

Promoting Farm-Firm linkage in tomato value chain in Rwanda

**Case of AIPD Ltd and URUGERO tomato farmers' cooperative in Busoro sector,
Nyanza district –Rwanda**



A research project submitted to Van Hall Larenstein University of Applied Sciences in partial fulfilment of the requirements for the degree of Master in Management of development,

Specialization in Rural Development and Food Security.

By

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DEDICATION

To almighty God

To my beloved wife and daughter

I dedicate this thesis report

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ACRONYMS

2-2 tango:	Two-Two tango
ACED:	Agricultural Competitiveness an Enterprise Development
AIPD:	Amayaga Integrated Project for Development
AIPD Ltd:	Agency for Investment, Promotion and Distribution
CDI:	Center for Development and Innovation
GDP:	Gross Domestic Products
CODEX	Codex Standards for tomato
DRC:	Democratic Republic of Congo
EU:	European Union
FAO:	Food and Agriculture Organization
F-F:	Firm-Farm
Fig:	Figure
ICT:	Information, Communication and Technology
IFDC:	International Fertilizer development Center
IPAR:	Institute of Policy Analysis and Research
ISAE:	Institut Supérieur d' Agriculture et d'Elevage
MFIs:	Micro-Finance Institutions
MINAGRI:	Ministry of Agriculture and Animal Resources
NAEB:	National Agricultural Export Development Board
NGOs:	Non-Governmental Organizations
NISR:	National Institute of Statistics in Rwanda
OSU:	Oregon State University
PhD:	Doctor of Philosophy
RAB:	Rwanda Agricultural Board
RBC:	Rwanda Broadcasting Corporation
RBS:	Rwanda Bureau of Standards
RCA:	Rwanda Cooperative Agency
RDB:	Rwanda Development Board
RISE:	Rural Innovation Systems and Entrepreneurship

Rwf:	Rwandan Franc
SIDO:	Small Industries Development Organisations
SNV:	Netherlands Development Organisation
SORWATOM s.a:	SOCIETE Rwandaise de la Tomate societe anonyme
SWOT:	Strengths -Weakness- Opportunity- Threats
TAS:	Thai Agricultural Standards
VC:	Value chain
VHL:	Van Hall Larenstein
WB:	WORLD BANK
WEF:	World Economic Forum
WFP:	World Food Program
WUR:	Wageningen University

Abstract

The tomato crop is considered as food and cash crop and at the same time it is used in different food preparations for various categories of consumers in rural and urban settlements. Tomato farmers in Busoro sector, Nyanza district in Southern province of Rwanda, are used to growing tomatoes through business relations with agri-processing firms. Previously, URUGERO tomato farmers were in contract farming with SORWATOM s.a, which is a processing company based in Kigali city. It had failed to continue working with tomato farmers in Busoro sector due to the poor relationship that occurred between them. Later on AIPD Ltd as a new processing company based in Busoro sector had come to restart tomato value chain in the area by re-establishing business relations between URUGERO tomato farmers' cooperative.

The objective of this research is to develop a strategy for tomato value chain development by improvement of relationship between URUGERO tomato farmers and AIPD processing company through an analysis of the firm-farm relationship in Busoro sector of Nyanza district in Rwanda. The research has the two following main questions with four sub-questions for each: "What is the structure of tomato value chain in Busoro sector? And what should be done to improve the business relationship between URUGERO tomato farmers' cooperative and AIPD Ltd towards tomato profitability and sales in Busoro sector?"

To find the answers to these questions, 2-2 tango tool was used for collecting primary data. The tool involved three main steps: The description of business case, survey and debriefing meeting through focus group discussion. The survey results were processed and analysed using the median scale from 0 to 3 calculated by the help of workbook from Microsoft Excel, which produced a table showing the average median score per challenge area, and a pair of graphs. One of the graphs shows the F-F scores and the other shows the level of agreement per challenge area. Therefore, a focus group discussion for debriefing meeting was held with both the staff of the firm and tomato farmers' representatives. The Executive secretary and the sector Agronomist of Busoro sector, the head of department and 2 staff in department of food quality in the Higher Institute of Agriculture and Animal Husbandry (ISAE) also attended. IASE was triggered by the study results and decided to conduct further research on tomato production and processing in Busoro sector.

The results indicated that production, productivity, farmer group functioning, stakeholder collaboration and quality standards are the prevailing issues in tomato value chain in Busoro sector. There was a disagreement between firm and farmers on these areas because they have different views on the statements, which implies that an improvement is required in order to be on the same level of satisfaction. From the results it can be concluded that both farmers and the firm were positive on the relationship with an average median score of 2.5 for all challenge areas.

The study arrived at these recommendations that Agri-Hub Rwanda will organise as soon as possible, a stakeholder workshop with all the stakeholders involved in tomato value chain in order to put their efforts together towards restoring tomato value chain in Busoro, AIPD Ltd will facilitate the farmers in capacity building in terms of tomato production, quality standards, cooperative management and monitoring, and conflict resolution. There is a need also for Agri-Hub Rwanda and AIPD Ltd to facilitate tomato farmers to get organised in agricultural producers' organisations. It will help to increase the tomato production if farmers will have started to grow tomatoes thrice a year, on both wetlands and hillside. This will enable the processing plant to operate the whole year round.

CHAPTER 1: Introduction

This report is about a thesis research undertaken on a business case between Agency for Investment, Promotion and Distribution (AIPD) Limited and URUGERO tomato farmers' cooperative operating in Busoro sector of Nyanza district, in Southern Province of Rwanda. The research was conducted for two main reasons, one for partial fulfilment of the requirements of master degree in Management of Rural Development and Food security at VHL University, and two for developing 2-2 tango as a newly initiated participatory tool by CDI-WUR in partnership with AgriProfocus (APF).

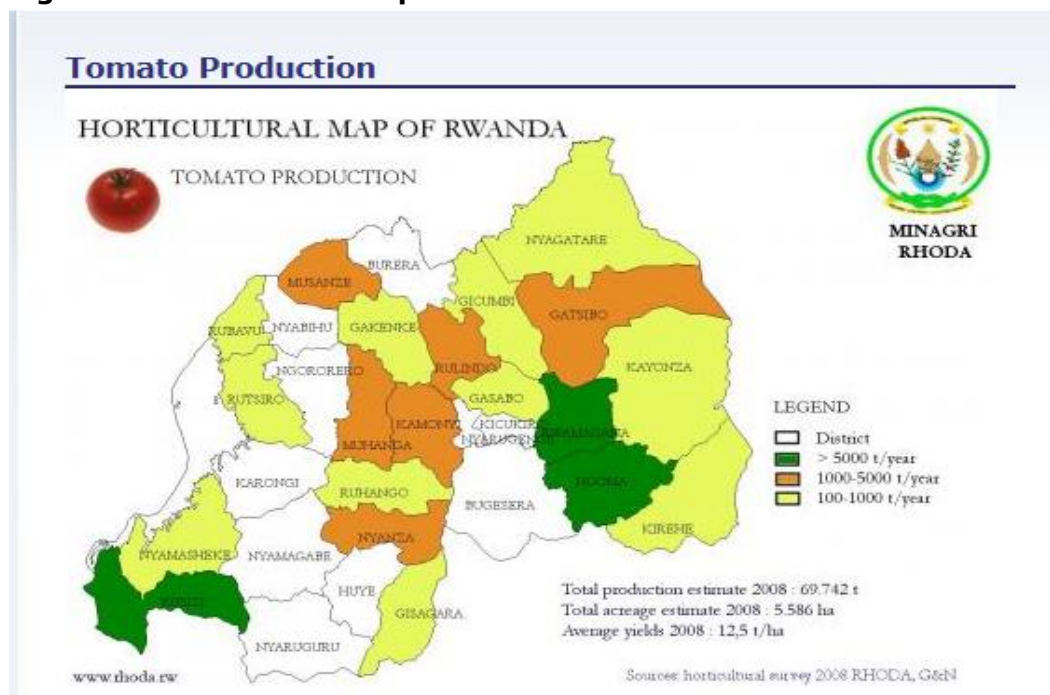
Rwanda is a country located in east Africa. It is bordered by Burundi in south, Uganda in north, Tanzania in East and Democratic Republic of Congo in the West. The size of Rwanda is 26, 338 square kilometres, the water covers only 1,390 square kilometres (NISR, 2011).

The majority of population is located in rural area and depend on agriculture sector (NISR, 2011). The agriculture sector plays a key role in realizing Rwanda's vision of transforming the country's economy by 2020 (MINECOFIN 2000). Given its predominant role in the economy, agriculture is considered as a main catalyst for sustainable growth and poverty reduction. This is basically linked to the fact that agriculture is the main source of employment in Rwanda (World Bank, 2011). Also, about 80% of the total export revenues is generated by agriculture. According to World Bank (2011), Rwanda intends to create more diversified export opportunities, more efforts are being made to promote horticultural crops such as fruits, vegetables, cut flowers, essential oils such as petunia and geranium, macadamia nuts, Vanilla and silk. The tomatoes fall under the category of vegetables that the government of Rwanda considers to be vital sector in poverty eradication and food security for the citizens.

1.1 Case context

According to the horticultural map of Rwanda, Nyanza district which is our area of study has the potential for tomato production where the yield varies between 1,000 and 5,000 tonnes per year (Figure1). These quantities request an efficient value chain to ensure the tomatoes reach consumers. The development of tomato value chain is important in contributing to the food security of rural smallholder farmers. It is at the same time food crop and cash crop for the farmers in Busoro sector. A significant number of farmers in this area especially in Rwabusoro marshland along Akanyaru River are engaged into tomato production whereby a collaboration with firm is necessary in order to increase the productivity. The farmers often complain of lack of inputs, climatic conditions, low prices offered for their tomatoes that affect their returns and income to be invested in the enterprises. Besides leading to low yields the quality of tomatoes produced is very low and results in low prices from the firm. When the quantity of tomatoes rejected increases on the market other buyers become and trader buy these tomatoes cheaply because of their perishability and sell in urban areas. The farmers seem to be losing either way, meanwhile the consumers of the tomatoes consider retail prices to be high.

Figure 1: Horticultural map of Rwanda



Source: <http://amis.minagri.gov.rw/content/tomato-production>

1.2. Problem owner

Agri-Hub Rwanda is part of Agri-ProFocus (APF). APF is a partnership, originating from the Netherlands, with a mission to create spaces and opportunities for multi-stakeholder action and learning, in order to enhance entrepreneurship among organised farmers. Agri-Hub Rwanda is funded by contributions from members of the Dutch APF partnership active in Rwanda, Agriterro, IFDC, Oxfam Novib, SNV and Terrafina. Their contributions are being matched by a subsidy from the ministry of Foreign Affairs from the Netherlands. Agri-Hub Rwanda believes that farmers are the key to local economic growth and sustainable agri-food systems. There is a need then to strengthen a farmer to make sure that the producing level in the chain is working properly.

Furthermore, according to APF (2013), the priorities of Agri-Hub Rwanda in 2013 will focus on agricultural innovation on business brokering:

- ✓ Promotion of private sector support programmes relevant for Rwandan agriculture;
- ✓ Promotion of calls for the agricultural sector development fund of EKN managed by ICCO;
- ✓ Facilitating firm-farm business deals;
- ✓ Training and coaching track on gender in value chain.

These above mentioned reasons justify therefore, the interest of Agri-Hub Rwanda in a research to be conducted for AIPD as a private company which deals with tomato growers in a commercial way (agribusiness).

As a master student, I have been requested by Agri-Hub Rwanda to study the existing firm-farm relationship in that area in order to come up with recommendations that will be useful to improve that relationship towards a win-win situation between tomato farmers and AIPD Ltd.

The results of this study will also help other researchers who will need to read and use this information in the future.

1.3. Problem statement

Busoro sector has potentials for tomato productivity during 3 agricultural seasons which are 2 rain seasons on hillside and 1 dry season in the marshland (MINAGRI, 2008). When recommended inputs (seeds, fertilizers and pesticides) are available, tomato farmers are interested only by dry season in the marshland which gives them abundant tomato yield than other seasons. During that harvesting time tomato prices fall down whereas the yield doesn't last more than two months. Nevertheless, AIPD Ltd as a processing company needs a constant tomato yield which can allow it to be operational all year round for effective investment and improvement of farmers' income in the area. However, AIPD Ltd and URUGERO tomato farmers are concerned by irregularities in tomato production due to seasonal hazards (floods and drought) leading to the demotivation of farmers, and stakeholders working in tomato value chain such as inputs suppliers, and financial institutions. These constraints deteriorate business relations between farmers and other involved stakeholders. There is no published research that has been conducted in regards to farm-firm relationship for tomato production in Busoro. These justify therefore, the relevance of undertaking the research in that area.

1.4. Research objective

The overall objective of this research is to develop a strategy for tomato value chain development by improvement of relationship between URUGERO tomato farmers and AIPD processing company through an analysis of the firm-farm relationship in Busoro sector of Nyanza district in Rwanda.

Key words: value chain, tomato chain, farm-firm relationship, farmers, cooperative, contract farming, Rwanda

1.5. Research questions

This research has two central questions and four sub questions for each as mentioned as follows:

1. What is the structure of tomato value chain in Busoro sector?
 - a. What are the stakeholders and their roles in tomato value chain?
 - b. What are the value shares for different actors in tomato value chain?
 - c. What factors to take into consideration in order to expect the sustainability of tomato value chain in Busoro sector?
 - d. What consumer categories of tomatoes produced in Busoro sector?
2. What should be done to improve the business relationship between URUGERO tomato farmers' cooperative and AIPD Ltd towards tomato profitability and sales in Busoro sector?
 - a. What characterise current relationship that links tomato farmers and AIPD Ltd?
 - b. What are the constraints faced by tomato farmers and AIPD Ltd?
 - c. What are the production risks do farmers and AIPD Ltd encounter?
 - d. What are future perspectives to improve business relations between the firm and farmers?

1.6. Organisation of thesis report

This thesis report is made of six chapters which are introduction, literature review and conceptual framework, methodology, results/data processing/analysis, and discussions. The report is ended by conclusions and recommendations.

Chapter 2: Literature review and conceptual framework

2.1. Definition of concepts

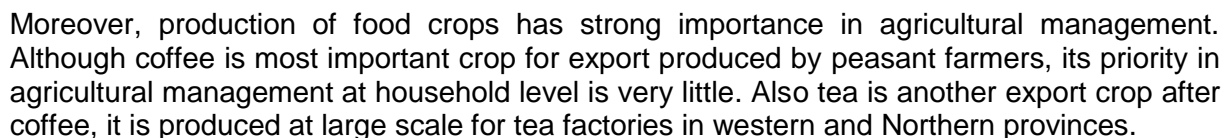
- a. **Value chain:** The value chain is a series of activities a product/service must pass through until it serves its final purpose of solving a customer need. In each phase of value chain the product/service gains some value. If a phase is malfunctioning the chain will break down and the mission of generating value for the customer will not be accomplished.
- b. **Firms:** Firms are defined as entities which purchase specific agricultural product from farmers for processing or marketing purposes.
- c. **Relationship:** Partnership among different person or institution, with a purpose of helping each other in their daily activity. This relationship can be guided by a written or oral contract (Frederick and Roy, 2003).
- d. **Farm:** The farm will be used as an area of land that is used for growing tomato in order to sell it to the firm.
- e. **Cooperative:** The definition of RCA (2011) was used to explain a cooperative as an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise, according to internationally recognized co-operative values and principles.
- f. **Food security:** Food security exists when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and preferences for an active and healthy life (WFP, 1012).
- g. **Contract farming:** Contract farming is defined as a pre-negotiated agreement of production of agricultural produce between a farmer and a firm. The terms of contract shall include commitment on the part of producer to deliver a specified variety, quality and quantity of produce at specified time, place and price. In return, firm in most cases provides inputs, extension services and influence production decisions.
- h. **Smallholder farmers:** In developing countries smallholder farmers are the ones holding a land smaller than two hectares (Prowse, 2008). Their integration in global value chains is important step towards poverty reduction.

2.2. Agriculture in Rwanda

Agricultural sector is very important in Rwandan economy, it is a source of employment for around 90 per cent of the population, 91 per cent of the food consumed in the country is provided by this sector whereas its contribution on GDP is estimated at 36 per cent (IPAR, 2009). Nevertheless, agricultural sector faces various challenges due to climatic change as consequences of global warming which reduces the productivity. Still there is potential to develop the sector using modern practices of farming in order to increase both productivity and quality of products, development of value addition, and initiatives of export oriented agriculture. In Rwandan agriculture, food crops come forward in production with rate of 90% by which 66% is consumed by producers and the increase in food crop production is not balancing with population growth (FAO, 2006).

In addition, there is little value addition lead agriculture with only 2% of enterprises in agro-processing sector (IPAR, 2009). This is because of insufficiency: of financial means, entrepreneurial spirit, marketing skills, transport infrastructure, and technology.

Figure 2: growth in food yields, 1996-2008



According to WFP (2006), Rwanda has two rain seasons (A and B seasons) - the big rainy season (B) from mid-February up to May and the smaller rainy season (A) starting with mid-September to mid-December. A dry season or season C starts from the beginning of June to the beginning of September. This season is usually used for planting in marshlands (see figure 3). Therefore, the rainfall and temperatures vary in different parts of the country. Generally drier and warmer climate is observed in the interior and east whereas there heavier rain and lower average temperatures in the north and west. Busoro sector has also such seasons.

Seasonal calendar												
Season B (long rains)							Season A (short rains)					
Planting*			Harvesting				Planting		Harvesting			
Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec*	Jan	
				Planting			Harvesting					
			Season C (marshlands)									

Source: WFP, 2006

Rwandan climate is conditioned by this landscape: the further to the west, the lower the altitude, the warmer the temperature, and the lesser the precipitations (MINAGRI, 2008). The rainfall between June and August is much less than that in other months in the whole country. The period of cultivation can be divided into two-the first growing season which starts from September to January (season A), and the second from February to June (Season). Therefore, as for relationship between altitude and agriculture, most suitable zone for agricultural production is situated between 1500m and 1700m.

2.3. Tomato production in Rwanda

In Rwanda, tomato is the second major vegetable in volume produced and area cultivated (after cabbage), and is the first in cash value (ACED, 2011). It is sold fresh and processed on domestic market and outside. It is supposed that Eastern part of DRC is potential market for tomato processed in Rwanda since it is a common ingredient in Congolese kitchen (food habit). Burundi also has this potential.

Furthermore, at the farm level tomatoes suffer faces drought stress during the dry season as well as pests and diseases which pose serious problems on production. For instance, insects and *phytophthora infestus* seriously damage tomatoes in the field during rainy and dry seasons. Also viral diseases such as leaf curl virus cause serious damage on tomato production in Rwanda. ACED (2011) indicated that the main threat on tomato value chain is over-dependency on rainfall and climate variability. In addition, another challenge to be overcome for tomato production is deficiency of strong and functional relations between producers and farmers.

2.4. Tomato production and food security

Tomato production has importance on four dimensions of food security, availability, utilization, accessibility and stability. It is used worldwide as a fresh vegetable or as a spice in food preparation. Currently tomato is the main crop observed on petty trade by small scale business persons in the informal sector. Tomato is also grown commercially and become the source of employment for a large number of people (Tshiala and Olwoch, (2010).

Tomatoes are known for culinary purposes. It has become a must have in the kitchen to add flavour and appetising colour to the food among Rwandan society consumers. The tomato is not only excellent in salads and sauces, but also has a plant chemical that prevents cancer and heart disease. Raw, cooked, tinned, chopped or purred, they are a household staple. Tomatoes are extremely healthy and rich in antioxidants, beta-carotene and the plant chemical lycopene (Bahoneza, 2012). In addition, Tomato processing is important in order to increase its availability throughout the year through preservation, it is processed into various products including sauce, paste, ketchup, chutney, puree, jam, juice or squash, base of other sauces(chili, garlic, etc.), it provides a medium for baked and canned beans, maize, carrots, green peas, etc.

2.5. Agricultural value chain

Kaplinsky and Morris (2000) summarize value chain as a full series of activities which are necessary to convey a product or service from conception, through the different stages of production(including a combination of physical transformation and the inputs of different producer services), distribution to final consumer as well as final disposal after use.

Agricultural value chain in developing countries faces various factors that may constrain its upgrading. Trienekens (2011) concurred some of them, such as scarcity of specialised abilities and difficult access to technology, market, physical infrastructures, inputs, information, resources and other services. Although, the main ambition of value chain is to make value addition of products or services for a market through transformation of resources

Chain operators: they are those enterprises, entrepreneurs who perform functions of producers, processors; traders; Wholesalers; Exporters; Retailers and consumers in the chain.

Chain supporters: they provide support services to the chain operators but they do not own the product.

Chain enablers/influencers: They create and define conditions for chain operators to do business. They set the policy environment and business climate. They are mainly composed of governmental bodies at different levels.

The RISE framework 'gives rise' to important strategic orientation for interventions seeking to contribute to agribusiness development and farmers entrepreneurship promotion in Africa. It provides lenses for looking at agribusiness development dynamics as indicated below (see numbers in figure above).

(1). Dynamics around bulking nodes: these dynamics refer to local markets, trade hub, processing unit, collection centres. These include volume, quality, labour, storage, product development volume, quality, labour, storage, product development, use of by-products.

(2) Pre-harvest processes: They include farmers 'production practices, productivity and quality, farmers 'organisation rate, modalities of selling of primary produce to traders and processors.

(3) Downstream relations among stakeholders: include sellers and buyers of (processed)products at/through bulking nodes(millers, trades, wholesale) and relations further down the line(retail, consumers).

(4) Commercial relations and price transmissions along the value chain. Refer to the transactions and prices at different stages along value chain, value and benefits accrue to different chain operators and part accrues to primary producers and labourers.

(5) What are the relations of chain operators with chain supporters (agro-inputs dealers, banks and MFIs, transporters, etc.)? Are there problematic or missing relations? What are opportunities to improve access to services (credits, inputs, transport, research and advice)?

(6) The relations (of chain operators and supporters) with chain enablers (predominantly public sector). What institutions that define/influence the business environment? Are new relations with districts, ministries and public services emerging? What about opportunities or threats in the external environment?

(7) Relations with donors and external facilitators. Do donors and NGO's distort factor,

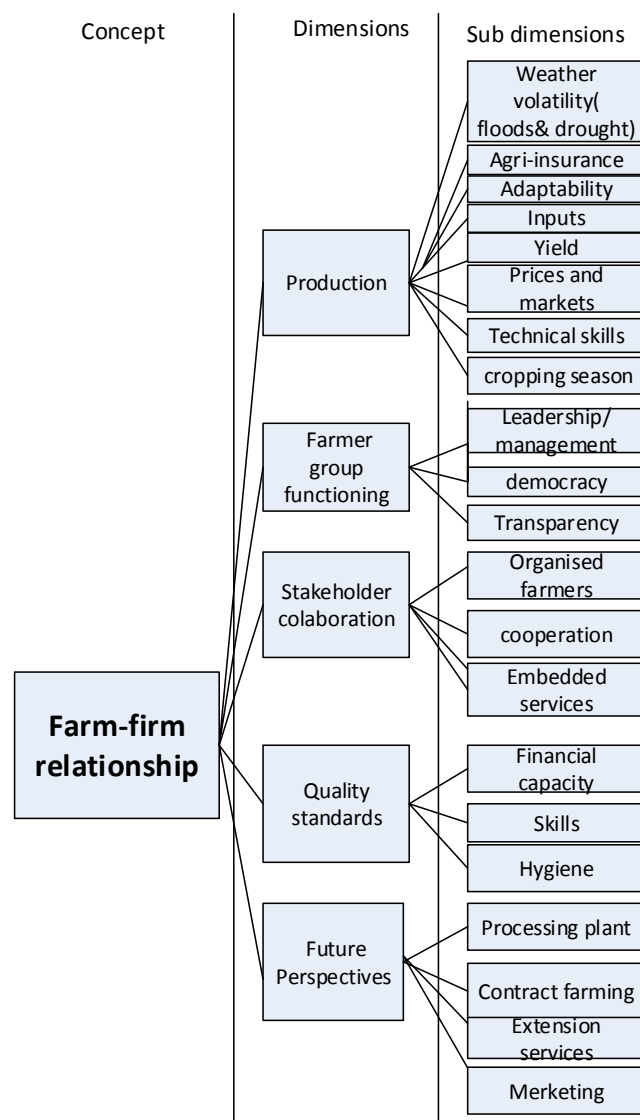
Output and labour markets? Do external interventionists adapt their support as the market system evolves?

This study focused number 2 which includes tomato farmers 'production practices, productivity and quality, farmers 'organisation rate, modalities of selling of primary produce to traders and processors. It is at this level that firm-farm relations happen in various transaction forms. The RISE model shows that for proper functioning of the chain, there is need of a strong relationship at level 2. This will be the core part of the study, in which 2-2 tango as participatory tool will be useful to come up with recommendations towards improvement of firm-farm relationship.

2.7. Firm-Farm relationship

The figure 5 describes relations between farm-firm based on 7 challenge areas indicated as follows. This framework was adapted after arriving to the field and describing the business case.

Figure 5: Conceptual framework of firm-farm relationship



A. Production risks

Agriculture sector always encounters several risks leading to poor agricultural harvest. Agricultural risk is connected with negative effects that come from poorly expectable biological, climatic and price variables. Amongst these variables are climatic conditions and natural hazards (pests and diseases, floods and drought) which are beyond control of agricultural producers. In addition, hardships in change of both input and out prices are prevailing issues in production.

World Bank (2005) and Roll et al. (2006) classifies agricultural risks as follows: agriculture is often limited by high volatility of production results or production risk. Different from other entrepreneurs, it is very difficult for farmers to forecast with certainty the quantity of produce they will get due to external factors like weather conditions, pests and diseases. Besides external factors, farmers may also be stuck by difficulties occurred during harvesting and

collecting that can result to yield losses. Market risks and fluctuating prices of agricultural inputs and outputs are also limiting factors for production.

B. Farmer Group functioning

According to RCA (2011) a cooperative is established by farmers in reaction to unfavorable market conditions which is a common problem for them. This might be a problem related to the marketing of crops resulting in low farm gate prices, availability and accessibility of inputs such as fertilizers and seeds, value addition, quality, and access to cheap credits. Therefore, by forming a cooperative initiative, rise their household income and reinforce the economic situation of their farm.

Cooperatives are formed to do something better than individuals could do for themselves or through a non-cooperative form of business. The main objective of cooperative, is to develop market power in order to sell products at higher prices or enter new markets. Usually many cooperative are formed to obtain and deliver inputs such as seed, feed, fertilizer, and petroleum more economically. Therefore, in cooperative, members ensure availability of needed services or pool risk. Furthermore, acting together, members can take advantage of economies of scale or develop bargaining power (OSU, 2004). In such functioning, the cooperative tries to fulfill members 'needs at the minimum possible cost. Contrariwise, some cooperative in Rwanda are characterized by poor management and weak leadership. Democracy and transparency principles are still issues to overcome.

C. Quality standards

In Rwandan agribusiness most of firms and farmers might not meet quality standards due to limited financial capacity, low skills and insufficient hygiene. TAS, 2007 and Codex, 2008 highlighted all activities related to harvesting, postharvest handling and transportation should be hygienically practiced in order to prevent any contaminations which will be dangerous to the consumers.

EU (2007), TAS (2007), CODEX (2008), Barrett and Anthon (2008), and Carmona (2011), indicated that commercial tomatoes should be supplied fresh to the consumer after post-harvest technologies. They classify tomato standards according to eight following indicators: quality of tomatoes, provisions concerning size, provisions concerning tolerances, provisions concerning presentation, provisions concerning marking and labelling, provision concerning packaging and presentation, and provisions concerning contaminants and pesticide residues. In addition, tomatoes might be classified in four commercial types: Round, ribbed, oblong or elongated, and cherry and cocktail tomatoes.

D. Contract farming

Different authors explain contract farming as a pre-negotiated agreement of production of agricultural produce that exist between a producer and buyer. The terms of agreement shall include commitment on the part of producer to deliver specified variety, quality and quantity of produce at specified time, place and price. In return, buyer may provide inputs, extension services and influence production decisions (Asokan, 2007 and Begum 2005).

Prowse (2012) mentioned that agricultural produce under contract may be a field crop, horticultural crop, livestock or animal products. Generally, the buyer in contract farming stands in place of a processor, exporter marketing firm, input or service provider. However, most studies on contract farming focus on either advantages or criticism of contract farming. Most of the studies on contract farming focus on either advantages or criticism of contract farming. A limited number on studies have stated the case of continuity or break up of contract relationships.

Contract farming can be defined as a system where a private sector firm provides inputs to the farmers such as agricultural micro credits, seeds, pesticides and fertilizers in exchange for exclusive purchasing rights for the resulting crop yield. According to the WDR 2008, contract farming enables smallholder farmers to participate in a new high value product markets and improves quality standards, thus increasing and stabilising farmers' incomes. Eaton and Shepherd (2001) defines also contract farming as a partnership between agribusiness and farmers. The contract farming necessitates a long term commitment for both sides in order to be sustainable and successful.

The farmers and firms might be linked with each other by 5 probable farming contract model but this report focuses on only one model applicable to the business case; centralised model, nucleus estate model, multipartite model, intermediary model and informal model.

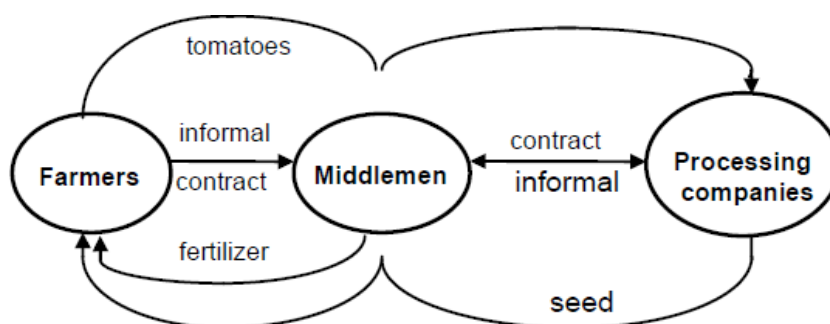
Informal model

This model of contract is mostly observed in developing countries where it is applied for individual entrepreneurs or small companies. They make a simple, and informal production contracts with farmers on seasonal basis. It is mainly applicable for crops like tropical fruits, fresh vegetables, watermelon, etc. These crops frequently necessitate a minimal amount of processing. Also, inputs are frequently limited to the provision of seeds, fertilizers, pesticides, and technical support limited to grading and quality control stuffs.

Eaton and Shepherd (2001) and, found that the success of informal model relies on the availability of supporting services which are mostly to be delivered by government organizations. In addition, individual investors often are not financially strong enough to provide inputs for farmers. Therefore, they must either rely on government supports (extension services, provision of inputs, etc.) or develop a kind of arrangements whereby micro-finance institutions provide loans to farmers against the security of a contract with the investor. This is considered as an informal multipartite contract. This kind of contract is the most temporary and speculative of all contract farming models, it has high risks of default by both company and farmer. The figure 6 illustrates contractual relations between companies and farmers.

Therefore, it is very important that arrangements concluded between companies are back up by law even though in many countries, the delay and inefficiency of legal systems is the challenge for legal action.

Figure 6: Informal model of contract farming



Source: Eaton and Shepherd (2001),

E. Market and prices

Previous research found that small-scale farmers are always wondering on what they can produce with limited marketing opportunities, which in most cases complicate the diversification into new crops. Eaton and Shepherd (2001), found that farmers are not motivated to cultivate unless they are sure of the market of their crop. Companies or processors also will not invest in projects unless they are assured that the projected produces can be regularly produced by farmers. Only contract farming can offer adequate solution by guaranteeing market to the farmers and assuring consistent supply to the company. In addition, in case the outlets for the same crops are available, farmers may benefit from contract farming in the sense that it is not necessary for them to search for and negotiate with local and international traders, and project sponsors usually arrange transport for their produces from the farm gate.

SIDO (2009) also said that processors need to ensure timely purchases from farmers in order to prevent tomato produce, to get damaged by the sun after harvest awaiting transport from processor. It was also noted that, the better is explore the option of arranging some payments advances for farmers before the harvest. This would help to prevent premature harvests done by the farmers in order to get fast cash.

Chapter 3: Methodology

3. 1. Type of research

This research has a qualitative and quantitative approach and is based on empirical data, literature and documents. The data were collected through one business case. The research was carried out in two main categories which are Desk study and field work.

3.2. Strategy

The research used a case study followed by a survey with two-to-two tango tool for data collection.

3.3. Description of study area

The research was carried out on the business case between Agency for Investment, Production and Distribution Limited (AIPD Ltd) and URUGERO tomato farmers' cooperative working in Rwabusoro marshland, in Busoro sector located in Nyanza District of Southern Province in Rwanda as illustrated on the figure 7 below. In order to successfully complete this research, I chose to work on a business case between AIPD Ltd and only one farmers' cooperative instead all 9 cooperatives in collaboration with AIPD Ltd because I wanted to focus on a particular case in order to come up with specific information.

Nyanza district is one of seven district of Southern Province in Rwanda. It has 10 administrative sectors and 307,000 inhabitants in which about 53% of them is constituted by females (NISR, 2011). Busoro sector which our area of study is one of 10 sector of Nyanza district situated in eastern part of the district. It is bordered by Ruhango district in the north and Bugesera district in the east.

RWANDA MAP

The map shows the following districts: MUSANZE, BURERA, RUCUMBI, GATSIBO, NYABIHU, GAKENE, RULINDO, KAYONZA, NGOROKERO, RUTSIRU, KAMONYI, NYAMAGANA, KIBUNGO, KIRIHE, KARONGI, RUKUNDA, GICUKIRO, NYAMASHIRE, GIKONGORO, NYANZA, BUGESERA, CYANGUGU, RUYE, NYARUGURU, and GICOMBA.

CARTE ADMINISTRATIVE DU DISTRICT DE NYANZA

The map shows the following sub-districts: CYABAKAMITI, MUKINGO, KISSOMA, BUSORO, NYAKISOZI, RWABICUMA, BUSASAMANA, MUYIRA, KIBIRIZI, NYAZO, and NYARUGURU.

Legend:

- Unité de district
- Unité de sous-district
- BUSASAMANA
- BUSORO
- CYABAKAMITI
- KIBIRIZI
- KISSOMA
- MUKINGO
- MUYIRA
- NYAZO
- NYAKISOZI
- RWABICUMA

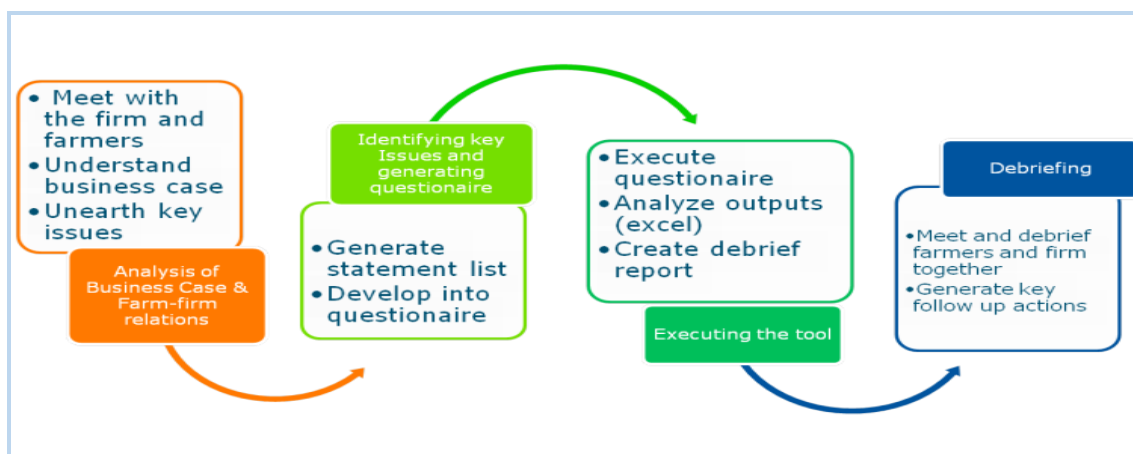
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3.4. Desk study

The secondary data were collected through literature review by using the latest scientific books, specialised journals, PhD thesis (electronic and hard copies), internet web sites and local reports.

The primary data were collected from AIPD Ltd and URUGERO tomato farmers' cooperative working in Rwabusoro marshland in Busoro sector in Nyanza district-Rwanda. The 2-2 tango as a participatory tool was used to assess relationship between AIPD Ltd and tomato farmers grouped in URUGERO cooperative. The following methods and steps were used and allowed us to come up with results that can respond to the research objective (see figure 8).

Figure 8: 2-2 tango logical steps



Source: adapted from <http://api.ning.com>

I. Business case description

For further information on business case, three steps related to data collection, processing and analysis were used.

a. Data collection: Identification of a business case

For identification of current business case, a **focus group discussion** with farmers and AIPD Ltd staff took place to discuss current business case between firm and farm. Then, we drawn together tomato chain map (see figure 9) in order to understand clearly the issues prevailing in the business case. This method was applied for 8 people divided into 2 groups of 4, made of 4 from URUGERO tomato farmers' cooperative, 2 persons from AIPD Ltd and 1 from AgriProFocus-Rwanda and one person from local government Busoro sector). Getting information from various actors is important for a good start. From the interviews, the business case as well as firm-farm challenge areas were clearly identified. The following are pictures shows business case description exercise.

Picture 1: Pictures showing a process of business case description



b. Data processing: Reflection on challenge areas

After the description of business case between AIPD Ltd and URUGERO cooperative, it was a better occasion to reflect on their business case in order to see together what are the key challenges, problems, issues and opportunities that are mostly raised by participants. Later on, a report on the business case was produced and shared with the same persons who attended interview. Next to the report, the business case was analysed with SWOT.

c. Data analysis: Identification of indicators and formulation of statements

The information from business case report was useful to formulate 9 statement indicators for each challenge area. The statements were prior translated in Kinyarwanda language, and tested for 2 respondents to check their clarity and possibility for answering before being scored both by firm and farmers.

II. Survey

A survey using a structured questionnaire is another methodology used and the questionnaire was elaborated according to challenges identified used after that challenge areas have been identified/formulated. The research went through three steps which are sampling, scoring of statements, data entry.

a. Selection of respondents and sampling

Twenty seven farmers (20 men and 7women) were randomly selected from 206 members of URUGERO tomato cooperative. Also, 3 (2men and 1 woman) staff members of AIPD Ltd strategically selected to be part of the interview team. The table 2 below shows clustering of respondents.

Table 1: Sample composition of respondents

Clusters	Number	Function	Gender	
			Male	Female
Urugero tomato cooperative	27	Producing	20	7
AIPD Ltd	3	Processing	2	1

b. Data collection: Scoring the statements

The scoring of statements was done by means of self-administration of questionnaire by farmers and firm staff in the presence of the researcher after explaining the way which the statements should be scored in order to get reliable data. The scoring of statements was to measure a degree of agreement/disagreement of respondents. Their views were shown by score scales counting from 0 to 3 as indicated in table below:

Table 2: Scoring scale of statements

Statements		Scores			
#	Challenge area	0	1	2	3
		Totally disagree	Disagree	Agree	Totally agree
		☹☹	☹	☺	☺☺

The researcher was continuously explaining to one by one as scoring exercise was progressing accordingly (see photos below).

Picture 2: Scoring exercise



c. Data processing and analysis: Data entry and preparation of debriefing report

The scores collected with 2-2 tango were entered into Excel workbook in order to come up with a debriefing report which afterward was shared with both the company and tomato farmers in focus group discussion. Before starting the data entry, the questionnaires were numbered according to the side in which respondent belongs. Questionnaires of respondents from farmers were numbered aside from 1 to 27 whereas questionnaires from firm were numbered from 1 to 3. In the excel sheet there were specific places in which data from the firm and farm have to be entered separately. The scores were entered following a logical sequence based on statements that belong to each challenging area, from challenging area 1 to 9. After that all scores extracted from firm and farm questionnaires were correctly entered into excel sheet, table and two graphs (one showing f-f scores and another showing level of agreement between f-f) per challenge area were generated automatically. In Excel sheet we used Median formula to measure all scores and present them on the scale of 0 to 3. The interpretation of scores was done in the following options:

- **0&1:** A very low score, caused by the disagreement of the respondents with the statements. Meaning that the aspect of the cooperatives performance was unsatisfactory and there is an urge for improvement or change.
- **1.5:** A low score, dissatisfaction of the respondents is present; therefore improvement is necessary to meet the needs and wishes of the respondents.
- **2:** A positive score, the satisfaction of respondents is not optimal. Improvement of the cooperative is not obligatory, but advisable in order to increase satisfaction among members
- **2.5&3:** A very high score, the average respondent fully agrees with the statements and indicates a high level of satisfaction. Change or improvement is not needed.

III. Focus group discussion for debriefing meeting and further analysis

After producing a debriefing report from survey results, a feedback session took place to discuss about findings towards appropriate recommendations to solve the issues found. The session was attended by various persons such as 36 tomato farmers, 4 AIPD Ltd staff, 1 Executive secretary of Busoro sector, 1 Agronomist of the sector, 1 Head and 2 staff of food quality department in Higher Institute of Agriculture and Animal Husbandry (IASSE) and 3 journalists of Rwanda Broadcasting Corporation (RBC). The findings were presented by the researcher to the participants using power point presentation and flip chart prepared in Kinyarwanda language. The list of challenge areas, the graph showing overall scores, and the biggest lines showing difference in F-F scores were basically presented to the audience. The presentation triggered an interesting discussion for the side of the farmers, company, Busoro sector staff and the visitors. The discussion was open (participative) and participants got opportunity to express their views and ask clarification where they have a confusion, don't agree or they don't understand at all. The presentation was done indoors and took 1.5 hour time in the conference room of Busoro sector office. The event passed on Rwanda Television emission.

Chapter 4: Relationship between AIPD Ltd and URUGERO cooperative.

4.1. Tomato business case

This study analysed tomato business case that links Agency for Investment, Production and Distribution (AIPD) Ltd as a marketing and processing company and URUGERO tomato farmers living in Busoro sector in Nyanza district, Southern Province-Rwanda.

Previously the case was between tomato farmers and another processing company called SORWATOM s.a which is based in Kigali city. The company had a contract farming with tomato farmers 10 years ago. The company used to buy tomatoes from Busoro area for processing them in tomato paste. Its relationship with tomato growers has become gradually ineffective which led into failure to continue the business with farmers in Busoro. The poor relationship with the farmers was characterised by delay in payment (more than 6 months), low price, low capacity to take all produced tomato and violating contract agreements. After that in 2011, AIPD Ltd as a new company came in business relation to support tomato farmers and develop tomato value chain by promoting the chain through processing and marketing. AIPD Ltd was set up by the local NGO called Amayaga Integrated Project for development to fulfil the missing function in within the chain. The company aims to make tomato value chain operational. Currently, the tomato value chain in Busoro is totally different from how it was during SORWATOM time. Therefore, AIPD Ltd wants to make a difference of two value chains. Figure 9 shows the tomato value chain in the past (during SORWATOM moments) and the current value chain.

4.2.1. Value chain actors

Before 2012, the tomato value chain was composed by: NAEB and agri-shops as inputs suppliers, tomato farmers as producers of fresh tomatoes, traveling traders and SORWATOM s.a in collecting function, SORWATOM s.a and wholesalers in Kigali in wholesaling. The supermarkets, shops, open market and urban traders in retailing whereas in consuming are urban high and low income consumers, rural low income consumers and institutional consumers. In supporting function were NAEB, MFIs, Nyanza district, and transporters.

After 2012, value chain actors as well as supporters have changed. AIPD Ltd is currently negotiating with farmer to establish a contract farming which will determine their business partnership in Tomato value chain. Currently, farmers are still in producing function, 11 out of 46 farmers are females. Which is different from before 2012, where 76 out of 206 farmers were females. Before and after 2012, both men and women participate in tomato value chain in Busoro. Women are mostly involved in producing activities such as sowing, weeding and harvesting. Men are mostly involved in pests and disease control (spraying chemicals) and marketing. There is no actor in processing now except AIPD Ltd who is tending to start in near future. Rural traders and traveling traders are in collecting of tomato produce, while wholesalers in Kigali are in wholesaling. Retailers and consumers remain the same excluding supermarkets in retailing and urban high income consumers at consuming level.

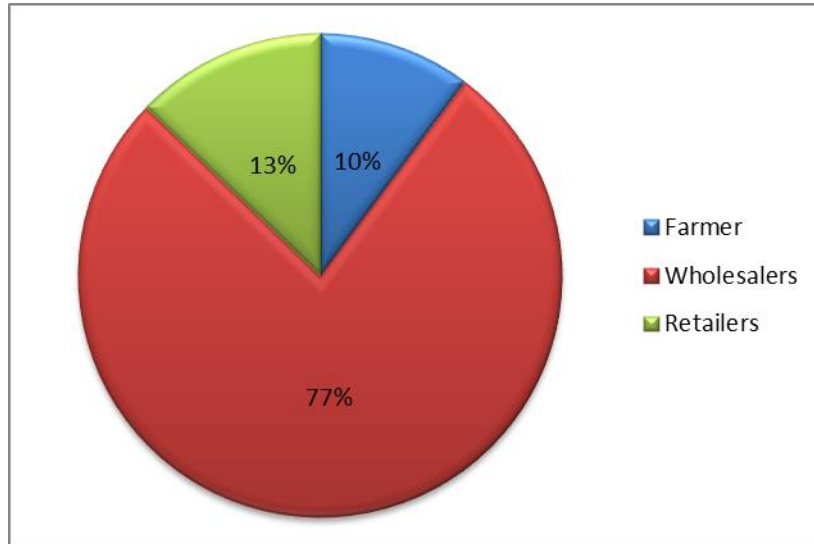
4.2.2. Value shares

Before, SORWATOM s.a was buying 80% of tomatoes produced in Busoro sector and the rest of produce was bought by rural and traveling traders. Farmers also used to sell small quantity of production to their neighbours. Currently, SORWATOM s.a is no longer buying the tomatoes from the farmers, and therefore about 100% of the production is bought by rural and traveling traders. The figure 10 shows how the tomato values were shared between chain actors during SORWATOM time whereas the figure 11 shows the current value shares.

Table 3: Chain actors, prices and value shares before and after 2012

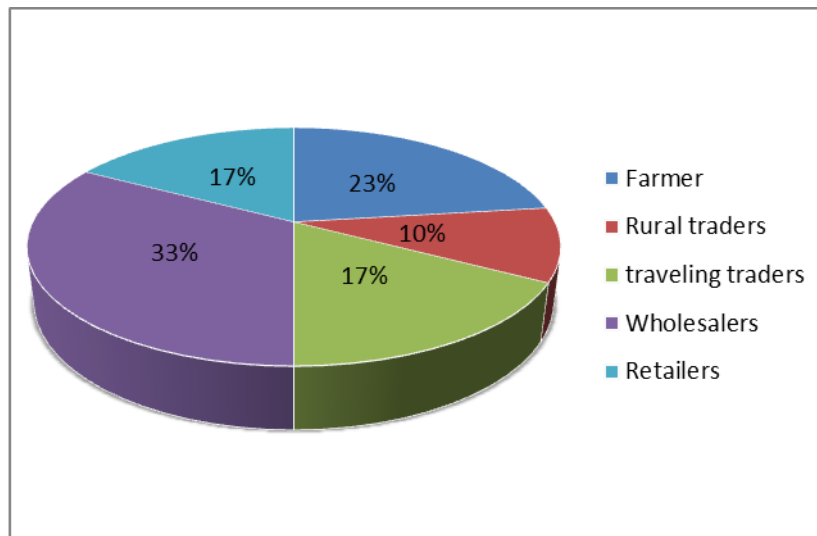
Chain actors	Value shares before 2012			Current value shares		
	Shares			Shares		
	Retail price	Added value	Value shares	Retail price	Added value	Value shares
Farmers	80	80	10	70	70	23
Rural traders			0	100	30	10
Traveling traders		0	0	150	50	17
Wholesalers	700	620	77	250	100	33
Retailers	800	100	13	300	50	17
Total			100			100

Figure 10: value shares of chain actors before 2012



It clearly comes out that the wholesaler (SORWATOM) was taking the biggest (77%) parts of tomato value shares than other actors. It is presumed that that portion is related to the variables costs invested tomato processing activities such as transporting, processing, and packaging. The farmer were receiving 10% of consumer price which is less than 50% of the value shares of all chain actors per unit . Therefore, this share is still very low considering the efforts and inputs spent on tomato production.

Figure 11: Value shares of chain actors after 2012



After that SORWATOM s.a had stopped to deal with tomato famers, the number of farmers as well as land area covered by tomato were reduced, from 206 to 46 farmers ploughing only one third of the total owned land size. The figure 9 of current tomato value chain map shows that about 100% of the current tomato produce in Busoro is sold to the rural and traveling traders. According to the figure 11 the farmer receives 23% of retail price of non-processed tomato which is still less than 50% of value shares in the chain. AIPD Ltd wants to increase the income earned by farmer by increase the unit price on farm gate as it will be operating nearby the farmer. The transport cost will be lower than for the former company which may increase the revenue for the farmers.

4.2.3 Consumers of tomatoes produced in Busoro sector

According to the results, less than 5% of the tomato produced in Busoro is consumed locally whereas about 95% of produce is sold to provincial and national markets where urban low and high income consumers buy tomato for home consumption. Institution consumers such as schools, prisons and restaurants buy tomatoes for various meal preparation.

4.2.5 Food security analysis

Tomato produced in Busoro is considered as a food crop and cash crop, where 1% is used for household consumption and 99% for the market. According to the study results, tomato contributes to three dimensions of food security. It can be eaten fresh, raw or cooked in sauce, in salads or in accompaniment with other food such as potatoes, beans, maize, and other vegetables (food utilization). An another part of produce is sold for earning the income needed by farmers to afford a variety of other crops that they don't produce or other basic needs(accessibility). Therefore, both tomato farmers and AIPD Ltd as are doing all their bests to restart the chain is sustainable way so that tomato yield can be available consistently. This will make tomato available at all time which indicates food stability.

4.3 Description of AIPD Ltd

AIPD Ltd was created with technical support Amayaga Integrated Project for development (AIPD) a Local Non- Governmental Organisation. AIPD NGO has the mission of leading rural people towards development through various ways (AIPD, 2011). It has 3 following main objectives:

- Uplifting rural cooperatives to high standards
- Fighting against corruption in rural area
- Promoting information and communication technology (ICT) in rural Area.

AIPD NGO has two main parts: Providing social support to the community and promoting social entrepreneurship within vulnerable groups. AIPD Ltd as a business has been initiated to facilitate vulnerable people to increase their income level by minimizing yield loss. Because in that time, farmers were suffering from production and marketing issues for tomato crop. It was created with mission to find solutions on issues that tomato farmers come across in tomato value chain. AIPD Ltd has its own management different from management of AIPD as NGO.

AIPD Ltd is a processing and marketing company based in Busoro sector nearby tomato farmers. The company started its operations in March 2011 by promoting tomato production in the area. Up to May 2013, the company was processing 10% of tomato in Busoro into two local products which are: Mayaga tomato Ketchup (see picture 3) and Jam, but due to standards requirements, it was requested by RBS to meet first those requirement so that it can continue with the processing activities. It has been created by individual investor, tomato individual farmers and cooperatives with a mission to handle the problem of loss of tomato yield in the area. It is also registered as a Limited (Ltd) company under number 102325915 in Rwanda Development Board (RDB). Three persons (a man and 2 women) from tomato farmers work in processing unit AIDP Ltd.

The company intends to be in contract farming with tomato farmers in order to produce tomatoes that it will use as raw material to make its final products. In return, AIPD Ltd will provide inputs and extension services to the farmers working in Busoro sector- Nyanza district.

The company is still in starting preparation where it is dealing with administrative procedures. Whereas AIPD NGO is still advocating for the farmers to find the supporters who may assist to restart the tomato chain in Busoro.

Picture 3: Amayaga tomato Ketchup



a. Functioning of the company

Currently AIPD Ltd rents a building which hold its offices and processing activities in Busoro sector. It has 4 staff (3men and a woman): 1 manager, 1 head of processing unit and 2 processing staff. The head of processing unit got trainings from India about tomato processing especially on Ketchup ad Jam. In return, he trained all staff about tomato processing. The processing activities are still on small scale because they are still processing those products manually and they are not able to process all produced tomato yet until the processing plant will be in place.

The company is in good way to install a big processing plant which will be able to process a maximum part of produced tomatoes. Four hectares of land in which the plant and green houses will be constructed has been bought already. The processing machinery have been also ordered from China. A design of the processing plant is ready whereas administrative documents are still in process.

The company is now mobilizing the farmers to increase tomato production because it has to be sure about constant availability of tomato yield to ensure business profitability. *“Installing such processing plant in rural area is too expensive, the processing plant mustn’t wait for the yield, but the yield must wait for the processing plant and market. We are in business!”* Said the AIPD Ltd manager.

According to the manager, the company has interest to work with individual farmers than farmers’ cooperative *“if we are dealing with individual farmer, we know exactly whom we are dealing with. Also individuals have reliable collaterals than cooperatives. It is more secure for us to work with individuals”* he said. The company is still in negotiation with farmers, contract farming have not yet started.

The company has guaranteed market for its final product in Rwanda, Burundi, and DRC because of uniqueness of its products (there is no other company that make Ketchup and Jam in the country).

b. Challenges for the company

So far the company is worried by:

- Yield volatility
- Poor functioning of farmer cooperative
- Getting all official documents required
- Quality standards

4.4 Description of URUGERO tomato farmers

URUGERO is tomato farmers' cooperative working in rwabusoro marshland along Akanyaru River in Busoro sector. It has 206 members (76 women and 130 men). It is legally recognised by Rwanda Cooperative Agency (RCA). URUGERO cooperative has all organisational structures as required by RCA: General assembly, new board of directors (previous board was removed by members), auditing committee, and advisory council. Despite legal status of URUGERO cooperative, the majority of members reported that they lost the trust towards their cooperative because of the mismanagement they realised on former board during a couple of last years. Although farmers have that bad news on their cooperative, they are still willing to grow tomatoes because they recognise the value of tomato as a cash crop. They are familiar with tomato production and know how producing activities are carried out. They know also that their land has potentials for tomato production. *"Tomato is our crop, all these houses you see were constructed by the money from tomatoes. If weather conditions went well and inputs are available, a farmer can get one million, 2 million, Of Rwandan francs"* they said.

The tomato is not a new crop for them because they were in contract farming ten year ago with another processing company (SORWATOM s.a) based in Kigali as mentioned earlier in the document. The relationship with tomato farmers and that company has failed. Therefore, it is difficult now for the farmers to obtain inputs for tomato production. They are in transitional phase whereby negotiations with AIPD Ltd as a new company based in Busoro are in mid-way. Currently, the number of farmers who planted tomatoes and covered area were reduced this year due to insufficient financial capacity of farmers to buy inputs. For instance, 46 out 206 tomato farmers in the cooperative planted tomatoes on smaller plots than before. Some of them use low quality inputs which are cheaper and available in small shops in Busoro sector.

4.5. Identification of challenge areas

From business case description through focus group discussion with tomato farmers, company staff, AgriHub Rwanda representative and local government representative, the following were identified as 9 challenge areas in tomato value chain in Busoro sector. We realised that the majority of challenge areas are in perspectives because the business is not really started yet, it is still in starting preparations. Both the farmer and the company have a new ambition to change a lot of things in the chain, reason why most of identified areas are in projection:

a. Production

According to the findings farmers come across with several challenges in tomato production. The core issue for this area is directly linked to weather conditions where floods were put on the top of limiting factors of tomato production in the marshland. In short conversation we had we some farmers in tomato field, one farmer said *"In 2012 planted tomatoes but later on I harvested fish instead"* This statement means that his tomato farm was full of water like in fish farm. He got nothing like tomato yield as he was expecting. Such situation is used to

happen in rwabusoro marshland and destroy enormously tomato yield in which farmers have had invested a lot of money and efforts (see picture 4).

Picture4: A tomato farm few days after flooding situation



This a very bad situation for tomato farmers in Rwabusoro marshland because it demotivates farmers and bring them insolvency situation towards financials. It would be better if farmers were insured against poor harvest resulted from natural hazards but this service is still unknown by the farmers in Busoro. In addition, availability of improved tomato seeds, fertilizers and pesticides was also identified as prevailing issues in tomato production. Few farmers can get some of those inputs at high prices whereas others use non-recommended inputs of low quality (see picture 6)

Picture 5: Farmers using inputs



Besides availability and affordability of inputs, it has been found that their skills on the use of them is limited which may expose a farmer to the loss of production and health problems because of inappropriate use and handling.

b. Productivity

Under this challenge area both farmer and firm agreed that floods, pests and diseases, lack of appropriate inputs come forwards in factors limiting tomato productivity in Busoro area because farmers are not able to solve these issues themselves. Some of these challenges

are unpredictable and needs very strong strategies that are beyond of farmers and company capacities. So far, irrigation and drainage infrastructures are not yet constructed in Rwabusoro marshland. This increases risks for farmers who always invest their efforts and money such situations. This also reduce the motivation of someone else who may think to support farmers in that area. Both firm and farmers know that there is potential for tomato but they are still looking each other asking themselves who should start between them. They are still all fearful to invest without intervention of supporters and influencers in the chain.

c. Farmer group functioning

Both firm and farmers agreed that URUGERO tomato farmers' cooperative doesn't function properly. The majority of respondents reported that the cooperative is no longer serving them as before because of weakness in leadership and management. "Better is to work individually because cooperative is only there for leaders' interests, not for members". In different conversations we had with farmers, the said that the former cooperative President and treasurer abused cooperative money, and none of them was punished. It was noticed that challenges present in URUGERO cooperative are in relation with limited of skills on cooperative management, leadership, conflict management and culture of impunity in cooperatives.

d. Stakeholder collaboration

Stakeholder collaboration has been identified as one of main challenges in tomato value chain in Busoro sector. The actors who were investing in inputs supply given up because of farmers' incapability to pay back inputs they were given as loans due natural hazards (floods and drought). The majority of actors are no longer motivated to continue working in such conditions as long as sustainable strategies to mitigate those risks have not been taken. In addition, farmers are in need to get embedded services (extension services, micro-credits, agricultural insurance, irrigation and drainage facilities, etc.).

e. Quality standards

Tomato products are mostly used for human consumption, for that reason quality standards have to be taken into account during the whole chain in order to prevent injuries the consumers' health. Therefore, during our field study we noticed that both tomato farmers and the company staff don't have enough skills about quality and standards required by RBS. Apart from knowledge gap, the company has not yet started using processing machinery that could help to increase quality standards for tomato ketchup and jam.

In addition, farmers are still using cheap and non-recommended inputs which are most the time suspicious about the quality and standards.

Generally, it has been found that quality/standards issues in tomato value chain are mainly linked to the knowledge gap lack of appropriate equipment for farmers and firm, and lack hygienic techniques for tomato preparation.

f. Perspectives for company functioning

The research findings showed that all areas related to the perspectives were highly appreciated by both firm and farmers, but the company seemed to be more positive than farmers. This is because the company has ambition to make a difference from the functioning of former companies who failed to establish a good firm-farm relationship during a couple of 5 past years.

The processing plant will operate nearby farmers in rural area which is totally different from other companies. I will be very easy for the company to know and understand farmers because they will be always together whereas former companies were operating in capital

city which has realities different from rural area realities. The company will also facilitate farmers to get inputs and other required embedded services (trainings, credits, insurance, etc.).

In addition, the fact that the processing plant will operate in Busoro sector, it will increase economy of Busoro inhabitants and its neighbours because of employment creation and increased traffic in the area.

g. Contractual perspectives

Once all procedures related to the installation of tomato processing will be completed, the company will be engaged in contract farming with the farmers where all farmers' views will be considered in contract preparation. The majority of respondents (for firm and farm sides) said that they will benefit from written and clear contract farming. A seasonal contract farming was highly appreciated by both sides because tomato is a seasonal crop which doesn't require binding contracts. The company will be clear about the quantity and quality of tomato yield it will take from farmers. The contract will be between farmer and firm, not firm-cooperative in order to minimise risks of resisting to loan repayment for some farmers. The farmers will be paid through their own bank account not cooperative account as it was before.

The government will be integrated in contract designing and implementation between firm and farm in order to monitor its effectiveness and reduce probable dispute that may arise.

h. Perspectives on prices and marketing

The research findings showed that farmers are happy to be consulted during prices fixing. This will increase the chance for them to get compensative price than before. The company will not work in monopoly but it will establish a strong partnership with other buy in order to ensure that farmers' yield loss is reduced. The farmers will be free to sell their produce for other buyers in case they are not happy with the company prices. The farmers will be totally and timely paid according to the contract farming. Also, the tomato processed in Busoro will be sold even outside the country such as Burundi, DRC and Uganda.

i. Production perspectives

In order to ensure the continuity and profitability of processing activities, the tomato production both in marshland and on hillside will be increased as much as possible. During our field activities and horticulture map, both farmers and firm mentioned that Busoro has potential for tomato productivity in the marshland (see picture 6) as well as on hillside. The tomato will then be grown 3 times a year, 2 times during rainfall seasons on hillside and once during dry season in the marshland. For that reason, the company will make sure that recommended and affordable inputs are available for farmers. Tomato farmers will be trained about production of marketable tomatoes. In addition, farmers will be facilitated to obtain agricultural insurance (micro insurance) against production risks such as floods and drought. The company will also mobilize as many as possible stakeholders so that they could restore the trust to the farmers and provide again embedded services with the aim of increasing tomato production and profitability in Busoro sector.

Picture 6: A portion of Rwabusoro marshland in cultivation



As illustrated on picture 6 above, a little number of farmers managed to grow tomato this season while other big number is still waiting for stakeholders who may facilitate the to easily access to recommended inputs.

4.6. SWOT analysis of tomato business case between AIPD Ltd and URUGERO cooperative

Table 4: SWOT analysis of tomato business case in Busoro-Rwanda

Strengths	Opportunities
<ul style="list-style-type: none"> ○ Willingness of farmers and firm ○ Familiarity for tomato production ○ The firm is based in the same area ○ The firm has trained staff on processing ○ Legal recognition of both firm and cooperative ○ Cooperative has its own house ○ The firm has its own plot for processing plant ○ The firm has well equipped office ○ Uniqueness of tomato ketchup and jam made in the region ○ Processing plant in rural area 	<ul style="list-style-type: none"> ○ Potentials for tomato productivity ○ Fertile soil ○ High demand of tomatoes ○ Tomato may be grown all year around(marshland and hillside) ○ Possibility of 3 cropping seasons ○ Local universities are interested by the chain ○ Tomato ketchup processed in Busoro is unique in Rwanda ○ The processing plant will be constructed nearby farmers in rural area ○ Existence of electricity in Busoro
Weaknesses	Threats
<ul style="list-style-type: none"> ○ Low level of trust each other(F-F) ○ Insufficiency of technical skills for farmers ○ Poor management of farmer cooperative ○ Slight accountability for members ○ Lack of skills about cooperative functioning and management ○ Reduced motivation for the farmers ○ The firm is afraid to invest before availability of tomato yield ○ Reliance on rainfall 	<ul style="list-style-type: none"> ○ Floods ○ Pests and diseases ○ Drought ○ Climatic variability ○ Lack of stakeholders in the chain ○ Lack of inputs ○ Perishability of tomato ○ Poor infrastructures ○

4.7 Evaluation of business case between AIPD Ltd and URUGERO Cooperative

The survey was carried out on 9 challenge areas which are listed in table 5, the overall results are compiled in table 6, the overall scores are visualised in figure 12. After presentation and analysis of challenge areas in general, the findings for each challenge area were also presented and analysed by the use of a table compiling the overall median scores (from F-F respondents) for each statement under a specific challenge area, a graph showing F-F scores per statements, and another graph illustrating the level of agreement between F-F for each statement.

Table 5: challenge areas in tomato case-Rwanda

Challenge areas	
1	Production
2	Productivity
3	Farmer group functioning
4	Stakeholder collaboration
5	Quality standards
6	Perspectives for company functioning
7	Contractual perspectives
8	Perspectives on prices and marketing
9	Perspectives on production

Table 6: Average scores per challenge area

Overall results	Median scores per challenge area									Median all areas
Challenge areas	1	2	3	4	5	6	7	8	9	
Farmers' scores	1.0	3.0	1.0	1.0	1.0	3.0	3.0	3.0	3.0	3.0
Company scores	0.0	2.0	2.0	1.0	2.0	3.0	3.0	3.0	2.0	2.0
Median firm-farm per challenge area	0.5	2.5	1.5	1.0	1.5	3.0	3.0	3.0	2.5	2.5
Median overall score (all challenge areas)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Difference farmers - median F-F score	0.5	0.5	-0.5	0.0	-0.5	0.0	0.0	0.0	0.5	0.5
Difference Company - median F-F score	-0.5	-0.5	0.5	0.0	0.5	0.0	0.0	0.0	-0.5	-0.5
Diff farmers median-company median	1.0	1.0	-1.0	0.0	-1.0	0.0	0.0	0.0	1.0	

The average median score for the firm-farmer relationship for all the challenge areas was positive at 2.5. Meaning that the respondents are satisfied with the cooperative performance for all challenge areas. The adjustments could be made to lift the level of satisfaction to the final stage. Generally, the farmers had very higher median scores (3) than the firm for challenge areas 1, 2 and 9. While the firm scored below the farmer median at 2, it means that the satisfaction level of the respondents is not optimal. Therefore, improvement of the cooperative performance is not obligatory, but advisable in order to increase satisfaction among members. The firm has higher scores (2) than the farmers (1) on the areas of quality standards and farmers group functioning. It means that for the firm, the satisfaction level of the respondents is not optimal and the improvement is not obligatory, but advisable in order to increase satisfaction among members; for the farmers, respondents disagree with the statements, which means that the aspect of cooperative performance was unsatisfactory and there is an urge for improvement or change.

Both the farmers and the firm give a very low score (1) for area of 'stakeholder collaboration', caused by the disagreement of the respondents with the statements. Meaning that the aspect of cooperative performance was unsatisfactory and there is an urge for improvement or change.

Figure 12: Visual F-F overall scores challenge areas



It can be observed that the perceptions of farmers and the company are quite different for challenge area 1, 2, 3, 5 and 9. At first sight, there is much more agreement for the areas 4, 6, 7, and 8.

4.7.1. Challenge area “Production”

The challenge area of production has 9 key indicators listed in table 7 below. The overall findings for this challenge area are summarized in table 8 below.

Table 7: Key indicators of challenge area 1

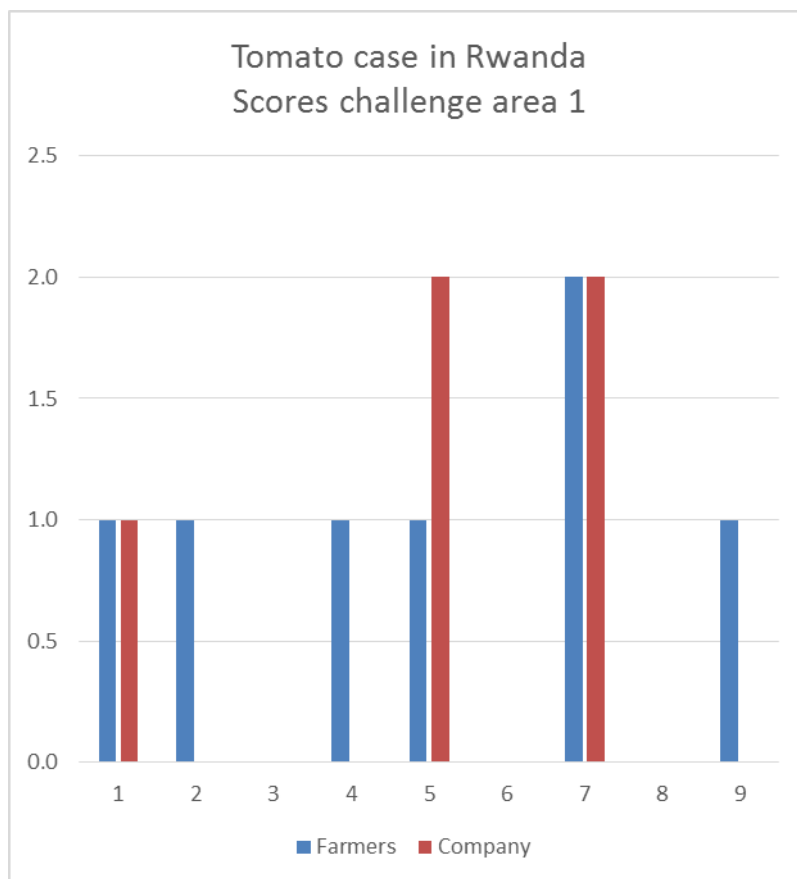
Statements challenge area “Tomato production”	
1.1	Recommended pesticides and fungicides are available
1.2	Recommended pesticides and fungicides are affordable
1.3	Improved tomato seeds are available
1.4	Improved tomato seeds are affordable
1.5	Tomato grown in Rwabusoro marshland are tolerant for diseases
1.6	Tomato grown in Rwabusoro marshland are insured against any cause of poor yield
1.7	Yield is increasing in Rwabusoro marshland
1.8	Farmers are able to calculate production costs for a kg of tomato
1.9	Farmers get quick feedback for problems they have for tomato production

Table 8: Overall findings on challenge area 1

Challenge area 1	Median scores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	1.0	1.0	0.0	1.0	1.0	0.0	2.0	0.0	1.0	1.0
Company scores	1.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0
Median firm-farmer statement score	1.0	0.5	0.0	0.5	1.5	0.0	2.0	0.0	0.5	0.5
Median firm-farmer area score	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Difference farmers - median F-F score	0.0	0.5	0.0	0.5	-0.5	0.0	0.0	0.0	0.5	0.5
Difference Company - median F-F score	0.0	-0.5	0.0	-0.5	0.5	0.0	0.0	0.0	-0.5	-0.5
<i>Diff farmers median-company median</i>	0.0	1.0	0.0	1.0	-1.0	0.0	0.0	0.0	1.0	

The average median score for the challenge area of production is very low (0.5), caused by the disagreement of the respondents with the statements. Meaning that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. The F-F scores are visualised in figure 13.

Figure 13: Visual F-F scores on production area



In the areas of '5', it clearly comes out that the farmers are not as positive as the firm about the statements saying "tomato grown in Rwabusoro marshland are tolerant for diseases". The company gives the lowest score for areas 2, 4 and 9, caused by the disagreement of the respondents with the statements. Meaning that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. It can be observed that in this area the level of agreement is not very high. There are at least 3 statements for which the farmers give a far higher score than the Company. This means that farmers are more concerned than the company about this challenge area. But the firm and farm have the same positive understanding on the statement 7 with score 3.

In addition, both firm and farm totally disagree with these statements: 1, 2, 3, 4, 6, 8 and 9. These indicate that tomato farmers needs improved seeds and agricultural insurance. Besides of those services, farmers have also gaps in calculation of production cost for tomato crop.

4.7.2. Challenge area “Productivity”

The challenge area of productivity has 9 key indicators listed in table 9 below. The overall findings for this challenge area are summarized in table 10 below.

Table 9: Key indicators of challenge area 2

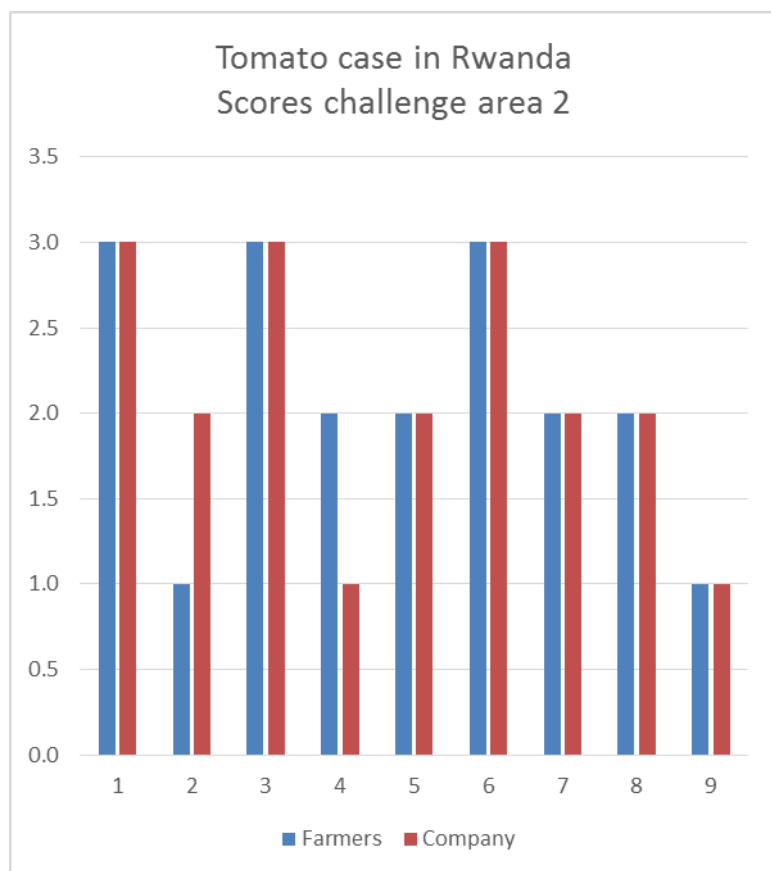
Statements challenge area “Productivity”	
2.1	Rwabusoro marshland has potentials for tomato production
2.2	Tomatoes are grown in rwabusoro marshland all year around
2.3	There are appropriate measures to control floods in Rwabusoro marshland
2.4	Tomatoes can be grown on hillsides
2.5	Farmers are satisfied by the yield they get
2.6	Tomato have a significant impact on socio-economic situation on people who dwell Busoro area.
2.7	All tomato diseases in the marshland are controlled
2.8	All farmers grow high yielding varieties available in Rwanda
2.9	Farmers earn more money from tomatoes than other crops

Table 10: Overall findings on challenge area 2

Challenge area 2	Median scores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	3.0	1.0	3.0	2.0	2.0	3.0	2.0	2.0	1.0	2.0
Company scores	3.0	2.0	3.0	1.0	2.0	3.0	2.0	2.0	1.0	2.0
Median firm-farmer statement score	3.0	1.5	3.0	1.5	2.0	3.0	2.0	2.0	1.0	2.0
Median firm-farmer area score	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Difference farmers - median F-F score	0.0	-0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Difference Company - median F-F score	0.0	0.5	0.0	-0.5	0.0	0.0	0.0	0.0	0.0	0.0
<i>Diff. farmers median-company median</i>	0.0	-1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	

The average median score for the challenge area of productivity is positive (2), the satisfaction of respondents is not optimal for this challenge area. Therefore, an improvement of the cooperative performance is not obligatory, but advisable in order to increase satisfaction among members. The F-F scores are visualised in figure 14.

Figure 14: Visual F-F scores on productivity



In the area of '2', it clearly comes out that the farmers are not satisfied by the 2nd statement. It is indicated by a very low score (1), caused by the disagreement of the respondents with the statements. It means that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. Whereas the satisfaction of company is not optimal. Therefore, improvement on this statement is necessary to meet the needs and wishes of the respondents. On the other side, the company gives the lowest score (1) for area 4 which shows the disagreement of the respondents with the statement, while farmers have a positive score on the statement which means that the satisfaction of respondents is not optimal. Therefore, for the company view, improvement of the cooperatives performance is not obligatory on this statements, but advisable in order to increase satisfaction among members. The farmers' point of view on this statement, showed that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change.

In addition, both farmers and the company have a very low score on statement 9, caused by the disagreement of the respondents with the statement. This means that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. According to various conversations with farmers, tomatoes can easily adapt on hillside but the problem that farmers have so far is an easy access to improved inputs

(tomato seeds, fertilizers and pesticides). It can be observed that in this area, the level of agreement is very high. There are 7 statements for which the farmers and firm feel the same.

4.7.3. Challenge area “Farmer group functioning”

The challenge area of farmer group functioning has 9 key indicators listed in table 11 below. The overall findings for this challenge area are summarized in table 12 below.

Table 11: Key indicators of challenge area 3

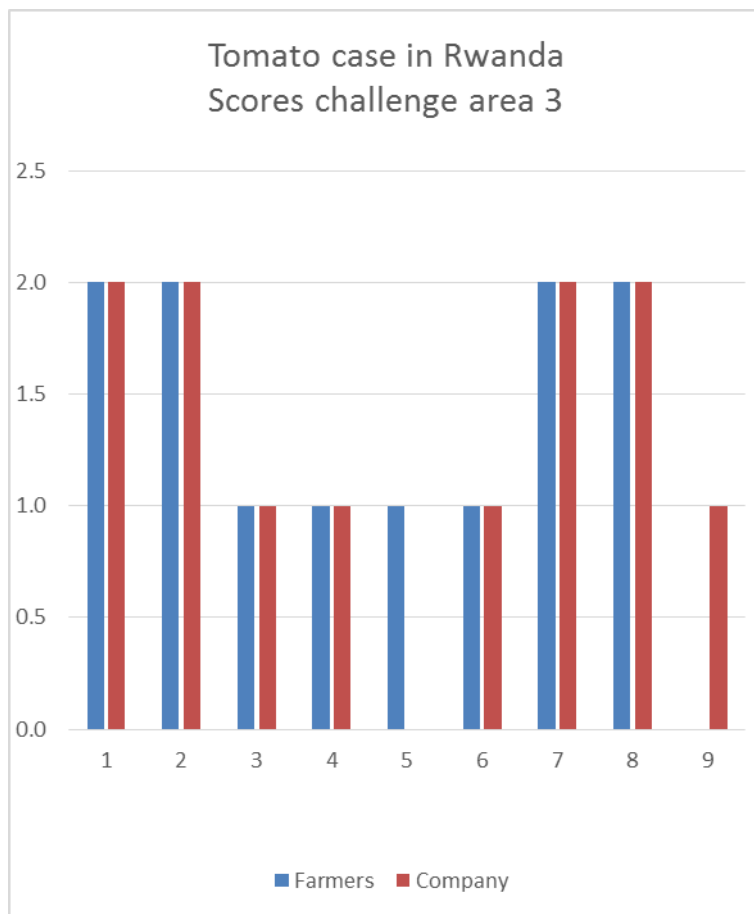
Statements challenge area “Farmer group functioning”	
3.1	Farmers are organized in cooperative
3.2	Farmers know advantages of working in cooperative
3.3	Farmers prefer to work as individuals than organised in cooperative
3.4	Members are aware on what is going on in cooperative
3.5	Coopertive leaders fullfil all responsibilities assigned by members
3.6	There is a transparency in cooperative management and functioning
3.7	The cooperative structures are set democratically and equally
3.8	Cooperative leaders represent common interests of members.
3.9	All farmers have common goal

Table 12: Overall findings on challenge area 3

Challenge area 3	Median scores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	0.0	1.0
Company scores	2.0	2.0	1.0	1.0	0.0	1.0	2.0	2.0	1.0	1.0
Median firm-farmer statement score	2.0	2.0	1.0	1.0	0.5	1.0	2.0	2.0	0.5	1.0
Median firm-farmer area score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Difference farmers - Median F-F score	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	-0.5	0.0
Difference Company - Median F-F score	0.0	0.0	0.0	0.0	-0.5	0.0	0.0	0.0	0.5	0.0
Diff. farmers median-company median	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	-1.0	

The average median score for the challenge area of productivity is very low (1), caused by the disagreement of the respondents with the statements. It means that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. The F-F scores are visualised in figure 15.

Figure 15: Visual F-F scores on farmer group functioning



In the area of '5, it clearly comes out that the firm disagrees with the statement. It means that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. Whereas the farmers disagreed with statement 9 with a very low score (0). These two statement showed that there is a problem in cooperative functioning, management and membership. Member themselves and leaders don't understand very well the -importance of cooperative. As conclusion, it can be observed that in this area the level of agreement is very high. Both firm and farmer gave more or less the same score on the majority of statements.

4.7.4. Challenge area “Stakeholder collaboration”

The challenge area of stakeholder collaboration has 9 key indicators listed in table 13 below. The overall findings for this challenge area are summarized in table 14 below.

Table 13: Key indicators of challenge area 4

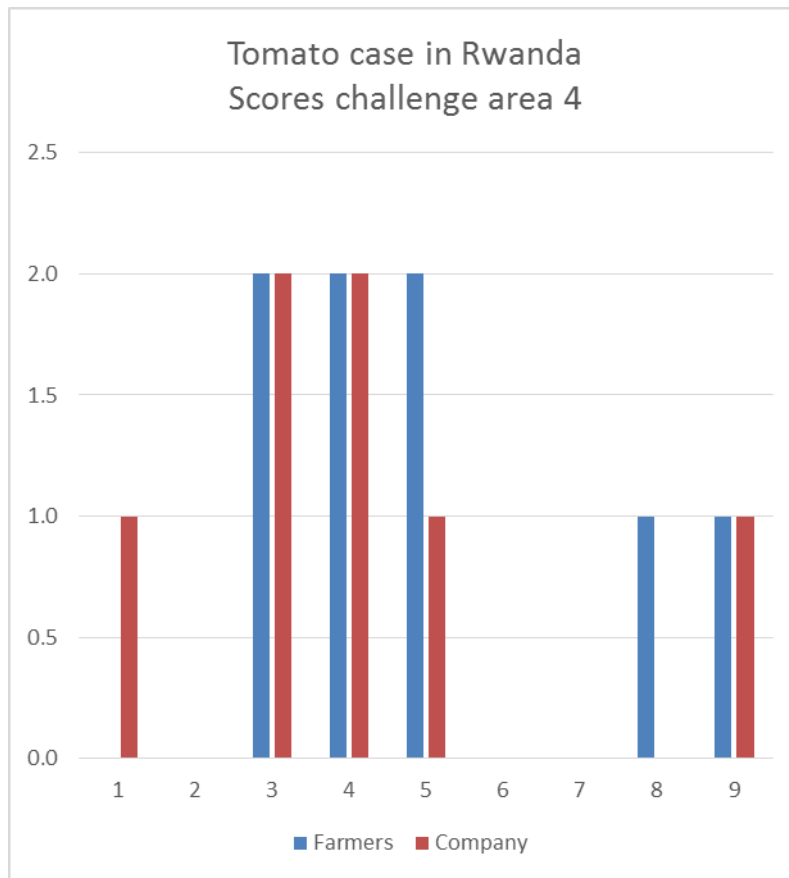
Statements challenge area “Stakeholder collaboration”	
4.1	We have enough stakeholders providing embedded services for tomato crop
4.2	Farmers get extension services for tomato production
4.3	Farmers use properly received inputs
4.4	Tomato farmers are familiar to work with microfinance institutions
4.5	MFIs are willing to provide credits for tomato production
4.6	A lot of stakeholders are happy to work with tomato farmers when there are floods in the marshland
4.7	It is easy for stakeholder to work with individual farmers than organized farmers
4.8	It is easy for individual farmer to obtain stakeholders than being in cooperative
4.9	Farmers know the destination of their tomatoes after sale

Table 14: Overall findings on challenge area 4

Challenge area 4	Median scores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	0.0	0.0	2.0	2.0	2.0	0.0	0.0	1.0	1.0	1.0
Company scores	1.0	0.0	2.0	2.0	1.0	0.0	0.0	0.0	1.0	1.0
Median firm-farmer statement score	0.5	0.0	2.0	2.0	1.5	0.0	0.0	0.5	1.0	1.0
Median firm-farmer area score	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Difference farmers - median F-F score	-0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0
Difference Company - median F-F score	0.5	0.0	0.0	0.0	-0.5	0.0	0.0	-0.5	0.0	0.0
Diff. farmers median-company median	-1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	

The average median score for the challenge area of stakeholder collaboration is very low (1), caused by the disagreement of the respondents with the statements. It means that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. The F-F scores are visualised in figure 16.

Figure 16: Visual F-F scores on stakeholder collaboration



In the area of '1, 2, 6, 7, 8 and 9', it clearly comes out that both the farmers and firm are not positive, with very low scores (0 and 1), caused by the disagreement of the respondents with the statements. Meaning that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change.

It can be observed that in this area the level of agreement is high. On the statements 5 and 8 the farmers give a far higher score than the Company. Farmers have been demotivated to work in cooperative because they have experienced a bad reputation on cooperative functioning due to the mismanagement that characterised URUGERO cooperative during a couple of 5 past years. In contrast, a lot of stakeholders prefer to work with organised farmers for successful and sustainable results. Tomato farmers in Rwabusoro marshland need therefore to be organised in order to improve their relations with various stakeholders involved in tomato value chain.

4.7.5. Challenge area “Quality standards”

The challenge area of quality standards has 9 key indicators listed in table 15 below. The overall findings for this challenge area are summarized in table 16 below.

Table 15: Key indicators of challenge area 5

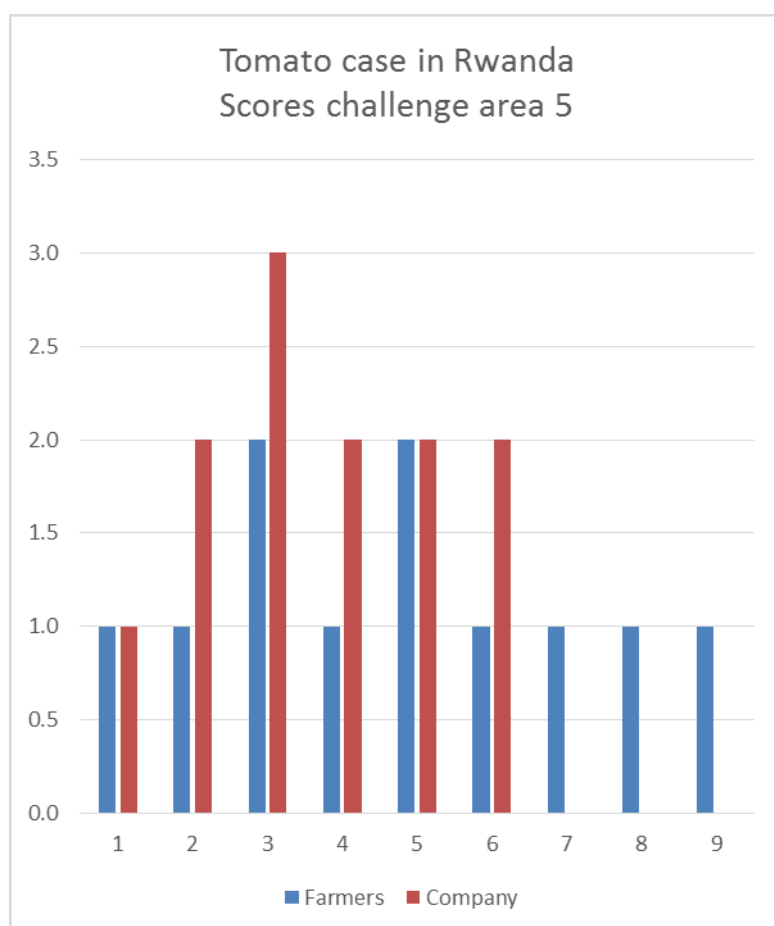
Statements challenge area “Quality standards”	
5.1	I understand the quality standards required for tomato crop
5.2	It is easy for farmers to follow quality standards conditions
5.3	Farmers have yield collection centers
5.4	Farmers always keep hygienically yield collecting centers
5.5	All farmers use the same variety of tomatoes
5.6	All farmers use recommended pesticides, fungicides chemicals and fertilizers
5.7	Recommended pesticides, fungicides and fertilizers are available
5.8	Farmer is able to buy by her/himself recommended pesticides, fungicides and fertilizers
5.9	Farmers understand preventive methods for consequences caused by improper use of pesticides

Table 16: Overall findings on challenge area 5

Challenge area 5	Median scores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	1.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0
Company scores	1.0	2.0	3.0	2.0	2.0	2.0	0.0	0.0	0.0	2.0
Median firm-farmer statement score	1.0	1.5	2.5	1.5	2.0	1.5	0.5	0.5	0.5	1.5
Median firm-farmer area score	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
Difference farmers -median F-F score	0.0	-0.5	-0.5	-0.5	0.0	-0.5	0.5	0.5	0.5	-0.5
Difference Company - median F-F score	0.0	0.5	0.5	0.5	0.0	0.5	-0.5	-0.5	-0.5	2.0
Diff. farmers median-company median	0.0	-1.0	-1.0	-1.0	0.0	-1.0	1.0	1.0	1.0	

The average median score for the challenge area of quality standards is low (1.5), dissatisfaction of the respondents is present; therefore improvement is necessary to meet the needs and wishes of the respondents. The F-F scores are visualised in figure 17.

Figure 17: Visual F-F scores on quality standards



In the areas of '2, 4 and 6', it clearly comes out that the farmers have very low scores (1), caused by the disagreement of the respondents with the statements. It means that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. Differently, the company has a positive score (2) on the same areas, which indicates that an improvement of the cooperative is not obligatory, but advisable in order to increase satisfaction among members. In addition, for the area 3, F-F views are also different where the company fully agree with the statement and indicates a high level of satisfaction, while the farmers have a positive score which indicates that the satisfaction of respondents is not optimal. Therefore, improvement is not obligatory, but advisable in order to increase satisfaction among members.

The firm gives the lowest score (0) for statements 7, 8 and 9 whereas the farmers gave very low scores (1). However, it clearly comes out that farmers are more concerned by this challenge than the firm because the farmers are the one who are much more involved in producing activities (ploughing, applying various inputs, hygienic issues, etc.). Farmers need then to be careful as much as possible in order to supply/deliver the good quality tomatoes. Nonetheless, farmers reported that their knowledge/skills about quality standards is still very low.

It can be observed that in this area the level of agreement is high. Both firm and farmers feel that they are concerned by quality standards. The reason behind is that the farmers and even firm staff have never been trained before about quality standards. Also the processing plant with competent machinery has not yet started. Therefore, this area need much more improvement for both sides.

4.7.6. Challenge area “Perspectives for company functioning”

The challenge area of perspectives for company functioning has 9 key indicators listed in table 17 below. The overall findings for this challenge area are summarized in table 18.

Table 17: Key indicators of challenge area 6

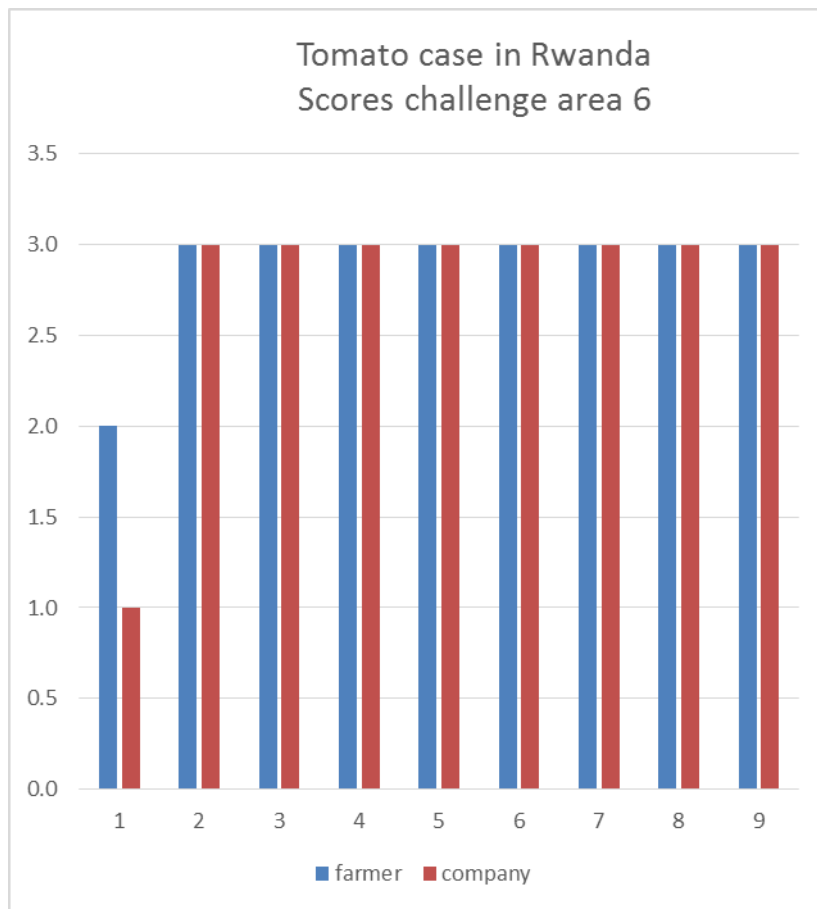
Statements challenge area “Perspectives for company functioning”	
6.1	It is advantageous for the company to work with individual farmer
6.2	It is advantageous for the company to work with organized farmers
6.3	Given the processing plant will operate nearby farmers, will increase economy of Busoro inhabitants and its neighbors
6.4	The processing company will get enough yield that can make it functional all year around
6.5	The company will facilitate farmers to know how to produce needed tomatoes
6.6	The company will facilitate the famers to get loans for tomato production
6.7	The company will regularly inform the farmers about the functioning of tomato processing plant
6.8	The processing plant will be a solution for current problems in tomato marketing
6.9	The processing plant will be well equipped to process tomato that meet quality standards

Table 18: Overall findings on challenge area 6

Challenge area 6	Median scores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Company scores	1.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Median firm-farmer statement score	1.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Median firm-farmer area score	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Difference farmers - median F-F score	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Difference Company - median F-F score	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Diff. farmers median-company median</i>	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

The average median score for the challenge area of perspectives on company functioning is very high (3), the average respondents fully agree with the statement and indicates a high level of satisfaction. Change or improvement is not needed. Because the company is still new, and therefore its plan is fresh and sounds well to the farmers. The F-F scores are visualised in figure 18.

Figure 18: Visual F-F scores on perspectives on company functioning



It clearly comes out that both the farmers and firm totally agree with almost all statements indicating how the processing plant will operate. The exception is on statement 1, where the firm has a very low score (1), caused by the disagreement of the respondents with the statement. Meaning that the aspect of cooperative's performance was unsatisfactory and there is an urge for improvement or change. Unlike for the farmers who have a positive score (2), showing that the satisfaction of the respondents is not optimal. Therefore, the improvement of the cooperative performance is not obligatory, but advisable in order to increase satisfaction among members.

For concluding, it can be observed that in this area the level of agreement is very high. The firm and the farm have at least the same feeling about this perspective. They have to do all their bests to achieve it in sustainable manner.

4.7.7. Challenge area “Contractual perspectives”

The challenge area of perspectives for company functioning has 9 key indicators listed in table 19 below. The overall findings for this challenge area are summarized in table 20.

Table 19: Key indicators of challenge area 7

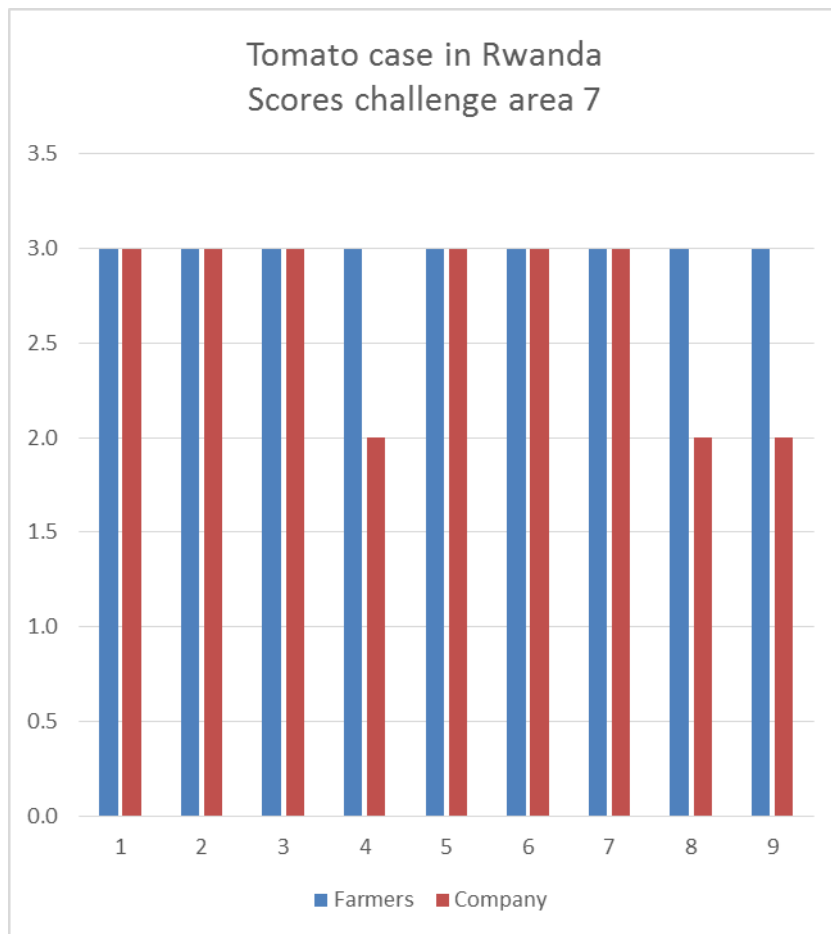
Statements challenge area “Contractual perspectives”	
7.1	A clear contract farming will be signed between farmers and the company
7.2	Farmers will have common understanding on elements of their contract and the company
7.3	The company and the farmers will be in closer collaboration to prepare contract farming
7.4	It is more advantageous to sign seasonal contract than long term contract
7.5	It is helpful that the government will intervene in contract farming implementation
7.6	Farmers will benefit from written and legal contract
7.7	The company will benefit from written and legal contract
7.8	Risks and losses will be equally shared between farmers and company in case of natural disasters
7.9	The company will buy all tomato yield produced by the farmers

Table 20: Overall findings on challenge area 7

Challenge area 7	Median scores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Company scores	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0	3.0
Median firm-farmer statement score	3.0	3.0	3.0	2.5	3.0	3.0	3.0	2.5	2.5	3.0
Median firm-farmer area score	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Difference farmers - median F-F score	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0
Difference Company - median F-F score	0.0	0.0	0.0	-0.5	0.0	0.0	0.0	-0.5	-0.5	0.0
<i>diff farmers median-company median</i>	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	1.0	

The average median score for the challenge area of contractual perspectives is very high (3), the average respondent fully agrees with the statement and indicates a high level of satisfaction. Change or improvement is not needed. This will be a new occasion for both the firm and farmers to be linked in contract farming, so they are all willing to sign a contract that makes a difference from previous ones. The F-F scores are visualised in figure 19.

Figure 19: Visual F-F scores on contractual perspectives



In more than half of statements for this area, it clearly comes out that both the farmers and the firm are satisfied (with 3 score) with the elements of contract farming which will link them each other. The farmers are more excited than the firm about these statements 4, 8, and 9, where they gave a very high score (3) indicating a high level of satisfaction whereas the firm gave a positive score indicating that the satisfaction of respondents is not optimal. So, the improvement of the cooperative performance is not obligatory, but advisable in order to increase satisfaction among members.

It very clear that farmers needs to honestly collaborate with the firm with whom they will seasonally sign clear contract and respect all its elements. They need to deal with a financially competent company which will be able to buy all their produce and/or facilitate them otherwise. They just wish to respect the entire contract for both sides during implementation time.

4.7.8. Challenge area “Perspectives on prices and marketing”

The challenge area of perspectives on prices and marketing has 9 key indicators listed in table 21 below. The overall findings for this challenge area are summarized in table 22 below.

Table 21: Key indicators of challenge area 8

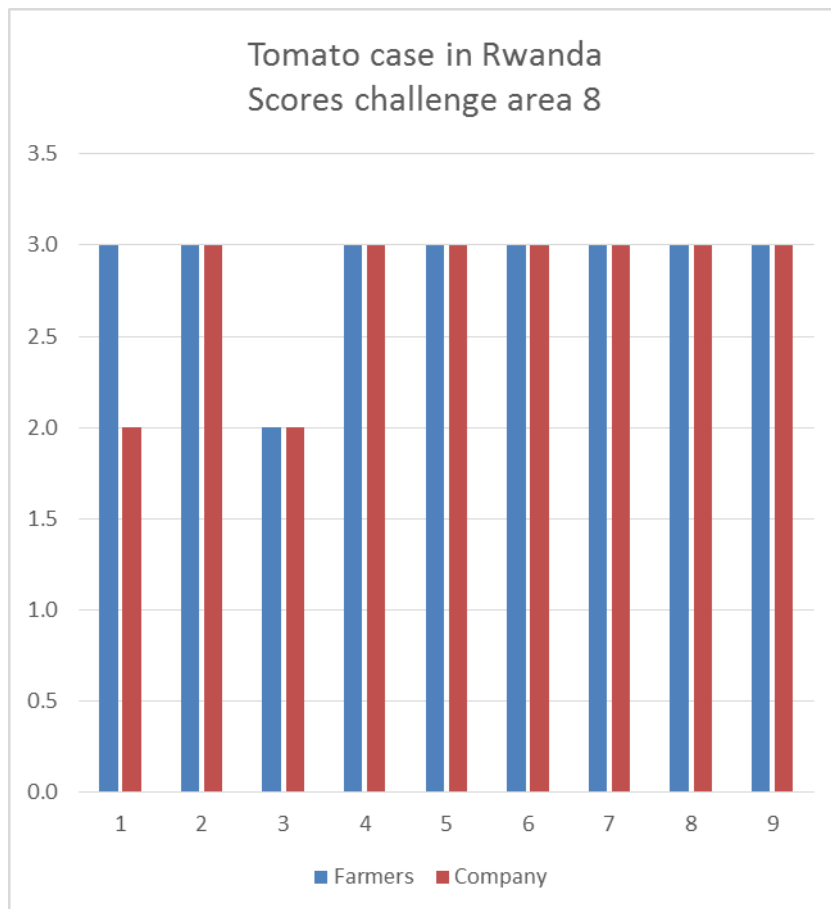
Statements challenge area “Perspectives on prices and marketing”	
8.1	The company will be clear with the quantity of tomatoes that it will be able to buy from farmers
8.2	The company will inform the farmers on time the quality of needed tomatoes
8.3	There will be other tomato buyers in Busoro area
8.4	Farmers will be free to sell their tomatoes to other buyers in case they are not satisfied with the price provided by the company
8.5	Farmers are hopeful to get better price for the company
8.6	Farmers will be paid timely
8.7	It is advantageous for farmers to be paid through cooperative
8.8	The proper marketing of tomato will improve the economy of the whole district and neighbors
8.9	The tomato processed in Busoro will be sold even outside the country

Table 22: Overall findings on challenge area 8

Challenge area 8	Median scores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Company scores	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Median firm-farmer statement score	2.5	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Median firm-farmer area score	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Difference farmers - median F-F score	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Difference Company - median F-F score	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diff farmers median-company median	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

The average median score for the challenge area of prices and marketing perspectives is very high (3), the average respondent fully agrees with the statement and indicates a high level of satisfaction. The F-F scores are visualised in figure 20.

Figure 20: Visual F-F scores on prices and marketing perspectives



On 8 out of 9 statements, it clearly comes out that farmers and firm are very positive. This shows their high satisfaction about the projection on prices and marketing modalities. It is a better goal to achieve for their future perspectives in order to come up with win-win situation within their transactions. From the time when the company will have started already, the firm has to be clear with the quantity of tomatoes that it will be able to buy from farmers and facilitate the farmers to sell extra tomatoes. This would make the company trustworthy towards farmers. The company also has a positive view on this regards but its satisfaction is not optimal. The improvement is not obligatory, but advisable in order to increase satisfaction among members. As conclusion, it can be observed that in this area the level of agreement is very high. The change is not compulsory for both side.

4.7.9. Challenge area “perspectives on production”

The challenge area of perspectives on prices and marketing has 9 key indicators listed in table 23 below. The overall findings for this challenge area are summarized in table 24 below.

Table 23: Key indicators of challenge area 9

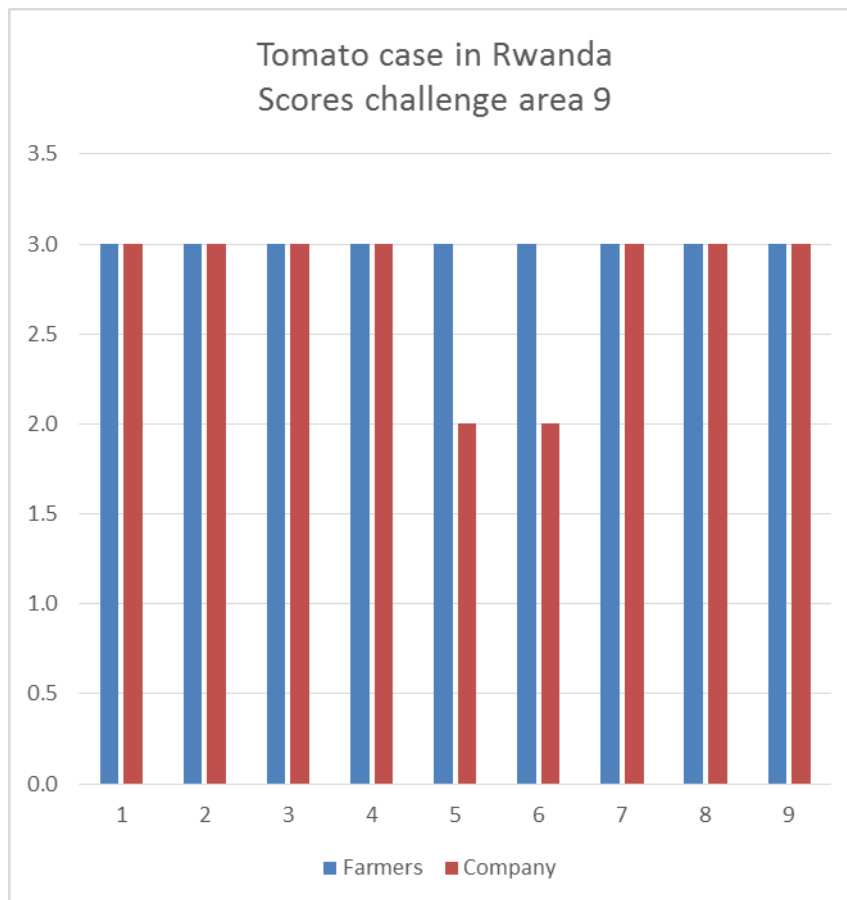
Statements challenge area “perspectives on production”	
9.1	The yield in the marshland can be increased
9.2	The yield on hillside can be increased
9.3	Farmers will receive tomato seeds on time
9.4	Farmers will receive pesticides, fungicide and fertilizers on time
9.5	Farmers will buy improved tomato seeds for better prices
9.6	Farmers will buy recommended pesticides, fungicides and fertilizers for better prices
9.7	The stakeholders may restore the trust for farmers
9.8	In case the trust for the farmers will be restored by stakeholders, it will improve tomato production and its derivatives
9.9	Taking insurance for tomato production will help in preventing losses caused by floods

Table 24: Overall findings on challenge area 9

Challenge area 9	Median cores per statement									Average- median area score
Statements	1	2	3	4	5	6	7	8	9	
Farmers' scores	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Company scores	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0
Median firm-farmer statement score	3.0	3.0	3.0	3.0	2.5	2.5	3.0	3.0	3.0	3.0
median firm-farmer area score	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Difference farmers - median F-F score	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0
Difference Company - median F-F score	0.0	0.0	0.0	0.0	-0.5	-0.5	0.0	0.0	0.0	0.0
Diff farmers median-company median	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	

The average median score for the challenge area of production perspectives is very high (3), the average respondent fully agrees with the statement and indicates a high level of satisfaction. The F-F scores are visualised in figure 21.

Figure 21: Visual F-F scores on production perspectives



On 7 out of 9 statements, it clearly comes out that farmers and firm are very positive and have common view on the statements. This show their high satisfaction about the projection on production. Farmers needs to work in conducive environment in order to increase tomato yield as much as possible. Farmers wish to receive tomato seeds, pesticides, fungicide and fertilizers on time. The firm expects to get on time and consistently the required production on year basis for the viability of the business.

4.8. Results of debriefing session in focus group discussion

The session was needed as the farmers took opportunity to share and discuss 2-2 tango results with firm and other stakeholders. In that occasion, firm and farmers debated on 4 prevailing issues in the chain as shown by research results: Production, farmer group functioning, stakeholder collaboration and quality standards which were lowly scored by both sides. They identified areas on which they are able to find solutions themselves and areas on which they need other stakeholders to support (extension services, agricultural insurances, inputs distribution, irrigation systems, trainings, and micro credits). The table 25 shows in detail the responsibilities assigned on firm, farmers and supporters.

Firm and farmer agreed on perspectives areas which were highly scored by both sides. They agreed each other to do their bests to maintain the level of those areas even when the processing plant will have started in order to increase level of trust towards win-win situation between the firm and farmers. It was noticed that there is a dilemma about who should start between the firm and farmer. The firm is concerned by low and seasonal yield in order to expect to be operational all year round “the processing plant should not wait for the yield, the yield should wait for the processing plant instead” said by the company manager. The farmers don’t agree with this statement, and on their side they don’t trust the capacity of processing plant in case of abundant yield they are expecting. The company promised the farmers to link them with other traders in case it is not able to take all produced tomatoes. AIPD Ltd will make sure that there is no tomato yield will be wasted anymore because it will always facilitate the farmers to find market for all their produce. The following are the pictures showing debriefing meeting event.

Picture7: Debriefing meeting



The debriefing exercise was very interesting for all participants as the farmers got opportunity to propose their own solutions for prevailing challenge areas in tomato value chain. The Executive secretary of Busoro sector has highly appreciated the exercise in these words “*This is really a kind of research we want, a research which consider views of our people, and a research that gives a feedback to the respondents*”. Agri-Hub Rwanda accepted to organise a stakeholders’ meeting which will gather all stakeholders (MINAGRI, RAB, NAEB, SORWATOM, inputs Suppliers and some NGOs working in agricultural sector) involved in tomato value chain to put together all their efforts so that tomato value chain in Busoro area could restart as soon as possible. During this meeting we took occasion to collect additional information from the debate raised between participants after presentation of findings. This feedback session triggered Higher Institute of Agriculture and Animal Husbandry (ISAE) to conduct further research in tomato value chain especially in production and processing.

Table 25: Responsibilities of firm, farm and other supporters

Challenge areas	What AIPD Ltd accepted to do	What farmers accepted to do	What other stakeholders may help to solve
1. Production <ul style="list-style-type: none"> • Availability and affordability of recommended inputs • Calculation of production cost • Quick feedback on problems that farmers have on tomato production 	<ul style="list-style-type: none"> -Negotiate with inputs suppliers to integrate farmers into voucher system - Look for expert - 	<p>Farmers are willing to join voucher system</p>	<p>RAB can help to import inputs</p> <p>-Busoro sector Agronomist accepted to provide technical assistance</p>
2. Productivity <ul style="list-style-type: none"> • Growing tomato thrice a year • Growing tomato on hillside • Diseases and pest control • Use of high yielding varieties • Increase the income from tomato 	<ul style="list-style-type: none"> -Facilitation for inputs supply 	<p>-Farmers will use their own lands to grow tomato</p>	<p>-MINAGRI/RAB, ISAR may help to provide recommended inputs</p>
3. Cooperative functioning <ul style="list-style-type: none"> • Working as individual than organised farmers • Awareness of members about what is going on in cooperative • Cooperative leaders fulfil all responsibilities assigned by members • Transparency in 	<ul style="list-style-type: none"> -Advocacy for trainings 	<p>-Behaviour change</p>	<p>-RCA may build capacities of members about cooperative functioning, management, conflict resolution, cooperatives structures, book keeping and accounting in</p>

cooperative management functioning and <ul style="list-style-type: none"> All members have common goals 			cooperatives
4. Stakeholder collaboration <ul style="list-style-type: none"> Existence of stakeholders providing imbedded services Farmers get extension services for tomato production Willingness of MFIs to provide micro credits for tomato production A lot of stakeholders are happy to work with farmers when there are floods in marshland It is easy for stakeholder to work with individual farmers Farmers know the destination of their tomatoes after sale 	-Advocacy Negotiate with MFIs to give cheap credits to the farmers Advocacy for agricultural insurance Always keeping farmers informed about marketing of tomato	-Fair collaboration with stakeholders Farmers will join Micro Ensure Framers accepted to work in cooperative Farmers will be active, and participating regularly in various meetings	-Agri-Hub Rwanda accepted to organize a stakeholder workshop which help farmers obtain embedded services -AIPD NGO may also help in terms of advocacy for the farmers Agri_Hub Rwanda has talked to Micro ensure(Agricultural insurance agency) RCA may help to build their capacity in this regard
5. Quality standards <ul style="list-style-type: none"> I understand the quality 	Look for expert	Attendance	Rwanda Bureau

standards required for tomato crop <ul style="list-style-type: none"> It is easy for farmers to follow quality standards conditions Farmers keep yield hygienically collecting centres All farmers use the same variety of tomato All farmers use recommended pesticides, fungicides and fertilizers Recommended pesticides, fungicides and fertilizers are available Farmers is able to buy recommended pesticides, fungicides and fertilizers using own money Farmers understand preventive methods for consequences caused by improper use of pesticides 	in standards Organise training about standards Supervision Facilitate farmers to obtain required variety for tomato Facilitate farmers to obtain inputs nearby the farmers	Hire permanent cleaner Contribute in selection of variety Adaptation of the variety Proper use of inputs	of standards will provide experts NAEB and RAB may facilitate the procurement Busoro sector Agronomist accepted to demonstrate how agricultural chemicals are used properly
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Chapter 5: Discussions of firm-farm relationship

The chapter 5 discusses the outcome of focus group discussion on tomato business (Tomato value chain), the survey results and the outcome of the debriefing meeting.

I. Tomato value chain in Busoro

According to the study results, there was a change of stakeholders in tomato value chain in Busoro. Previously, SORWATOM s.a was in bulking node of the chain and at the same time facilitating the farmers to access the required inputs. However, the company stopped 3 years ago. This triggered AIPD Ltd as a new processing and marketing company to restart the chain, which is currently not operating as it should be operating. This stakeholder's change demotivated the farmers to increase tomato yield which has an impact on their socio-economic situation and the entire sector as well. There is a need therefore for the farmers to be in strong stakeholder partnership in order to increase tomato productivity in the area. This stoppage also had an impact on other chain actors such as rural and traveling traders; wholesalers and retailers were also depending on this employment opportunity. It has also in impact on availability and stability of tomato in the market, which influenced three dimensions of food security: availability, accessibility and utilization.

II. Firm-farm views on their relationship

The survey results showed that farmers and the company scored on an average, a median of 2.5 out of 3 on all challenge areas which is a positive score. Generally, there is an agreement across most of the challenge areas whereby the following were found as prevailing challenges in tomato case in Busoro: Production, productivity, farmer group functioning, stakeholder collaboration and quality standards issues. The respondents from both the firm and farmers showed the high level of satisfaction on areas 6, 7, 8 and 9. It is presumed that this is because farmers have the hope in the new company to bring a change in tomato value chain.

a. Production

Under the challenge area of production, there seem to be a slight difference in perception on availability of improved tomato seeds, agricultural insurance and calculation of production cost. But both the company and farmers scored less than a positive score (2) for almost all statements, except area 1.7 on which both farmers and the company feel the same with a positive score of 2. The farmers might not use inputs and do not insure their crops because they have limited financial means and are less informed about agricultural insurance and calculation of production costs. The company is still relying on extension services provided by government institutions (MINAGRI, RAB, NAEB,etc.) or other stakeholders.

Moreover, it seems from the results that farmers are highly concerned about the issues of flooding in Rwabusoro marshland and inaccessibility to inputs, which discourage them to grow tomato continuously. One farmer mentioned during the discussion in the business case description, *" I had planted tomatoes in the marshland, but I was surprised to harvest fish"* This statement was to show how often floods destroy tomato production in the the marshland. The farmers are used to growing tomato during season C when it is in dry season, but unexpectedly, once in five years flooding occurs in the marshland. This is in the same direction with what IPAR (2009) found out about natural hazards *"agricultural sector doesn't perform properly because it faces various challenges due to climatic change as consequences of global warming"*. KIT (2008) found out one of the main challenges in agricultural marketing is limited access to financial services such as loans and insurance.

It makes sense that farmers don't use improved tomato seeds, recommended pesticides and fertilizers, since they cannot afford them nearby using their own money. RCA (2011) indicated that farmers encounter problems of availability and affordability of inputs such as improved seeds, pesticides and fertilizers. Farmers still have knowledge gaps in the calculation of production cost as well as functioning of crop insurance companies because they are still new approaches for them. They do not even see the importance of insuring their crops or calculating their investment in tomato production.

Conclusively, both firm and farmers feel that production risks have a negative effect on tomato availability, which is directly related to the decrease of household food security in Busoro sector. The farmers need therefore to be facilitated on access to essential embedded services such as credits, inputs, crop insurance, extension services and irrigation in order to overcome risks they come across in tomato production.

b. Productivity

Analysis indicated that farmers and firm have more or less the same positive understanding on productivity challenge area, meaning that the respondents were satisfied with the cooperative performance. The adjustments could be made to lift the level of satisfaction to the final stage. It can be concluded that there is a high level of agreement on this area, leading to a confirmation that Busoro sector has potential for tomato production. But they do not fully agree with the statements about the possibility of growing tomatoes on hillside all year round. This is different from what WFP (2006) and MINAGRI (2008) indicated about planting seasons in Rwanda, where they said that about 2 rainy seasons(A&B) are suitable on hillside planting, whereas dry season(B) is suitable for planting in marshlands. However, farmers are still relying only on season C which does not require them using a lot of pesticides and fungicides. So far, farmers have constraints about availability and affordability of inputs as they are able to procure by themselves enough inputs for tomato production. Analysis indicated that both the firm and farmers feel the same way, that the following points are issues in tomato value chain which need improvement: 2.2(tomatoes are grown in rwabusoro marshland all year around), 2.4(tomatoes can be grown on hillsides), 2.5(farmers are satisfied by the yield they get), 2.7(all tomato diseases in the marshland are controlled), 2.8(all farmers grow high yielding varieties available in Rwanda) and 2.9(farmers earn more money from tomatoes than other crops).

Conclusively, Busoro sector has potential to produce tomato thrice a year, one time in marshland and twice on hillsides. There is a need for farmers to have access to affordable and improved inputs in order to increase tomato productivity leading to the improvement of socio-economic situation of people in Busoro sector.

c. Farmer group functioning

Under this challenge area, analysis indicated that both the cooperative and the company did not agree with the statements about organising the farmers in cooperatives, functioning and management of URUGERO farmers cooperative. According to survey analysis, the aspect of cooperative performance was unsatisfactory and there is an urge for improvement or change. This low level of satisfaction with the statements was due to the bad reputation that both farmers and cooperatives realised on previous cooperatives' leadership and functioning. Therefore, the company prefer to work with individual farmers in order to avoid any risk that could come from cooperative mismanagement, which may lead to its collapse. Also, the majority of farmers feel also to work as individuals instead of working as cooperative because of the disappointment they experienced on their cooperative 3 years ago.

However, farmers should not be discouraged with the past experience because a well managed farmer cooperatives has so many advantages for members and the whole community as well. In case farmers are organised in producers' organisation and function

according to cooperative principles, they may successfully solve the challenges that hinder their development. This is in line with what RCA (2011) indicated saying that *“cooperatives are formed to do something better than individuals could do for themselves or through a non-cooperative form of business”* This author emphasizes also that *“by forming a cooperative initiative, rise their household income and reinforce the economic situation of their farm”*

In addition, OSU (2004) also confirmed the findings of RCA (2011) with the statement mentioning *“acting together, members can take advantage of economies of scale or develop bargaining power”*. It is therefore, advantageous for the farmers to work as organised producers so that they can gain trust over stakeholders, embedded services and increase their bargaining power, leading to the increased income and food security within their households. It is also advantageous for the company to work with organised farmers to insure yield consistency, quality and traceability.

d. Stakeholder collaboration

According to the research analysis, both farmers and the company feel that stakeholder collaboration is a big challenge in current tomato value chain in Busoro. This is proved by very low scores (0-1) on 6 out of 9 challenge areas. It is an indication of a disagreement of the respondents with those statements, meaning that the aspect of the cooperative performance was unsatisfactory and there is an urge for improvement or change. This situation began as a result of the failure of relationship that happened between URUGERO cooperative and SORWATOM s.a during the last 2 years, and the floods which destroyed all tomatoes in Rwabusoro marshlands, which made farmers unable to pay back loans of inputs. From that time, stakeholders who were providing embedded services became demotivated and therefore the majority of farmers were not able to procure inputs by themselves which paralysed the tomato value chain in Busoro area.

Furthermore, analysis indicated different views of the farmers and the company on statement 4.5 about collaboration with MFIs. Here the company has a very low score(0), caused by the disagreement of the respondents with the statement, which means that the aspect of cooperative performance was unsatisfactory and there is an urge for improvement or change. On the other hand, farmers have a positive score(2) which means that the satisfaction of respondents is not optimal. Therefore, the improvement of URUGERO cooperative performance is not obligatory on this statement, but advisable in order to increase satisfaction among members. This difference may be due to the fact that the company is still new in the area and does not have enough information about the collaboration of financial institutions and farmers. Moreover, the satisfaction of both the farmers and the company is not optimal on statements 4.3 about use of inputs and 4.4 about cooperation with MFIs, which is indicated by a positive score(2) for both. These indicate that improvement of the cooperative performance is not obligatory, but advisable in order to increase satisfaction among members. From these findings we can say that stakeholders involved in inputs supply are sometimes afraid to deliver a lot of inputs to the farmers assuming that farmers misuse them. The MFIs are also afraid to provide agricultural credits because agriculture is a risky area which needs insurance against natural hazards and weather conditions for MFIs to be sure the loans will be paid back. KIT (2008), emphasized also that various actors in the chain mistrust and seek to take advantage of each other. *“The chain becomes unproductive, as the business developments of one actor are not well adjusted to its partners in the chain. It becomes hard to improve products, processes and markets, and breaks appear in support services and infrastructure”*.

In conclusion, we can say that both farmers and the company need to build a strong partnership with various stakeholders, providing embedded services so that the tomato value chain in Busoro could be improved and operate in sustainable way. This is strengthened by what World Economic Forum (2010) found out confirming that agricultural issues in many countries are almost similar, such as constraints of access to finances, improved inputs and

storage facilities. The authors propose an affective solution for breaking these bottlenecks in value chain- building farmer capabilities and improving inputs technologies are amongst the adequate solutions to address this issue. Also, to strengthen tomato value chain in Busoro, efforts of every involved stakeholder at all levels should be connected to each other. By coordinating their efforts, stakeholders could alleviate risks as results of assembling their contributions and build on each other's experiences to link market powers for sustainable development.

e. Quality standards

From data analysis, quality standards in tomato value chain is also a challenge for the side of the farmers and the company. This is confirmed by very low scores (0&1) that both farmers and the company gave on four statements out of 9, proving their disagreement with statements. Both parties feel that the aspect of cooperative performance is unsatisfactory and that there is a need for improvement or change in these regards. These issues are knowledge and financial based. Limited financial means to procure recommended inputs, and limited skills, may limit the farmers and the company to meet quality standards.

However, there are differences in views of the farmers and the company for 4 out of 9 statements on quality standards issue, but the level of satisfaction on the side of the company is higher than for the farmers. However, all satisfaction levels for both sides are still not optimal yet. The improvement of the cooperative performance is not obligatory, but it is advisable in order to increase satisfaction among members, even company staff as well. The company had started a small scale processing of tomatoes into Jam and Ketchup but because of issues of standards, it was requested by RBS to meet the required quality standards in order to be allowed to continue the processing of food products. In order to obtain the authorization of operating at large scale processing, the company has to build its capacity in relation with quality standards and facilitate the farmers to obtain all required skills at farm level. In addition, EU (2007), TAS (2007), CODEX (2008), Barrett and Anthon (2008), and Carmona (2011) mentioned that commercial tomatoes have to meet quality standards in order to prevent the damages on human health. Harvesting, post-harvest handling and transportation must be hygienically practiced in order to prevent any contaminations which will be dangerous to the consumers (TAS, 2007 and Codex, 2008). There is a need therefore, for farmers and company staff to be trained for tomato production, harvesting, post-harvest handling, transportation and hygiene.

III. The results from the debriefing meeting

In debriefing meeting, participants agreed that there is a need to restart tomato value chain in Busoro. One main recommendation they proposed to Agri-Hub Rwanda is to organize a stakeholder workshop as soon as possible. Agri-Hub Rwanda promised to organise this event in September 2013. This will be an opportunity for all involved stakeholders to analyse what went wrong and take appropriate strategy for renovating the chain in sustainable way.

IV. Reflection on 2-2 tool

The 2-2 tango tool was helpful for understanding the prevailing problems in tomato case as the farmers took the opportunity to freely express their views. The debriefing meeting is the most important steps because the participants find the opportunity to react on the outcomes of previous study steps and propose their own recommendations towards appropriate solution of identified issues. Unlike other research methodologies, the tool empowers the farmers and integrates them into research process which rise also their level of ownership in the research orientation. But the only constraint with the tool is that it is still seemed by respondents as too academic and time consuming especially for scoring exercise.

Chapter Six: Conclusion and recommendations

This chapter concisely talks about conclusions and recommendations drawn from the study research.

6.1. Conclusion

The findings showed that in Busoro sector there was one processing company within collecting and processing functions, and was broken down. Another company is taking over the functions of its predecessor, but it has not started yet due to financial and administrative procedures. Currently, farmers both men and women are in producing function, they sell their crop to rural traders who supply to traveling traders, then to wholesalers in Kigali. The retailers buy from wholesalers to supply consumers in rural and urban settlements.

The relationship between AIPD Ltd and URUGERO cooperative was accessed in participatory way and farmers took the opportunity to express their views about firm-farm relations, as well as asking more questions about the areas which were not clear to them. From the assessment, the firm and farm come up with participatory conclusions and recommendations leading to the solution of issues identified. They divided tasks to fulfil as chain actors and proposed other supports who may help to renovate the tomato chain.

The firm-farmer relationship between AIPD Ltd and URUGERO tomato farmers' cooperative seemed to be good and with more or less total agreement for many areas. But there are some areas which need improvement in order to increase satisfaction among tomato farmers and the company. Even though they are still at a pioneering stage of business relations, the challenge areas related to perspectives got the highest scores from both firm and farmers which give the hope for a brilliant firm-farm relationship in the future.

According to the results and discussion, current prevailing challenge areas in tomato value chain in Busoro are floods, shortage of improved seeds, recommended pesticides and fertilizers as well as market issues. These are the challenges falling under category of production risks. Likewise, productivity, cooperative functioning (issues of mismanagement, membership and ownership), stakeholder collaboration and quality standards issues came up also as major challenges hindering tomato value chain in Busoro sector. Therefore, after realising the prevailing issues constraining tomato production in Busoro through an assessment of the relationship between the firm and farm, and after analysing strengths and opportunity in tomato business case, Agri-Hub Rwanda, on the demand of the participants in the debriefing meeting promised to organise in very near future, a stakeholders seminar in which the sustainable strategies to restore the tomato value chain in Busoro will be taken.

6.2. Recommendations

The following recommendations came out from a combination of the recommendations that were suggested by participants during the debriefing sessions and discussed in the previous section(s) of the document: Then, the next step will be successful if all stakeholders put in action all their promises.

It will be better, if Agri-Hub-Rwanda puts in action its promises in due time so that involved stakeholders are mobilized to provide embedded services to the farmers in Busoro sector.

It will be interesting if Agri-Hub Rwanda and AIPD Ltd could facilitate tomato farmers to get organised in cooperative and get trained as soon as possible, in tomato production, quality standards, cooperative management and functioning, and conflicts resolution.

It would also be better for AIPD Ltd and URUGERO cooperative to overcome the barrier of fear and take advantage of new relationship with involved stakeholders.

It will be of great interest for both firm and farm if tomato will have been grown thrice a year in marshland as well as on hillside.

It will be helpful for the farmers if URUGERO cooperative improve its functioning and relationship between members.

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Annexes 1

Statement list 2-2 Tango

For the researcher:

Please fill in the following information about the case:

Country:	
Case:	
Name researcher:	
Date:	

For the respondent:

Please fill in the following information:

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

For **company** employees:

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

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





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

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

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

	<p>.....</p> <p>[If applicable:] Since when do you have this position in the board?</p> <p>.....</p>
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We are now beginning with the statements. Please answer them to the best of your ability. Good luck!

Statements		Scores			
		0	1	2	3
		Totally disagree	Disagree	Agree	Totally agree
					
1	Tomato production				
1.1	Recommended pesticides and fungicides are available				
1.2	Recommended pesticides and fungicides are affordable				
1.3	Improved tomato seeds are available				
1.4	Improved tomato seeds are affordable				
1.5	Tomato grown in Rwabusoro marshland are tolerant for diseases				
1.6	Tomato grown in Rwabusoro marshland are insured against any cause of yield loss				
1.7	There is increase of Tomato productivity in Rwabusoro marshland				
1.8	Farmers are able to estimate production costs per kg of tomato produced				
1.9	Farmers get quick feedback on problems encountered in tomato production				
2	Productivity				
2.1	Rwabusoro marshland is suitable for tomato growing				
2.2	Tomatoes are grown in rwabusoro marshland in all seasons of year				
2.3	There are appropriate measures to control floods in Rwabusoro marshland				
2.4	Tomatoes can be grown on hillsides				
2.5	Farmers are satisfied by the tomato yield				
2.6	Tomato have a positive impact on socio-economic development of farmers				
2.7	All tomato diseases in the marshland are controlled				
2.8	All farmers grow high yielding tomato varieties available in Rwanda				
2.9	Tomato is the most profitable crop among others				
3	Farmer group functioning				

3.1	Tomoto growers are organized in cooperatives				
3.2	Farmers know advantages of working in cooperative				
3.3	Farmers prefer to work as individuals than operating in cooperatives				
3.4	Members are aware on what is going on in cooperative				
3.5	Coopertive leaders fulfil all responsibilities assigned by members				
3.6	There is a transparency in cooperative management and functioning				
3.7	The cooperative structures are set democratically and equally				
3.8	Cooperative leaders represent common interests of members.				
3.9	All farmers have common goal				
4	Stakeholders collaboration				
4.1	We have enough stakeholders for tomato crop				
4.2	Farmers get extension services for tomato production				
4.3	Famers use properly received inputs				
4.4	Tomato farmers are familiar to work with microfinance institutions				
4.5	MFIs are willing to provide credits for tomato production				
4.6	Many stakeholders feel happy to work with tomato farmers when there are floods in the marshland				
4.7	It is easier for stakeholder to work with individual farmers than grouped farmers				
4.8	It is easier for individual farmer to obtain stakeholders than being in cooperative				
4.9	Farmers know the fate of their tomatoes after sale				
5	Quality standards				
5.1	I understand the quality standards required for tomato crop				
5.2	It is easy for farmers to implement quality standards applicable on tomato				
5.3	Farmers have yield collection centers				
5.4	Farmers always keep collection centers clean				
5.5	All farmers use the same variety of tomatoes				
5.6	All farmers use recommended pesticides, fungicides chemicals and fertilizers				
5.7	Recommended pesticides, fungicides and fertilizers are available				
5.8	Farmer is able to buy her/himself recommended pesticides, fungicides and fertilizers				

5.9	Farmers understand the danger associated with improper use of pesticides				
6	Perspectives for company functioning				
6.1	It is worthy for the company to work with individual farmer				
6.2	It is worthy for the company to work with grouped farmers				
6.3	The processing plant operating nearby farmers, will increase economy of Busoro inhabitants and its neighbors				
6.4	There is certainty that the processing company will get enough yield to process				
6.5	The company will facilitate farmers to know how to produce required tomatoes				
6.6	The company will facilitate the famers to get loans for tomato production				
6.7	The company will regularly inform the farmers about the operations processing plant				
6.8	The processing plant will be a solution for current problems in tomato marketing				
6.9	The processing plant will be well equipped to process tomato that meet quality standards				
7	Contractual perspectives				
7.1	Clear agreements will be signed between farmers and the company				
7.2	Farmers will have clear understanding on key elements of the contract with the company				
7.3	The company and the farmers will collaborate to prepare farming contract				
7.4	short term contract is better than long term contract				
7.5	It is helpful that the government get involved in the implementation of farming agreements				
7.6	Farmers will benefit from written and legal contract				
7.7	The company will benefit from written and legal contract				
7.8	Risks and losses will be equally shared between farmers and company in case of natural disasters				
7.9	The company will buy the whole tomato yield produced by the farmers				

Statements		Scores			
		0	1	2	3
		Totally disagree	Disagree	Agree	Totally agree
		☹☹	☹	☺	☺☺
8	Perspectives on prices and marketing				
8.1	The company will be clear with the quantity of tomatoes that it will be able to buy from farmers				
8.2	The company will inform the farmers on time the quality of needed tomatoes				
8.3	There will be other concurrent tomato buyers in Busoro				
8.4	Farmers will be free to sell their tomatoes to other buyers in case they are not satisfied with the price provided by the company				
8.5	Farmers expect to get better price from the company				
8.6	Farmers will be paid timely based on the agreement statements				
8.7	It is advantageous for farmers to be paid through cooperative				
8.8	The proper marketing of tomato will improve the economy of the whole district and neighbors				
8.9	The processed tomato in Busoro will be sold even outside the country				
9	The perspectives on production				
9.1	The yield in the marshland can be increased				
9.2	The yield on hillside can be increased				
9.3	Farmers will receive tomato seeds on time				
9.4	Farmers will receive pesticides, fungicide and fertilizers on time				
9.5	Farmers will buy improved tomato seeds for reasonable prices				
9.6	Farmers will buy recommended pesticides, fungicides and fertilizers reasonable prices				
9.7	The stakeholders may restore the trust for farmers				
9.8	Trusting farmers will lead to increased tomato production and its products				
9.9	Insuring tomato crop will help in preventing losses caused by disasters like floods				