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The profitability of rural Agricultural Cooperatives in Rwanda.

A comparative study of two selected cooperatives.



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HUYE, November 2014

DECLARATION

I, MUKAMUTESI Odile, do declare that this thesis entitled The Profitability of rural agricultural cooperatives in Rwanda. A Comparative study of two selected cooperatives is my own piece of work, it has not been presented anywhere for any degree or examination in any other University or college, and that all sources I have used or quoted have been indicated and acknowledged as complete references.

MUKAMUTESI Odile

Signed.....

Date.....

Supervisor: Dr. Simeon WIEHLER

Signed.....

Date.....

DEDICATION

This thesis is dedicated to:

To Almighty God

To my parents;

To my husband MURWANASHYAKA Emmanuel

To my children Isingizwe Shyaka Irénée;

Ikuzwe Shyaka Landry;

Irakoze Shyaka Ghyslaine;

To my family and family-in-law;

To all my friends, colleagues and classmates.

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MUKAMUTESI Odile

ABBREVIATIONS

ACS: Agricultural Cooperative Service

ADENYA: Association pour le Développement de Nyabimata

AFSTA: African Seed Trade Association

CIP: Crop Intensification Program

EDPRS: Economic Development and Poverty Reduction Strategy

FAO: Food and Agriculture Organization

FAOSTAT: Food and Agriculture Organization Statistics

GDP: Gross Domestic Product

GoR: Government of Rwanda

IFAD: International Fund for Agricultural Development.

IFOAM: International Federation of Organic Agriculture Movements

IFPRI: International Food Policy Research Institute

ILO: International Labor Office

ISAR: Institut des Sciences Agronomiques au Rwanda

KIAKI: Koperative Iharanira Amajyambere yo muri Kivu

MINAGRI: Ministry of Agriculture and Animal Husbandry

MINALOC: Ministry of Local Government Community Development and Social Affairs

MINECOFIN: Ministry of Finance and Economic Planning

NCBA: National Cooperative Business Association

PSTA: Strategic Plan for Transformation of Agriculture

RAB: Rwanda Agriculture Board

RCA: Rwanda Cooperative Agency

SACCO: Saving and Credit Cooperative

UNICOOPAGI: Union des Cooperatives Agricoles Intégrées (union of integrated agricultural cooperatives)

USAID: United States Agency for International Development

USDA: United States Department for Agriculture

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ABSTRACT

‘The profitability of rural agricultural cooperatives in Rwanda. A comparative study of two selected cooperatives’ is a study that examined two agricultural cooperative members of UNICOOPAGI (Union des Coopératives agricoles Intégrés) in Nyamagabe and Nyaruguru districts especially Urumuri and KIAKI operating in administrative sectors of Kibirizi and Kivu. This study was based on the problem statement of determining whether wheat which can be stored for great length of time but is less valuable, or potatoes which can not be stored long, but are of great value, create greater profitability for cooperative members. The research questions were: What is the profitability of agricultural cooperatives growing Irish potatoes versus those growing wheat? What are the factors that cause differential profitability? What are the challenges encountered by agricultural cooperatives members of UNICOOPAGI in improving the profitability of their cooperatives? It was also based on the following objectives: 1) To compare the profitability of two agricultural cooperatives of UNICOOPAGI growing Irish potatoes and wheat in rural areas of Nyamagabe and Nyaruguru district. 2) To find out the factors which cause differences in profitability between Urumuri and KIAKI. 3) To highlight the challenges faced by the two agricultural cooperatives of UNICOOPAGI in rural areas of Nyamagabe and Nyaruguru districts.

Data was obtained using a questionnaire administered to 131 respondents including 66 male and 65 female members of Urumuri and KIAKI cooperatives and interview administered to 8 staff from UNICOOPAGI, agronomist in Kivu and Kibirizi sectors and cooperative presidents and secretaries. The findings from the research showed that during the agricultural year of 2012-2013 irish potatoes in KIAKI was more profitable with the gross profit margin of 53% whereby members of KIAKI cooperative had much returns of **26,188Rwf** in growing irish potatoes compared to those from Urumuri cooperative that grew wheat with a gross profit margin of 51% and a return to members of **7,834 Rwf**. Lastly, the research findings highlight that agricultural cooperative members face some challenges in growing irish potatoes and wheat such as lack of good variety of irish potato seeds and expensive fertilizers, insufficient quantity of wheat seeds for Urumuri cooperative, lack of capital, diseases and post harvest losses and recommends to increase multiplication sites for wheat and irish potatoes in order to facilitate farmers get good variety of seeds, to improve transport and communication networks, sensitize financial institutions (banks) to facilitate farmers get access to credit and increase the number of field studies on the side of UNICOOPAGI.

CHAPTER ONE: GENERAL INTRODUCTION

This research is about the profitability of rural agricultural cooperatives in Rwanda. It is based on a comparative study of two selected cooperatives one growing irish potatoes and another growing wheat. The first chapter provides the background of the study, the statement of the problem, research questions, research objectives and the significance of the study.

1.1. Background of the study

Countries in the world reach a certain degree of development due to a lot of effort nationals put in different economic activities which generate income like commerce, construction, agriculture, fishing etc. Rwanda is one of the five countries that constitute East Africa. It is a small country that measures only 26,338 square km. The results of the 4th Population and Housing Census of Rwanda give a total resident population of 10,537,222 in 2012 GoR (2012:6). The economic activity that is practiced by many people in rural areas where they cultivate different things needed in daily life like potatoes, beans, peas, maize, bananas, wheat, coffee, tea and cassava.

According to the United Nations (2010:5) in all developing regions, children in rural areas are more likely to be underweight than urban children. In Latin America and the Caribbean and parts of Asia, this disparity increased between 1990 and 2008, the gap between the richest and the poorest households remains enormous. In Southern Asia, 60 percent of children in the poorest areas are underweight compared to 25 per cent of children in the richest households. From the above we realize that it tends to be due to poverty where families in rural areas don't have the ability to meet sufficiently the basic needs because of low income level.

The population of the developing world is still more rural than urban: some 3.1 billion people, or 55 per cent of the total population, live in rural. At least 70 per cent of the world's very poor people are rural, and a large proportion of the poor and hungry are children and young people. The sub-Saharan Africa, has the highest incidence of rural poverty whereby the regions are affected by poverty and hunger. The livelihoods of poor rural households are diverse across regions and countries, and within countries basing on varied degrees, from smallholder farming- including livestock production and artisanal fisheries -agricultural wage labour, wage or self-employment in the rural non-farm economy and migration. Agriculture plays a vital role in most countries – over 80 per cent of rural households farm to some extent, and typically it is the poorest households that rely most on farming and agricultural labour. Rural poverty results from lack of assets, limited economic opportunities and poor education and capabilities, as well as disadvantages rooted in social and political inequalities(IFAD 2010:15).

The Food and Agriculture Organisation noticed that poverty is still a crucial problem in African countries and specifically in rural areas where the majority of people depend on agriculture as economic activity which is so weak to help beneficiaries to meet food security, medical insurance, and to adopt the culture of saving and increasing income level FAO, (2009:5).

In Rwanda, the economy is based on agriculture which contributes 45 per cent of the country's export revenue, and over 70 per cent of the population is engaged in the agricultural production GoR, (2010:51). Modern agriculture emphasizes two dimensions of time and space. Time relates to increasing crop intensification in a situation where there are no constraints for inputs while space relates to increase in area for cultivation which increases also productivity (Panda 2010: 6).

Poverty being a rural phenomenon where the majority of the people live in most developing countries, the mechanisms to reduce it should target the recipients. One of these methods which are used widely today is to organize people in form of associations or cooperatives, Adebayo et al.(2010). Agricultural cooperatives can help farmers get a better deal at various stages of production and distribution as noted by DFID, (2010). Other advantages are emphasized by IFAD (2012:2) that through membership of a co-operative farmers are collectively able to negotiate better prices for inputs, transport and storage facilities. Cooperatives can also help them expand access to markets, people need to unit themselves in cooperatives because they play a crucial role in reducing poverty, improving food security and generating employment opportunities. In all African countries, Jürgen (1993:4) stated that there were traditional forms of cooperation which have survived the impact of colonialism and the structural changes which accompanied the so-called modern society.

In Rwanda, the GoR (2012:14) stated that there were different forms of mutual assistance that survived until now which help Rwandans them to get own solutions to those problems, like work groups where members help each other in rotation (umubyizi), jointly carry out farming (ubudehe), construction and community action (umuganda, ubudehe), rotating savings and credit associations whose members make regular contributions to a circling loan fund (ibimina). However, this traditional philosophy of mutual assistance in the economically oriented initiatives is encouraged in the Rwandan culture. The Government of Rwanda as noted by Davis (1995:5) has elaborated the policy of promoting cooperatives regarded as a voluntary, democratic, autonomous association of persons, whose purpose is to encourage members to grow in community and to act collectively both for the intrinsic value of being part of a living community and to overcome their problems of economic dependency through putting together their efforts.

According to Braverman et al. (1991:7-8) authorities considered cooperatives as suitable vehicles for agricultural development and socio-political change. This shows that cooperatives are channels through which various message can be sent to members. By organizing themselves in cooperatives, Ndahiro (2006) emphasized that cooperative members are able to acquire loans from the banks which help them to carry out activities that can generate income to improve their welfare since the development of a country like Rwanda does not only depend on government economic plans but also on the extent to which its people are involved in economically productivities,

Cooperative members have access to quality supplies and services at a reasonable cost, mutual help between members, and share in the earnings and enhance local economy, helping the rural population mobilize their own human, financial, and productive resources Daman (2003:3). This means that cooperative members themselves decide the nature and objective of their enterprise because cooperatives offered a possibility of addressing vulnerability, assisting in poverty reduction and as one of the few vehicles for reconciliation after 1994.

Kamaani (2000:1) also considers cooperatives as one of the ways in which the welfare of people can be improved. So, rural areas where agriculture is the main source of income, farmers join cooperatives so as to uplift their standard of living. Basing on the above ideas the researcher is now interested in carrying out a research about “The profitability of rural agricultural cooperatives in Rwanda. A comparative study of two selected cooperatives”. The research was based on cultivation of irish potatoes in KIAKI cooperative and wheat in Urumuri cooperative both of them united in UNICOOPAGI.

1.2. *Problem statement*

This research is designed as a comparative study of two selected cooperatives growing irish potatoes and wheat so as to find out the profitability of rural agricultural cooperatives in Rwanda as the livelihood of many people in this area is based on agriculture, an economic domain where cultivators face more difficulties in getting finance (credit) as compared to industrial sector by the fact that it is a seasonal industry whereas other industries are not seasonal. Agricultural production is not only more risky and uncertain due to its heavy dependency on climatic factors like rain, sun but also farm output are perishable in nature and generally cannot be stored for a long period under natural conditions. This affects the production in terms of loss in quality depending on duration and place of storage and quantity due to different pests like insects, rodents which entails the need of application of fertilizers.

Agricultural products are also produced in a particular season throughout the year. There is more supply at harvesting season while the market value of the production is generally low at this time. So there is necessity to store the production for different periods and different aims like high market value, food grains, seeds and food.

This research will determine whether wheat which can be stored for great length of time but is less valuable, or potatoes which cannot be stored long, but are of great value, create greater profitability for cooperative members.

1.3. Research Questions

This research was guided by the following research questions

1. What is the profitability of agricultural cooperatives growing Irish potatoes versus those growing wheat?
2. What are the factors that cause differential profitability?
3. What are the challenges encountered by agricultural cooperatives members of UNICOOPAGI in improving the profitability of their cooperatives?

1.4. Objectives of the research

The general objective is to compare the profitability of two agricultural cooperatives of UNICOOPAGI growing Irish potatoes and wheat in rural areas of Nyamagabe and Nyaruguru district.

The specific objectives are:

To find out the profitability of two agricultural cooperatives of UNICOOPAGI growing Irish potatoes and wheat in rural areas of Nyamagabe and Nyaruguru district.

To find out the factors which cause differences in profitability between Urumuri and KIAKI cooperatives.

To highlight the challenges faced by two agricultural cooperatives of UNICOOPAGI in rural areas of Nyamagabe and Nyaruguru districts.

1.5. Significance of the study

This study is beneficial to different people of various levels like cooperative members, local Government, Non Governmental Organization and future researchers. It is conducted on socio

economic development mainly and precisely for two crops (wheat and irish potatoes) cultivated by two agricultural cooperatives of UNICOOPAGI.

1.5.1. Scientific and academic interest of the research

Conducting this research responded to academic regulations of the University of Rwanda for the partial fulfillment of the requirements of the award of a degree of Masters in Business Administration. Consulting it will help future researchers to carry out other researches.

1.5.2. Stakeholder interest of the research

The research highlights the driving forces for joining agricultural cooperatives in rural areas. It is beneficial in one way or another to MINAGRI, UNICOOPAGI to find out solutions to challenges faced by agricultural cooperative members so as to improve their profitability.

1.6. Delimitation of the study

Due to limited time and magnitude of the study, this study focuses on the profitability of agricultural cooperative in Rwandan rural areas. It is geographically and temporally limited. Geographically, it is conducted on two agricultural cooperatives of UNICOOPAGI operating in rural areas of Nyamagabe and Nyaruguru districts, Southern Province while temporally in the agricultural year of 2012-2013.

1.7. Organization of the study

This study consists of five chapters. The first is the introductory chapter that comprises problem statement, objectives, significance and interest, research questions and Hypothesis, limitation and delimitation of the study and lastly organization of the study.

The second chapter deals with literature review and definitions of key concepts, the third presents the appropriate methodology that is used as research tools; the fourth comprises the analysis of data and results interpretation. Lastly the fifth chapter concludes with a summary conclusion section and recommendations.

CHAPTER TWO: LITERATURE REVIEW

This chapter provides a review of some existing literature on the Profitability of rural Agricultural Cooperatives in Rwanda, a comparative study of two selected cooperatives. It covers the conceptual framework and the theories related to the profitability of agricultural cooperatives in Rwandan rural areas, cooperatives guiding values and principles, types of cooperatives and agricultural cooperatives in particular, the contribution of agricultural cooperatives to social, economic, institutional, environmental, sustainable development, food security, advantages and constraints faced by members.

2.1. Conceptual framework

This conceptual framework concerns the key concepts used in this study and that need to be defined and clarified.

2.1.1. Profitability

Profitability as stated by Hofstrand (2009:1) is the primary goal of all business ventures. Without profitability the business cannot survive in the long run. Profitability is measured with income and expenses. It helps to measure current and past profitability and then forecast the future profitability. Income is money generated from the activities of the business while expenses are the cost of resources used up or consumed by the activities of the business. In a few words, profitability is measured with an income statement whereby a list of income and expenses during a period of time for the entire business is made. Furthermore, Loth (1999), FAO (2007: 31) stated that the Gross profit amount is obtained by subtracting the cost of sales (cost of goods sold) from revenues.

Gross Profit = Revenues-Cost of goods sold

The Gross profit margin analysis uses the percentage calculation to provide a comprehensive measure of a company's profitability. It shows the Gross profit as a percentage of Revenue. A high percentage means that the business is making a healthy profit on the goods or financial products it sells, before administrative costs.

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Net Sales (Revenue)}}$$

Profitability can also be calculated by using the Return On Investment (ROI) method, a measure that investigates the amount of additional profits produced due to a certain investment. Once ROI is

positive , that means an investor has earned more than the cost of investment. It is expressed in percentage.

$$\text{Return On Investment (\%)} = \frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}} \times 100$$

2.1.2. Profitability in farm production

Regarding to profitability, Maniriho and Bizoza (2013:31) referred to it as a benefit-cost analysis which is a technique used to conduct a financial analysis whereby all costs incurred in agriculture are analysed so as to come up with benefit. It is used as a decision tool after computing all costs against benefits valued in local currency. Ton (2013:13) argued that the main indicators of farm profitability are price, income and gross margin. It is particularly dependent on sale price per unit and the cost of production.

In agriculture domain, profitability in terms of money can be found out by considering the difference between the total revenue and the total production cost so that the researcher can find out a cooperative that is more profitable than another as cooperative can be advantageous to both members and the surrounding community socially, economically, politically and environmental.

2.1.2.1. Factors that Affect Profitability in Agriculture

Authors Samboko (2011:7), Zulu (2011:14) found that several factors influence agricultural profitability at farm level. These include; the farm gate price, government price policies, farm location, production costs, variety of seed used, yield, farm size, land tenure which also influences yield, experience in production of crop which impacts on yield, education level of the household head, age of household head, household size, and distance to market. In agricultural cooperative daily management, farmers tend to pursue activities that increase their income, reduce their financial, physical risk and reduce labor requirements.

Concerning to other incomes such as aid from different partners in agriculture, penalty for members who do not fulfill cooperative rules and regulations Samboko (2011:8) regarded them as important and direct determinants of productivity through their effects on farm input acquisition. Farm size (small or large) and land tenure (their own or hiring) affects productivity by the fact that commercial farmers

have higher yields than smallholders, Well-functioning input and output markets are an indirect determinant of productivity as they affect profitability of farming outlets and input access.

This section describes five types of socioeconomic conditions that facilitate agricultural cooperatives to achieve their goals as stated by FAO (2009); World Bank (2010) the first concerns the access to land which is the main factor to agricultural production and its size affects the production and adoption of new technologies. The second is the nature of land tenant with property rights can help to invest in long term asset like inputs through credits. The third regards technology and technical assistance, and the fourth markets like market information, attaining certain quality and standards in production and handling. These are exogenous condition since they are the main factor for agricultural production. The fifth type of condition consists of the managerial and collective action capabilities of members. This type of condition is “endogenous” since it depends mainly on the members’ attributes and the internal cooperative organization.

Access to land made the members of Urumuri Cooperative buy five forests from cooperative production. This shows that they can get credits and other financial support in the cooperative activities. With credit, a cooperative can access to technology and technical assistance, services and resources that can increase productivity of the cooperative and the profitability, World Bank 2010.

Dealing with conditions necessary for the success of agricultural cooperatives Daman (2003:6) stated that there are several factors which are responsible for the success of agricultural cooperatives:

Cooperatives are member-driven, member-controlled and member-responsive organizations; design of the cooperatives imparts high drive level and a cohesive governance structure.

Cooperatives must integrate their operations with the needs of their member household i.e., the latter derive economic benefits from their membership of the cooperatives – single or multipurpose; and these benefits tend to be higher than from any other competing system.

Well-integrated vertical structures of cooperatives exist and these provide support in order to enable the base level cooperatives to effectively and efficiently serve their individual members.

Cooperatives undertake comprehensive programmes for member education in order to facilitate the process of members’ participation, members’ involvement and empowerment; and for training of staff and members of boards of directors.

Cooperatives establish viable and strong linkages with external research and development/ extension agencies in the field of agriculture and technology. These are appropriate to the needs of cooperatives and their members;

Cooperatives strive to become self-reliance, accumulate capital and develop other resources in order to remain free from all external controls and directions; and

Cooperatives are open, ethical, caring, and socially aware institutions. These display social concern in their business operations and in their relations with customers, employees and members, and the community at large.

Nevertheless, the institute of agriculture in Rwanda (ISAR, 2008) reported that farmers face limiting factors to potato and wheat productivity such as lack of high yielding varieties, insufficient clean seeds, diseases, lack of access to credit, post-harvest losses due to poor handling and storage facilities, poor seed distribution system, and inadequate production technologies, all of them can have a negative impact on profitability when no measures are taken on time.

Amongst these factors, Brook (1995:40) realized that diseases are the main production constraint in Rwanda. Growth and quality of potatoes are influenced by environmental factors such as temperature, moisture, and light and soil type. Referring to these factors that influence growth some are largely uncontrollable by the farmer like length of growing season, air and soil temperature, light intensity and duration, humidity and wind where as other factors can be controlled by the grower such as variety of the seed, pest management, planting date and harvest date.

The agricultural cooperatives under this study are goal oriented because they aim at developing their residence areas by promoting the agriculture of wheat, maize and irish potatoes, they implement trainings they get in their daily life such as making kitchen gardens, fighting against soil erosion, participating in activities organized by different levels like village, cell or sector.

2.1.2.2. Value and Profitability

There are many words to describe the meaning of value. According to Zulu (2011:11) the term value can be described as monetary or material worth or the worth of something in terms of the amount of other things for which it can be exchanged or in terms of some medium of exchange, The term refers to the monetary as how much something is worth in money or other goods for which it can be exchanged, how much something is worth compared with its price. In this case, the definitions of

value relates to market value which helps wheat and Irish potatoes cooperative members in Nyamagabe and Nyaruguru turn their production into Rwandan monetary value in order to come up with the profitability of agricultural cooperatives. Profitability is simply the revenue earned from wheat and Irish potatoes produced less the cost of production.

2.1.2.3. Common Methods of Profitability Analysis

There are many methods that can be used to determine the profitability of an enterprise as well as identify the factors that influence profitability. Some of these methods include gross Profit margin by analyzing the cost of production and total revenue. However, gross margin analysis appears to be a common method used to determine profitability; the gross margin is used because of its accuracy in estimating profit by subtracting the total variable costs from the total revenue, Zulu (2011:14). Using this method, the researcher is able to find out the profitability of agricultural cooperatives of Urumuri and KIAKI and come up with the cooperative that is more profitable than the other.

2.1.3. Cooperatives

The International Cooperative Alliance (1995) defined a cooperative as an autonomous association of persons united voluntarily to meet their common economic, social, cultural needs and aspirations through a jointly owned and democratically controlled enterprise. Cooperatives in Rwanda are considered as a tool for people's participation in the sense that ownership of the cooperative is exclusively of the members, for the members and by the members in the process of development and a factor for poverty alleviation. According to Koopmans (2006:9) a cooperative is defined as a member-controlled association for producing goods and services in which the participating members, individual farmers or households, share the risks and profits of a jointly established and owned economic enterprise. In this context, cooperative members are both owners and investors in a cooperative.

2.1.3.1. Characteristics of a Cooperative

As stated by Ortamnn (2007:42), The United States (US) National Cooperative Business Association (NCBA, 2005) the unique characteristics of cooperatives relative to other (investor-oriented) businesses:

- Cooperatives are owned and democratically controlled by their members i.e those that use the cooperative's services or buy its goods) and not by outside investors. Members elect their board of directors from their ranks. Major policy decisions are based on the one-member, one-vote principle that states equality of members in a cooperative.

- Cooperatives return surplus income (revenue over expenses and investment) to members in proportion to their use or patronage of the cooperative, and not proportionate to their investment or ownership share.
- Cooperatives are motivated not by profit, but by providing a service to satisfy members' requirements for affordable and quality goods or services.
- Cooperatives exist solely to serve their members.

When one looks at the above statements, we realize that cooperatives exist for members' service with the common goal of development. Cooperatives are formed to allow growers to achieve greater control of the marketing of their production, and to share in the quantitative and qualitative benefits of being a user-owned organization Jay (2002: 15). Those characteristics are more explained in principles and values of cooperatives.

2.1.3.2. Principles and Values of Cooperatives

An International cooperative association made an exhaustive survey of cooperative members and highlighted a set of values and principles to base on the findings. According to RCA (2011:10), there are seven principles that guide cooperative stated below:

Voluntary and Open Membership

Cooperatives are voluntary organizations because members are free to accept responsibilities and open to all people able to use its services and willing to accept the responsibilities of membership, without gender, social, racial, political or religious discrimination, RCA (2011:10), Nyinawumuntu (2012: 20). It is understandable that everybody can be a cooperative member and must participate in order to achieve goals for a cooperative because joining is a result of one's decision.

Democratic Member Control

Cooperatives are democratic organizations controlled by their members those who buy the goods or use the services of the cooperative even though they may delegate some powers to managers and leaders. This control can reinforce accountability of leaders to members who actively participate in setting policies and making decisions Tamana (2005:6). In agricultural cooperatives, all members are treated equal. This is based on the idea of one member, one vote.

Members' Economic Participation

Members contribute equally in the economic development of their cooperative and control the capital of the cooperative. This benefits member in proportion to the business they conduct with the cooperative rather than on the capital invested, Nyinawumuntu (2012: 20). This helps in achieving the value of solidarity in their cooperative and a good management system which enhance interest of all members and keep trust from either current or future generations.

Autonomy and Independence

Cooperatives are autonomous, self-help organizations controlled by their members. It can be reinforced by application of laws and governmental support, Nyinawumuntu (2012: 20). This can be achieved by registering the cooperative so as to get a correct identity. In Rwanda there has been established the Rwanda Cooperative Agency (RCA) to make a control over cooperatives in their daily operations with members and consumers of their goods and services.

Education, Training and Information

Cooperatives provide education and training for members, elected representatives, managers and employees so they can contribute effectively to the development of their cooperative, reach their goals, Nyinawumuntu (2012: 20). Cooperative members also inform the general public about the nature and benefits of cooperatives. These trainings should be in various domains such as Human Resource Management, financial Management, Property Management and Reporting in order to facilitate cooperative members increase economies of scale.

Cooperation among Cooperatives

Referring to the values of cooperatives this principle facilitate reaching solidarity where cooperatives serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional and international structures, Nyinawumuntu (2012: 20). This principle is very crucial in human beings relations because cooperation can help agricultural cooperatives achieve goals of helping one another, enhancing unity and development and then increase in profitability due to hardwork reserved to cooperative activities.

Concern for Community

The above principle reminds cooperatives to focus on member needs, work for the sustainable development of communities through policies and programs accepted by the members, Nyinawumuntu

(2012: 20). This shows that when cooperatives meet their goals, the region and the country in general develop. In agricultural cooperatives that operate in rural areas people help one another to reach personal goals, to satisfy their needs and be market oriented in their activities, providing employment to people in need. Moreover, there are three fundamental goals derived from the Rochdale principles to guide many cooperatives. First, members unite to gain services, supplies, and access to markets they would not otherwise be able to utilize. Second, those who use the cooperative own it. Third, members control the cooperative's activities through the one member, one-vote Rochdale principle Schaffner (2002: 16)

The table 2.1 refers to agricultural cooperative practices based on cooperative principles which are recruitment of new members because a big size of a cooperative, membership fee, member participation, trainings gained from a cooperative, caring to others, self responsibility and accountability all of them have a positive impact on profitability for a cooperative and increase in returns for members.

Table 2.1. Co-operative Principles and Practices

Co-operative Principles and Practices	
Principles	Practices
Voluntary and open membership	Member recruitment policy, rules of admission, equal opportunities,
Democratic member control	Constitution, voting rights, role of the board, members and management
Member economic participation	Economic performance, rewards to members, capitalization and how surplus is used
Autonomy and independence	Relations with government, other organisations and institutions and market position,

Education, training and information	Member, board and management training and public relations
Co-operation among members	Federation, networks, joint enterprises, movement building
Concern for community	Policy on community development, environment and networking

Source: Tamana (2005:9)

2.1.3.3. The values of cooperatives

Referring to the basic values of cooperatives RCA (2011:11) highlighted **self help** which is based on the belief that all people can and should strive to control their own destiny. Cooperators believe that full individual development can take place only in association with others. Individuals also develop through cooperative action by the skills they learn in facilitating the growth of their cooperative. Cooperatives are institutions that foster the continuing education and development of all those involved with them.

Self-Responsibility RCA (2011:11) expresses that members assume responsibility for their cooperative – for its establishment and its continuing vitality. Members have the responsibility of promoting their cooperative among their families, friends and acquaintances and ensure that their cooperative remains independent.

Equality as a cooperative value, RCA (2011:11) stated that cooperatives are based on equality. Members, whether an individual or a group, are all equal. It does not depend on the social and economic status of the member;

Equity in a cooperative is regarded by RCA (2011:11) as a value of treating members should be treated equitably in how they are rewarded for their participation in a cooperative, normally through patronage dividends, allocation to capital reserves in their name, or reduction in charges.

Solidarity, in cooperative activities, RCA (2011:11) regards it as an action that is not just a disguised form of limited self-interest. It helps cooperative members and managers play their roles actively so as to achieve their goals. Ethical values of cooperative members are honesty, openness, social responsibility and caring for others, they are very useful for a cooperative to reach profitability and

service to members. These values can be found out in different types of cooperatives regarding to their activities.

2.1.3.4. Types of Cooperatives

Dealing with types of cooperatives, Tamana (2005:15) argued that cooperatives can be formed for individuals, business, or communities' drives. They differ in size, with regard to the number of members and the activity they perform which may be either economic (agriculture, savings, transport, handicrafts), Social services (housing, medical services) and others like musician cooperative, Soccer Fans cooperative.

In addition to that, The United Nations (2009:4) focusing on types of cooperatives stated that there are three main types of cooperatives. The first, **Consumer cooperatives** are owned by the people who buy the goods or use the services at close to cost price of the cooperative. They include credit unions, child care cooperatives, electric and telecommunications cooperatives, food co-ops, health care co-ops, housing cooperatives. They are organized by individuals who seek to purchase goods and services. By organizing a cooperative, consumers are able to achieve prices and quality not available from for profit businesses. The second, **Producer cooperatives**, which include agricultural cooperatives, enable members to achieve higher profits through reduced input costs and better marketing their products. The third, **Worker or employee-owned cooperatives** that provide members with opportunities for employment and skills improvement.

Before cooperatives were organized, United Nations (2009:4) reported that farmers were often trapped in a situation in which processors could dictate the prices paid for crops. Members of these cooperatives have found that they can adapt quickly to changing economic conditions rather than become victims; they can lower their operating costs by pooling purchasing power for goods and services. In many cases, this is tied to members' dual roles as producers and consumers, most often in agricultural cooperatives.

This study falls in the second type of cooperative which is Producer cooperatives because farmers band together in order to solve problems related to agriculture with the aim of uplifting their living conditions. Dealing with Agricultural cooperatives (Cropp 1989; USDA, 2004) classified them into three broad categories according to their main activity namely:

1. Marketing cooperatives (which may bargain for better prices, handle, process or manufacture, and sell farm products).

2. Farm supply cooperatives (which may purchase in volume, manufacture, process or formulate, and distribute farm supplies and inputs such as seed, fertilizer, feed, chemicals, petroleum products, farm equipment, hardware, and building supplies), and
3. Service cooperatives (they provide services such as trucking, storage, grinding, drying, artificial insemination, irrigation, credit, utilities and medical insurance. These cooperatives usually vary greatly with regard to functions performed, and can also vary greatly in size.

Among these categories of cooperatives, Urumuri and Kiaki cooperatives refer to marketing cooperatives because they grow, bargain the price and sell the agricultural products for members. Apart from the above types of cooperatives, Rwanda Cooperative Agency highlighted six types of cooperatives that are found in Rwanda.

Agricultural Marketing Cooperatives

Regarding to Agricultural Marketing Cooperatives operating in Rwanda, RCA (2011:13) stated that they provide farmers with agricultural inputs and sell their crops and produce to wholesalers; marketing boards; inter-cooperative partnerships, Fair Trade organizations or other types of overseas customers. In addition, many agricultural marketing cooperatives contribute funds to help improve a variety of rural social services such as education, primary health, water and electricity supplies, care facilities and other community needs.

Arts Crafts (Handicraft) Cooperatives

These types of cooperatives, RCA (2011:13) emphasized that they assist individual craftspeople who make various items of artwork acquire raw materials; control quality of items made and market them to various buyers for the benefit of members.

Housing Cooperatives

Housing Cooperatives RCA (2011:13) confirmed that they enable members to assist in the construction of houses for each other or save money and borrow loans to construct or purchase houses through a mortgage scheme.

Fisheries Cooperatives

For RCA (2011:13) fisheries cooperatives are those cooperatives that enable their members to manage fish farming assist members with purchase and maintenance of fishing equipment, market fish and enable fisherman to save money regularly and borrow loans as needs arise.

Multi-purpose Cooperatives

In the context of Multi-purpose cooperatives RCA (2011:13) stipulated that they carry out several activities at the same time according to the needs of their members e.g. buying and selling of various farm crops, operating petrol station, a shop, and providing financial services.

Saving & Credit Cooperative (SACCO)

Concerning to these cooperatives, RCA (2011:13) argued that It is a primary cooperative society that lends money collected from its members at low rates of interest. SACCOs are very effective tools for mobilizing savings and building a critical mass of capital that is made available to the members for borrowing at relatively cheaper interest rates compared to those offered by commercial banks and other lenders. This is a type of cooperatives that is easy to start and manage.

Martin L.et el (2000: 91) dealing with new generation cooperatives found that they can be useful structures for strategic alliances. Cooperatives are particular types of businesses owned by and run for the benefit of those making use of its services. There are two distinct types of cooperatives that are most common in the agri-food industry, producer and consumer cooperatives and emphasizes that the objective of a cooperative is to meet its customers' and members' needs as well as to provide economic benefit to member owners generating profits that sustain long-term development and growth. The positive impact of cooperatives on the local economy is strengthened by the fact that net earnings are returned to members, who usually reside in the local community.

We can realize that agricultural cooperatives can be called either producer or marketing due to their activities performed by members and their main goals being to serve, unite members while participating in the national economy. The above types of cooperatives that operate in Rwanda are among strategies adopted to find solutions to existing problems.

2.1.3.5. Resources to manage in a cooperative

Like any other business, there are three major types of resources managed in a cooperative such as human, capital, and facilities resources.

Human resources

The most important resource in a cooperative is people since the success of all phases of the business depends on competent personnel working together smoothly and efficiently USDA (1997:6). This concerns people in management in different organs such as Board of Directors, The supervisory Committee and the General Assembly all of them must collaborate to maintain or improve good member-patron relations which involves providing good, honest service and helpful information about the cooperative and the products it handles. So, members should be informed about policies, operating practices, and financial requirements, their responsibilities for making the cooperative successful. Finally, Bhuyan (2007:280) indicated that the positive interaction through a good communication among cooperative members and between management and members affect the cooperative's success by reducing transaction costs and enhance revenues.

Capital resources

Financial management, a key to operating cooperatives, involves managing assets such as cash, accounts receivable, inventories, fixed assets, and investments in other organizations. It includes managing liabilities, such as accounts payable and current notes payable, and obtaining favorable long-term financing USDA (1997: 7). An agricultural cooperative requires periodic analysis of the cooperative's financial position in order to find out how it is profitable.

Facility resources

Facilities in agricultural cooperative are lands, storage grounds; transport means building and equipment which represent a large proportion of a cooperative's assets USDA (1997:7). Therefore, important management considerations include scheduled maintenance; rearrangement, remodeling, and replacement to improve operating efficiency, daily operating cost records, preventive maintenance programs for rolling stock such as delivery trucks, grounds maintenance and pest control, adequate insurance, disposal of unproductive assets, and observance of safety, health, and other environmental regulations.

It is remarkable that when human resources in a cooperative fulfill responsibilities as required with adequate physical or financial facilities, profitability can be achieved.

2.1.3.6. The cooperative movement in Rwanda

Concerning to the historical process of cooperative movement in Rwanda, Wanyama et al (2009: 366) indicated that cooperatives were established for the first time in Rwanda in 1953 by the Belgians in the colonial period as instruments for driving the agenda of the government's socio-economic goals. Due to the paternalistic approach of the colonial administration that sought to keep Africans in underprivileged positions, cooperatives were not considered to be attractive to Africans, as they restricted their activities to the social and agricultural sectors where cooperatives were strictly controlled by the colonial administration to the point of fixing the prices that cooperatives could pay their members for their produce, which was lower than what private European entrepreneurs paid.

Musahara (2012:11) argued that cooperatives were governed by the Royal Decree of 16, August 1949 which has been replaced by a new one in 1956. The Royal Decree was abrogated on 22, November 1966 on the occasion of the publication of the first Rwandan Law on cooperatives. Since 12, October 1988, cooperatives have been functioning in Rwanda in reference to the Decree N° 31/88 till the new Law N° 50/2007 of 18/09/2007 providing for the establishment, organization and functioning of cooperative organizations in Rwanda was enacted.

Wanyama et al (2009: 366) indicated that the cooperative movement process has been very slow for a long time and there were only 8 cooperatives in 1962 organized in colonial manner: they were mainly centered on mining or cash crops (tea or coffee) and the leading motive was more economic than (rural) social and welfare interests.

After independence, Musahara (2012:4,5) the new government wanted to use cooperatives to organize people for economic development and between 1962 and 1966 alone the number shot to 36. In 1966 the government passed another law on cooperatives. Between 1967 and 1973 they grew to 423 and from 1974 to 1980 they had grown three fold to 1203. During the period there was considerable institutional development. In 1975 an office in charge of cooperatives and community development started and in the same year a cooperative bank was registered.

Cooperatives in Rwanda, after 1994 played an important role in addressing vulnerability, assisting in poverty reduction and acted as one of the few vehicles for reconciliation. 1996 a count of 'cooperatives' is given as 4,557 and by 2005 about 10,038 associations were identified. Among these cooperative organizations, 68 per cent were operating in agriculture 12.2 per cent in finance 4.4 per cent in commerce, 4.2 in services and there were 47 Banques Populaires which played an invaluable

role in promoting the living conditions of their members and contributing to the socio-economic development of the country on the whole.

Nowadays, Nkuranga (2013:2) emphasized that cooperatives are considered as a good means to promote socio-economic development especially in rural areas since they put together people in different domains such as agriculture, rearing (cattle breeding), beekeeping, fishing, commerce, craft, savings and credit.

Cooperatives have been a model for bringing together people across all spheres of society in common economic and social interests. In Rwanda, Nkuranga (2013:2) indicated that cooperatives comprised nearly 2.5 million members grouped into approximately 5,000 active cooperative entities. Most commonly found in Rwanda in the agricultural sector, cooperatives are providing significant results in the production of tea, coffee, rice, wheat, maize, Irish potatoes, vegetables, fruits, milk, meat and fish but also seeing gains in other sectors such as finance SACCOs (savings and credit cooperatives), mining and transportation (motorcycles and minibuses) as well. Among those active cooperative entities about 2,400 are agricultural cooperatives Ellen and Miet (2013:8). The Ministry of Commerce as stated in GoR (2009:15) aimed at strengthening cooperatives by facilitating the access of cooperatives' members to Information and Communication Technologies in order to help them acquire the required knowledge for the promotion of good practices in cooperative management and to be connected to the national and international markets.

2.1.4. Agriculture in Rwanda

The term agriculture as stated by Panda (2010: 93) is derived from the Latin words "ager" or "agri" meaning "soil" and "cultura" meaning "cultivation". It is a broad term encompassing all aspects of crop production livestock farming, fisheries, forestry, but in this work we focus only on crop production. Rwanda is relatively unique in that there are at least two main staples seasons, GoR (2011:8); Season A and Season B, with a third season, C, available in the marshlands.

Agriculture is the most important human economic activities practiced in many rural countries on small plots. The effect is that people in rural areas live in extreme poverty which hinders them to satisfy basic needs like food, children's education, medical insurance. They are affected by various problems such as inadequate resources, food shortage, lower level of income and saving, poor health, school drop out for children, persistent diseases, poor shelter and illiteracy due to economy based on agriculture.

The Government of Rwanda (2012:9) recognizes the central role of the agriculture sector both in terms of economic growth and poverty reduction. Agriculture accounts for more than 34% of the gross domestic product (GDP), provides 70% of exports, employs 80% of the workforce and provides raw materials to industries and a market for manufactured goods. Agriculture as remarked by Cafeiro (2003:1). is broadly conceived as the set of activities that use land and other natural resources to produce food, fiber and animal products that can be used for direct consumption (self consumption) or for sale, either as food or as input to the manufacturing industry.

Agricultural production is sensibly more uncertain than that in any other sector of the economy. Input in the production process need to be committed well in advance, and there is little or no power for farmers to reverse the decisions on the inputs when they discover that output production may be either less than expected or valued less of what it was supposed to be.

With this argument Daman (2003:4) expressed that it is often assumed that world food shortage can be eliminated by increasing food and agricultural production through the application of modern technology. This appeals supplying modern inputs such as large-scale irrigation, chemical fertilizers, farm machinery and pesticides to improve the productive capacity of the land. At harvest, there is a need to store the produce by applying the fertilizers for the market value to increase in order to get enough profitability.

Agriculture in Rwanda as noted by World Bank (2011:7) is practiced under the Crop Intensification Program since September 2007 as a production system that can increase food production in the country. Productivity is a function of the usage of improved inputs such as seeds, fertilizers, water and machineries. The CIP focuses on six priority crops namely maize, wheat, rice, Irish potato, beans and cassava. The Government of Rwanda (2012:23) emphasized that the CIP is implemented with eight pillars that are: land use consolidation; proper management and use of agricultural inputs such as fertilizers in large; fertilizer and improved seeds purchase and distribution through the private sector (enterprise or farmer cooperatives, using auction and vouchers); extension services; capacity building; access to finance; post-harvest handling and storage, and marketing. The World Bank (2011:8) stated that it can be very helpful to achieve the aim of transforming agriculture from subsistence-based farming to a 'Productive, high-value, market-oriented' sector through a number of interlinked Interventions and policy reforms.

Arumugam (2011:4) highlighted that the implementation of that program resulted into increase of crop productivity. This made the production of maize and wheat to increase by 6-fold while that of Irish potato and cassava has tripled. The increase in productivity took the country further beyond the food security to produce surplus quantities that enable to export food crops to markets in the region.

2.1.4.1. Production of Irish potatoes in Rwanda

Irish potato as considered by Scott, (1988) is one of the main root and tuber crops in Rwanda like sweet potatoes and cassava grown for its richness in hydrocarbons and starch. Irish potatoes have been cultivated in Rwanda for nearly a century, and most accounts trace introduction of the crop to the arrival of German missionaries in the late 19th century. Sharad (2008: 4) stated that it is considered as the world's most widely grown tuber crop and the fourth largest food crop in terms of fresh produce after rice, wheat, and maize (corn). It is the most important food crop cultivated in the highland regions in Rwanda and the dominant potato varieties are Kirundo, Cruza, Mabondo and Victoria, Mpyisi (2002:3). In Rwanda, potato is the second major food crop after banana (FAOSTAT, 2010). The highland regions located in southwest and north of the country have the most favorable climatic conditions for potato production GoR(2000). These highland regions account for more than 80% of the national potato production, and the remainder is produced in marginal agro-ecologies all over the country, Munyemana and Von Oppen (1999).

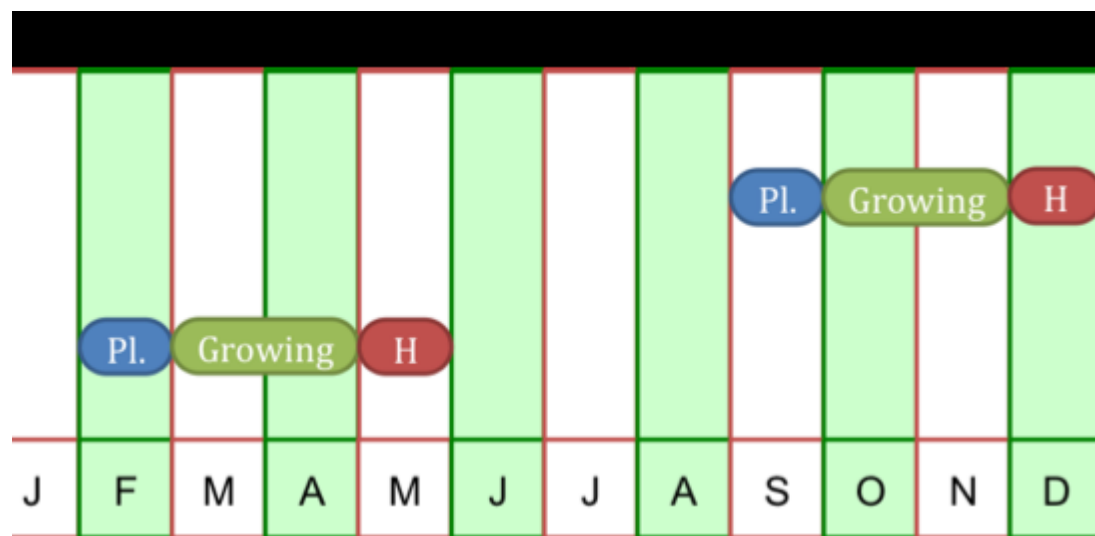
Banque Populaire du Rwanda (2012: 4) argued that the potato production cycle is short, only about 4 months between planting and harvesting compared to 6 months for beans or 8 months for maize. It allows two main growing seasons from September to December for Season A and February to May for Season B, however in some regions it is possible to extend the growing cycle beyond those seasons if sufficient moisture is available in the soil provided water (rain / irrigation) is available. Due to high yields and good profitability of the potato production, farmers tend to neglect the crop rotations to maximize their short-term profits which are a significant potential risk as it could enhance problems linked to disease and soil degradation.

The major limiting factors to potato productivity in Rwanda include lack of high yielding varieties, insufficient clean seeds, diseases, lack of access to credit, post-harvest losses due to poor handling and storage facilities, insufficient clean potato seed tubers, poor seed distribution system, and inadequate production technologies (ISAR, 2008).

According to Brook et al (1995:40) amongst these factors, diseases are the main potato production constraint in Rwanda. Growth and quality of potatoes are influenced by environmental factors such as soil type, temperature, moisture and light. Many factors that influence potato growth are largely uncontrollable by the grower: length of growing season, air and soil temperature, light intensity and duration, humidity and wind. Other factors that influence growth of the crop can be controlled by the grower like variety of potato, size of mother seed tuber, seed piece cutting, seed piece types, plant stand, moisture, pest management, planting date and harvest date.

In Rwanda, Banque Populaire du Rwanda (2012: 5) found that there is generally a lack of adequate seed material because of insufficient multiplication and as a result farmers may use their seeds for a larger number of cycles or purchase seeds from uncertified sources. This is due to the fact the main areas of attention or limiting factors are related to (i) inputs (heavy reliance on pesticides), (ii) production (short production cycle) and (iii) distribution to markets essentially transport availability at harvest, the availability of potato seeds and the highest production costs. Each crop requires between 6 and 8 applications of 3 different pesticides, it is one of the crops with the heaviest pesticide usage in Rwanda.

Figure 1.1 Irish potato growing seasons in Rwanda



Source: BPR (2012:4)

The above figure shows that there are two main seasons for growing irish potato chosen to be cultivated in Districts of Nyaruguru , Nyamagabe and Muhanga of the Southern Province. This crop passes through three main stages such as Planting, Growing and Harvesting. The season A starts from September to December and the season B starts from February to May.

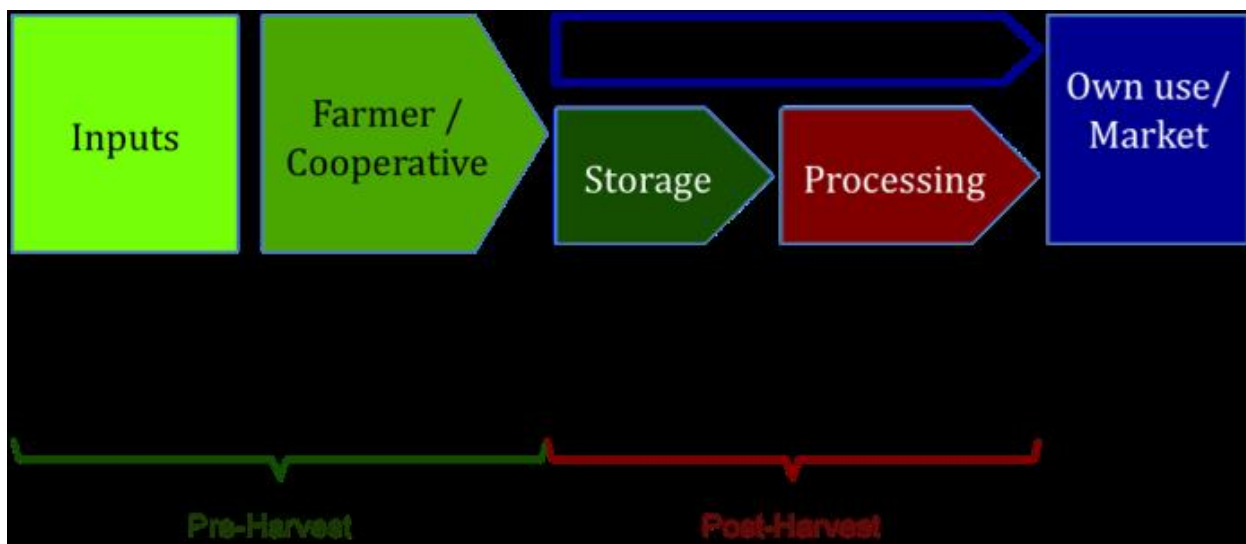
Figure 1.2 Area of production of irish potatoes in southern province



Source: Province <http://old.southernprovince.gov.rw/spip.php?article749>

The above figure shows that the population in the mentioned districts of Southern province has increased the area for cultivating irish potatoes from 2010 by 2623 ha, 2011 by 12100 ha and 2012 by 19974.2 ha as a result of land use consolidation program.

Figure 1.3. Irish Potato Value chain



Source: BPR (2012:3)

As mentioned on the above figure, during the period called Pre-harvest, the farmers prepare land, have access to inputs like seed, fertilizers, advice from agricultural technicians while Post-harvest the output is taken to the storage facility where there is transport means and people, fertilizers, watchmen and processing the harvest to the market.

2.1.4.2. Production of wheat in Rwanda

Wheat is in the same category of small grains with sorghum, and millet. It is grown for food for people, animal food (cattle, poultry), and raw material for a diversified number of industrial product glucose, fiber and starch. It is applied in industries for alcohol, textile, biscuits, pharmaceuticals and organic chemicals. It is preferred by farmers due to its ease cultivation, wide environmental adaptability (hill slopes, transport, storage for a long period, it has ready marketability and richness in energy), Panda (2010: 6).

In his study about cereals Xinshen (2010:18) found that a number of cereals are grown in different countries, including rye, oats, barley, maize, triticale, millet and sorghum. On a worldwide basis, wheat and rice are the most important crops, accounting for over 50% of the world's cereal production. Wheat is an important cereal staple crop both directly for human consumption and indirectly via livestock feed. It is cheap to produce, easily stored and transported, and does not deteriorate readily if kept dry.

In Rwanda, Nkuriyimana (2010:20) argued that wheat is very important in national food security that is why it is in ID Voucher System which started with purchase of fertilizers (50% of value) at the level of land consolidation in the farming system. According to Muhayimana (2012:15) It is cultivated in ten districts (Nyaruguru, Nyamagabe, Nyamasheke, Karongi, Rutsiro, Gicumbi, Ngororero, Rulindo, Musanze,) of Congo-Nile Crest, Volcanic soils and Buberuka highlands (Burera) at altitudes superior to 1900m where it constitutes a major staple food for farmers. Moreover, the Government of Rwanda (2012:7) stated that there are five (5) varieties namely KS Mwamba, Musama, Bisagi, EN161 and EN 48 recommended to the population to grow by RAB due to their resistance to diseases and appreciation by Pembe for baking quality and high protein content. Then, Muhayimana (2012:15) stated also that wheat is daily consumed in rural areas as grain cooked, dough, porridge, and traditional beer while in urban area it is consumed as bread, dough and porridge, It is appreciated as a source of energy, carbohydrate, protein and fibre, as well as containing a range of micronutrients such as

vitamin E, some of the B vitamins, magnesium and zinc in both developed and developing countries, its long time conservation and easy transport.

Expressing the importance of a seed in crop production, Tsegaye (2012:1) stipulated that seed is a critical input in crop production and one of the most precious resources in farming, a basic unit for distribution and maintenance of plant population. The importance of improved seeds in boosting agricultural production is well recognized by agricultural scientists, farmers and development workers. Seed has to be available for every crop production cycle. It has to be there at the right time, in the right quantities, with the right qualities and at the right price so that farmers can access the seed they need since bad seed are related to disease and poor harvest.

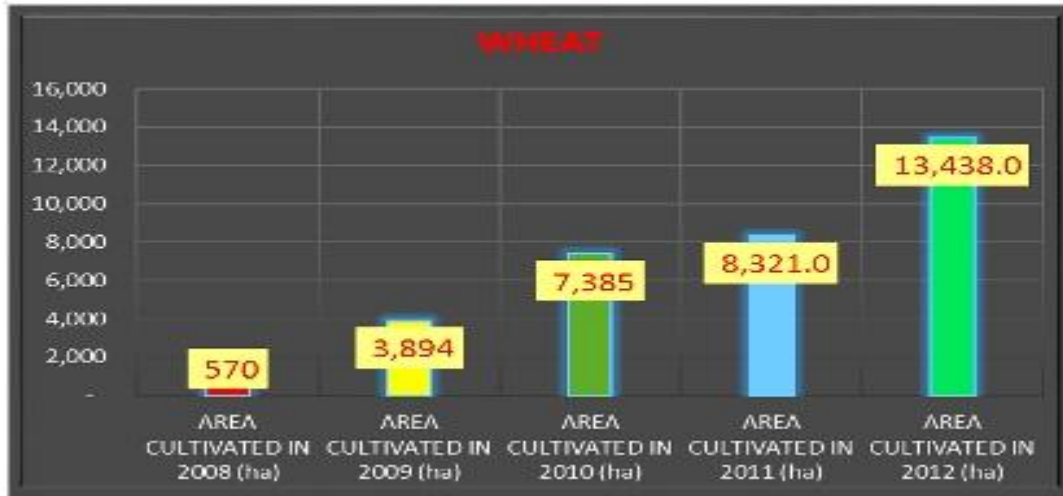
Picture 1.1 Wheat disease



North Dakota State University, Wheat diseases identification, (2011:8)

Yellow rust (disease) is a challenge to wheat farmers of Nyamagabe district. This is one of wheat diseases where by leaves becomes yellow due not applying chemicals and mostly affects productivity. In agricultural calendar of the Southern province the crop of wheat was chosen to be cultivated in Districts of Nyaruguru and Nyamagabe, it is cultivated in season A and B in rotation with maize and irish potatoes.

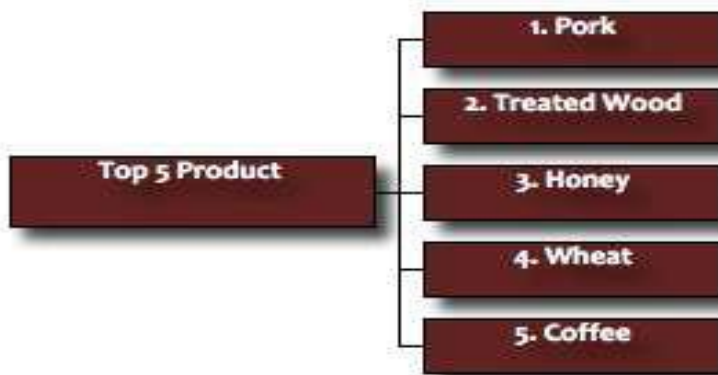
Figure 1.4 Area of Wheat production in the Southern province



Source: Province <http://old.southernprovince.gov.rw/spip.php?article749>

As we see from the above figure the area has increased since 2008 by 570ha, 2009 by 3894ha, 2010 by 7385ha, 2011 by 8321ha, 2012 by 13438ha due to an increase in use of improved inputs and easy access to them by farmers through Crop Intensification Program. The same crop is among the five top priority products in Nyamagabe district.

Figure 1.5 Five top priority products in Nyamagabe District



Source: Nyamagabe District (2013:32)

In agriculture, as stated by the Government of Rwanda (2011:6) many post-harvest activities occur after harvest prior to consumption by formal or informal markets; these include primary handling (drying, threshing, shelling, winnowing, sorting), aggregation and transport, storage and speculation, marketing, and processing. The harvest process itself can also be considered a post-harvest activity because it significantly impacts the stabilization and perish ability of the product, and takes place after

production has finished. Farmers are sensitized to manage these activities safely so as to avoid losses that occur at many points after harvest while increasing the volume and value of staple crops within the market and available for consumption and sale. Mpyisi (2002:3) also confirmed that post-harvest losses are quantitative or qualitative loss resulting in a measurable decrease in monetary value.

2.2. Overview of agricultural cooperatives

In the following paragraphs the agricultural cooperatives will be discussed as their roles in different domains such as development, food security, poverty reduction, sustainable development and advantages they provide to members.

2.2.1. History of agricultural cooperatives

Agricultural cooperatives are regarded by Daman (2003:9) as primary level or a basic level autonomous organization. Its basic objective is to improve the standards of living and the quality of life of its members residing in rural areas by undertaking various economic activities which help them to increase productivity and production of agricultural and allied activities and thereby help increase their income. In the cooperative, members are also expected to participate actively in its organizational structure as well as in its economic business.

The modern cooperative originated in Europe and spread to other industrializing countries during the late 19th century as a self-help method to counter extreme conditions of poverty (Hoyt, 1989). However, the first agricultural cooperatives was the consumer cooperative established in Rochdale Society of Equitable Pioneers, Ltd in 1844, England, by a group of workers. The cooperative's objectives were to address members' needs for better housing, employment, food, education and other social requirements.

In the same point of view Daman(2003:5) highlighted the features of the agricultural cooperatives in Japan such as farm guidance and better-living services to achieve a high degree of communication with the members and to enrich their economic and social life; Protection of interests of farmer-members through mutual insurance, health-care; Carefully planned and well-executed marketing and supply functions through specially-created and cooperative-owned holding companies; Production of quality consumer goods and service, ensuring higher economic returns to the farmer members through a process of 'value-addition' and encouraging the farmer members in controlling pollution to produce and market the healthy, safe, and nourishing agricultural products to safeguard the interests of consumers.

The active cooperatives entities in Rwanda are 5000 and about 2.400 agricultural cooperatives Ellen and Miet (2013:8). This shows that once the above features are applied in agricultural cooperatives, they increase participation and commitment of members in all cooperative activities and profitability for the cooperative and members in general. For the cooperative members of UNICOOPAGI, every member gets a prepaid medical insurance for household members, training and a market for their produce at RAB after analyzing the production cost with members.

Regarding to factors that shaped the development of cooperatives, Cropp (1989) highlighted the following: Economic conditions (caused by war, depression, technology, government economic policy, etc). Farmer organizations (including quality of their leadership, their motivation and enthusiasm to promote cooperatives, power to influence public policy) and Public policy (as determined by government interest, legislative initiative, and judicial interpretation).

The common types of agricultural cooperatives include input supply, marketing and processing cooperatives Nkhoma (2011:25), so they are considered as a tool that promotes development by reducing poverty. The agricultural cooperatives in this study were formed due to economic conditions by the fact that members lived in poverty, holding small lands which could not generate an income that can help satisfy their needs. Then, it is also among policies to be implemented in Rwanda while strengthening unity of the population.

2.2.2. Agricultural cooperatives in Rwanda

Agriculture in Rwanda is managed by the Ministry of Agriculture and the follow up of agricultural activities is made by Rwanda Agriculture Board (RAB). Agricultural sector as stated by The Government of Rwanda (2012:22) is responsible for mapping out strategies on which to maintain broad self sufficiency in basic food and at the same time be able to expand export earnings by promoting Coffee, Tea and other horticultural products, thus increasing yield per acre. The sector in consultation with other institutions established policies that enable market for inputs and products to function efficiently while providing necessary marketing information for both producers and consumers.

The National Agricultural Policy relies on the following four strategic axes: 1) Transformation and modernization of agriculture; 2) Agriculture value chains development; 3) Promotion of competitiveness for agricultural products; and 4) Development of entrepreneurship spirit. Its specific objectives are to: i) Enable rural communities to develop a sense of responsibility as actors in

agricultural development; ii) Increase agriculture, animal and fish production as a result of improvements in productivity; iii) Increase revenue as a result of diversification of economic activities in the rural sector; iv) Strengthen the linkages between production and market; and v) Ensure the sustainable management of natural resources.

Nowadays, the same author emphasized that agriculture being practiced under the CIP (Crop Intensification Program) relies on the pillars of land use consolidation; proper management and use of agricultural inputs, such as fertilizers, in bulk; fertilizer and improved seeds purchase and distribution through the private sector (enterprise or farmer cooperatives, using auction and vouchers); extension services; capacity building; access to finance; post-harvest handling and storage, and marketing. A land use consolidation component encourages farmers with adjacent land to grow the same crop and enables them to make use of economies of scale and increase access to quality inputs as stated above.

In addition to that, the World Bank (2011: 11) stated that the Government established a fertilizer voucher system for maize and wheat farmers where dealers deliver inputs to the farmer at a predetermined subsidized price; they are paid the subsidy on the agro-input by microfinance institutions engaged by CIP. Some measures are implemented in order to maintain soil fertility like controlling soil erosion by radical terraces, irrigation due to droughts, irregular rainfalls, landslides and climate change-related phenomena.

2.2.3. The functioning of UNICOOPAGI and its cooperatives

UNICOOPAGI is a union of 27 integrated agricultural cooperatives, 2311 members composed of 1001 males and 1310 females, started in 1991 with the mission of professionalizing farmers through the reinforcement of their cooperatives. In their daily activities, UNICOOPAGI assists cooperatives in getting legal personality, administration and management, looking for markets of their agricultural products, education and continuous training of cooperative members in saving, citizen participation, and training farmers in integrated soil fertility management technology. They also supply agricultural inputs such as lime, mineral fertilisers, pesticides and vegetable seeds, sell agricultural products and promote men and women's economic rights. In the agricultural domain, Arumugam (2011:13) noted that UNICOOPAGI operates as a service provider engaged under CIP in distributing the fertilizers and other inputs to farmers in Nyamagabe, Huye, and Nyaruguru districts. UNICOOPAGI buys, collects wheat farmers' production, dries it at 14% of moisture content, packs and stores the production in its

appropriate stores, Muhayimana (2012:17). It operates in districts where these crops produced under the Crop Intensification Programme (CIP), maize, beans, rice, Irish potatoes, wheat and cassava are earmarked as ‘priority crops’ but producers face serious challenges like poor soil fertility, soil acidity which makes them use both organic and inorganic manure to increase productivity and land fragmentation.

During this comparative study, the research was carried out on two cooperatives of Urumuri Cooperative from Kibirizi sector which cultivates wheat in Nyamagabe district and KIAKI of KIVU sector which cultivates Irish potatoes in Nyaruguru district. The comparison relied on the fact the former cooperative deals with cereals that can be stored longer while the latter deals with tubers, valuable by people but cannot be stored longer. Both cooperatives of KIAKI and Urumuri got the legal personality in 2008 to grow wheat, irish potatoes, maize and vegetables. In this case, urumuri cooperative grows EN161, a certified variety of wheat whose produce is bought by RAB through UNICOOPAGI.

2.2.4. Comparisons of traditional and modern agriculture

Agriculture in Rwanda is developing from traditional to modern agriculture in the crop intensification program (CIP), the farmer move from subsistence agriculture to market oriented one. Goals are also totally different as shown in the table below which reflects the profitability in such domain even for the agricultural cooperatives under this study.

Table: 2.2. Comparisons of traditional and modern agriculture

ATTRIBUTE	TRADITIONAL	MODERN	TRANSITION
Farmer Goals	Subsistence, social, surplus sale, minimise risk	Business, commercial sales, persistence, high risk	"Pull of cash, consumerism; and modernity; Push of land conversion, demand for labour
Government/ Other Intervention	Little support, especially for food crops; more for export; no government protection	High support, subsidies, price supports, security/extension network/sales force	Food imports; special food/fiber exports

Agriculture Type	Polycropping, polyvarieties, integration w/ livestock	Monocrop, fewer varieties; livestock as specialty	Research and development for new varieties., cropping systems, inputs
Labour	High per unit land area, mainly family include. kids; animal traction	Low per unit area; machinery, fossil fuels, chemicals	Rural-urban migration; fewer farms; more landless
Soil Properties Maintenance	Shifting cultivation, fallowing, manuring	Synthetic fertilizers	Land pressure, marginal lands under cultivation
Pests	Interplanting, rotation, natural predators	Synthetic pesticides	Scarce/costly labour
Weeds	Hand weeding, cultivation, rotation	Synthetic herbicides	Ditto
Cash Inputs	Low; cash poor, few purchased inputs (e.g., save seed)	High; need credit; multiple purchased inputs, seed, machines, chemicals	Unstable/ Declining commodity prices

Source: Donald, A.F. 1997. An introduction to cooperatives. Rural Business-Cooperative Service. From Internet: <http://www.rurdev.usda.gov/rbs/pub/cir55/cir55rpt.htm>, Accessed on 18/7/2013

The table above shows that in modern agriculture farmers are market oriented in their activities by growing one crop. In this study, KIAKI grows Irish potatoes while Urumuri grows wheat. They produce quality products and apply fertilizers in order to increase productivity, then profitability after sale. In agricultural cooperatives of UNICOOPAGI, farmers are sold inputs at a lower cost, are trained to store the production in order to enhance food security in households.

2.2.5. Financial Profitability and Performance of agricultural cooperatives

According to Mellor (2009:28) the objective of cooperatives is simply to give members a better price or service. So, there are three measures are used to determine profitability and performance such as: Gross sales or other measure of the size of the business, e.g. gross revenues, such as billings, loans,

premiums; Gross expenses (the difference between sales and expenses is calculated as an indicator of profitability) and Total administrative/operating cost (calculated as a percent of sales and as change over time).

In addition to that Mellor (2009:30) stated that for a cooperative to be profitable, it must be financially stable and efficient over the long term, have staying power, particularly to get through hard times, this may be shown by the total assets such as: the physical and financial building blocks of the business. Regarding to the total debts and total equity, debt subtracted from assets equals equity or the ownership capital of the members. Equity should be growing over time as a primary means of ensuring the cooperative's sustainability when it declines per member it can be a worrisome sign and the total reserves. Once a cooperative fulfils conditions that facilitate achieving profitability, objectives towards satisfying members' needs, the country also develops hence sustainable development.

2.2.6. Agricultural Cooperatives and sustainable development

This section highlights the role of agriculture in promoting sustainable development for a country. As Murwanashyaka (2013:34) indicated sustainable development means achieving a quality of life that can be maintained for many generations because it is: -Socially desirable: it fulfills people's cultural, material and spiritual needs in equitable way; Viable: it pays for itself, with costs not exceeding income; - Ecologically sustainable: it maintains the long-term viability of supporting ecosystems. This being said, sustainable development means the development that meets the needs of the present without compromising the ability of future generation to meet their own needs. Here, the development contributes so much to economic growth, social progress and then to the preservation of environment. In all, sustainable development is that development which improves human living conditions for both present and future generations. In agricultural sector, sustainable development can be reached through food and nutrition security, Sustainable management of natural resources, erosion control, water capture and management, input use, marshland development and irrigation development, GoR (2012:33).

In this context, Gertler (2001:7) argued that sustainable development is often represented as having three dimensions for action: the economic, the social, and the environmental. Agricultural Cooperatives play an important role in the development of countries especially in social, economic, institutional or political, and environmental.

2.2.6.1. The social development role of Agricultural cooperative

With regard to the social role of cooperatives Mukarugwiza (2010:18) found that they play a role in the social protection of their members and their families, especially in getting health insurance. Although health insurance is mandatory for all Rwandans, cooperatives have made it easier for their members to pay premiums for health insurance schemes that are popularly referred to as *mutuelle de santé*.

Mutual assistance in Rwandan culture can be maintained among cooperative members in various social activities that take place in happiness or stressful ceremonies like wedding or burial. Cooperatives are for a purpose of uplifting the social conditions of its members through principles of voluntary and open membership, democratic, control, participation of members, cooperative members' education, autonomy and solidarity among cooperatives themselves. In this regard, cooperatives not only base on the spirit of mutual support but also rely on achieving the benefits of economies of scale. In addition to that job creation, cooperatives helped to improve the living conditions of their members. Cooperatives help members have used their cooperatives to build houses, pay school fees for their children, produce food for the family, and improve their clothing. Furthermore, Stringer (2001:11) stated that agriculture operates as important social welfare infrastructure in remote locations, creating development opportunities and producing basic necessities for isolated communities. Agriculture provides basic subsistence occupations for millions and permits people to supply themselves with the three fundamental human needs: food, clothing and shelter.

Socially, Co-operatives are effective schools for sustainable development Gertler (2001:6).

Educating members, employees, and the public is a co-operative principle which helps to upgrade the technical, managerial, and organizational skills of their members and staff through short courses, advanced education, peer instruction, and learning by experimentation.

Social integration and the enfranchisement of marginalized groups through co-operative organizations and co-operative action are much needed counterweights to processes of exclusion and exploitation. So, there is no discrimination in agricultural cooperative because there are different categories of people like widows, widowers, people affected by disease like HIV/AIDS working together which itself qualifies as a step towards a sustainable society (UNRISD 1994).

2.2.6.2. The economic development role of Agricultural cooperative

The economic role played by agricultural cooperatives were emphasised by Fatemeh (2011:23) as providing the farmers with production inputs, such as fertilizers, seeds and chemical substances, etc. In addition, it holds guide symposiums for the farmers to acquire them with the necessary knowledge and skills about the agricultural new methods that aim at increasing the agricultural production and, therefore, promoting the rural society.

Cooperatives are regarded as development tools that should promote social empowerment and economic goals. Zeuli (2002:1) argued that an agricultural cooperative is considered as one of the important economical and social organizations in rural societies through local ownership and control, and net profits distributed to those who use the Cooperatives as they combine people, resources, and capital into larger, more viable and economically competitive units. The structure and objectives of cooperatives make them to behave differently in their communities than businesses with other organizational structures. In addition, cooperatives offer a way for a group of individuals to pool their limited resources to achieve a critical mass since they combine people, resources, and capital into larger, more viable and economically competitive units.

Co-operatives as noted by Gertler (2001:6) emphasize positive working relationships, and to social conditions such as mutual trust and good will. Cooperatives are likewise central to sustainable development in that they provide the necessary context for improving living standards without depending exclusively on increased levels of private consumption. IFAD (2012:6) noted that agriculture – farming, forestry, fisheries and livestock – is the main source of employment and income in rural areas, where most of the world's poor and hungry people live. Agricultural cooperatives play an important role in supporting small agricultural producers and marginalized groups such as young people and women.

Cooperatives offer small agricultural producers opportunities and a wide range of services, including improved access to markets, natural resources such as land and water, information, communication, technologies, credit, training and warehouses. Co-operatives reduce inequality and promote equitable sharing of the costs and benefits of sustainable development this is the sustainable resource use, Gertler et al (2001:6). Agriculture is considered as an important activity that contributes to poverty reduction in many countries.

In Australia as stated by Stringer (2001:12) agriculture remains more productive than industry so the real price of food declines, which contributes to increased savings; increased incomes; economic stability; and overall total factor productivity. In Columbia, Binswanger and von Braun, (1991:60) stated that past evidence suggests that periods of high agricultural growth rates are associated with falling rural poverty.

In Italy, Mellor (2001) found out that strong agricultural growth leads to: (1) lower food prices (for urban consumers and rural net-food buyers); (2) increased income generating opportunities for food producers and jobs for rural workers (thus reducing rural-urban migration, with positive consequences for real urban wage rates); and (3) positive intersectoral spillover effects including migration, trade and enhanced productivity.

In both China and Indonesia, World Bank, (1996) stated that rapid agricultural growth substantially reduced rural poverty, improved food security in both rural and urban sectors, and provided a significant demand side stimulus for non-agricultural goods and services.

The importance of agriculture in the national economy, Xinshen (2010:15) is also realized in African countries too. In Ethiopia, income generation role of agricultural growth has been important for poverty reduction, as many poor in rural Ethiopia either mainly produce for own consumption need or are the net buyers of cereals, the direct consumption effect of agricultural growth is equally important in poverty reduction in the country. However, Ellen and Miet (2013:3) found that cooperative membership lead to higher prices and higher farm incomes among banana farmers in Kenya.

Dealing with the role of cooperatives in Rwandan economy, Mukarugwiza (2010:18) emphasized that cooperatives are instruments used to alleviate poverty and to accelerate agricultural production in Rwanda. They contribute to the achievement of the Millennium Development Goals, Vision 2020 and the Economic Development and Poverty Reduction Strategy (EDPRS) program that focus on rural economic transformation, human resource development, development and promotion of the private enterprises and poverty alleviation. Beside the above macro-economic role, cooperatives create decent employment for their members and staff.

The Government of Rwanda (2009:4) has put in place different strategies that aim at fostering development such as Vision 2020 which seeks to transform the economy by bringing about a rapid increase in growth and a significant reduction in poverty and EDPRS. In EDPRS I covering 2008-2012, the agriculture sector contributed 32.7% of GDP and 28% of total growth. It grew at 5.4%

sustained by higher than expected expansion of food production, GoR (2012:22). It is also regarded as a pathway out of poverty by improving productivity and increasing sales of produce is an important income earner for smallholders during the period of EDPRS II that covers 2013-2018. The Government of Rwanda (2009:15) considers now the cooperatives as full partners in efforts for alleviating poverty. To harmonize and coordinate the interventions in that sector, it has been decided to design a national policy for promoting the cooperatives and to gather in a single document the strategies chosen and the priority activities retained for the years 2006-2008.

2.2.6.3. The institutional development role of Agricultural cooperative

The political role of cooperatives is important in its articulation of cross-cutting issues in society like gender, HIV/AIDS, human rights, children's rights, among others Mukarugwiza (2010:19). Agricultural Cooperatives advocate for people with different issues for solution and provide trainings to members for better understanding of the governmental policy like land management, fertilizer application and the post harvest management to fight against hunger.

Kwapong et al (2010: 4) focusing on cooperative contribution in improving rural livelihoods stated that the revived cooperatives in Uganda were contributing to poverty reduction where by over 90 percent of surveyed members reported changes in their income after joining and marketing their produce through the cooperative, with 92 percent of these reporting an increase in income over the past five years.

Chirwa(2009:5) argued that agricultural cooperatives facilitate smallholder producers' participation in decision-making at all levels, support them in securing land-use rights, and negotiate better terms for engagement in contract farming and lower prices for agricultural inputs such as seeds, fertilizer and equipment. Through this support, smallholder producers can secure their livelihoods and play a greater role in meeting the growing demand for food on local, national and international markets, thus contributing to poverty alleviation, food security and the eradication of hunger.

In Japan, agricultural cooperatives serve the members at the same time being under the control of the members. The Japanese agricultural cooperatives stand committed to "3-H Agriculture – Healthy, High Quality and High Technology", Daman (2003:5). The Japanese Agricultural Cooperative Movement had successfully introduced a number of innovations which are of great relevance to the Movements in the Region,

In Ethiopia, agricultural performance was the best way to fight against hunger and poverty. In the recent years, the policy reforms, agricultural investments and public service provision have provided an increase to agricultural production, primary cereals in Ethiopia agriculture has witnessed the most rapid growth in its history. The cereals cultivated include barley, maize, teff, wheat and sorghum, (Xinshen 2010:15). In Rwanda, the agricultural policy appeals people to cultivate storable products including maize, wheat in the category of cereals in order to fight against hunger. It is also a marketable product since it is cultivated for different reasons for people, cows, poultry and etc.

2.2.6.4. The Environmental development role of Agricultural cooperative

Agricultural Co-operatives are sensitized to integrate management of natural resources, erosion control, water capture and management, use of terraces, tree plantation, input use, marshland development and irrigation development in their activities GoR (2012:33) to promote sustainable development and fight against soil degradation.

2.2.6.5. Cooperatives as pillar for agricultural development and food security

Agricultural cooperatives play an important role in development and achievement of food security. Chambo (2009:6) explained that food security is achieved when all people at all times have physical and economic access to sufficient, safe and nutritious food preferences for active and healthy life. According to the FAO Committee on World Food Security, there must be a guarantee of 'physical and economic access to adequate food for all household members; without undue risk of losing such access Daman (2003:22). The basic elements in food security Vicious Circle are known to be: i] Low food consumption; leading to ii] Low physical activity, ill health; which means iii] Low productivity; and, finally ending up in [iv] Low purchasing power. Therefore to prevent starvation i.e., to ensure food security, people must have the means to acquire enough to eat Daman (2003:22).

The Sources of food insecurity are based on policy shifts and agricultural development because there are a large number of people who are getting displaced from agriculture due to relevant factors are like free market economy based on basic philosophy of maximization of resource allocation through markets; simultaneous policy shifts away from land reforms and redistribution of wealth; minimum government intervention in agricultural production and markets; dominance of private sector free of price control; and export-led growth to relive pressure on Balance of payment.

In order to achieve food security Daman (2003:23) suggested some measures that can be implemented. There should be own production and people should have the ownership of land to produce food for

themselves. People should have the purchasing power which is generated from employment in farm and nonfarm sector to purchase food. The Households directly produce food or at least an important proportion of food, and Households purchase most of the food from the Increasing public and private investment in agricultural infrastructure, including irrigation and drainage, rural energy, transport and markets; upgrading the quality of human resources, disseminating technologies that do not erode the environmental resource base to the detriment of future generations.

Developing favorable input and output pricing policies. Giving rural people and their organizations a larger role in planning and managing the use of natural resources for productivity activity. Co-operatives are practical vehicles for co-operation and collective action, both of which are crucial to sustainable development. In as much as co-operatives promote co-operation and collective action, they provide an organizational vehicle for addressing collective social ecological interests which is a key contribution to sustainable development and a vehicle for accomplishing these kinds of economic justice through shared or collective enterprise Gertler et al (2001:7).

For the importance of agriculture Stringer (2001:12) stated that it plays a role in providing jobs, income and food contribute indirectly to education which in turn provide private and public benefits. The better the education, the more opportunities for a higher-paying job and the ability to be well-nourished and to work more, earn more, consume more and save more. Agriculture contributes to these increased incomes by enhancing food security (production and access via increased incomes). As incomes increase for subsistence and other rural households, families increasingly spend to educate their children.

Increasing agricultural productivity enables the agricultural sector to move from subsistence to a commercial mode of production, while ensuring food security and improved food intake by household members, World Bank (2011:13). It also increases learning capacity and school performance and leads to longer school attendance, fewer school (and work days) lost due to sickness, higher earnings, longer work lives and a more productive work force, hence sustainable development.

2.2.7. Advantages and Challenges of Agricultural Cooperatives in Rwanda

This section concerns the highlights of most common Advantages and Challenges faced by Agricultural Cooperatives in Rwanda which are over the hump of their profitability.

2.2.7.1. Advantages of Agricultural Cooperatives in Rwanda

Advantages of being a cooperative member depend upon how much one uses it, rather than his/her equity stake. The following are some advantages of cooperative membership cost Cooperatives have the important role of bringing people together to create secure and satisfying employment that can not be found on the open labor market.

Agricultural co-operatives enable producers to improve bargaining power by providing groups of producers with marketing power more comparable to that held by processors and other market players. They also gather market information and share that information with their members or by acting as a bargaining agent on producers 'behalf.

Achieving economies of scale in activities such as processing, storing, transport, retailing, quality control, and publicity, handling large volumes of product, co-operatives can reduce the per-unit cost of marketing and processing for producers. Similarly, the cost of inputs and services can also frequently be lowered if larger volumes are ordered through a central agency.

The surpluses generated by co-operative businesses are returned to producers on the basis of patronage, co-operatives allow producers to capture additional profits beyond the farm gate.

Koopmans (2006:19) stated that the most important feature of a cooperative is that farmers try to solve their problem or take advantage of an opportunity together, instead of trying to do this individually.

Farmers start an agricultural cooperative in order to mobilize more resources than they can individually supply, to create attractive alternatives for purchasing goods and services, to operate a business more efficiently than can be done on an individual basis.

Cooperative members gain access to volume discounts and negotiate from a position of greater strength for better delivery terms, credit terms, and other arrangements. For instance, members of agricultural cooperatives in UNICOOPAGI benefit seeds, pests, credits and fertilizers at a low cost comparing to others who get them from the market.

The co-operative could be a group of people who are unable to get sensible credit arrangements or who are unable to purchase or acquire housing at a reasonable price or for rent through the existing market system. For association to be practiced people must first and foremost be encouraged to act together. It is this acting together in unity that is the essence of association. All successful co-operatives, therefore, unite and involve their members in an economic and social community.

According to Musahara (2012:6) ILO identifies that cooperatives advocate for the disadvantaged including the old and children, provision of vital financial services, offer insurance for health hazards and life and by pooling risk together.

Besides the economic benefits, the agricultural cooperatives may render three types of intangible benefits as stated by Rodriguez (2011:12). First, cooperatives stimulate stronger social bonds like solidarity, partnership and trust among the members. This enhances their capacity for other collective action, which may exceed the cooperative to benefit the whole rural community. Second, the members' "collective action" skills are enhanced through their learning process in management and interaction within the cooperative. This consists of developing the ability to resolve conflicts and reconciling individual interests through democratic procedures, Rodriguez (2011:12). The third intangible benefit comprises of increases in the farmers' awareness and capacity to defend their political and economic interests. This may be expressed in participation in public affairs, involvement in public advocacy and community development, Rodriguez (2011:12)

Cooperatives assist in strengthening local communities and economies since they are community or regionally based, investment in, and surplus revenue from the co-op stays within the local economy. Cooperatives increase accountability to farmers/producers as co-op governance provides for meetings, reports, election of the board, and voting on major policy issues and decisions by members on a one-person, one-vote basis.

2.2.7.2. Challenges of Agricultural Cooperatives in Rwanda

As everything has both a positive and a negative effect the agriculture sector is very important in the national economy as remarked in above section but farmer encounter difficulties in way of achieving production and profitability in rural areas. In their daily activities, agricultural cooperatives suffer from insufficient access to finance as the banking system imposes heavy collateral requirements and poses inappropriate lending conditions, such as periodicity of repayment not linked to the agricultural cycle, Graem (1999:40), low productivity and high dependence to climate.

There is also severity of diseases which cause losses to the production in plots and to the stored grains which requires the application of fertilizers at many steps like sowing, and storing. Regarding to the human aspect, some farmers are illiterate. This makes innovation in agricultural sector to be low. Poor land use and poor soil management which result in soil erosion and soil loss and poor productivity Mukarukaka(2011:8). All agricultural activities are based on season. This is a challenge because

climate change by heavy or lack of rain, premature or longer sunny season which affects production so much and profitability.

Agricultural cooperatives in rural areas face a challenge of lack of infrastructure, Bowman& Zilberman (2013:2) like electricity which prevents them to use ICT tools in daily management of their activities. They use hand written records which take a long time and delays to do research and application of trainings acquired. Transport is also concerned because there is a long distance between their operating environment and markets. Lack of storage facility makes post harvest management difficult as they have no place to dry irish potatoes, wheat and advanced machines for winnowing are not enough to fight against losses.

The low levels of adoption of improved varieties are lack of information, high costs of seed and fertilizer, long distances to seed outlets. This makes them use their low yielding seed. The seed availability and quality are the two key issues that farmers are concerned for the profitability of the crop, Almekinders et al (1999: 291). After harvesting good storage is vital to minimize post-harvest losses and although moisture content is the most important property affecting stability of the grain during storage, temperature and duration of storage are also important factors Brigid (2004:8). Agricultural cooperative members of Nyamagabe and Nyaruguru districts face challenges of lack of assorting commodities, access to credit, poor storage facilities, lack of good seeds variety, soil degradation and expensive fertilizers.

CHAPTER THREE: RESEARCH METHODOLOGY

This section presents the research methodology that is used in this study including the description of the case study area. Additionally, the methodological aspects describe the research design, selection of participants for the study, methods and techniques for data collection and analysis and the limitations of the study.

3.1. Description of the study area

The study area concerns two districts of Nyamagabe and Nyaruguru located in South Province because the crops under study were selected to be produced there at the southern province level as they are produced in big quantities, adapt to the climate specifically in the mentioned agricultural cooperatives. Situated South-West of the Southern Province, the new District of Nyamagabe is one of the 8 Districts comprising the Southern Province. It is surrounded by the Districts of Karongi and Ruhango in the north, Nyanza and Huye on the East, Nyaruguru in the South, Rusizi and Nyamasheke on the West. It is subdivided into 17 administrative Sectors, 92 Cells and 536 Villages (Imidugudu), Nyamagabe District Development Plan [2008-2012], July, 2007:4.

For Nyaruguru district, it is among 8 districts of the southern province situated in the south west. It is subdivided into 14 administrative sectors 72 cells and 332 villages. It is surrounded by Huye district in East, Nyamagabe and Huye in the North, Western Province in the West and the Republic of Burundi in the South, Nyaruguru District Development Plan [2007-2011], 2007:12.

The majority of the population of Nyamagabe and Nyaruguru Districts lives on agriculture, they produce the following crops: Irish potatoes, wheat, maize, sorghum, peas, bananas, beans, cassava, and soya. Daniel (1996:34) indicated that farmers in these districts face serious problems in food production linked to poor soil fertility due to soil acidity, land fragmentation and unexploited land.

UNICOOPAGI, a union of 27 integrated agricultural cooperatives producing maize, Irish potatoes, wheat in Nyamagabe and Nyaruguru districts of the Southern province with 2311 members composed of 1001 males and 1310 females, started in 1991 with the mission of professionalising farmers through the reinforcement of their cooperatives. In their daily activities, UNICOOPAGI assists cooperatives in getting legal personality, administration and management, looking for markets of their agricultural products, education and continuous training of cooperative members in saving, citizen participation, and training farmers in integrated soil fertility management technology. They also supply agricultural inputs such as lime, mineral fertilisers, pesticides and vegetable seeds, sell agricultural products and

promote men and women's economic rights. In the agricultural domain UNICOOPAGI operates as a service provider engaged under CIP in distributing the fertilizers and other inputs to farmers in Nyamagabe, Huye, and Nyaruguru districts, UNICOOPAGI (2012). UNICOOPAGI plan activities with cooperative representatives before beginning agricultural seasons and discuss about the production cost so as to determine the price after harvest. Concerning to cooperatives under study, KIAKI and Urumuri aim at promoting development in their sectors through growing Irish potatoes, wheat and maize but they gain other property from agriculture like forests, breeding of cows and fields.

3.2. Research design

In this section, we highlighted the steps that were followed during our research, from problem statement, methodology, data collection to results analysis. The field data collection exercise was conducted after getting clearance from the relevant authorities such as UNICOOPAGI as the direct sponsor, the authorities in charge of cooperatives at districts and sector level, leaders of cooperatives.

During this empirical research, the researcher collected quantitative data in Nyamagabe for Urumuri Cooperative from Kibirizi sector which cultivates wheat and KIAKI from Kivu, in Nyaruguru district, the sector which cultivates Irish potatoes. Cooperative leaders were contacted about calendar of cooperative activities so as to administer a questionnaire to 131 cooperative members with a set of questions in their mother tongue, that is, Kinyarwanda. A structured interview was administered to 8 people including the staff in charge of cooperatives in those two sectors, the staff in charge of cooperatives at UNICOOPAGI, the coordinator of UNICOOPAGI, the president and a secretary of each agricultural cooperative.

The techniques such as questionnaire, observation, face-to-face interview and documentary technique were helpful in collecting data for analyzing and interpretation. After collecting data, data were coded and edited them for verifying their relevance. Cross-tabulation in tabulating the data, where the two entries, one for indicators and another for categories of respondents helped to interpret the data easily and facilitate the analysis and drawing conclusions. Finally, the researcher we came up with a crop that is more profitable than another for cooperative members and the community after making a comparison.

3.3. Population of the study

This study concerned the members of two agricultural cooperatives operating in rural areas of Nyamagabe and Nyaruguru districts, especially 124 members of Urumuri Cooperative with 72 males and 52 females from Kibirizi sector which cultivates wheat in Nyamagabe and 139 members of KIAKI cooperative with 60 males and 79 females, Kivu Sector, Nyaruguru district which cultivates Irish potatoes in big quantity, these crops are also favorable to the land. The total number of members is 263 including 131 males and 132 females. These cooperatives are united in UNICOOPAGI where the coordinator and agronomist, two cooperative presidents and secretaries, two staff in charge of agriculture at sectors under study were consulted.

3.4. Sampling procedures and sample size

Sampling is the process of selecting from the population. For this topic, a purposive sampling was used where two categories of respondents: two agricultural cooperative members of rural areas and authorities were selected. The target population includes staff in charge of cooperatives at the mentioned districts, the leaders of UNICOOPAGI, the staff in charge of cooperatives and agriculture at Kibirizi and Kivu sectors, and cooperatives members of Urumuri Cooperative and KIAKI operating in the above stated sectors.

Table 3.1: The Population study per cooperative and per gender and sample size

Gender	Population study¹			Sample size		
	Male	Female	Total	Male	Female	Total
Cooperative						
Urumuri	72	52	124	36	26	62
KIAKI	60	79	139	30	39	69
Total	132	131	263	66	65	131

Source: Researcher's design, September 2013

¹ Répertoire des coopératives membres de l'UNICOOPAGI, Octobre, 2012

As indicated in the table 3.1 the total sample size is 131 people from the study population of 263 members of Urumuri and KIAKI cooperatives. The proportion of the sample size of the two cooperatives included both 132 male and 131 females. For keeping proportional correspondence of the study population and the sample size on one hand and between male and female within the cooperative on the other hand, the researcher selected the half of the total number of each cooperative member with respect of gender composition that is 66 males and 65 females. This helped to get information on profitability of rural agricultural cooperatives especially in Nyamagabe and Nyaruguru districts in a manner that captures gender differences.

3.5. Research Methods and techniques of data collection

During the period of data collection the researcher went to UNICOOPAGI in order to get contacts of cooperative presidents of KIAKI in Kivu sector, Nyaruguru district and Urumuri in Kibirizi sector, Nyamagabe district with the objective of knowing the total number of cooperative members and a calendar of cooperative activities. The researcher discussed with the coordinator and the agronomist about the functioning of UNICOOPAGI and its cooperatives. This helped to know that KIAKI worked on Tuesdays while Urumuri worked on Tuesdays and Fridays every week. After approval of the questionnaire consisting open and closed ended questions by the supervisor it was translated in Kinyarwanda, a mother tongue of agricultural cooperative members then a copy was submitted to UNICOOPAGI for checking its relevance and then addressed to one hundred and thirty one(131) respondents that is 66 males and 65 females who were cooperative members. Responses were given by writing.

Through direct observation the researcher went to meet cooperative members in their respective operating areas, saw them in cooperative activities of carrying grasses for making organic manure and watering ones already made in Urumuri while KIAKI were cutting leaves on irish potatoes plant before harvesting which facilitated to take pictures. The researcher also saw the registers used in daily cooperative management such as attendance, reports for meetings and financial reports. The researcher collected data from secondary sources concerning the topic of study by reading the textbooks, annual reports, dissertations of other researchers and consulting the internet.

Structured Interview was administered by asking respondents directly at their working areas such as UNICOOPAGI office for the coordinator and the staff in charge of agriculture, the two staff in charge of agriculture in sectors of the study area, and two cooperative presidents and two secretaries at their

working environment after setting the questions of interview guide in Kinyarwanda for responses to be translated in English later. It facilitated to realize the importance of agricultural cooperatives in rural areas, cooperative roles in development and strategies put in place for challenges faced by cooperatives.

After collecting data the efforts were oriented to data processing activity by checking the number of returned questionnaires, arranging, coding them and translating responses in numerical terms in order to facilitate the analysis and the way the findings were communicated to the readers.

After organizing data, the next step was the presentation whereby data was organized in orderly manner that offer significant information from gathered data and, therefore, facilitate statistical analysis using tables and charts to show the relationship between two variables. Once data were obtained from the field, they were cleaned, coded and analyzed through SPSS and Excel spreadsheet package tools before they were interpreted. Analyzing the data means turning the raw observations into summaries that can be interpreted. Regarding to the nature of data, the researcher used descriptive statistics to analyze the data collected basing on the number of respondents calculation in percentages was performed and the researcher referred to the latter to draw conclusion and recommendations. Profitability was analyzed through computation of Gross margin and Gross margin Profit by using Microsoft Excel.

3.6. Delimitation, scope, and Time-frame of the study

Since it is rare that an inquiry can be carried out to the whole population Javeau (1985:42), there is a number of reasons why delimitations and scope of this study should be clearly established. Basing on required financial resources, time and a big area that UNICOOPAGI covers the researcher limited herself on agricultural cooperatives of UNICOOPAGI operating in rural areas especially Urumuri from Nyamagabe district, Kibirizi sector and KIAKI from Nyaruguru district, Kivu sector as located in the Southern Province for the agricultural year of 2012-2013. The time allocated for collecting data was five months starting from March to July 2014.

3.7. Limitations of the study

The researcher faced the following problems during the process of data collection in the field such as changing working days for many times on the side of KIAKI due to reasons of various activities from local authorities that concerned the whole population. As the research was carried out in rural areas problem of network affected communication between the researcher and cooperative managers, lack of

electricity made their mobile phones off many times, the problem of transport, roads are not in good conditions, there are no cars with a long journey only motorcycles are used and expensive. There were some respondents who were illiterate, they do not know how to read and write their colleagues wrote for them, it took additional time and the accuracy of their information is not reliable. Others were unwilling to respond because they considered the study as useless basing on challenges they meet in agriculture.

3.8. Ethical Statement

This research study was conducted after clearance and approval of the research topic by the University of Rwanda, Faculty of Economics and Management, College of Business and Economics as well as after getting the approval from UNICOOPAGI. During the data collection process and the report writing, the researcher ensured that explanation of the purpose of the research to the participants were provided beforehand, the identities and interests of all respondents were protected and acknowledgement of all the sources of data used and quotations in the report.

CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS AND DATA ANALYSIS

Chapter four is an empirical chapter that presents the field research findings. These findings constitute a summary of field opinions closely linked to the data collection instruments (semi-structured questions and interviews), as presented in the appendices 1 and 2. This chapter is interested in finding out the profitability of rural agricultural cooperatives in Rwanda by comparing agricultural cooperative of KIAKI growing irish potatoes in Nyaruguru district and that of Urumuri growing wheat in Nyamagabe district.

4.1. Characteristics of the respondents

The sample size established for this study is 131 from whom 69 respondents are members of KIAKI Cooperative 39 female and 30 male growing irish potatoes in Kivu sector, Nyaruguru district others 62 belong to Urumuri cooperative 26 male and 36 female growing wheat in Kibirizi sector, Nyamagabe district.

Table 4.1 Identification of respondents by cooperative, sex and age

Name of cooperative				Age					Total
				< 30	31 – 40	41 – 50	51 - 60	61-70	
KIAKI	Sex	Female	Count	8	10	11	8	2	39
			%	11.6%	14.5%	15.9%	11.6%	2.9%	56.5%
	Male	Count	5	11	12	1	1	30	
		%	7.2%	15.9%	17.4%	1.4%	1.4%	43.5%	
	Total	Count	13	21	23	9	3	69	
		%	18.8%	30.4%	33.3%	13.0%	4.3%	100.0%	
Urumuri	Sex	Female	Count	5	8	9	3	1	26
			%	8.1%	12.9%	14.5%	4.8%	1.6%	41.9%
	Male	Count	7	12	9	6	2	36	

	%	11.3%	19.4%	14.5%	9.7%	3.2%	58.1%
Total	Count	12	20	18	9	3	62
	%	19.4%	32.3%	29.0%	14.5%	4.8%	100.0%

Source: Primary data, July 2014

Regarding respondents identification by sex and age the table 4.1 shows that KIAKI cooperative consists of many female members while Urumuri has many male members too. The active population in both cooperatives is between 30-50 years old but Kiaki has many of them 82% whereas Urumuri has 80.6%.

Table 4.2. Identification of respondents by Marital status

Name of cooperative				Marital status				Total
				Single	Married	Widow	widower	
KIAKI	Sex	Female	Count	8	22	9	0	39
			%	11.6%	31.9%	13.0%	.0%	56.5%
	Male	Count	5	24	0	1	30	
		%	7.2%	34.8%	.0%	1.4%	43.5%	
	Total	Count	13	46	9	1	69	
		%	18.8%	66.7%	13.0%	1.4%	100.0%	
Urumuri	Sex	Female	Count	4	16	6	0	26
			%	6.5%	25.8%	9.7%	.0%	41.9%
	Male	Count	8	27	0	1	36	
		%	12.9%	43.5%	.0%	1.6%	58.1%	
	Total	Count	12	43	6	1	62	
		%	19.4%	69.4%	9.7%	1.6%	100.0%	

Source: Primary data, July 2014

The table 4.2 shows respondents' marital status in both cooperatives consists of married, single, widow and widower members. Married status accounts more than 60%, single accounts less than 20%, widow more than 10% and widower less than 5%. This shows that there is no obstacle from being a cooperative member because all people are welcomed. So, a cooperative is considered as a comfortable place for reintegration for different reasons because there are people with different categories with the aim of helping one another.

Table 4.3. Identification of respondents by Sex and Educational Level

Name of cooperative				Educational Level					Total
				No level	Primary	Secondary	TVET	CERAI	
KIAKI	Sex	Female	Count	11	25	2	0	1	39
			%	15.9%	36.2%	2.9%	.0%	1.4%	56.5%
	Male	Count	8	18	0	1	3	30	
		%	11.6%	26.1%	.0%	1.4%	4.3%	43.5%	
	Total	Count	19	43	2	1	4	69	
		%	27.5%	62.3%	2.9%	1.4%	5.8%	100.0%	
Urumuri	Sex	Female	Count	6	18	0	2	0	26
			%	9.7%	29.0%	.0%	3.2%	.0%	41.9%
	Male	Count	7	21	5	2	1	36	
		%	11.3%	33.9%	8.1%	3.2%	1.6%	58.1%	
	Total	Count	13	39	5	4	1	62	
		%	21.0%	62.9%	8.1%	6.5%	1.6%	100.0%	

Source: Primary data, July 2014

The table 4.3 shows that the educational levels of respondents are primary, secondary, TVET, CERAI and no level. A big number of respondents (more than 60%) in both cooperatives attended primary education, more than 20% did not go to school; they neither know to write nor to read. The level of attendance in TVET is less than 5%, many respondents from Urumuri attended secondary level while many of KIAKI attended CERAI too. This table shows that Urumuri cooperative have a lot of members who can read and write as compared to KIAKI cooperative. This facilitates also application of training acquired into daily agricultural activities and life in general.

Table 4.4 Respondents by Family size and number of adults

				Family size and number of adults				
Name of cooperative				Number of adults				Total
				1 Adult	2 Adults	3 adults	more than 3 adults	
KIAKI	Family size	1-5 people	Count	3	23	16	12	54
			%	4.3%	33.3%	23.2%	17.4%	78.3%
	6-10 people	Count	0	4	5	6	15	
		%	.0%	5.8%	7.2%	8.7%	21.7%	
	Total	Count	3	27	21	18	69	
		%	4.3%	39.1%	30.4%	26.1%	100.0%	
Urumuri	Family size	1-5 people	Count	0	19	5	6	30
			%	.0%	30.6%	8.1%	9.7%	48.4%
	6-10 people	Count	1	10	7	14	32	
		%	1.6%	16.1%	11.3%	22.6%	51.6%	
	Total	Count	1	29	12	20	62	
		%	1.6%	46.8%	19.4%	32.3%	100.0%	

Source: Primary data, July 2014

From the table 4.4 regarding family size of 1-5 people and adults many respondents (more than 10%) from both cooperatives live in such family sizes. For the number of active population, they live in families with 2 adults, 3 adults and more than 3adults in both agricultural cooperatives. There are others less than 5% who live in families of one adult that is widow or widower in KIAKI and no adult in Urumuri live in such families.

For the family size with 6-10 people, the same table shows that a big number of respondents from KIAKI cooperative live in families with, more than 3 adults, 3 adults and 2adults in both agricultural cooperatives but less than 5% of respondents live in families with 1 adults in Urumuri.

This table implies that families in such category are still young, there are not many active population, there people who live in families but who cannot work, implementation of family planning is low hence a need to join cooperatives. In these cooperatives, KIAKI has not many respondents, who live in families of 6-10 people.

Table 4.5 . Respondents by family size and Number of children

				Respondents regarding family size		
Name of cooperative				1-3 children	4-8 children	Total
KIAKI	Family size	1-5people	Count	40	14	54
			%	58.0%	20.3%	78.3%
	6-10 people	Count	2	13	15	
		%	2.9%	18.8%	21.7%	
	Total	Count	42	27	69	
		%	60.9%	39.1%	100.0%	
Urumuri	Family size	1-5 people	Count	27	3	30
			%	43.5%	4.8%	48.4%
	6-10 people	Count	10	22	32	
		%	16.1%	35.5%	51.6%	
	Total	Count	37	25	62	
		%	59.7%	40.3%	100.0%	

Source: Primary data, July 2014

The table 4.5 concerning the family size and the number of children with family size of 1-5 people shows that a big number of respondents in KIAKI live in families of 1-3 children (more than 75%) comparing to less than 50% who live in such families in Urumuri. This shows that respondents from these families who are cooperative members are still young and implement the government program of family planning.

For the family size of 6-10 people where there are 5-8 children the table shows that Urumuri has many respondents (more than 35%) comparing to KIAKI (18%) who live in such family size. This implies that many respondents are old, they have a lot of children which shows a low level of implementation of family planning programmes therefore not enough active population in a family to generate an income that can help satisfy all of their needs which require much financial means that is why they need to join their forces to improve production.

4.2. Respondents' experience and reasons to join agricultural cooperatives

Respondents joined these agricultural cooperatives during different period of time with different reasons

Table 4.6.Experience and reasons to join agricultural cooperatives

				What are the reasons that pushed you to join the cooperative?					
Name of cooperative				new technology	poverty	raise income	unemployment	unity	Total
KIAKI	Experience	1-5	Count	2	6	2	1	3	14
		Years	% of Total	2.9%	8.7%	2.9%	1.4%	4.3%	20.3%
	More than 5	Count	12	17	6	5	15	55	
		Years	% of Total	17.4%	24.6%	8.7%	7.2%	21.7%	79.7%
Total		Count	14	23	8	6	18	69	
		% of Total	20.3%	33.3%	11.6%	8.7%	26.1%	100.0%	
Urumuri	Experience	1-5 years	Count	4	6	3	1	12	26
			% of Total	6.5%	9.7%	4.8%	1.6%	19.4%	41.9%
	More than 5	Count	6	14	4	2	10	36	
		Years	% of Total	9.7%	22.6%	6.5%	3.2%	16.1%	58.1%
Total		Count	10	20	7	3	22	62	
		% of Total	16.1%	32.3%	11.3%	4.8%	35.5%	100.0%	

Source: Primary data, July 2014

Reference made to the table 4.6.regarding experience and reasons that pushed people to join agricultural cooperatives in rural areas, there are categories of respondents with 1-5years and more than 5 years experience as an agricultural cooperative member. The main reason for joining agricultural cooperatives in both cooperatives and both categories is poverty and search of unity. Other reasons include acquisition of new technology, raising income and unemployment. This shows that poverty in rural areas is a big problem because it prevents population to meets their basic needs. Cooperatives can be used as a tool to enhance unity between members and the community since they

share different things, they acquire advice that is helpful in improving productivity hence income from agriculture and living conditions. Young cooperative members expressed their views that their membership was due to lack of employment. The experience and reasons of joining agricultural cooperatives are supported at different levels by different institutions.

4.3. Support provided to agricultural cooperatives

This support comes from the Government of Rwanda through its agricultural al institutions an UNICOPAGI.

Table 4.7. Kind of support Agricultural cooperatives get from the government

T			Name of cooperative		Total
			KIAKI	Urumuri	
What kind of support do you get from the government?	Advice	Count	40	22	62
		%	30.5%	16.8%	47.3%
	Fertilizers	Count	0	6	6
		%	.0%	4.6%	4.6%
	Follow up	Count	8	9	17
		%	6.1%	6.9%	13.0%
	Guidelines	Count	21	16	37
		%	16.0%	12.2%	28.2%
	improved seeds	Count	0	9	9
		%	.0%	6.9%	6.9%
Total		Count	69	62	131
		%	52.7%	47.3%	100.0%

Source: Primary data, July 2014

The table 4.7 shows that both agricultural cooperatives get advice, guidelines, follow up from the government. The cooperative of Urumuri gets fertilizers and improved seeds for wheat but KIAKI does not get any support in terms of improved seeds and fertilizers.

Kind of support Agricultural cooperatives get from UNICOOPAGI

Table 4.8 Kind of support Agricultural cooperatives get from UNICOOPAGI

			Name of cooperative		Total
			KIAKI	Urumuri	
What kind of support do you get from UNICOOPAGI?	Advice	Count	25	12	37
		%	19.1%	9.2%	28.2%
	field study	Count	14	11	25
		%	10.7%	8.4%	19.1%
	follow up	Count	11	7	18
		%	8.4%	5.3%	13.7%
	improved seeds	Count	0	5	5
		%	.0%	3.8%	3.8%
	Market	Count	0	13	13
		%	.0%	9.9%	9.9%
	Training	Count	19	14	33
		%	14.5%	10.7%	25.2%
	Total	Count	69	62	131
		%	52.7%	47.3%	100.0%

Source: Primary data, July 2014

The table 4.8 shows that UNICOOPAGI provides both agricultural cooperative members with training, advice, field study, follow up of agricultural activities but Urumuri also gets improved seeds and a market because UNICOOPAGI is among service providers of MINAGRI that distributes wheat seeds and fertilizers, then collects their productivity to RAB for sale. Considering the support provided by the Government and UNICOOPAGI to agricultural cooperative members the tables no 4.7 and 4.8 show that advice is paramount, UNICOOPAGI trains them, makes a follow up and takes them to field studies. Cultivators of irish potato face the challenge of expensive potato seeds and fertilizers as UNICOOPAGI does not provide them for this crop, lack of good yielding variety, heavy reliance on fertilizers and climate changes.

4.4. Advantages gained from agricultural cooperatives

The respondents in both agricultural cooperatives acknowledged 100% gaining social advantages from joining them in rural areas as their place of residence as indicated in the following tables.

The table 4.9 related to social advantages that people gain from joining agricultural cooperatives in rural areas shows that all respondents in both cooperatives gain mutual assistance, education of their children, medical insurance, food security, training and sharing responsibilities. This implies that they support one another in different situations either good or bad like marriage, funeral, they make turns for cultivation in their own fields. The cooperatives prepay medical insurance for family members and collect the reserved amount later, they send their children to school and achieve responsibilities towards schools requirement easily through facilitation from agricultural cooperatives, they managed to achieve food security through implementation of advice from agronomists in their own fields and they produce enough food for the households' members, and fight against malnutrition by having a kitchen garden for each family. Other advantages like sharing responsibilities, doing one activity together, sharing ideas, helping one another, joining forces, discussing problems they face and hence finding solution through cooperatives as they are trained in conflict management.

What are Social advantages gained from agricultural cooperatives?

Table 4.9. Social advantages gained from agricultural cooperatives

			Name of cooperative		Total
			KIAKI	Urumuri	
Social advantages	medical insurance	Count	11	13	24
		%	8.4%	9.9%	18.3%
	sharing responsibilities	Count	8	4	12
		%	6.1%	3.1%	9.2%
	Training	Count	7	9	16
		%	5.3%	6.9%	12.2%
	education of children	Count	11	16	27
		%	8.4%	12.2%	20.6%
	food security	Count	15	8	23
		%	11.5%	6.1%	17.6%
	mutual assistance	Count	17	12	29
		%	13.0%	9.2%	22.1%
Total		Count	69	62	131
		%	52.7%	47.3%	100.0%

Source: Primary data, July 2014

This was emphasized by a respondent from Urumuri cooperative 'Uniting with others under cooperatives has helped our families develop which we could have never achieved if worked selfishly'. This shows that cooperatives are very important for people in rural areas and the community in general.

What are Economic advantages gained from agricultural cooperatives?

Table 4.10. Economic advantages gained from agricultural cooperatives

			Name of cooperative		Total
			KIAKI	Urumuri	
Economic advantages	Saving	Count	23	18	41
		%	17.6%	13.7%	31.3%
	access to credit	Count	12	17	29
		%	9.2%	13.0%	22.1%
	food security	Count	10	3	13
		%	7.6%	2.3%	9.9%
	purchasing power	Count	8	7	15
		%	6.1%	5.3%	11.5%
	acquisition of new technology	Count	9	12	21
		%	6.9%	9.2%	16.0%
	increase in income	Count	7	5	12
		%	5.3%	3.8%	9.2%
	Total	Count	69	62	131
		%	52.7%	47.3%	100.0%

Source: Primary data, July 2014

The respondents in both cooperative acknowledge 100% that they gain economic advantages from joining agricultural cooperatives in rural areas as their place of residence as indicated in the table 4.10. These economic advantages include education in saving whereby members have bank account number

and makes deposits, a program that is very helpful to them about access to credit in order to start projects, acquisition of new technology, increase in income, food security and purchasing power whereby they can have financial means to buy fertilizers for their own fields to improve productivity, being able to get children's school necessities and clothes. This implies that cooperatives are regarded as tools to promote development in rural areas.

There is also a saving model within cooperatives which facilitates members can borrow a certain amount of money to solve some problems and pay back with a small rate of interest. A cooperative is a place where members can get easily agricultural advice from agronomist from local authorities and UNICOOPAGI with the aim to increase productivity. The respondents regard this as acquiring new technology in both cooperatives. The combinations of all these advantages make them achieve food security and sell the surplus due to increase in income as they are trained to be market oriented in their activities. Respondents emphasized on getting market for the produce in general and agricultural inputs like improved seeds, fertilizers for urumuri members in particular. Agricultural cooperatives help members being goal oriented in their life as they get development ideas from their colleagues.

4.5. Reasons for growing a chosen crop

Agricultural cooperatives have different reasons for growing a certain crop in any region as expressed by members of cooperatives under study.

The table 4.11 about the reasons growers may have towards a certain crop, respondents in this study argued that their main reason to grow irish potatoes and wheat because they are more productive, market available, and cheap to grow.

Table 4.11 Reason for the preference to grow a chosen crop

			Name of cooperative		Total
			KIAKI	Urumuri	
Reason for the preference to grow chosen crop	cheap to grow	Count	15	15	30
		%	11.5%	11.5%	22.9%
	more productive	Count	33	32	65
		%	25.2%	24.4%	49.6%
	market available	Count	21	15	36
		%	16.0%	11.5%	27.5%
Total	Count	69	62	131	
	%	52.7%	47.3%	100.0%	

Source: Primary data, July 2014

The idea behind is that farmers aim at profitability and value of whatever they do. So a market for production is very important so as to get profitability.

Picture 4.2: Wheat in the field**Picture 4.3: Wheat in the field**

Source: Primary data, July 2014, Urumuri cooperative

The picture 4.2 and 4.3 show wheat under study from Urumuri cooperative in the field. They cultivate N161, The variety recommended by RAB due to its appreciation by Pembe for good quality baking flour.

Picture 4.4 Irish potato before harvesting



Source: Primary data, July 2014, KIAKI cooperative

This picture shows irish potato in KIAKI cooperative. This is the period before harvesting, cooperative members have cut branches so as they can get the sun to diminish water in a potato and they harvest good potatoes for sale.

Table 4.12. Chemicals cooperatives get from UNICOOPAGI

			Name of cooperative		Total
			KIAKI	Urumuri	
What kind of chemicals do you get from UNICOOPAGI	None	Count	69	0	69
		%	52.7%	.0%	52.7%
	NPK 17. 17. 17	Count	0	12	12
		%	.0%	9.2%	9.2%

DAP	Count	0	24	24
	%	.0%	18.3%	18.3%
UREA	Count	0	17	17
	%	.0%	13.0%	13.0%
LIME	Count	0	9	9
	%	.0%	6.9%	6.9%
Total	Count	69	62	131
	%	52.7%	47.3%	100.0%

Source: Primary data, July 2014

The table 4.12 concerning chemicals that agricultural cooperatives get from UNICOOPAGI respondents from KIAKI cooperative stated that they get no chemicals while Urumuri gets DAP , UREA, NPK 17.17.17 and LIME. It shows that UNICOOPAGI does not intervene in irish potatoes in KIAKI in terms of inputs whereas wheat is its intervention domain for chemicals. It also plays a role of a service provider for MINAGRI in distributing agricultural inputs to farmers in Nyamagabe, Nyaruguru and Huye. The profitability in agricultural cooperatives is reached through a combination of various factors such as fertilizers and materials to use them as shown in the pictures 4.5 below.

Picture 4.5 Fertilisers used in agriculture



Picture 4.6 Fertilisers used in agriculture



Source: Primary data, July 2014, Urumuri cooperative

These kinds of fertilizers are used in agriculture at the time of planting or weeding.

Picture 4.7 Fertilizers used in agriculture



Picture 4.8 Materials used in agriculture



Source: Primary data, July 2014, Urumuri cooperative

These fertilizers are used in agriculture when the crops are in the fields so as to avoid disease, pests, or reduce after harvesting loss whereas materials are used in agriculture so as to apply fertilizers to crops which are in the fields, avoid pests and loss after harvesting when the produce is kept in the store.

Table 4.13 Market for cooperative production

Concerning a market for production as stated in the table 4.13 UNICOOPAGI collects the production of Urumuri Cooperative to sell it to RAB because they cultivate the varieties that are recommended by RAB due to their baking quality and appreciation by Pembe whereas KIAKI sells the production to local population and schools. A market for production is one the factor that motivates farmers to grow irish potatoes or wheat in this area under study.

			Name of cooperative		Total
			KIAKI	Urumuri	
Where do you get market for your production?	Local	Count	54	0	54
		%	41.2%	.0%	41.2%
	Schools	Count	15	0	15
		%	11.5%	.0%	11.5%
	UNICOOPAC	Count	0	62	62
		%	.0%	47.3%	47.3%
Total	Count	69	62	131	
	%	52.7%	47.3%	100.0%	

Source: Primary data, July 2014

4.6. Reasons for the respondents to remain as agricultural cooperative members

Respondents have different reasons of remaining as agricultural cooperative members.

Table 4.14. Reasons for the respondents to remain as agricultural cooperative members

The table 4.14 shows that all respondents in both agricultural cooperatives plan to remain as cooperative members in the coming years 100%. The reasons are that they find cooperatives help them to get information, cooperation has improved between members, they share responsibilities, help one another and share experience but Urumuri cooperative members also had access to quality inputs as wheat growers were supported in getting fertilizers and seeds at the reduced price. Respondents emphasized that cooperatives help them have and achieve their own objectives through shared development ideas and experience because they apply them in daily life. The positive impact is that they managed to purchase mattress, telephones, and domestic animals like goats, pigs and school materials for their children.

Reasons for remaining as an agricultural cooperative member

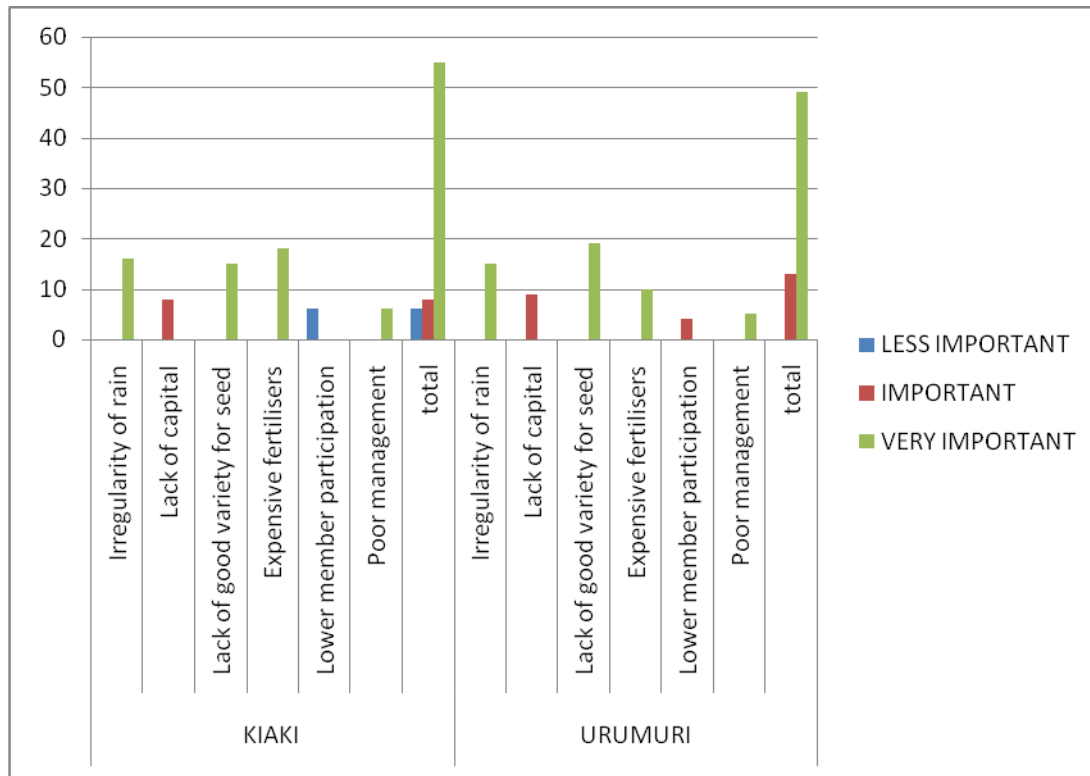
			Name of cooperative		Total
			KIAKI	Urumuri	
Reasons for remaining as an agricultural cooperative member	Getting information	Count	17	13	30
		%	56.7%	43.3%	100.0%
	Sharing experience	Count	10	6	16
		%	62.5%	37.5%	100.0%
	Access to quality inputs	Count	0	15	15
		%	.0%	100.0%	100.0%
	Help one another	Count	13	6	19
		%	68.4%	31.6%	100.0%
	Improved cooperation between members	Count	17	12	29
		%	58.6%	41.4%	100.0%
	Sharing responsibilities	Count	12	10	22
		%	54.5%	45.5%	100.0%
	Total	Count	69	62	131
		%	52.7%	47.3%	100.0%

Source: Primary data, July 2014

4.7. Challenges faced by respondents in agricultural cooperatives

Agricultural cooperatives faced challenges which affect their profitability.

Chart 4.1. Challenges faced by agricultural cooperatives



Source: Primary data, July 2014

The chart 4.1 shows that challenges encountered by respondents from KIAKI and Urumuri cooperative in agriculture include lack of good variety of seeds, expensive fertilizers, irregularity of rain and lack of capital. The challenges considered to be very important are those factors that affect the production hence profitability of irish potatoes and wheat like lack of good variety of seeds, expensive fertilisers, irregularity of rain. Challenges that are less important affect production and profitability at a low level such as lack of capital, poor management and lower member participation. The research findings show that in Urumuri cooperative no respondent consider a challenge in agriculture to be less important because when one of them happens the productivity and profitability are affected. In KIAKI cooperative some respondents find low member participation of less importance. There are many reasons for this like integration of people with different social status in a cooperative such as widow, widowers or old people, unemployed people, women who have small children do not work like young people or cooperative members who do not fulfill their responsibilities.

4.8. Profitability analysis of irish potatoes and wheat in agricultural cooperatives under study

The following section concerns analysis of profitability of irish potatoes and wheat for agricultural cooperatives under study and cooperative members. The profitability is remarked after analyzing all production costs as data was given by the secretaries of these cooperatives and the revenues from the output.

Table 4.15 Profitability analysis of irish potatoes in KIAKI Cooperative

The profitability from growing irish potatoes in KIAKI cooperative was computed by total revenues less production costs basing on data from the cooperative about all production costs incurred, the output and the price.

Method I: Calculation of Gross Profit Margin

ITEM	Revenue/cost in Rwf per ha
Total revenue	6,800,000.00
Variable cost	
Seeds	2,400,000.00
Inorganic fertilizers	70,500.00
Organic fertilizers	75,800.00
Labour expenses	542,100.00
security expenses (watchmen)	20,000.00
Pesticides expenses	51,400.00
Total variable cost	3,159,800.00
Gross margin	3,640,200.00
Gross profit margin	0.535323529
Profit per member	26,188.49

Source: Computation of the gross margin and gross profit margin using Microsoft Excel

Method II: Calculation of return on Investment

Return On Investment (%) = $\frac{\text{Gain from Investment}-\text{Cost of Investment}}{\text{Cost of Investment}} \times 100$

$$\text{Return On Investment} = \frac{6,800,000 - 3,159,800}{3,159,800} \times 100 = 115\%$$

The profitability analysis of irish potatoes in KIAKI cooperative for the agricultural year of 2012-2013 is presented in the above table 4.15. The above analysis shows that both the gross margin and the Return On Investment were positive. The cooperative had a gross profit margin of 53% and the Return On

Investment of **115%** which implies that irish potatoes was profitable for the cooperative and their members with a return of **26,188** Rwf each member after sale. This was due to rain that fell in its normal conditions and the seeds they cultivated were of good variety. It also shows that variable cost incurred included cost of seeds, labour, inorganic fertilisers, organic fertilizers and pesticides. The analysis showed that seeds and labour accounted the highest cost of the total variable cost. This is due to the fact that growers of irish potatoes get no support in terms of seeds or fertilizers, multiplication sites for seeds are not enough, the crop relies heavily on fertilizers.

Table 4.16 Profitability analysis of wheat in Urumuri cooperative

The profitability from growing wheat in Urumuri cooperative was computed by total revenues less production costs basing on data from the cooperative about all production costs incurred, the output and the price.

Method I: Calculation of Gross Profit Margin

ITEM	Revenue/cost in Rwf per ha
Total revenue	1,875,000.00
Variable cost	
Seeds	30,387.50
Inorganic fertilizers	14,562.50
Organic fertilizers	54,625.00
Labour expenses	771,900.00
security expenses(watchmen)	18,000.00
Pesticides expenses	14,068.75
Total variable cost	903,543.75
Gross margin	971,456.25
Gross profit margin	0.51811
Profit per member	7,834.32

Source: Computation of the gross margin and gross profit margin using Microsoft Excel

Method II: Calculation of return on Investment

$$\text{Return On Investment (\%)} = \frac{\text{Gain from Investment}-\text{Cost of Investment}}{\text{Cost of Investment}} \times 100$$

$$\text{Return On Investment} = \frac{1,875,000-903,544}{903,544} \times 100 = 107\%$$

The profitability analysis of wheat in Urumuri cooperative for the agricultural year of 2012-2013 is presented in the above table 4.16. The above analysis shows that both the gross margin and the Return On Investment were positive with a gross profit margin of 51% and a Return On Investment of **107%** which implies that wheat was profitable for Urumuri cooperative and members with an amount of **7,834** Rwf each member after sale. As they mentioned, this was due to the fact that growers of this crop got support in terms of seeds and inorganic fertilizers, good factors for productivity but they face a challenge of lack of rain. It also shows that variable cost incurred included cost of seeds, inorganic fertilizers, organic fertilisers, labour and pesticides. The analysis showed that labour and organic fertilisers accounted the highest cost of the total variable cost.

As the research concerned comparing irish potato in KIAKI and wheat in Urumuri cooperative so as to find out the cooperative that is more profitable than the other, findings from the research show that irish potatoes in KIAKI were more profitable with the gross profit margin of 53%, a Return On Investment of 115% as shown in the table no 4.15 than wheat in Urumuri cooperative with a gross profit margin of 51% and a Return On Investment of 107% as indicated in the table 4.16 above.

This implied that members of KIAKI cooperative had more returns of **26,188 Rwf** in growing irish potatoes comparing to those of Urumuri cooperative growing wheat with **7,834 Rwf**. Even if irish potatoes cannot be stored for a long time the research findings show that they are more productive and profitable comparing to wheat which can be stored for a long time, gets support in terms of seeds, inorganic fertilisers from the Government and UNICOOPAGI, a market from RAB through UNICOOPAGI.

4.9. Highlights of findings of the study

This section highlights the empirical findings. Regarding the sex, age, marital status of respondents, the research findings showed that KIAKI cooperative has a big number of women comparing to Urumuri cooperative with a lot of men too. The active members from both agricultural cooperatives are between 30-50 years old. A number of married, single respondents in both cooperatives exceed that of widow and widower. This means that they join agricultural cooperatives in order to help one another on the way towards profitability through social and economic development.

For educational level, Urumuri had many literate respondents with primary education comparing to KIAKI which had many illiterate respondents. This facilitates the level of implementation of acquired training in different domains within cooperatives and individual basis.

The study showed that a big number of respondents from both cooperatives lived in a family size of 1-5, 6-10 people where there are either 2, 3 or more than 3 adults who are active population by the fact that less than 5% of respondents only live in family with 1 adult. This implies that even widow and widowers in both cooperatives have other people they live together in their daily life like children or other family members.

As children were concerned, the study highlighted that many families of both cooperatives members have between 1- 3 children (more than 55%) in KIAKI comparing to Urumuri 43%. For the respondents' families with 5-8 children, KIAKI has 20% comparing to Urumuri with more than 35%. This implies that respondents from KIAKI are younger than those from Urumuri, the level of implementation of family planning program is also low especially in Urumuri cooperative. Having a large family implicates a lot of needs and more financial means which is a sign of poverty as in rural areas the main source of livelihood is agriculture therefore a reason for joining forces to satisfy them.

As experience in agricultural cooperatives was concerned, many respondents (58%) in Urumuri and (more than 75%) in KIAKI were more than 5 years of experience where as members with experience of 1-5 years were 20% in Urumuri, 20.3% in KIAKI and 41% in Urumuri were 1-5 years experience. As these agricultural cooperatives started their activities in 2008 this shows that people from KIAKI understood the sensitization about joining cooperatives comparing to those from Urumuri cooperative or the importance of joining cooperatives.

Their main reasons to join cooperatives were poverty, the need to acquire new technology in agriculture, raise their income or unemployment for some. The study confirmed that these cooperatives help their members to find solutions to the problems they encounter in their daily life.

For support gained, respondents from both cooperatives acknowledge advice from the Government and UNICOOPAGI, the former sets guidelines while the later provides trainings and makes also a follow up and field study. Urumuri cooperative is facilitated by the government to get improved seeds of wheat and fertilizers, UNICOOPAGI makes distribution, analyze the production cost with cooperative members so as to determine the price and collect the produce to RAB for sale.

After joining agricultural cooperatives, all respondents in both cooperatives confirmed that they gain social advantages like mutual assistance, education of their children, medical insurance, food security, training and sharing responsibilities. There are also economic advantages like training in saving, access

to credit, and acquisition of new agricultural technology, purchasing power and increase in income all of them reducing poverty.

The findings showed that the main reasons for growing irish potatoes and wheat are that these crops were more productive in those areas, the market is available and they are cheap to grow, they sell the production to local population or schools for KIAKI while UNICOOPAGI provides Urumuri with seeds, chemicals like NPK 17.17.17, DAP, UREA, LIME at a reduced cost as wheat is among crops promoted under Crop Intensification Program in Rwanda (CIP) and collects the production for sale on the side of Urumuri. All these are necessary conditions for profitability in agriculture.

Considering advantages of joining agricultural cooperatives, the study showed that the members of both cooperatives plan to remain unanimously as cooperative members because they get information, share experience and responsibilities, acquire new technology in agriculture, access to quality inputs, improve cooperation between members who are also neighbors and increase income. So they find cooperatives very profitable in promoting their standards of living conditions.

The findings showed that respondents from their respective agricultural cooperatives grade challenges they meet as very important because they have much effect on the production and profitability like lack of good variety of seeds, expensive fertilizers, poor management and irregularity of rain. Challenges graded as important is lack of capital whereas lower member participation is regarded by some respondents from KIAKI as less important as it appears when there is a management issue in a cooperative. This implies that some respondents in cooperative may be careless about cooperative activity or do not fulfill their responsibilities or difficult to manage.

The profitability analysis of irish potatoes in KIAKI cooperative for the agricultural year of 2012-2013 showed that the gross margin was positive. The cooperative had a gross profit margin of 53% which implies that irish potatoes was profitable for the cooperative and their members with an amount of **26,188 Rwf** each member after sale. This was due to rain that fell in its normal conditions and the seeds they cultivated were of good variety. The analysis showed that seeds and labour accounted the highest cost of the total variable cost. This is due to the fact that growers of irish potatoes get no support in terms of seeds or fertilizers, multiplication sites for seeds are not enough, the crop relies heavily on fertilizers.

The profitability analysis of wheat in Urumuri cooperative for the agricultural year of 2012-2013 table showed that the gross margin was also positive with a gross profit margin of 51% which implies that

wheat was profitable for Urumuri cooperative and members with an amount of **7,834 Rwf** each member after sale due to the fact that growers of this crop got support in terms of seeds and inorganic fertilizers, good factors for productivity but the rain was not sufficient too. The analysis showed that labor and organic fertilizers accounted the highest cost of the total variable cost.

As the research concerned comparing irish potatoes in KIAKI and wheat in Urumuri cooperative so as to find out the cooperative that is more profitable than the other, findings from the research show that irish potatoes in KIAKI is more profitable with the gross profit margin of 53% as shown in the table no 4.15 as members of KIAKI cooperative had more returns of **26,188 Rwf** in growing irish potatoes comparing to those from Urumuri cooperative that grewed wheat with a gross profit margin of 51% and a return to members of **7,834 Rwf**. Even if irish potatoes cannot be stored for a long time the research findings show that they are more productive and profitable comparing to wheat which can be stored for a long time, gets support in terms of seeds, inorganic fertilizers from the Government and UNICOOPAGI, a market from RAB through UNICOOPAGI.

After analyzing advantages and challenges met by respondents in their agricultural cooperatives in this study, they suggested that in order to improve the profitability in agricultural cooperatives, members of both cooperatives should be given cows to breed so as to get organic manure easily, an important input in agriculture, KIAKI opted for irish potato seeds and fertilizers because they do not get any whereas Urumuri suggested also to get wheat seeds and fertilizers at the right season, quantity and quality. These highlighted findings should be challenged to existing theories. The following section related to theoretical implications deals with the research findings from the study and what has been discussed in theory.

4.10. Theoretical implications

This section deals with the balance and imbalance between theories and practices. This theoretical and empirical discussions analyze how the theories are coherent or not with the research findings. The major ideas rely in the fact that rural agricultural cooperative members may find profitability in the success of their cooperatives in terms of social development, economic development, sustainable development and food security.

4.10.1. Conditions Necessary for the Success of Agricultural Cooperatives

FAO (2009); World Bank (2010) highlighted five types of socioeconomic conditions that facilitate agricultural cooperatives to achieve their goals as. The first concerns the access to land which is the

main factor to agricultural production and its size affects the production and adoption of new technologies. The second is the nature of land tenant with property rights can help to invest in long term asset like inputs through credits. The third regards technology and technical assistance, and the fourth markets like market information, attaining certain quality and standards in production and handling. These are exogenous condition since they are the main factor for agricultural production. The fifth type of condition consists of the managerial and collective action capabilities of members. This type of condition is “endogenous” since it depends mainly on the members’ attributes and the internal cooperative organization.

The research findings showed that access to land made the members of Urumuri Cooperative purchase five forests from cooperative production, respondents from both cooperatives indicated that they get technical assistance from agronomists and cooperative managers stated that members participate as required. All of them are conditions that enhance productivity and profitability, which helped KIAKI to purchase fields, 5 cows, office materials like tables, books, shelves, forests and build a dry store for themselves. According John, M. (2009) for a cooperative to be profitable, it must be financially stable and efficient over the long term, have staying power, particularly to get through hard times, this may be shown by the total assets such as: the physical and financial building blocks of the business. From the previous arguments, the research also showed that both cooperatives have a model of saving money between members where they get a certain amount for various individual reasons. We can note that the above statements are also indicators of profitability in agricultural cooperatives. In this case, Urumuri cooperative purchased forests, a cow and has got a machine that helps watering the crops during the sunny season as it has been shown by Picture 4.8. and 4.9 below.

Picture 4.9: Watering machine of Urumuri cooperative



Source: Primary data, July 2014

The above picture shows members of Urumuri cooperative watering vegetable waste so as to have organic manure to use in agriculture. This reduces the quantity of inorganic fertilizers to be used and increases productivity.

Picture: 4.10. Cooperative members are preparing organic manure



The picture 4.9.related to preparation of organic manure in agricultural cooperatives, Urumuri cooperative members apply it as a result of acquired training that facilitates them to reduce costs of organic manure because when they do not have it, they purchase from neighbors.

Dealing with conditions necessary for the success of agricultural cooperatives, Daman (2003) emphasized that agricultural Cooperatives undertake comprehensive programmes for member education in order to facilitate the process of members' participation, members' involvement and empowerment; and for training of staff and members of boards of directors. Responses from cooperatives managers indicated that the cooperatives consist of a general assembly, administrative council, and survey council who have been trained about their roles, and other themes related to agriculture, gender and property management, fighting against soil erosion, participating in activities organized by different levels like village, cell or sector with the aim of improving their awareness to development, adopting modern agriculture. This came with good impact as authorities at sector level noted that cooperatives members are goal oriented in their lives.

4.10.2. Agricultural cooperatives and social development

With regard to the social role of cooperatives Mukarugwiza (2010) found that they play a role in the social protection of their members and their families, especially in getting health insurance, mutual assistance in Rwandan culture can be maintained among cooperative members in various social activities that take place in happiness or stressful ceremonies like wedding or burial, pay school fees for their children, produce food for the family, and improve their clothing. As cooperatives are for a purpose of uplifting the social conditions of its members, the findings confirm this theory.

Social integration and the enfranchisement of marginalized groups through co-operative organizations and co-operative action are much needed counterweights to processes of exclusion and exploitation. So, there is no discrimination in agricultural cooperative because there are different categories of people like widows, widowers, people affected by disease like HIV/AIDS working together which itself qualifies as a step towards a sustainable society, UNRISD (1994). The findings showed that within cooperatives single, married, widow and widowers fulfill their responsibilities harmoniously but no information was revealed about affected by HIV/AIDS. Agricultural cooperatives play an important role in advocacy for cross-cutting issues in society like gender, HIV/AIDS, human rights, children's rights, among others Mukarugwiza (2010). This is because in a cooperative you may find members who also participate in decision making at different levels such as cell, village, youth and women. Increasing agricultural productivity enables the agricultural sector to move from subsistence

to a commercial mode of production, while ensuring food security and improved food intake by household members, World Bank (2011). It also increases learning capacity and school performance and leads to longer school attendance, fewer school (and work days) lost due to sickness, higher earnings, longer work lives and a more productive work force, hence sustainable development. Socially, Co-operatives are effective schools for sustainable development, Michael (2001). Educating members, employees, and the public is a co-operative principle which helps to upgrade the technical, managerial, and organizational skills of their members and staff through short courses, advanced education, peer instruction, and learning by experimentation. The Argument was confirmed as respondents acknowledge to get training, sharing ideas, experience, responsibilities and ability to fulfill school requirements for children's education.

4.10.3. Agricultural cooperatives and economic development

The economic role played by agricultural cooperatives were emphasized by Fatemeh (2011) as providing the farmers with production inputs, such as fertilizers, seeds and chemical substances, etc. In addition, it holds guide symposiums for the farmers to acquire them with the necessary knowledge and skills about the agricultural new methods that aim at increasing the agricultural production and, therefore, promoting the rural society.

Kimberly (2002) argued that an agricultural cooperative is considered as one of the important economical and social organizations in rural societies through local ownership and control, and net profits distributed to those who use the Cooperatives as they combine people, resources, and capital into larger, more viable and economically competitive units. In addition, cooperatives offer a way for a group of individuals to pool their limited resources to achieve a critical mass since they combine people, resources, and capital into larger, more viable and economically competitive units. Cooperatives offer small agricultural producers opportunities and a wide range of services, including improved access to markets, natural resources such as land and water, information, communication, technologies, credit, training and warehouses, Michael (2001). These are achieved through support of the government and UNICOOPAGI, saving activities in which respondents are involved and they facilitate profitability. Dealing with the role of cooperatives in Rwandan economy, Mukarugwiza (2010) emphasized that cooperatives are instruments used to alleviate poverty and to accelerate agricultural production in Rwanda. They contribute to the achievement of the Millennium Development Goals, Vision 2020 and the Economic Development and Poverty Reduction Strategy (EDPRS) program me that focus on rural economic transformation, human resource development,

development and promotion of the private enterprises and poverty alleviation. Beside the above macro-economic role, cooperatives create decent employment for their members and staff. Empirical findings emphasized that cooperatives reduced poverty in their families as they managed to purchase animals for breeding like pigs, goats, mattress, telephone and productivity increased due to application improved inputs and advice given.

4.10.4. Agricultural Cooperatives and sustainable development

This section highlights the role of agriculture in promoting sustainable development for a country. As Murwanashyaka (2013) indicated that sustainable development means achieving a quality of life that can be maintained for many generations because it is: -Socially desirable: it fulfills people's cultural, material and spiritual needs in equitable way; - Viable: it pays for itself, with costs not exceeding income; - Ecologically sustainable: it maintains the long-term viability of supporting ecosystems. Here, the development contributes so much to economic growth, social progress and then to the preservation of environment. In all, sustainable development is that development which improves human living conditions for both present and future generations. In agricultural sector, the research findings showed that sustainable development can be reached because respondents from agricultural cooperatives argued to reach food and nutrition security, management of natural resources, erosion control, water capture and management, input use, marshland development, the use of terraces, tree plantation and irrigation which enhance profitability.

CHAPTER V: GENERAL CONCLUSION AND RECOMMENDATIONS

This chapter provides a general conclusion and recommendations made to improve the profitability of rural agricultural cooperatives in Rwanda.

5.1. General Conclusion

In brief, this study entitled profitability of rural agricultural cooperatives in Rwanda. A comparative study of two selected cooperatives intended to compare the profitability of two agricultural cooperatives growing Irish potatoes and wheat at the same time answering the following questions: What is the profitability of agricultural cooperatives of UNICOOPAGI growing Irish potatoes versus those growing wheat? What are the factors that cause differential profitability between Urumuri and KIAKI cooperatives? What is the impact of the profitability from agricultural cooperatives of UNICOOPAGI focusing on Irish potatoes and wheat growers' socio economic living condition? What are the challenges encountered by agricultural cooperative members of UNICOOPAGI in improving living conditions of their members in rural area?

The research findings showed that agricultural cooperatives help members get profitability from their cooperatives in different domains such as social, economic, environmental, institutional and financial which help them satisfy some needs and fight against poverty. Socially, agricultural cooperative members share responsibilities, advanced education, peer instruction, and learning by experimentation, improved cooperation between members, share knowledge, food security, mutual assistance, social integration for marginalized people like widow, widowers, those affected by HIV/AIDS, orphans and getting advice, advocacy and participating in decision making at various levels.

Economically, they have access to credit, they get education in saving, and they have access to inputs at a reduced cost such as fertilizers, seeds and chemical substances, new agricultural technology, markets for the produce, sharing the benefits. Agricultural cooperative members are sensitized to environmental management by fighting against erosion through creating terraces, planting trees, management of natural resources, water capture and management, input use, marshland development, irrigation so as to maintain sustainable development.

Nevertheless, agricultural cooperative members face some challenges in growing Irish potatoes and wheat like doing an activity that is seasonal based since irregularity or much rain affects the productivity and profitability. There is a lack of good variety of Irish potato seeds and expensive

fertilizers, insufficient quantity of wheat seeds for Urumuri cooperative, lack of capital because financial facilities are not available for farmers as a result of lack of investment in agriculture.

As comparison was made between irish potatoes in KIAKI and wheat in Urumuri cooperative during the agricultural year of 2012-2013 the research findings showed that irish potatoes were more profitable in KIAKI with a gross profit margin of 53% and a return to members of **26,188 Rwf** comparing to wheat in Urumuri cooperative with a gross margin of 51% and a return to members of **7,834 Rwf**.

The research highlighted that the difference in profitability in irish potatoes and wheat between KIAKI and Urumuri cooperative was due to the fact that irish potatoes in KIAKI has been grown in a season that was good as it rained in its normal conditions, it was more productive and sold at good price as a crop that is more liked by the people. This helped cooperative members to accumulate enough resources such as forests, cows, and office furniture. For Urumuri cooperative it had many advantages in growing wheat like getting seeds and fertilizers at a half of the total price, a market from RAB but the climate did not facilitate profitability due to lack of rain.

The profitability gained from agricultural cooperatives helped members to fulfill responsibilities towards schools for education of their children, they work together, they are goal oriented in their lives, and they managed to provide some materials for themselves like telephone, mattress, and domestic animals and reduced poverty in their families.

5.2. Recommendations

These recommendations are based on the findings of this study and can improve the profitability of agricultural cooperatives once considered by the implementers of agriculture and advisers of cooperative in order to fight against hunger and poverty in rural areas of Nyamagabe and Nyaruguru districts that are very favorable to agriculture of irish potatoes and wheat.

5.2.1. Recommendations to MINAGRI

- To increase multiplication sites for wheat and irish potatoes in order to facilitate farmers get good variety of seeds in enough quantity and quality at the right season and distribution to be done on time so as to increase the profitability of agricultural cooperatives through food security and poverty reduction.

- To improve transport and communication networks such as roads, electricity in rural areas so that farmers can access seeds and fertilizers at a reduced cost, improve communication with others and increase profitability through using ICT.
- To train agricultural cooperative members in water capture and management in order to irrigate crops in sunny seasons and facilitate them getting necessary facilities.
- To facilitate agricultural cooperative members getting tools for better management of the productivity for dry wheat in order to avoid post harvest loss.
- To recruit a staff at cell level in charge of agriculture in order to follow up agricultural activities in time.
- To sensitize private sector, regional and international investors to invest in agriculture since it is the major economic activity practiced in rural areas.
- To sensitize financial institutions (banks) to facilitate farmers get access to credit because the banking system imposes heavy collateral requirements and poses inappropriate lending conditions, like periodicity of repayment not linked to the agricultural cycle.

5.2.2. Recommendations to UNICOOPAGI

- To increase the number of field studies so as to help agricultural cooperatives members have partnership with other farmers in the other Provinces nationally or at regional level to share experience that improve profitability.
- To recruit another agronomist in order to improve service delivery in terms of technical assistance to agricultural cooperative members to increase their profitability.
- To increase the number of winnowing machines to avoid post harvest losses.
- To sensitize partners and donors to participate in providing inputs of irish potatoes like improved seeds and fertilizers.

5.2.3. Recommendations to Agricultural cooperatives

- To participate in the program of one cow per family among cooperative members themselves and extends it to one pig, goat etc per family in order to help one another get manure and use vegetables so as to reduce the cost of inorganic fertilisers.

- To have the culture of saving seeds from their production for future agricultural season.

5.3. Suggestion for further research

This study was limited on comparing the profitability of wheat and irish potatoes in rural agricultural cooperatives especially in Nyaruguru and Nyamagabe district. Fellow researchers may extend it to:

- ✓ The profitability of agricultural cash crops in Nyamagabe district. A comparative study of coffee and tea.
- ✓ The determinants of honey production and profitability in Nyamagabe and Nyaruguru districts.
- ✓ The profitability of rural population from Nyungwe National park. A comparative study of Nyamagabe and Nyaruguru districts.
- ✓ The Analysis of Nyungwe National park projects in promoting irish potato and wheat production in Nyamagabe and Nyaruguru districts.

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APPENDICES

Research questionnaire design for data collection

Topic: The profitability of rural Agricultural Cooperatives in Rwanda. A comparative study of two selected cooperatives.

Research question	Dimension	Indicators	Field questions	Targeted information
<p>What is the profitability of agricultural cooperative members assisted by UNICOOPAGI in rural areas of Nyamagabe district?</p> <p>2 What is the impact of the profitability from agricultural cooperatives assisted by UNICOOPAGI in rural areas of</p>	<p>Social</p> <p>Legal</p>	<p>Capacity building,civil education, medical insurance,improved living conditions</p> <p>Regulations,legal protection, cheap fertilizers through voucher</p> <p>Training,advocacy,se eds,fertilisers</p>	<p>What are the reasons that pushed you to join agricultural cooperatives?</p> <p>What kind of support do you get from the government?</p> <p>What kind of support do you get from UNICOOPAGI?</p> <p>4. How does joining agricultural cooperatives help you socially?</p>	<p>Reasons of joining agricultural cooperatives</p> <p>Advantages from the Government and UNICOOPAGI</p>

<p>Nyamagabe district on members socioeconomic living conditions?</p>	<p>Economic</p>	<p>Loans from Twizigamire savings and credit cooperative,savings, money, market for production, cheap fertilizers and seeds</p>	<p>How does joining agricultural cooperatives help you economically</p> <p>6. Do you breed any domestic animals ?</p> <p>7. If not ,how do you get organic manure?</p>	<p>Economic advantages</p> <p>Domestic animals</p> <p>Means of getting organic manure.</p>
			<p>8. Why did you choose to grow this crop among the others grown in the district?</p> <p>9. In which cultivation step do you get more</p>	<p>Reasons of Preference of their crop</p> <p>Kind of cultivation steps</p>

			<p>facilities?explain</p> <p>10. What kind of chemical fertilizers do you get from UNICOOPAGI?</p> <p>11. Where do you get a market for your production?</p> <p>12. Do you have a drying storage for your production?</p> <p>13. Does your cooperative implement the policy of land use consolidation?</p>	<p>NPK17.17.17, lime,DAP,Urea</p> <p>Market for production</p> <p>Means of keeping the quality of the production</p> <p>Type of practiced agriculture</p>
	Environmental	Diseases, lack of enough rain or when it rains heavily, poor fertility	14. What are the challenges do you face while growing this crop?	Challenges they face.

Questionnaire for Agricultural cooperative members (English version)

Section 1: Respondent identification

1. Sex: Female Male
2. Age of the household heads : < 30
- 31-40
- 41-50
- 51-60
4. Marital Status: Single
- Married
- Widow
- Widower
4. Educational level :
- a) No level b) Primary c) Secondary
- d) TVET e) CERAI f) University
5. Name of cooperative
- a) KIAKI b) Urumuri
6. Do you grow Irish potato as a main crop ?..yes No.
7. Do you grow wheat as a main crop? Yes No
8. What is your household size ? How many adults ?.....
- How many children?.....

Section 2: Questions related to the research topic

1. How long have you belonged to this cooperative?
2. What are the reasons that pushed you to join agricultural cooperatives?
.....
3. What kind of support do you get from the government?
.....
4. What kind of support do you get from UNICOOPAGI?
.....
5. Do you find any social advantage in joining agricultural cooperatives?

.....

6. Do you find any economic advantage in joining agricultural cooperatives?

.....

7. Why did you choose to grow this crop among the others grown in the sector?

a) Cheap to grow b) more productive c) market available

8. What kind of chemicals do you get from UNICOOPAGI?

a) NPK17.17.17
 b) DAP
 c) Urea
 d) lime
 e) others

9. Where do you get a market for your production?

.....

10. Do you plan to remain as a cooperative member ? Yes
 No

Explain the reason.....

.....

11. Which of the following are benefits f being an agricultural cooperative member?

Acquisition of new technology
 Access to credit
 Access to quality inputs
 Increase in income
 Improved cooperation between members

12. Choose and grade the level of importance of the challenges you faced while growing this crop?

Challenge	Less important	Important	Very important
Irregularity of rain			
Lack of good variety			

Expensive inputs			
Low member participation			
Lack of capital			
Poor management			

13. Referring to the agricultural year of 2012-2013, complete the table below

a) How much money did you invest in agriculture? (inputs)

Item	Unit cost(Rwf)	Total cost(Rwf)
Organic fertilizers(kg)		
Inorganic fertilizers(kg)		
Seeds (kg)		
Cultivators		
Harvesters		
Pesticides		
Watchmen		

B) What was the production did you have? (output)

Name of crop	Quantity produced(kg)	Unit price (Rwf)	Revenue(Rwf)

Thank you!!!!

INTERVIEW QUESTIONS

1. Do you find agricultural cooperatives growing wheat /irish potatoes profitable?
2. What are the factors that increase profitability of agricultural cooperatives?
3. What is the impact of the profitability from agricultural cooperatives of UNICOOPAGI focusing on Irish potatoes and wheat growers' socio economic living condition?
4. What are the challenges encountered by agricultural cooperatives?
5. What are the strategies put in place?