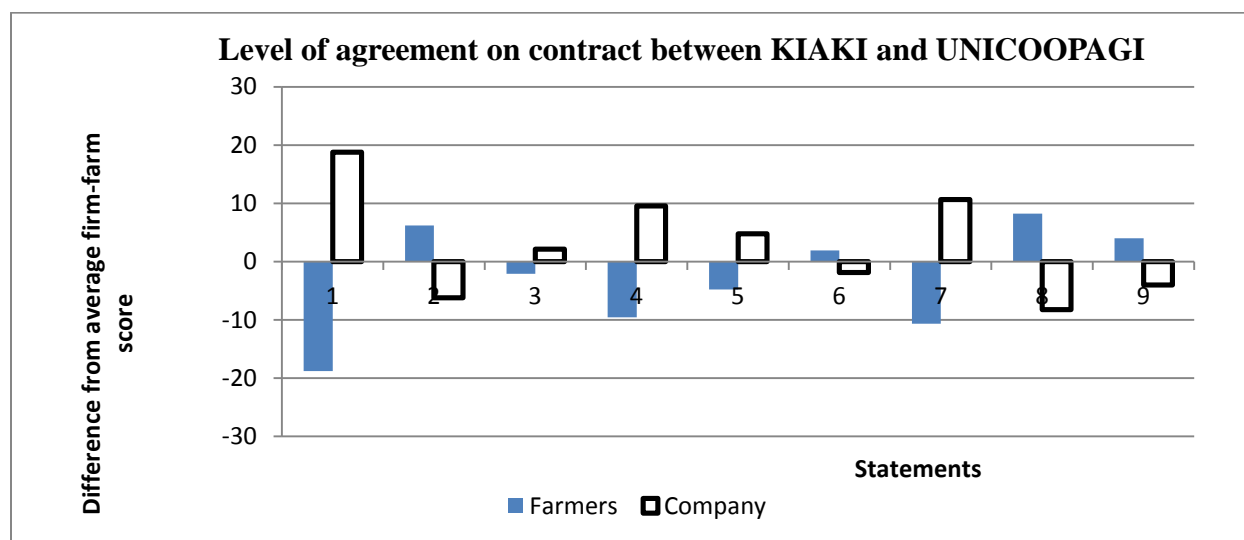


Figure 4.2.10: Level of agreement on contract between KIAKI and UNICOOPAGI

It can be observed on these graphs the high difference on scoring and level of agreement on the first statement. There are differences also in level of agreement for the statements 4, 7 and 8.

4.2.6. Post-harvest facilities and quality management

The following table represents all statements scored by wheat farmers and UNICOOPAGI. The results score for every statement in post-harvest facilities and quality management are shown in figure 4.2.11 and 4.2.12.

Table 4.2.6: Statements in post-harvest activities and quality management

6 Post-harvest activities and quality management /statements		Remarks
6.1	Transport of wheat is easy for cooperative farmers	Low score for farmers, moderate score for the union
6.2	Drying is professionally done	High scores for farmers, lowly scored by UNICOOPAGI
6.3	Farmers are able to dry down to required moisture level	High score for both side
6.4	Threshing is professionally done	High scores for farmers, lowly scored by UNICOOPAGI
6.5	Farmers produce wheat without any impurities	Highly scores for farmers, lowly scored by UNICOOPAGI
6.6	KIAKI has adequate storage facilities	Lowly scored by both side but famers score far less than for UNICOOPAGI
6.7	Member cooperatives use the UNICOOPAGI threshers	Very lowly scored by both side but famers score far less than for UNICOOPAGI
6.8	Member cooperatives use the UNICOOPAGI winnowers	Very low score for farmers, low score for UNICOOPAGI
6.9	Member cooperatives use the storage facility of UNICOOPAGI	Low score for farmer , high score for UNICOOPAGI
6.10	KIAKI benefits from the truck of UNICOOPAGI	Low score for farmer, high score for UNICOOPAGI

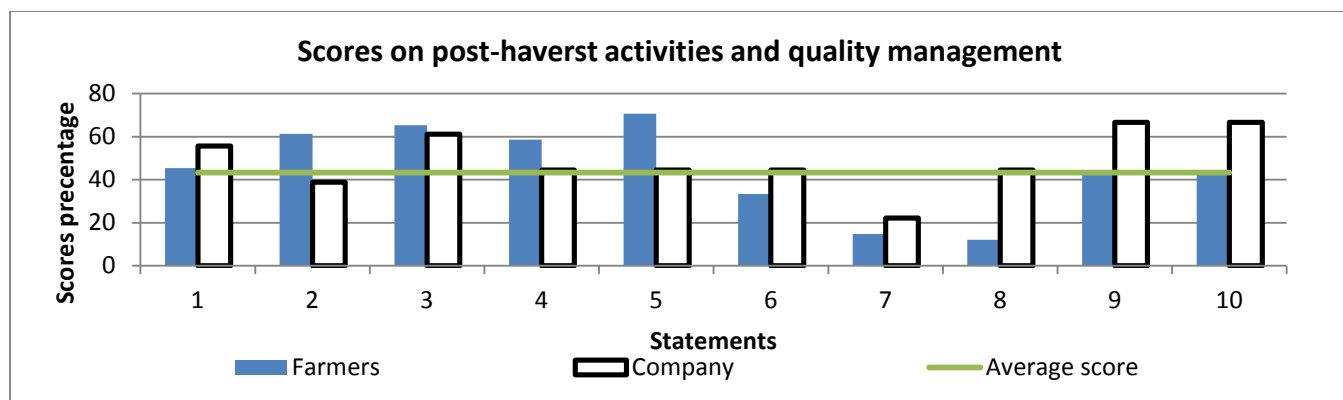


Figure 4.2.11: Average score per statement on post-harvest activities and quality management

It can be observed from this challenges area differences in scoring for many statements. Differences are remarkable on statements 2, 5, 8, 9 and 10. The average firm-farmer statements score is low at 43.2%. Both sides have averages for all statement at low scores. Farmers' average score for all statement is low at 42.0 whilst UNICOOPAGI' average score also is low at 44.4%. The score for farmer is observed on eighth statement and its highest score is 70.7% on the fifth statement. Two statements (9 and 10) are high scored at 66.7% by UNICOOPAGI.

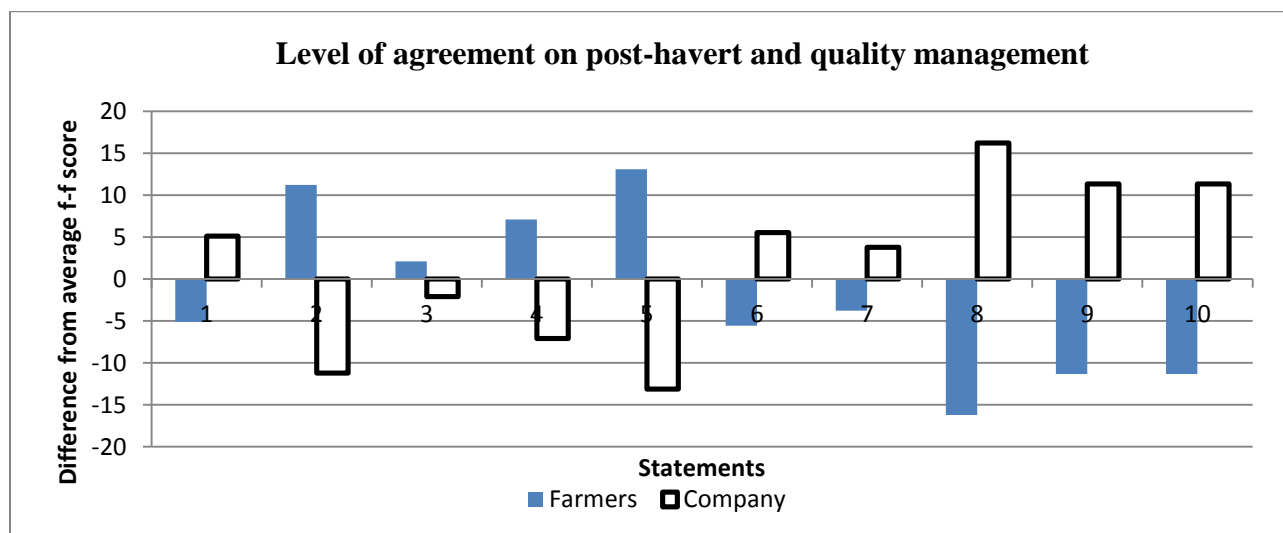


Figure 4.2.12: Level of agreement on post-harvest facilities and quality management

There are high differences in level of agreement 2, 5, 8, 9 and 10 statements. For others statements there are no significant differences in level of agreement.

4.2.7. Commercial relations

The following table presents all statements scored by farmers and UNICOOPAGI in commercial relations. The percentages of average score per statement by UNICOOPAGI and KIAKI farmers are illustrated in figure 4.2.13 and the level of agreement presented also in figure 4.2.14.

Table 4.2.7: Statements in commercial relations

Commercial relations		Remarks
7		
7.1	UNICOOPAGI is clear about the quantity of wheat it wants to buy from the farmers' cooperative	High score for both side
7.2	UNICOOPAGI clearly informs wheat farmers about quality requirements	Highly score by both side
7.3	UNICOOPAGI pays farmers a fair price	Low score for farmers, high score for UNICOOPAGI
7.4	Wheat farmers know the price at which UNICOOPAGI sells the wheat to its clients	Lowly score for farmers, low score for UNICOOPAGI
7.5	UNICOOPAGI pays wheat farmers at the agreed time	High score for both side
7.6	The appreciation of wheat quality is done professionally	Moderate score for both side
7.7	The reasons for the rejection of farmers' wheat quality are clear	Low score for farmers, high score for UNICOOPAGI
7.8	The farmer cooperative keep records of the wheat delivered to UNICOOPAGI	Low score for farmers, high score for UNICOOPAGI
7.9	I trust weighing scale used by UNICOOPAGI at the local selling point	Same score for both side
7.10	Wheat farmers are happy to sell their produce to UNICOOPAGI	Same score for both side

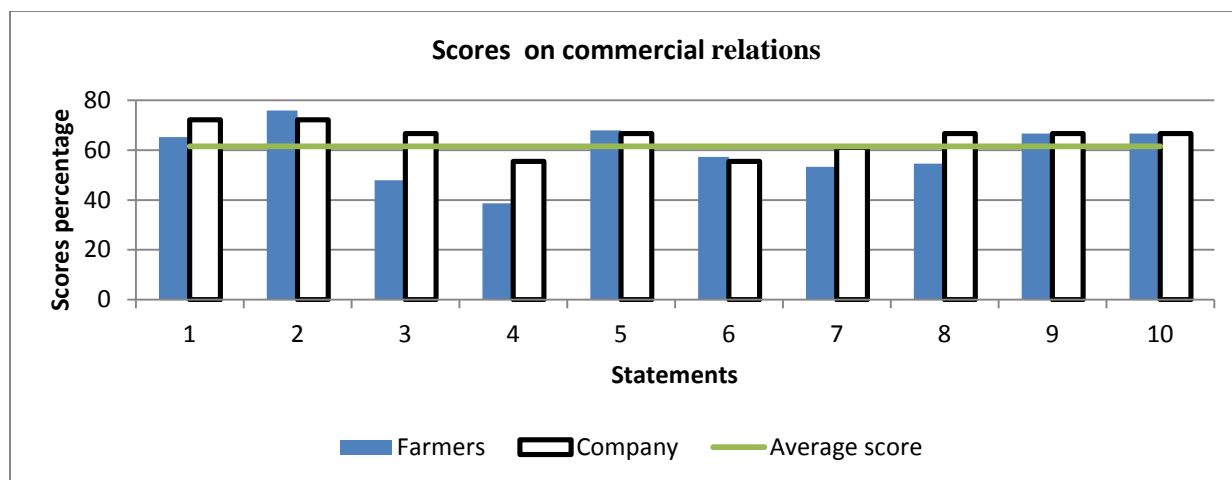


Figure 4.2.13: Average score per statement on commercial relations

Both sides score statements 9 and 10 high at 66.7%. The statement 4 very lowly scored at 38.7% by farmers while UNICOOPAGI scored it at 55.6%. The highest score is 76.0 % done by farmers on statement 2 whilst UNICOOPAGI' highest scores is 72.2% for two statements (1 and 2). The average farmer score for all statement is 58.0% whilst the average UNICOOPGI score for all statement is high at 65.0%. The average firm-farm statement score for all statement is 61.5%.

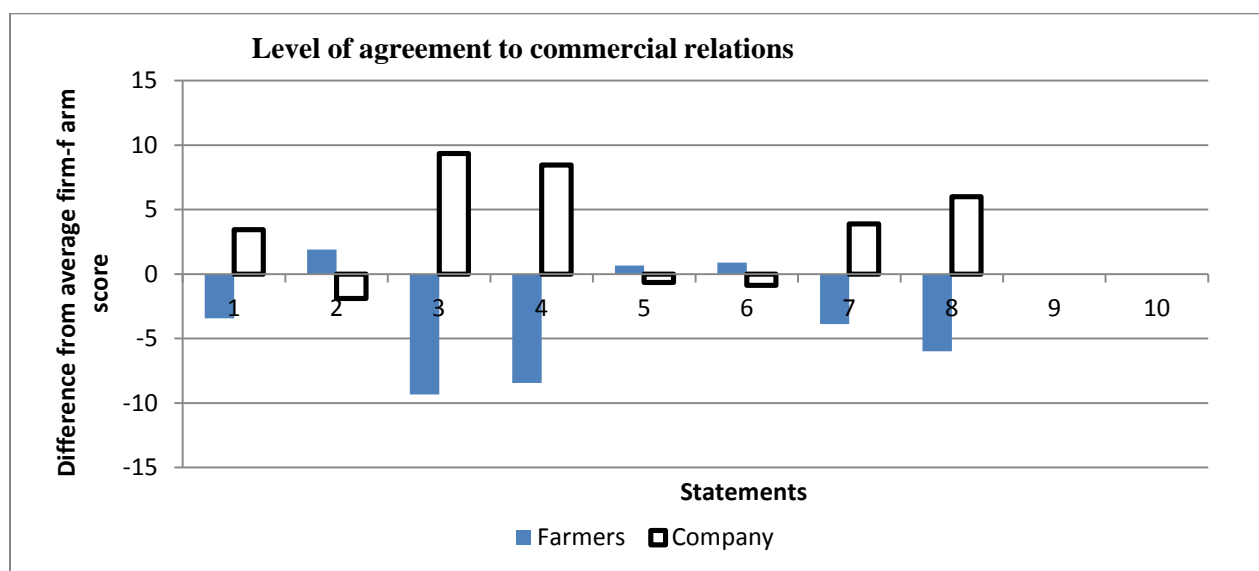


Figure 4.2.14: Level of agreement on commercial relations

High differences in scoring the statements 3, 4, 7 and 8 are observed on this graph. The statements 9 and 10 were scored at same score and the difference in agreement is zero. The

statements 5 and 6 have no significant difference in scoring and level of agreement for both sides. For other statements differences in scoring can be observed but not too high.

4.2.8. Stakeholder network and collaboration

The following table 4.2.8 presents all statements scored by farmers and UNICOOPAGI in stakeholder's network and collaboration. The percentages of average score per statement by UNICOOPAGI and KIAKI 'farmers are illustrate in figure 4.2.15 and the level of agreement presented also in figure 4.2.16.

Table 4.2.8.: Statements in stakeholders' network and collaboration

8	<i>Stakeholder network and collaboration</i>	<i>Remarks</i>
8.1	The input procurement systems works properly	High score for both sides
8.2	UNICOOPAGI and government agronomists work well together	High score for both sides
8.3	Wheat farmers set the priorities for wheat research	High score for farmers low score for UNICOOPAGI
8.4	Banks and MFI's are interested to invest in the wheat sector	Low score for farmers high score for UNICOOPAGI
8.5	Other buyers want to source wheat in Nyaruguru District	High score for both sides
8.6	KIAKI and UNICOOPAGI work intensively together with wheat millers	Low score for farmers, and very lowly scored by UNICOOPAGI
8.7	Local wheat is of better quality than imported wheat	High score farmers, lowly scored by UNICOOPAGI
8.8	Stakeholders in the wheat sector regularly meet and discuss challenges to address	Low score for farmers and high score for UNICOOPAGI

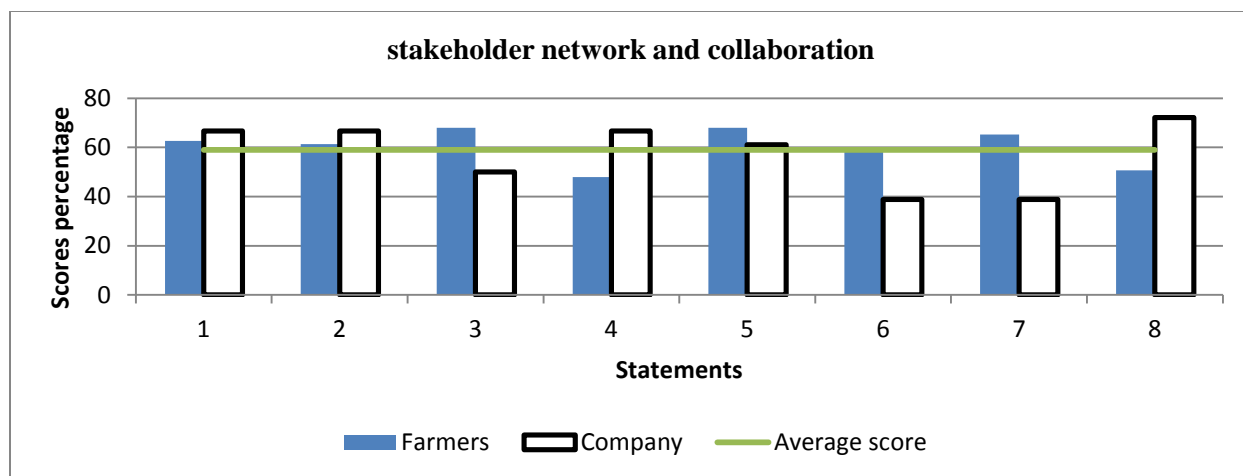


Figure 4.2.15: Average score per statement on stakeholders' network and collaboration

The average score for firm-farm for all statement is 59 %. Farmer' scores for all statement are 60.3 % whilst the average score for all statement for UNICOOPAGI is 57.6 %. There significant differences in scoring statements 3 to 8 statements. For the first and second there are no significant differences in scoring for both sides.

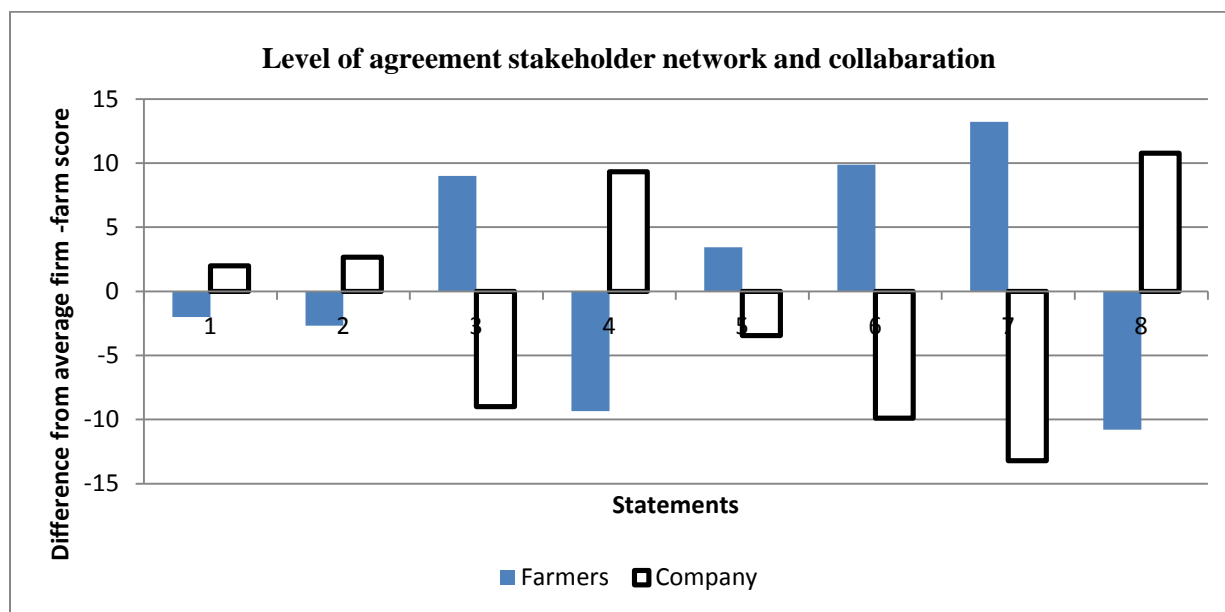


Figure 4.2.16: Level of agreement on stakeholder network and collaboration

The differences in scoring and high levels of disagreement are observed on statements 3, 4, 6, 7 and 8. For others statements differences in scoring are not significant.

4.2.9. Perspectives

The following table 4.2.9 presents all statements scored by farmers and UNICOOPAGI in challenge area on perspectives. The percentages of average score per statement by UNICOOPAGI and KIAKI farmers are illustrate in figure 4.2.17 and the level of agreement presented also in figure 4.2.18.

Table 4.2.9.: statements in perspectives

9	Perspectives	Remarks
9.1	Wheat yields per hectare can double	Highly scored for both sides
9.2	Modern threshers and winnowers can improve quality	Highly scored for both sides
9.3	UNICOOPAGI can facilitate procurement of lime in bulk	Low score for farmers and high score for UNICOOPAGI
9.4	More intensive relations with wheat millers can improve market perspectives	High score for both sides but far less than UNICOOPAGI
9.5	Improved storage and delayed selling can increase farmers' wheat income	High score for both side but farmers had more scored than UNICOOPAGI
9.6	KIAKI can use its contract with UNICOOPAGI to access loans	High score for both sides
9.7	Production costs of local wheat can seriously decrease and compete with imported wheat	low score for both sides
9.8	UNICOOPAGI can pay wheat farmers through bank transfers	High score for both sides

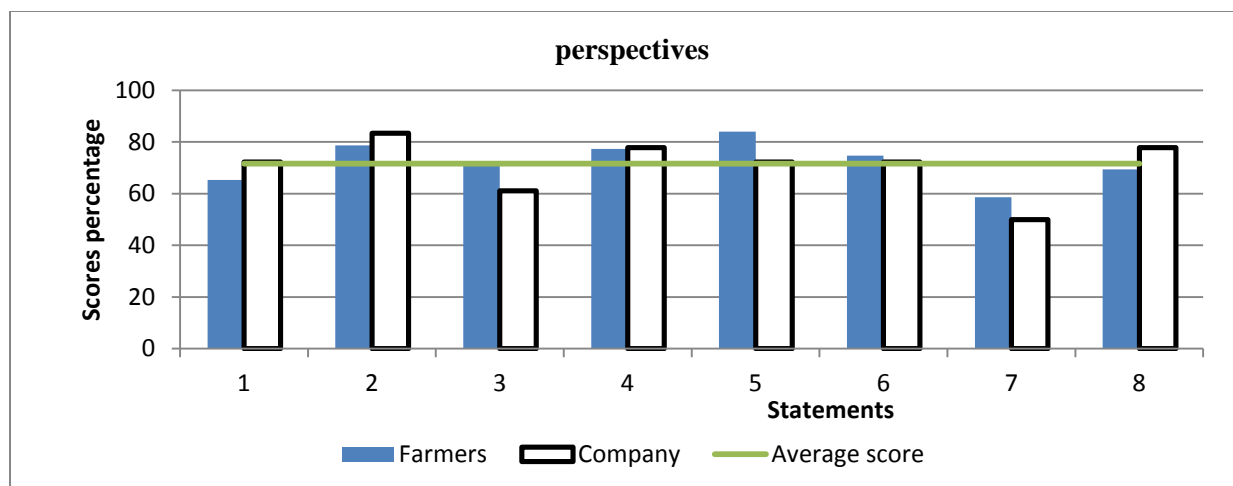


Figure 4.2.17: Average score per statement on perspectives

The average score for farmers for all statement on this challenge area is 72.5 % whilst it is 70.8 % for UNICOOPAGI. The average firm- farmer statement score is high at 71.7%. Only on the seventh statement the score is low for both sides other statements are highly scored for both sides. The highest score for farmer is observed on statement 5 scored at 84.0 % and the highest for UNICOOPAGI is observed on statement 2 scored at 83.3 %.

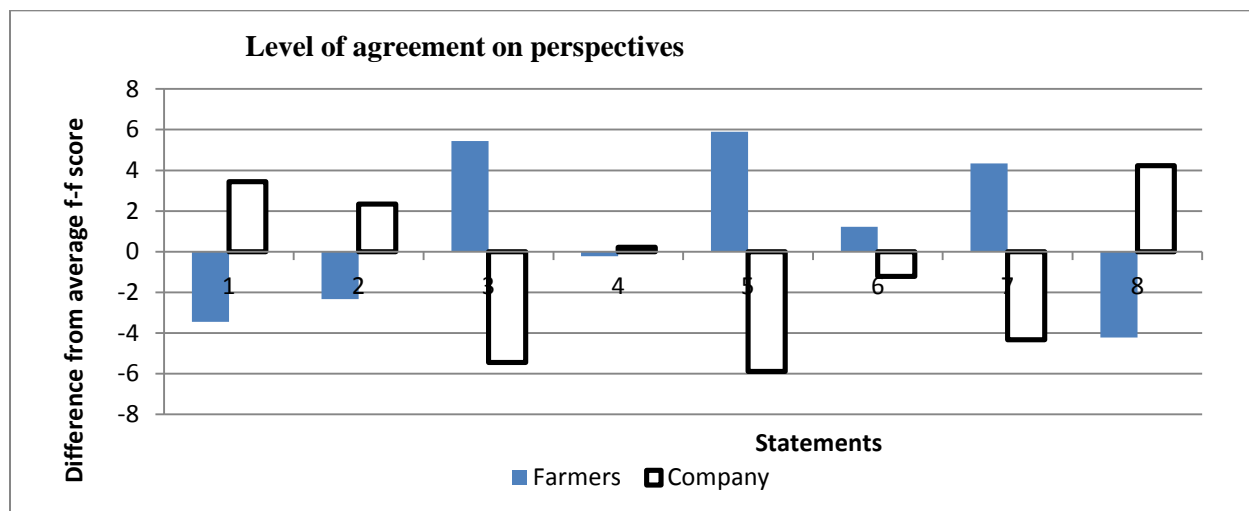


Figure 4.2.18: Level of agreement on perspectives

Significant differences are observed on these graphs at 3, 5, 7 and 8 statements. There is no significant score on statement 4.

4.3. Debriefing results

Some statements for different challenge areas have been scored differently by KIAKI members and UNICOOPAGI. These differences were discussed in debriefing meeting with KIAKI members and staff of UNICOOPAGI. KIAKI's members and staff of UNICOOPAGI appreciated the tool used in collecting information from their cooperative and union. They also appreciated coherence steps to get insight their relationships. ***The debriefing meeting was real moment to discuss about our problems and come up with solutions” said a member of KIAKI.*** However the tool is is time consuming in short period for a farmer and staff who had other activities plans. The results of discussions are presented in the table 4.3.1

Table 4.3.1: Action for improving firm farm relationships between KIAKI and UNICOOPAGI

Challenge area	Statements scored lowly or highly, highly disagreement	Action of KIAKI for improving firm–farm relationships	Action of UNICOOPAGI for improving firm–farm relationships
Access to inputs	<ul style="list-style-type: none"> . The cost of improved seeds is affordable to farmers . Sufficient lime is available to farmers . The cost of lime is affordable to farmers . The cost of fertilizers is affordable to farmers. . Adequate pesticides 	<ul style="list-style-type: none"> . Multiplication of improved seeds, conservation their own seed after harvest for next season. . Putting in place a selling point of lime for farmers. . Farmers to be guaranteed by UNICOOPAGI to suppliers of lime, participation in roads maintenance. . Negotiating a selling point of fertilizer for farmers with SOPAV. . Farmers getting pesticides 	<ul style="list-style-type: none"> . Continuous facilitation of multiplication of improved seeds, teaching farmers technique in seeds conservations. . Procurement of lime in bulk to cooperatives. . The union links farmers to lime suppliers, and does advocacy to government to subsidise lime. . Training to farmers on fertilizer retailing and its conservations in stock. . Putting in place chemical shop in the area, training on

	<p>are affordable in the wheat growing areas.</p> <p>. Farmers have access to credit to buy input</p> <p>Banks are interested to provide loans for wheat production</p>	<p>from chemical shop of UNICOOAPGI,</p> <p>. Farmers have to changes their negatives attitudes towards credits.</p> <p>. Applying adequate agricultural practices in order to increase the production and attract banks</p>	<p>conservation of chemicals to members of cooperatives.</p> <p>. Training to initiation on borrowing loans and on management of input credit. Facilitating farmers to get loans from TWIZIGAMIRE microfinance</p> <p>. UNICOOAPGI Links banks with cooperatives and interests bank in wheat production.</p>
Production and yields	<p>Farmers use the best varieties.</p> <p>. Farmers use fertilizers and farmyard as recommended by agronomists</p> <p>. Farmers apply erosion control</p> <p>Without government subsidy farmers would use fertilizers</p>	<p>. Farmers multiply and conserve themselves their own improved seeds.</p> <p>. Farmers plan to change their attitudes toward the application of recommended fertilizer and grow small livestock.</p> <p>. Farmers apply agro forestry techniques in their farms.</p> <p>. Farmers start to save for future fertilizers</p>	<p>. The union facilitate farmers to get improved seed and trains them how to conserve seeds.</p> <p>. UNICOOAPGI plan to increase farmers' field school and to facilitate farmers small livestock through its partners</p> <p>. The union facilitates farmers to access to agro forestry seeds and creates bench terraces through its partners</p> <p>. The union facilitates farmers to join banks and microfinances</p>
Functioning of KIAKI	KIAKI well implement the decision from	Farmers continue discussions about their decisions before its	Continuous of strong supervision of UNICOOAPGI

	<p>cooperative meeting</p> <p>UNICOOPAGI appreciate a well-functioning of KIAKI.</p>	<p>implementation</p> <p>Farmers support the new executive committee of the cooperative.</p>	<p>in partnership with local government in order to maintain and improve the actually well- functioning in different cooperatives.</p>
Functioning of UNICOOPAGI	<p>Small number of farmer field school</p> <p>sufficient know-how are provided to farmers</p> <p>Inadequate dissemination of information</p>	<p>. Production committee installs itself farmer' fields school</p> <p>. Farmers learn, test and apply agricultural practices provided by the UNICOOPAGI.</p> <p>. The executive committee accept to inform farmers in their regular meeting about the commitment agreed with UNICOOPAGI.</p> <p>Selecting participant to training through farmers 'meeting.</p>	<p>. Agronomists facilitate the installation of farmers field school at different locations</p> <p>. Competition between farmers and rewarding progressive farmers.</p> <p>. Participation in regular meeting of cooperatives and sending official document to cooperative</p> <p>Elaboration of criteria for attending different trainings</p>
Contact between UNICOOPAGI and KIAKI	<p>. KIAKI and UNICOOPAGI jointly elaborate the contract</p> <p>I know the production cost of 1 kg of wheat</p>	<p>. Farmers select representatives in contract elaboration and the contract be approved by the general assembly of the cooperatives. The representatives of farmers must keep the copy of contract.</p> <p>. The production committee of the cooperative teach farmers how to calculate the production</p>	<p>. The union drafts a contract and discuss it with farmers' representatives and signs the contract with an approval from general assembly of farmers.</p> <p>The union provides trainings on production cost to production committee and supervise the trainings to</p>

	The price paid to farmers cover the production cost and allows for benefits	cost . Farmers use high yielding varieties, apply recommended fertilizers and participate in roads maintenance in order to reduce the production cost	farmers with an agronomist. The union facilitates farmers to access to improved seeds and accepts to shows the price to its clients in price negotiation meeting.
Post- harvest facilities and quality management	. Drying wheat at standard moisture and without any impurities . Farmers use UNICOOPAGI threshers and winnowers Farmers use the storage of UNICOOPAGI and benefit from its truck	. Farmers accept to dry wheat on sheeting and on constructed drying ground by government . Farmers accept to pay the running cost of threshers and winnower . Farmers accept to pay the rent in using the truck and storage of the union	. UNICOOPAGI provides on loans of sheeting to farmers and tests the quality with adequate material . UNICOOPAGI facilitates the transport of threshers and winnowers to farmers and pays the technician. UNICCOPAGI accept to mobilise fund for rehabilitation of stock of cooperatives through its partners
Commercial relations	UNICOOPAGI pays farmers a fair price The reasons of rejection of farmers wheat are clear Farmer are happy to	Farmers continue to reduce the production cost by using high yields varieties needed by wheat millers Farmers get information from their cooperative before delivering their wheat Continuous doing well and trusting each other in weighing	UNICOOPAGI accepts to negotiate the price by varieties with farmers. The union accepts to send officially the quality standard and the quantity it wants to buy at cropping stage. Continuous doing well and trusting each other in

	sell their wheat to the union and trust its weighing at scale at selling point		weighing. Facilitates farmers to record their sales
Stakeholder network and collaboration	<p>Wheat farmers set the priorities for wheat research</p> <p>Banks and microfinance are interested to invest in wheat production</p> <p>Working actively with wheat millers</p> <p>Local wheat is of better quality than imported wheat</p> <p>Stakeholder are regularly meet and discuss challenges to address</p>	<p>Farmers accept to learn from famer field school and collaborate with progressives farmers skilled by UNICOOPAGI</p> <p>Farmers attract investors by increasing their production of wheat</p> <p>Farmers wants to supply their produce to wheat millers through the union</p> <p>Farmer use all efforts to me the requirement of wheat quality</p> <p>Farmers attend regularly meeting by their representatives</p>	<p>Continuous to increase the numbers of farmers' field school on integrated pest management practice.</p> <p>UNICOOPAGI try to negotiate with banks to invest in wheat production and a guarantee for farmers</p> <p>The union want to cooperate with farmers in order to construct their own milling factory</p> <p>The union facilitate the modern thresher and winnower to increase the quality of wheat.</p> <p>UNICOOPAGI organises meeting on season preparation and harvest preparation and invites all stakeholder on farm level</p>
Perspectives	UNICOOPAGI and Farmers totally agree on perspectives	Farmers willingly want to cooperate with the union in using modern thresher and winnower and rehabilitation of stock	<p>UNICOOPAGI plans to support farmers to improve the quality of wheat and reduce loss in post-harvest</p> <p>The union plans to construct</p>

		<p>Farmers plans to sell input to farmers</p> <p>Farmers plans to adopted to high yielding varieties instead of Musama</p>	<p>a small milling factory and the feasibility study is already available</p> <p>Continuous promoting wheat production and advocating and attracting privates sectors to invest in wheat.</p>
--	--	--	---

5. DISCUSSION AND INTERPRETATION OF RESULTS

In this chapter data are discussed using a value chain analysis and food security dimensions: Availability, Accessibility, Utilisation and Sustainability and also according to challenge areas. The sources of information in the discussion are data processed and presented in the above chapter, the literature review and the observation done during field work. The overall score firm-farmers relationship for all challenge areas is presented at 59.9%. This shows a moderate relationship between UNICOOPAGI and KIAKI. For some specific challenge areas low scores were attributed by wheat farmers as presented in previous chapter and need a high attention by UNICOOPAGI.

5.1. Access to inputs

KIAKI' farmers and UNICOOPAGI agree on the availability of different varieties of wheat to farmers because it is distributed by the Government through its policies of promotion of six major crops in which wheat is included. The accessibility to some varieties such as *KS Mwamba and 161* is still a challenge for farmers because they are still in multiplication. ***“To obtain these varieties in its distribution by government, farmers are required to have 0.5 ha of plot, fertilizer (DAP and Urea) sufficient organic manure which are not easier to many farmers”*** said the president of KIAK.

The availability of lime to address soil acidity stressed farmers in wheat production. As observed in the area, and witnessed by farmers and UNICOOPAGI, there is no shop for lime in Nyaruguru district. The unavailability and inaccessibility of lime has presented a high cost to farmers and most of the time farmers resort to cultivating without it or to apply a small quantity of lime and as result very low production has been observed. Farmers and UNICOOPAGI scored at very low score the availability and affordability of pesticides in wheat growing, because there are no selling points of them in the area and their prices are very high. Even if pesticides are distributed by the government, most of the time there is a delay in the distribution by the government and the gravity of pest or disease is irreversible when they eventually arrive. The bureaucracy in local government in distribution of pesticides was revealed by farmers and this affected its accessibility to wheat farmers which leads to low crop production. Both farmers and UNICOOPAGI suggests that the pesticides be distributed at the same time with improved seeds and fertilizers so they can apply it at the right time.

Fertilizers of wheat are subsidised at 50% of the price and the farmers have to pay the remaining price before getting these fertilisers (MINAGRI, 2007). Both sides scored lowly the affordability of fertilizer because even if these fertilizers are subsidised some poor farmers are incapable to pay their part. As revealed by the coordinator of UNICOOPAGI farmers had for a long time benefited from free fertilisers from donors and they refuse to pay for them. The accessibility to credit to buy inputs and loans for wheat production is a challenge and was lowly scored by farmers. ***“Banks are not interested in providing loans in wheat production because of instability of climate and the low production of wheat” said the coordinator of UNICOOPAGI.*** Only TWIZIGAMIRE microfinance can help farmers but with a high interest rate on the loans said a farmer.

The average score for statement on accessibility was low at 45.4% and this emphasises the gravity of the matter in accessibility to inputs to wheat farmers in Nyaruguru district. This score concretises also the unavailability and inaccessibility of inputs described in sub chapter 4.1.1 of the business case. Both sides scored this challenge area below 50%. The later indicates poor relationship between UNICOOPAGI and wheat farmers of Nyaruguru district in distribution of inputs.

The accessibility to inputs and credit is the major concern of farmers in firm-farmer relationship as stipulated by Bauman (2000) as obligation for the firm. As recorded by William (2006), in southern Uganda, the use of improved seeds in firm-farm relationships increased the production of wheat at 96% while the use of fertiliser increased the production by 50%. A high improvement in food security by favourable firm-farm relationship was observed in India where income of farmers under contract increased at 64% by using improved seeds of tomatoes and an assured market (Eaton and Shepherd, 2001). The same record can be observed in southern Rwanda with a strong improvement in distribution and accessibility to inputs and also with adequate relationships between farmers and companies.

5.2. Production and yields

MINAGRI (2011) mentioned the increase of wheat production among others crops promoted in CIP. Farmers scored moderately the increase of production because they still have problems on accessibility of improved varieties needed by wheat millers. They grow *Musama* variety which is tolerant to soil acidity but with low production, low content of flour and protein (ISAR, 2008). UNICOOPAGI as services provider highly scored the increase in wheat production. It finds out a good improvement in wheat production as also recorded by NISR (2011) a great

improvement in production of promoted crops comparing to the previous years. However the yield was not increased, because farmers were pushed to extend their plantation of wheat motivated by the free distribution of inputs but not focusing on wheat productivity. In debriefing meeting farmers accepted the insufficient application of organic manure because of lack of sufficient cattle. As revealed by the agronomist of UNICOOPAGI, around 30% of wheat farmers can buy subsidised fertilizers in his work area while others use small quantity or nothing. He thinks that without government subsidy farmers will have difficulty in using fertilizers. Farmers themselves in the debriefing meeting accepted their incapacity to afford non subsidised fertilizers. Both sides recognised the use of insufficient lime to address the issue of soil acidity because of its inaccessibility and unavailability in the area which leads to low wheat production.

Looking to the topography of the area farmers can hardly apply different erosion control measures. High rainfall and mountainous slope create the difficulties to farmers to control erosion. The continuous degradation of soil increases the soil acidity and decrease the soil productivity. The overall score to this challenge area is moderate. For both sides the scores area is around 50% which shows the low level of production of wheat in Nyaruguru district. The relationship in wheat production between UNICOOPAGI and wheat farmers can be mostly seen in extension services because the provision of other inputs is done by the government and private companies.

The same observation of low production and yield has been found by Vellema (2002) in tropical regions like sub Sahara in Africa where firm-farm relationship in crop production was seen as an institutionally innovative arrangement; wherein growers' competence to deal with new financial, organisational and technological conditions importantly affected whether yield improved income and productivity or not.

5.3. Functioning of KIAKI cooperative

“After electing a new committee last year, things are going well in our cooperative” said a member of KIAKI cooperative. This improvement is resulting from the government policy on regular monitoring on management of cooperatives by local government. Both sides KIAKI' members and UNICOOPAGI highly appreciated the way KIAKI' leaders work and implement democratically the decisions from their meetings. Farmers appreciate the functioning of the production committee by its new vision in use of new improved seeds, organisation of their activities and the way it collaborates with farmers and partners. The contracted loans repayment is highly appreciated by UNICOOPAGI comparing to previous years because good

management of the cooperative is also well appreciated. Farmers and UNICOOPAGI highly scored the benefit sharing of the sales of wheat by all members of the household. This was confirmed by ISAR (2008) and USAID (2010) which recognised wheat as a staple food in which all members of the household are involved in Nyaruguru district. Revenues from wheat which are normally obtained in season B are mostly invested in Irish potatoes production in rotation with wheat. Information on financial issues should be explained and shared very well with farmer because it scored relatively low at 52%. The high score at 68.7% of average firm-farmer for all statements on the functioning of KIAKI shows the good relationship between UNICOOPAGI and different cooperatives in helping its capacity building and its management.

5.4. Functioning of UNICOOPAGI

Farmers appreciated the monitoring done by UNICOOPAGI in distribution of inputs during the cropping season because UNICOOPAGI as a union of cooperatives played a role of services provider and advocacy for it. Both sides accepted the well distribution of inputs and highly scored around 70%. Extension services provided including the farmer field school and the skills needed in wheat production are still insufficient. Few farmers' field schools have been installed by UNICOOPAGI and all farmers cannot easily learn from them and this is possibly why they scored this statement at very low score. The same low score was attributed to criteria in selection of farmers for training which is done mostly by partners of UNICOOPAGI. ***“When the president of our cooperative is asked to select participants for training, he chooses anyone but mostly same persons in cooperatives either from executive committee or from his relatives” said a farmer.*** This shows how fair selection criteria should be adopted and UNICOOPAGI needs to pay attention in order to facilitate the participation in capacity building for all members of cooperative.

The planning of activities is jointly done by UNICOOPAGI and cooperative representatives. In this planning cooperatives define what they need from UNICOOPAGI and both sides appreciated the collaboration in this activity by attributing a score higher than 70%. The benefits of UNICOOPAGI from the trading of wheat are redistributed to farmers through different activities such as planning of activities, extension services and regular workshop. But farmers are not happy with this redistribution and had lowly scored this statement at 58.7% because they don't know exactly the benefit of UNICOOPAGI and also the union don't share information to all members of the cooperatives but only to their representatives.

Both sides UNICOOPAGI and KIAKI' members appreciated the facilitations to wheat farmers to get loan by creating microfinance TWIZIGAMIRE for them. ***“Farmers accessed easily to loans from this microfinance but with high interest rate which limited some of them”*** said the president of KIAKI. In the debriefing meeting farmers showed the happiness of the services offered by UNICOPAGI to them but as said by a farmer ***“it can improve to some activities such increasing the numbers of farmers’ field school”***. KIAKI's farmers appreciated all statements in the functioning of UNICOOPAGIA at 57.7% which shows the low dissemination of information on the functioning of the union to farmers. The coordinator of UNICOOPAGI recognised this weakness by saying in debriefing meeting that ***“our union is still having a communication problem to farmers and can affect negatively our relationships with KIAKI”***.

Lack of proper management in communication or others aspect and inadequate observation of its obligation in contract by the company may lead to losing its trust from farmers. Companies may have unrealistic expectations of the market for their product or the market may collapse unexpectedly owing to transport problems, civil unrest, change in government policy or the arrival of a competitor. Such occurrences can lead managers to reduce farmers' quotas (FAO, 2001).

5.5. Contract between UNICOOPAGI and KIAKI

Two types of contract are observed between UNICOOPAGI and KIAKI; informal and formal contracts. These contracts as explained by Prowse (2012) and Da Silva (2001) are respectively oral based on trustiness between farmers and companies and written contract signed between two contractors. The informal contract is observed in wheat production and the formal contract in multiplication of improved seed and in wheat collecting and buying. Individual farmers and cooperatives benefited from the formal contract. As scored lowly the content of the contract is not understood by farmers because they did not participate jointly with UNICOOPAGI in its elaboration. ***“Most of the time, a contract is elaborated by the union and signed by cooperative representatives without a consultation of general assembly of farmers”*** said a farmer as result the implementation is difficult to them. The union qualifies them incapable to support contract elaboration because most of them are illiterate. As long as farmers did not keep a copy of their contract they can't also follow the rules laid down in it. The poor farmers' participation in contract elaboration is confirmed by a low score of 55.6 % given by UNICOOPAGI and this indicates a poor transparency in collaboration.

Almost around 58% of KIAKI 'members knew how to calculate the production cost of one Kg of wheat. This comes from a strong assistance of NGO and government projects as mentioned by USAID (2010). With this capacity, farmers through their representatives participate in negotiations meeting with UNICOOPAGI and others buyers in collaboration also with local government. ***“It has been found that in price negotiations, farmers exaggerated the production cost of 1 kg as a result the price was to some extent fixed by the local government and all participants in meeting accepted the proposition”*** said the president of KIAKI. Even if farmers are represented in price setting they claim that the price given to their produce did not cover all the production cost whilst the union pretends giving to farmers a fair price. The price given is for all varieties of wheat which demotivates farmers who have different production cost for different varieties. Farmers indicate the fluctuation of the price during year the because of high demand of the product as also confirmed by Mutijima (2004) and MINAGRI (2011) but UNICOOPAGI did not change the negotiated price. The average firm-farmer statement score for all statements is high at 65.1% and this shows the willingness in establishing smart contract between UNICOOPAGI and KIAKI. Farmers scored all statement below that of UNICOOPAGI and this shows also a need in improvement in relationship by both sides especially to the union in contract elaboration and implementation.

5.6. Post- harvest facilities and quality management

Farmers are still using the traditional material in harvesting, drying, threshing, and winnowing which affect the quality and lead to and high loss in post-harvest. FAO (2010) indicated estimation at 14.5 % of the total production is lost in post-harvest activities in Rwanda. ***“There is no choice, we lost a lot of produce in winnowing, threshing and drying of wheat and also our energy and time”*** said a farmer. UNICOOPAGI (2012) has also the same average when it compared the traditional post-harvest and the modern threshers and winnower but the later are not accessible and affordable to farmers. The score on the use of these threshers and winnowers was low at 12%. The drying is done ground or on sheeting and threshing and winnowing done manually as result high impurities and low quality of wheat. Wheat among others crops was classified by CIP (2011) in crops which need a good processing and post-harvest facilities in order to compete the imported wheat and had started to construct different drying grounds in local areas but are still few in number.

After buying wheat from farmers, the union has to eliminate all impurities and tests content of moisture with modern instruments before its packaging. KIAKI has small storehouse in critical situation and need to be renovated whilst UNICOOPAGI has benefited from TRACAIRE, an adequate store with 60 tons capacity but not shared with farmers. Immediately at peak harvest, farmers are obliged to sell their produce because they could not store it in their houses or in cooperative' stock. The only alternative they have is to sell it to UNICOOPAGI which has limited financial capacity to buy all the produce. The union had also a small stock all because of small capacity.

Roads are not maintained destroyed by high erosion on high rainfall and transport cost of input and production is very high. Farmers could benefit from the union' truck but since the cost is high they preferred to transport by head from farm gate to the selling point or from the suppliers to their farms. ***“All these activities, efforts used, time spent increased the production cost and the price given cannot cover all of them”*** said a farmer. The average score at 43.2% given by the union and farmers to all statements of this challenge area emphasises the different problems in post-harvest facilities in wheat production. These challenges were also identified by Terpend, Kayumba and Ntaganda(2007) to be improved in order to meet the quality standard required by wheat miller in Rwanda. An amelioration of relationship in post- harvest facilities and quality management of UNICOOPAGI in partnership with other stakeholders will increase the quality and the production of wheat in Rwanda. Farmers and UNICOOPAGI willingly want to cooperate and to improve their relationships in post-harvest facilities by sharing bags for packaging and sheeting for drying on.

5.7. Commercial relations

The commercial relation is generally based on oral contract. Farmers knew through meeting and field workers that the union will buy their produce of wheat but they were not informed about the quantity it wanted to buy. The lack of this information affected their plans in wheat production and an improvement for this crop. It allowed them to produce for subsistence not for a strong market. Farmers knew the quality requirement for wheat to deliver to UNICOOPAGI but this information was not officially disseminated. ***“We knew exactly the quality standard when our productions were refused at the selling point”*** said farmers. The test of the quality at selling point is done by appreciation with eyes and also by crashing grain wheat with teeth of the collectors. This test of the quality is not appreciated by farmers because most of the time their production are refused not because of the low quality but because of inadequate friendships with some collectors.

At local selling point farmers trust the weighing scale of UNICOOPAGI and most of the time they sell to this union not because they are paying a fair price but because of good weighing done compared to others buyers. The fact that there is no alternative strong buyer like UNICOOPAGI pushed farmers to sell their produce to the union. For wheat farmer the price paid by UNICOOPAGI is unfair comparing to the production cost and the time spent for getting 1 kg of wheat. The table below illustrates the benefit value share of the wheat chain

Farmers are not informed about the price at which UNICOOPAGI sells their wheat to its client not because the information is a secret but because the quality requirement is too high to meet. The average scored for all statement for both sides is 61.5%. This score shows a good relation in benefit in value share. Even the benefit sharing is relatively different but which need an improvement in price making. This improvement should focus on setting different prices to different varieties.

5.8. Stakeholder network and collaborations

Many cooperatives were strongly assisted by projects such as ACDI VOCA and SAN among others in providing technical and financial support and actually as these projects ended their supports, they suffer in management terms (CIP, 2011). Actually UNICOOPAGI and other unions and strong cooperatives are mostly the ones involved in wheat production in collaboration with local government. Wheat millers don't collaborate with wheat farmers because they are more interested to buy wheat from outside country at cheap prices (MINICOM, 2011). Farmers and UNICOOPAGI agree on inadequate relationship with wheat millers and scored this relation at 38.9%. The closing activity of Nyungwe milling factory which was installed in the working area of UNICOOPAGI is sign of poor relationships of wheat millers and farmers in wheat production. Network and collaboration with stakeholders are not well established with farmers and UNICOOPAGI. As a result the input procurement system doesn't work properly because it involves few partners (local government and UNICOOPAGI) and when they don't meet the target it directly affects all farmers.

“Regular meetings are organised by either by local government or UNICOOPAGI but they are not attended by the privates sector as result the low investors in wheat production said the coordinator of UNICOOPAGI”. In these meeting problems or challenges are not solved because of incapacity of UNICOOPAGI or local government. ***“It can be found a good production of wheat if investors are attracted to operate in Nyaruguru because wheat is***

well adapted in the area and farmers are involved in it and want to cooperate with them”
said a farmer”.

Banks and microfinance's are not interested to invest in wheat production because they not sure of the repayment of the loans because of fluctuation of the climate which affect the production and also farmers don't have guarantee fund for their production. Farmers lowly scored this statement at 48% because they have problem to access the loans but UNICOOPAGI which has microfinance highly scored this statement at 66.7%. The issue on accessibility to loans from UNICOOPAGI' microfinance is the high interest rate. The average score for this challenge area for both sides is 59% which shows a poor network and collaboration in wheat production in Rwanda. The sustainability and a good improvement of wheat production need a strong partnership and monitoring of all stakeholders in wheat value chain.

5.9. Perspectives

Both UNICOOPAGI and wheat farmers are willing to improve their relationships in wheat production. All statements for both sides were scored in average of 71.7 % which is a promising score of an improvement their relationships. The union had started some steps for improving the relationships with wheat farmers by doing a feasibility study of installation of small milling factory of wheat which could help the processing of all produce from farmers. It also introduced the use of modern threshers and winnowers for improving the quality, reducing losses in post- harvest facilities and as a result reducing the production cost of one kg of wheat.

UNICOOPAGI highly appreciated the idea of facilitating the procurement of lime in bulk to farmers which can double the yield by hectare because already farmers who use recommended fertiliser and sufficient lime and organic manure got a high yield by hectare. Both sides UNICOOPAGI and farmers agree on the renovation of different storages of cooperatives which can help in storing their produce and waiting to sell them when the price is good during the year. The price fluctuates during the year is mentioned by Mutijima (2004) and most of the time doubles two months after the pick harvest.

The union willingly wants to introduce a formal contract in contract farming which can be presented to different banks as collateral and helps farmers to access to loans as a result farmers will be paid through bank transfers. The only statement was scored lowly in this challenge is the competitiveness of production cost of local wheat with imported wheat. The explanation of this low score comes from the lack of information about the production cost of imported wheat. The only thing they knew that, the price of imported wheat is cheap. If the

improved seeds and all input are available and accessible to farmers the production cost can decrease radically and compete to the imported wheat but this involves a strong network and collaboration of all stakeholders in wheat production.

5.10. Firm–farm relationships and food security

Wheat is one of staple foods in Nyaruguru district. Around a 40% of farmers' produce is for home consumption, 20% for strategic food and 40% sold. From when UNICOOPAGI and KIAKI started their relationships in wheat production an increase in production have been recorded in Nyaruguru district. KIAKI's members revealed in debriefing meeting and business case the availability and accessibility of wheat in home consumption because they produce it themselves and the price negotiated for wheat by UNICOOPAGI is affordable by low income consumers who are not producers of wheat. ***“With introduction of new varieties and good services provided by UNICOOPAGI our wheat growing increased its production even though we need more wheat”*** said a member of KIAKI. Wheat is utilised and consumed in different manner in that area. It is daily consumed in different way by household. Most families consumed it cooked, as dough, as porridge and as traditional beer. Both farmers and UNICOOPAGI confirm wheat as first staple food for the families which helps them to cope in two cropping seasons A and B. The sales of wheat are benefited by all members of the family and facilitate to invest also in other income activities such as growing Irish potatoes in rotation with wheat. These statements were respectively scored highly by both sides respectively at 68% and 74.1% and these indicate a contribution of a sustainability of food security through good relationships between UNICOOPAGI and wheat cooperatives farmers. The fact that wheat is staple food and cultivated at around 70% in season B every year is also key promising hope of its sustainability.

An adequate contract in crop production is a key important in food security and the profitability refers to types of contract and also the power and capacity in price negotiation of contactors (Vellema, 2002). A high improvement in food security in firm-farm relationship was observed in India where income of farmers under contract increased at 64% by using improved seeds of tomatoes and an assured market (Eaton and Shepherd, 2001).

5.11. Main indicators of the strong relationships between UNICOOPAGI and KIAKI

From the business case, survey results and the debriefing results it has been found the main indicators of strong relationships between UNICOOPAGI and KIAKI as presented in table 5.1 below.

Table 5.1 Main indicators of strong relationships between UNICOOPAGI and KIAKI

Actions	Indicators of strong relationships between UNICOOPAGI and KIAKI
extension services	Farmers are happy for services offered by UNICOOPAGI in seeds and fertilizers distribution.
Communication	They trust the information given to them by UNICOOPAGI. The later is the one which link farmers to Government a has reliable information to farmers
Fair Price	The mechanism in price making is done in transparency. Together farmer and UNICOOPAGI negotiate a price based on cost of production of one kg of wheat.
Payment at right Time	Farmers are paid cash directly after delivering their produce. With this payment farmer can easily invest in other income activities.
Fair Weighing	At selling point farmers trust the weighing scale done by UNICOOPAGI comparing to other buyers
Credit	Through its microfinance UNICOOPAGI facilitates its farmers to get loans. Criteria to get a credit are clear and applied equally to everyone who borrows a loans
Transparency	Appreciation on well- functioning of KIAKI or UNICOOPAGI, good communication and trust
Repayment of loans	UNICOOPAGI high appreciate the repayment of loans given to KIAKI
Benefit	The value share of the wheat chain is relatively the same
Implementation of decision	KIAKI and UNICOOPAGI cooperate very well in implementation of their decisions.

5.12: Remarks on 2-2 tango tool

KIAKI's members and staff of UNICOOPAGI appreciated the tool used in collecting information from their cooperative and union. They also appreciated coherence steps to get insight their relationships. ***“The debriefing meeting was real moment to discuss about our problems and to come up with solutions” said a member of KIAKI.*** However the tool is time consuming in shot period for a farmer and staff who have other plan of activities. The tool facilitates the researcher extract more information about relationships between KIAKI and UNICOOPAGI. It is good analytical tool in firm-farm relations.

6. CONCLUSION AND RECOMMENDATION

6.1. Conclusion

After presentation and discussion of results it can be conclude as follow:

The accessibility to input is a high challenge for wheat producers in Nyaruguru district. The price of fertilizers, pesticides and lime is not affordable to farmers. Subsidised fertilizers reached few farmers and most of the time distribution is delayed. Insufficient lime with high cost is a challenge to farmers. Poor relationship is observed between UNICOOPAGI and wheat farmers of Nyaruguru district in input distribution but both sides realise the problem and want to improve it.

Low volume and low yield of wheat are recorded in Nyaruguru district but comparing to the previous year's production there is a little improvement. Some farmers apply small quantity of lime and fertilizer and others use nothing in wheat production. High yielding varieties of wheat are not available and farmyard manure is insufficient to farmers. Farmers have difficulties to apply erosion control measures because of the mountainous and hilly area. Both farmers and UNICOOPAGI accept their moderate relationships in wheat production and yields but willingly seek its improvement.

With a strong supervision UNICOOPAGI and local government KIAKI is actually well-functioning. Decisions are made democratically and well implemented by farmers with good leaderships of their executive committee. UNICOOPAGI appreciates the repayment of contracted loans and transparency in sharing information on financial issues to farmers. Farmers invest the revenues from wheat to others income generating activities and all member of the household benefit from wheat income. KIAKA's members want to strength their well-functioning by regular meeting and official dissemination of information to farmers.

Staffs of UNICOOPAGI and KIAKI's members appreciate the well-functioning of UNICOOPAGI. The latter with cooperatives jointly define what services to provide to farmers in planning activities. Farmers appreciate the supports in getting loans, from UNICOOPAGI's microfinance *Twizigamire* and the transparency in delivering services. However farmers are claiming there are few numbers of farmer field schools and how the selection process of participants in trainings is done.

Informal contract is dominating in relationships between UNICOOPAGI and KIAKI cooperative. Formal contract is found in multiplication of wheat seeds and collection of wheat produced. UNICOOPAGI does not specifying the quantity and quality it wants to buy from farmers at cropping stage. The contracts are not jointly prepared with farmers and most of them are not clear to them. Wheat price is negotiated with farmers and cash paid to farmers could not cover the production cost.

Farmers are still using traditional facilities in threshing; drying and winnowing which bring a lot of impurities and high loss is inevitable in this process. Damaged roads increase the transport cost of truck and transport by head is common in the area. Storages facilities are poorly maintained and this increases the loss in storage. All these difficulties contribute to high production cost /kg of wheat. Both farmers and UNICOOPAGI regret having poor relationship in post-harvest and quality management and proposed some actions to improve it as presented in table 4.3.1.

Price setting is a challenge in commercial relations between UNICOOPAGI and wheat farmers. Farmers are not happy with same price given to all varieties of wheat produced even if they their representatives participate in this negotiation. Quantity and quality to buy from farmers' cooperative are not specific at planting stage and an eyes testing of quality of wheat are not appreciated by farmers. However farmers appreciate the weighing of their produce and the cash payment on time.

The few stakeholders do not collaborate very well in wheat production. Private' investors and banks are not interested to invest in wheat production because low production and fluctuation of climate which affect the production.

Although there are many challenges in relationships between UNICOOPAGI and wheat farmers, both sides are willing want to collaborate each other in order to improve their relationship in wheat production and marketing. UNICOOPAGI had already started to address some issue in relationship with farmers such a feasibility study of installation of small wheat milling factory and initiation in using modern thresher and winnowers in post-harvest activities.

The collaboration UNICOOPAGI and KIAKI cooperative has contributed to availability and accessibility to food for the households in the Nyaruguru. Wheat can be prepared in different ways for home consumption and all members of the family benefit from wheat income. The latter is invested in income generating activities for the households.

Correct weighing, negotiation of price based on production cost, reliable information given to farmer by UNICOOPAGI, cash payment at right time, trust and transparency in functioning of union and cooperative, farmers access to credit through microfinance *Twizigamire* have been found as main indicators of strong relationships between UNICOOPAGI and KIAKI.

In addition of this, 2-2 tango tool was appreciated by KIAKI's members and staff of UNICOOPAGI.

6.2. Recommendations

In order to improve the relationships between wheat cooperatives farmers and UNICOOPAGI the following recommendations can be proposed to different level:

To farmers

- ✓ Farmers participate actively in maintenance of roads so that transport cost can be reduced and make their working area accessible to trucks and apply agro forestry techniques in soil erosion control measures with appropriate varieties.
- ✓ In order to access to loans farmers are recommended to accept the payment through bank account for insuring banks on the repayment of loans.
- ✓ Farmers apply agricultural practices, fertility dose recommended by agronomist in wheat production and participate in putting in place their own farmers field school.
- ✓ Farmers produce and multiply their own seeds and also conserve it for a next cropping season in order to escape the delay in supplying seed by government.
- ✓ In order to access to inputs farmers are suggested to participate actively in renovation of their storages also invest in installation of shared shop of agricultural inputs with UNICOOPAGI.
- ✓ Suggestions of actions for improvement of firm-farmer relation to farmers in debriefing meeting are supported to be implemented.

To Cooperative

- ✓ Cooperatives prepare its business plan and elaborate projects which can be submitted to different sponsors or donors in order to support farmer in supply of input.
- ✓ Executive committee of KIAKI organise and facilitate in putting in place shop of different inputs and also negotiate a bank loans for modern threshers and winnowers.

- ✓ Production committee of KIAKI is recommended to assist its members to approach and collaborate with banks and other stakeholders in order can have access to loans and others services.

UNICOOPAGI

- ✓ UNICOOPAGI accepts to facilitate its cooperatives in developing project, business plan in order to get funds of the planning activities
- ✓ UNICOOPAGI facilitates its cooperatives in procurement of lime to their shop by its truck and develops a strong network with suppliers of lime from northern country.
- ✓ UNICOOPAGI facilitates the renovation of storages and also facilitate the accessibility to modern cheap threshers and winnowers to farmers so they can reduce losses in post-harvest and increase the quality which leads to a decrease of the production cost.
- ✓ UNICOOPAGI states precisely the volume and quality of wheat it wants to buy before its growing and the price of wheat depending on the variety so it can stimulate farmers to maximize their production.

To the Government

- ✓ Government facilitates farmers to access to subsidised lime in wheat production especially in Southern province where the acidity of soil is very high.
- ✓ Government accepts to distribute all inputs through the UNICOOPAGI in order to escape the bureaucracy observed in local government which delays the plantation of wheat and affects the production of crops.
- ✓ Government through its institution RAB prepares study on productivity and commercialisation of wheat in Rwanda in order to attract privates' investors in wheat production.

To Agriprofocus Rwanda

- ✓ The Agriprofocus Rwanda starts the facilitation in linking farmer's cooperative and wheat millers in order to find an alternative market for their produce
- ✓ The Agriprofocus Rwanda applies the 2-2 tango tool to others crops especially those in competitions with wheat in order to select which crop can be proposed to famers which presents good relationships between farmers and companies.

- ✓ The Agriprofocus facilitates farmers' cooperative and UNICOOPAGI in developing strategies implementation of their perspectives and actions for improving their relationships proposed in debriefing results
- ✓ The Agriprofocus continues advocacy for creating a guarantee fund for farmers in wheat production in order to attract the investment of different stakeholders (new investors, banks, microfinance, wheat millers) in wheat production and selling.
- ✓ The Agriprofocus continues research in focusing on feasibility study of market, quality and safety for wheat produced in Rwanda comparing to imported wheat.
- ✓ The Agriprofocus Rwanda applies the 2-2 tango tool in firm-farm relationships between wheat processors in different location in order to develop a good strategy of improving the relationship in wheat processing in Rwanda.

References

Agriprofocus, 2012; Organized Farmers as Partners in Agribusiness; Firm–Farmer partnership and contracting: taking linkages to the next level.

Ashok,G., Kavery G. and Maurice R. Landes., 2008. Toward Contract Farming in a Changing Agri-food System

Baumann, P., 2000; Equity and Efficiency in Contract Farming Schemes: The Experience of Agricultural Tree Crops. Working Paper 139, Overseas Development Institute, October 2000

CIMMYT (International Maize and Wheat Improvement Centre) 2004: Global trends influencing CIMMYT's future. Prepared by the Global Trends Task Force in support of strategic planning at CIMMYT Mexico, D.F.: CIMMYT

CIP, 2011: Crop Intensification Program, report on six major crops promoted in Rwanda, MINAGRI, Kigali.

Contore Nicola, 2012: The Crop Intensification Program: a Sustainable analysis, Overseas development Institute, 111 Westminster Bridge Road, London, SE1 7JD.

Da Silva Carlos Arthur B., 2005: The growing role of contract farming in agri-food systems development: Drivers, Theory and Practices. Agricultural Management, Marketing and Finance Service FAO, Rome

Den Hartog Adel P., Van Staveren Wija A. and Brouwer Inge D., 2006: Food habits and Consumption in developing countries. Manual for field studies, Wageningen Academic Publishers: The Netherlands.

Devereux S. and Maxwell S., 2005: Food security in Sub Saharan Africa. University of Natal Press, Pieter maritzburg, Southern Africa

FAO, 2010 the state of food Insecurity in the world available at [Http://www.fao.org/docrep/013/i1683e/i1683e.pdf](http://www.fao.org/docrep/013/i1683e/i1683e.pdf) accessed on 22 may 2012

Government report of Rwanda , 2011: Government annual report, July 2010-june 2011,

Hongdong Guo, Robert W. Jolly, Jianhua Zhu, 2005: Contract Farming in China: Supply Chain or Ball and Chain?

ISAR, 2008: Rwanda Agriculture Research Institute: Report on Wheat Program, Musanze, Rwanda

Jagdish Kumar and Prakash Kumar K., 2008: Contract Farming: Problems, Prospects and its Effect on Income and Employment; Department of Agricultural Economics, G. B. Pant University of Agriculture & Technology; Pantnagar - 263 145, Uttarakhand.

MINAGRI, 2004: Ministry of Agriculture and livestock: Agriculture Policies in Rwanda, Kigali

MINAGRI, 2009: Ministry of Agriculture and Animal Resources: Strategic Plan for the Transformation of Agriculture in Rwanda –Phase II, Final rapport

MINAGRI, 2011: Ministry of Agriculture and Animal Resources; National Post Harvest Strategy, kigali

MINALOC, 2011: Ministry of Local Government, Annual report 2011, Kigali

Mutijima, 2004: Plan strategique de la transformation de l'Agriculture au Rwanda. Analyse thematique productions. MINAGRI, Kigali.

NISR, 2011: National Institute of Statistic of Rwanda; Rwanda Statistical YearBook 2011,

Prowse M., 2012: Contract farming in developing countries- Institute of Development Policy and Management, University of Antwerp

RAB, 2011: Rwanda Agricultural Board, Annual report 2011, Kigali

RADA, 2011: Rwanda Agriculture Development Authority, Annual report 2011, Kigali.

Rehber, E. 2000; Vertical Coordination in the Agro-Food Industry and Contract Farming: A Comparative Study of Turkey and the USA. Food Marketing Policy Center University of Connecticut; Research Report No. 52, February 2000.

Runsten, D. and Key, N. 1996; Contract Farming in Developing Countries: Theoretical Aspects and Analysis of Some Mexican Cases, U.N. Economic Commission for Latin America and the Caribbean, Santiago

Terpend, Kayumba and Ntaganda, 2007: Diagnostic et elaboration du plan de development national de la filiere Ble au Rwanda

US Government, 2011: Rwanda feed the future 2012-2015 multi years strategy available at <http://www.feedthefuture.gov/sites/default/files/country/strategies/files/RwandaFeedtheFutureMulti-YearStrategy.pdf> accessed on 14 may 2012

Vellema Sietze, 2002: Making contract farming work? Society and technology in Philippine transnational agribusiness; Maastricht: Shaper publishing available on http://www.tad.wur.nl/NR/rdonlyres/0E68D3D2-B68A-41B1-95C9-928391AAAA53/47555/Vellema_webadvertisement.pdf accessed on 15 may 2012

Warning, M. and Hoo, W. 2000; The Impact of Contract Farming on Income Distribution: Theory and Evidence. Paper Prepared for Presentation at the Western Economics Association International Annual Meetings, June 2000

William Wamala Wagoire, 2006: Quantification of the value of improved wheat production. Options in South-western Uganda, Kachwekano, Agricultural Research and Development Centre, P.O. Box 421, Kabale – Uganda

Annex 1: Business Case Features; interview with farmer organization

1. 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.


Individual
Farmers




Farmers
Association



Cooperative



Union



Federation

Company Ltd

- b. Has the trading entity, owned by the farmer, been registered?
- o No, it is an informal entity

- Yes, it is a formal registered entity
- c. How has the trading entity been registered?
 - NGO
 - Cooperative (with right to be involved in economic activities)
 - Union (with right to be involved in economic activities)
 - Federation (with right to be involved in economic activities)
 - Non-profit business
 - Social business
 - Fully commercial business

<i>Observations:</i>	
----------------------	--

2. Product:

Does the business / farmer organization offer:

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

<i>Observations:</i>	
----------------------	--

3. Production

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

<i>Observations:</i>	
----------------------	--

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):	
<i>Observations:</i>	

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.



<i>Observations:</i>	
----------------------	--

6. Product branding

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

<i>Observations:</i>	
----------------------	--

7. Customer / Market:

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

<i>Observations:</i>	
----------------------	--

8. Revenue model:

Does the business / producer organization earn its income through:

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

<i>Observations:</i>	
----------------------	--

9. Pricing

- a. Which pricing mechanism is used:
 - List price: predefined fixed prices
 - Price depends on the quality of the product
 - Price depends on the type and characteristic of the direct customer
 - Price is determined as a function of the quantity purchased
 - Price is negotiated between two or more partners depending on negotiation power and/or negotiation skills
 - Price depends on inventory and time of purchase
 - Price is established dynamically based on supply and demand
 - Price is determined by outcome of competitive bidding
- b. Is the business / farmer organization cost driven or value driven?
 - Cost-driven (cheap)
 - Value driven (high quality)

<i>Observations:</i>	
----------------------	--

10. Trade Contracts

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



<i>Observations:</i>	
----------------------	--

11. Risk:

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



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

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

Transport risk →

Observations:	
---------------	--

12. Financial data

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

Annex2: questionnaire

Statements		Scores			
		0	1	2	3
		Strongly disagree	Disagree	Agree	Strongly agree
		☹☹	☹	☺	☺☺
1 Access to inputs					
1.1	Seeds of different wheat varieties are available to farmers()				
1.2	The cost of improved seeds is affordable to farmers				
1.3	Sufficient lime is available to farmers				
1.4	The cost of lime is affordable to farmers				
1.5	The cost of fertilizer is affordable to farmers				
1.6	Adequate pesticides are available in the wheat growing areas				
1.7	The cost of pesticides is affordable to farmers				
1.8	Farmers have access to credit to buy inputs				
1.9	Banks are interested to provide loans for wheat production				
2 Production and yield					
2.1	Farmers use the best wheat varieties				
2.2	Farmers rotate wheat with other crops				
2.3	Farmers use fertilizer as recommended by agronomists				
2.4	Farmers optimize the use of farmyard manure				
2.5	Also without government subsidy, farmers would use fertilizers				
2.6	Farmers apply enough lime to address the issue of acid soils				
2.7	Farmers apply pesticides in time to protect their wheat				
2.8	Farmers apply erosion control measures				
2.9	Wheat production in Nyaruguru is increasing				
2.10	Individual farmers' yields are increasing				
3 Functioning of cooperative (KIAKI)					
3.1	KIAKI operates democratically according to its constitution and by-laws				
3.2	Decisions of KIAKI meetings are well implemented				
3.3	The KIAKI production committee functions very well				
3.4	All members are informed about cooperative financial issues				
3.5	KIAKI always repays contracted loans				
3.6	KIAKI organizes wheat collection very well				
3.7	UNICOOPAGI is happy with the way the wheat farmers cooperative is managed				
3.8	KIAKI cooperative leaders always represent the interests of the members				
3.9	All members of the family benefit from the sales of wheat				
3.10	Wheat revenues are invested in other crops and activities				
4 Functioning of firm (UNICOOPAGI)					
4.1	UNICOOPAGI distributes wheat inputs very well				
4.2	Farmers learn a lot on the farmer field schools of UNICOOPAGI				

4.3	UNICOOPAGI has provided farmers sufficient know-how on wheat production				
4.4	I know the criteria for the selection of farmers for training				
4.5	KIAKI and other cooperatives define what services UNICOOPAGI should provide				
4.6	Benefits of UNICOOPAGI wheat trading are redistributed to farmers				
4.7	UNICOOPAGI facilitates wheat farmers to get bank loans				
4.8	Farmers are happy with the services offered by the UNICOOPAGI				
5 Contract between UNICOOPAGI and KIAKI					
5.1	I understand the content of the contract between UNICOOPAGI and KIAKI				
5.2	KIAKI and UNICOOPAGI jointly elaborate the contract				
5.3	Both contractors (UNICOOPAGI and KIAKI) keep copies of the contract				
5.4	I know the production cost of 1kg of wheat				
5.5	The wheat price stipulated in the contract was negotiated between UNICOOPAGI and the wheat farmers				
5.6	UNICOOPAGI is happy about the relationship with the farmers				
5.7	The price paid to farmers covers the production cost and allows for a benefit				
5.8	The farmer cooperative follows the rules laid down in the				
5.9	UNICOOPAGI follows the rules laid down in the contract				
6 Post-harvest activities and quality management					
6.1	Transport of wheat is easy for cooperative farmers				
6.2	KIAKI invests in local road maintenance to facilitate transport				
6.3	Drying is professionally done				
6.4	Farmers are able to dry down to required moisture level				
6.5	Threshing is professionally				
6.6	Farmers produce wheat without any impurities				
6.7	KIAKI has adequate storage facilities				
6.8	Member cooperatives use the UNICOOPAGI threshers				
6.9	Member cooperatives use the UNICOOPAGI winnowers				
6.10	Member cooperatives use the storage facility of UNICOOPAGI				
6.11	KIAKI benefits from the truck of UNICOOPAGI				
7 Commercial relations					
7.1	UNICOOPAGI is clear about the quantity of wheat it wants to buy from the farmers' cooperative				
7.2	UNICOOPAGI clearly informs wheat farmers about quality requirements				
7.3	UNICOOPAGI pays farmers a fair price				
7.4	Wheat farmers know the price at which UNICOOPAGI sells the wheat to its clients				
7.5	UNICOOPAGI pays wheat farmers at the agreed time				

7.6	The appreciation of wheat quality is done professionally				
7.7	The reasons for the rejection of farmers' wheat quality are clear				
7.8	The farmer cooperative keep records of the wheat delivered to UNICOOPAGI				
7.9	I trust weighing scale used by UNICOOPAGI at the local selling point				
1.10	Wheat farmers are happy to sell their produce to UNICOOPAGI				
8	<i>Stakeholder network and collaboration</i>				
8.1	The input procurement systems works properly				
8.2	UNICOOPAGI and government agronomists work well together				
8.3	Wheat farmers set the priorities for wheat research				
8.4	Banks and MFI's are interested to invest in the wheat sector				
8.5	Other buyers want to source wheat in Nyaruguru District				
8.6	KIAKI and UNICOOPAGI work intensively together with wheat millers				
8.7	Local wheat is of better quality than imported wheat)				
8.9	Stakeholders in the wheat sector regularly meet and discuss challenges to address				
9	<i>Perspectives</i>				
9.1	Wheat yields per hectare can double				
9.2	Modern threshers and winnowers can improve quality				
9.3	UNICOOPAGI can facilitate procurement of lime in bulk				
9.4	More intensive relations with wheat millers can improve market perspectives				
9.5	Improved storage and delayed selling can increase farmers' wheat income				
9.6	KIAKI can use its contract with UNICOOPAGI to access loans				
9.7	Production costs of local wheat can seriously decrease and compete with imported wheat				
9.8	UNICOOPAGI can pay wheat farmers through bank transfers				