

MOSHI CO-OPERATIVE UNIVERSITY

**DETERMINANTS OF THE PERFORMANCE OF IRISH POTATO
FARMER CO-OPERATIVES IN RWANDA: EXPERIENCE FROM THE
NORTHERN AND WESTERN PROVINCES**

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FARMER CO-OPERATIVES IN RWANDA: EXPERIENCE FROM THE
NORTHERN AND WESTERN PROVINCES**

BY

CHARLES UWARAMUTSE

**A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD DEGREE OF DOCTOR OF PHILOSOPHY OF
MOSHI CO-OPERATIVE UNIVERSITY**

NOVEMBER, 2023

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AND
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CERTIFICATION

The undersigned certify that he/she has read and hereby recommend for acceptance by Moshi Co-operative University a Thesis titled “Determinants of Performance of Irish Potato Farmer Co-operatives in Rwanda: Experience from Northern and Western Provinces, Rwanda” in fulfilment of the requirements for the award of a degree of Doctor of Philosophy in Co-operatives of Moshi Co-operative University.

Prof. Gervas M. Machimu

(Supervisor’s Name)



(Supervisor’s Signature)

Date: 15 November, 2023

Dr. Esther N. Towo

(Supervisor’s Name)



(Supervisor’s Signature)

Date: 15 November, 2023

ACKNOWLEDGMENTS

The completion of this thesis is by glory of the Almighty God who guided me throughout the journey of PhD studies. I am grateful for the financial support provided by the DAAD (German Academic Exchange Service). I would like to express my gratitude to all those who, through their guidance, encouragement, enthusiasm and patience during the study, contributed to the completion of this thesis. I am strongly indebted to my supervisors Dr. Esther N. Towo and Prof. Gervas M. Machimu for their tireless support in reading the script and constructive criticism towards the accomplishment of this research.

I would like to express my gratitude to Dr. G. Matto, Dr. H. Hamza, Dr. G. Kweka and Mr. B. Nkondora of the Directorate of Research and Postgraduate for their superb support. I am also indebted to Prof. K. Mangasini, Prof. B. Namwata, Prof. S.M. Seimu Liheta, Prof. L. Mataba, Dr. J.T. Kaleshu, Dr. C.K Komba, Dr. I. Kazungu, Dr. E. Lulandala, Dr. A. Mchopa, Dr. G.C Rwekaza, Dr. N. Towo, Dr. M. Mrimi, Dr. M. Bikolimana, Dr. Damian Sambuo, and Mr. C. Mnyasa for their support.

I also thank my research assistants, the National Co-operative Confederation of Rwanda, Rwanda Irish Potato Federation, Chairpersons of Irish potato co-operative unions and District co-operative officers in the study area and everyone who helped me to access study information. Finally, I am grateful to the University of Lay Adventists of Kigali, which gave me the opportunity to pursue Ph. D studies. A special word of thanks goes to Dr. Umumararungu K. Christine, Mr. Ndikumana Innocent and Mr. Butera Anastase for their unique support. God bless you all.

DEDICATION

To my wife Isabelle and our beloved children, Charles Jr, Serge, Grace, Daniella and Marie Ange who were the source of my strengths and perseverance during my studies. To my parents who, through their struggle, enabled me to be what I am today.

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LIST OF ABBREVIATIONS AND ACRONYMS

AGRA	:	Alliance for Green Revolution in Africa
AJCDT	:	African Journal of Co-operative Development and
ANOVA	:	Analysis of Variance
APTC Ltd	:	Agro Processing and Trading Company Limited
AT	:	Agency Theory
CIP	:	Crop Intensification Programme
CNFA	:	Cultivating New Frontiers in Agriculture
DAAD	:	Deutscher Akademischer Austauschdienst
DCO	:	District Co-operative Officer
EDPRS	:	Economic Development and Poverty Reduction Strategy
EDT	:	Expectancy Disconfirmation Theory
FA	:	Factor Analysis
FAO	:	Food and Agriculture Organisation
FAOSTAT	:	Food and Agriculture Organisation Statistics
FE	:	Fixed Effects
FECOPPORWA:		Fédération des Co-operatives des Producteurs de Pomme de terre au Rwanda
FGD	:	Focus Group Discussion
GDP	:	Gross Domestic Product
GoR	:	Government of Rwanda
ICA	:	International Co-operative Alliance
ILO	:	International Labor Organization
IOF	:	Investor-Owned Firm
IPFC	:	Irish Potato Farmer Co-operative
KIIs	:	Key Informants Interviews
LIQ	:	Liquidity
MINAGRI	:	Ministry of Agriculture and Animal Resources
MINICOM	:	Ministry of Trade and Industry
MoCU	:	Moshi Co-operative University
MSI	:	Farmer Satisfaction Index
NCCR	:	National Co-operative confederation of Rwanda
NCT:	:	Neo-Classical Theory
NGO	:	Non-Governmental Organization

NISR	:	National Institute of Statistics of Rwanda
NST	:	National Strategy for Transformation
PCA	:	Principal Components Analysis
POT	:	Pecking Order Theory
PPS	:	Probability Proportional to Size
RBT	:	Resource-Based Theory
RCA	:	Rwanda Co-operative Agency
RDB	:	Rwanda Development Board
RE	:	Random Effects
ROA	:	Return on Assets
ROE	:	Return on Equity
SACCO	:	Saving and Credit Co-operatives
SAI	:	Service Accessibility Index
SCAP	:	Share Capital
SDGs	:	Sustainable Development Goals
SMEs	:	Small and Medium Enterprises
SWOT	:	Strengths, Weaknesses, Opportunities and Threats Technology
TOC	:	Theory of Co-operative
UN	:	United Nations
USAID	:	US Agency for International Development
VIF	:	Variance Inflation Factor

EXTENDED ABSTRACT

Farmer co-operatives are expected to be the backbone of agricultural development by offering an extensive range of services to smallholder farmers. In many countries, governments have established an environment conducive to the development of co-operatives to ensure that they are profitable enterprises capable of improving the social and economic transformation of their members. However, smallholder farmer co-operatives in developing countries have proven to be largely poor. This thesis empirically analysed the determinants of performance of Irish Potato Farmer Co-operatives (IPFCs) in Rwanda. Specifically, the thesis analysed the determinants of members' satisfaction with access to IPFCs' services, examined the influence of co-operative characteristics on financial performance of IPFCs, examined co-operative governance factors that affect financial performance of IPFCs and determined the influence of market orientation dimensions on performance of IPFCs. The study employed mixed-methods sequential explanatory design and was conducted in the Northern and Western provinces, Rwanda. The design allowed the use of mixed-method approach and serves as means for triangulation and validation process. Northern and Western provinces were selected purposively due to their predominance in Irish potato farming. Purposive sampling technique was also applied to select co-operatives included in the study, 32 active IPFCs with audited financial reports were selected. Simple random sampling was used to select 387 members from sampled co-operatives and distributed to each co-operative on the basis of Probability Proportional to Size. This thesis used both primary and secondary data sources. The former employed a structured questionnaire, key informants' interviews (KIIs) and focus group discussion (FGD), while the latter was obtained from co-operatives' audited financial reports and administrative documents. Quantitative data were analysed by developing indices, descriptive statistics, Pearson correlation, factor analysis with principal component analysis, regression and ANOVA. Qualitative data obtained from KIIs and FGDs were analysed using content analysis to validate and triangulate quantitative findings. Findings reported a low level of members' satisfaction with IPFCs services and the latter failed to improve their activities, forcing some farmers' exit from Irish potato farming activities. Findings also showed that liquidity, leverage, number of employees, size of the co-operative and value of share capital are significant factors that contributed to financial performance. Moreover, among governance factors, the

study reported members' participation ($b = 1.456, p < 0.001$), accountability ($b = 0.520, p < 0.047$), transparency ($b = 1.046, p < 0.001$) and leadership ($b = 2.813, p < 0.001$) as significant factors contributing to the financial performance of IPFCs. Concerning market orientation dimensions, findings showed a positive significant relationship between customer orientation and financial performance ($b = 0.090, p < 0.001$), and competitor orientation and financial performance ($b = 0.055, p < 0.001$), while supplier orientation has shown a negative correlation ($b = -0.021, p < 0.05$). The study concluded that, due to limited financial capacity among IPFCs, providing the required services to their members is a significant concern. Most IPFCs failed to revive their activities, resulting in the exit from Irish potato farming activities for some of the farmers. If this problem persists, it will have a detrimental impact on the overall production of Irish potatoes in Rwanda. Limited financial capacity along with weak internal governance and reported cases of mismanagement among IPFCs encourage government interference in management and administration of their co-operatives. In response to the research findings, IPFCs should encourage their members to increase their shareholdings to raise capital for their co-operatives and to enhance performance. Rwanda Co-operative Agency (RCA) and other community development partners should organize capacity-building training for IPFCs leaders in self-governance to limit the interference of local authorities in co-operative administration under the guise of reported mismanagement and weak leadership.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

The United Nations officially recognises the important role that co-operatives play in inclusive local community development by encouraging people to participate in economic and social activities (UN, 2017). Cognisant of their contribution, International Labor Organization (ILO) has highlighted the importance of co-operatives in achieving the Sustainable Development Goals (SDGs) (ILO, 2015). Particularly, smallholder farmer co-operatives are the main pillars in facilitating socio-economic development of most countries and strategic means for poverty reduction and rural community development in developing countries (Moon and Lee, 2020). By pooling individual holdings, co-operatives should logically yield a surplus far above of what an individual holder is able to produce in a small plot. They are expected to increase production and satisfy the needs of their members and society at large (Verhofstadt and Maertens, 2014) by offering an extensive range of services to smallholder farmers, including improved access to agricultural inputs, adequate storage facilities, market for members' production, information communication, credit, agro-processing training, and extension (ILO, 2021; Lepe, 2016).

The impact of co-operatives on socio-economic transformation can only be realized when they perform in accordance with their goals of establishment, such as member capacity building, improved profit and satisfaction of members with expected services (Sunghye and Sang-ho, 2020). Farmer co-operatives aim to be successful businesses and at the same time, strong member organisations (Bijman *et al.*, 2012). They are therefore considered successful if they are successful both as a business enterprise and as a member-based organisation (Bijman, 2016). Being successful as a business entails being profitable and have good economic performance. Their success as member-based organisations means that members are satisfied with co-operative services and their objectives are met (Mann and Stoinescu, 2021).

As stated by Grashuis and Cook (2019) and Tarekegn (2017), satisfaction of members is essential for a co-operative to achieve its goals and objectives. Satisfied

co-operative members actively participate in their co-operatives' activities, hence the improved performance (Prasertsang *et al.*, 2020). Co-operatives should thus move beyond maximization of financial performance as their sole criteria of success and give priority to maximizing satisfaction of members' needs through offering a range of services that can improve their socio-economic status. Along with members' satisfaction, financial performance of co-operatives is very important for co-operative success. This is because it may be challenging for co-operative societies to sufficiently serve their members and contribute to the national economic development unless they are able to achieve their own sustainable development. However, smallholder farmer co-operatives in developing countries face several challenges, including financial problems, unfavourable institutional environments, poor managerial skills and limitations on market access, all of which hinder their performance (Mersha and Ayenew, 2018; Mhembwe and Dube, 2017).

several studies have also reported lack of improved technologies, access to agricultural inputs, improved storage facilities and weak bargaining power (Liu *et al.*, 2021; Zheng *et al.*, 2021; Grashuis; Dary, 2021) as challenges facing co-operatives in developing countries. Those challenges could be attributed to lack of financial capacity. According to Sanchez *et al.* (2023); Basterretxea *et al.* (2022); Kimetto and Kimani (2018), Poor financial performance of farmer co-operatives in developing countries has prevented them from serving their members effectively. Co-operatives' performance in developing countries has proven to be largely poor (Masuku *et al.*, 2016). It remains controversial whether the co-operatives have achieved their expected objectives in reality. Previous studies have reported governance problems (Matangaidze *et al.*, 2022; Hussein, 2020) and lack of market orientation culture (Homid *et al.*, 2018) as key factors that impair performance of farmer co-operatives.

In Rwanda, agriculture is the dominant sector of the economy, contributing 31% of the country's Gross Domestic Product (GDP) and employing about 70% of the country's working population (Rwanda Development Board [RDB], 2022). The expansion of the agricultural sector was specifically done through farming intensification and increased market orientation of the smallholder agricultural sector by creating solid agricultural co-operatives (Meador and O'Brien, 2019). Due

to their importance, the number of agricultural co-operatives in the country has increased very rapidly. In 2022, Rwanda reported approximately 11 019 registered co-operatives with 5 290 717 members, of which agricultural co-operatives cover 45.8% (Rwanda Co-operative Agency [RCA], 2022).

The Government of Rwanda (GoR) views co-operatives as a pivotal tool for achieving Vision 2050 and a number of Sector Strategic Plans (Ministry of Agriculture and Animal Resources [MINAGRI], 2018). GoR has thus established an environment conducive to the development of co-operative movement that includes law N° 024/2021 governing co-operatives in Rwanda and the national policy of 2018 on the promotion of co-operatives “toward private co-operative enterprises and business entities for socio-economic transformation” to ensure that they are profitable enterprise (International Labour Organisation [ILO], 2017). Agricultural policies for agricultural development in Rwanda focus on increased market orientation of the smallholder farm sector (Verhofstadt and Maertens, 2014) and co-operatives are seen as key vehicle (RCA, 2020). The Government also supports co-operatives in activities such as value chain development, research, and extension (International Labour Organisation [ILO], 2017).

Due to their contribution to the gross agricultural production, Irish potatoes (*Solanum tuberosum, ibirayi*) were prioritised as one of the most important crops falling under the crop intensification program in Rwanda for increasing production (FAO, 2016). Rwanda is ranked the fifth-largest producer of Irish potatoes in Africa after Algeria, Egypt, Malawi, and South Africa, and first in East Africa (FAO, 2022), which is significant given the relative land size of the country. Irish potatoes in Rwanda are mainly grown in the highlands in the North Western part of the country. The total area for potato crop is approximately 150 000 hectares per year. Since 2001, the production steadily increased to more than one million metric tons per year, but the yield is still low. The national yield average is approximately 10 tones/Ha (Rukundo, 2019). Irish Potato Farmer Co-operatives (IPFCs) in Rwanda are considered key vehicle for increased production and market orientation of the Irish potato farmers.

National Co-operative Confederation of Rwanda reported 116 registered IPFCs with 30 002 members. The report revealed 59 IPFCs in Northern, 34 in Western and 23 in Southern Provinces (NCCR, 2019). Due to their favourable climatic conditions, the districts of Musanze and Burera in Northern and Nyabihu and Rubavu in Western are the most productive, accounting for about 64% of the national Irish Potato production in Rwanda (NISR, 2022). The small number of IPFCs in the area is explained by reforms undertaken by RCA, including merging the co-operatives to improve their performance (Nkurunziza, 2019).

Despite government interventions to strengthen IPFCs as a pivotal tool for increasing Irish potato production, their performance is challenged by the ability to help members access quality agro-inputs, improved storage capacity, as well as ensuring coordination between farmer groups and potential buyers. This situation leads to low yields, high post-harvest losses, and subsequently, low prices on the market (Cultivating New Frontiers in Agriculture [CNFA], 2023). IPFCs are unable to provide adequate services to their members, who resorted to do business with private traders. This strongly affects the sustainability of farmer co-operatives and their members (RCA, 2022). The example is co-operative *Imyugariro* in *Musanze* district, which produced 200 tonnes of Irish Potato in 2017 but 30 tonnes were damaged due to the poor state of the storage facilities available (Tumwebaze, 2017). Likewise, the federation of Irish Potato farmers (FECOPORWA) is facing challenges in managing its collection centres as most of the farmers often prefer to sell the crop produce individually (FAO, 2016).

Strategies adopted by IPFCs, the government and other actors to increase production as well as other benefits associated with Irish potato farming have not yet resulted into the intended target. It is still questionable; why is such a situation happening? What really determines the performance of IPFCs in Rwanda? Why are many farmers not yet members of IPFCs? The expected outcome of this research is to establish solutions to revitalise the Irish potato sector in the country.

1.2 Co-operative Movement in Rwanda

The history of co-operatives in Rwanda is similar to that of many African countries. Traditionally, Rwanda had its own self-help forms that adhered to the principles of self-help and self-responsibility. *Ubudehe* (working together), *Umubyizi* (assisting each other) and *Umuganda* (community work) are a few of these forms that remain active today. However, the first formal co-operative movement was formed in 1953 (Sentama, 2009). The colonial government then employed the co-operative movement as an instrument to achieve its own objectives such as resource extraction and labour mobilisation, not those of the local populations (Mukarugwiza, 2010). Africans did not find co-operatives beneficial since they constrained their activities to the social and agricultural sectors which was a result of the paternalistic approach of the colonial administration, aimed to maintain Africans in disadvantageous positions. African co-operatives faced severe restrictions from the colonial government even in the agricultural sector. Wanyama *et al.* (2009) reported that the prices that co-operatives could charge their members for their produce were set by the colonial administration and were less than what private European business owners were willing to pay. As a result, there was minimal development in the co-operative movement during the colonial era.

The co-operative movement in Rwanda did not make significant progress after independence in 1962. They remained heavily influenced by the state and donors in whom they depended (Sentama, 2009). The government of that era used co-operatives as tools primarily for political interests and remained the biggest employer and consumer of products and services for a long period of time. Periodic violence, perpetual conflicts over ethnicity, bureaucracy and an ineffective judicial system did not assist in fostering an environment favourable for co-operative development (MINICOM, 2018). It was not until 1988 that the law governing co-operatives in Rwanda was revised, finally setting out a dedicated co-operative law. Since then, a new legislative and policy framework was implemented, materialised with the adoption of Rwanda's first policy on the promotion of co-operatives in 2006 revised in 2018 and the promulgation of the current law N° 024/2021, which governs the establishment, organization and functioning of co-operative organizations in Rwanda. Both Policy and Law recognize co-operatives in the

context of International Co-operative Alliance (ICA) by adhering to standard definitions, values and principles of the co-operatives.

In 2005, the Government of Rwanda recognised co-operatives as a tool for poverty reduction. Following the review of the Economic Development and Poverty Reduction Strategy (EDPRS), the government realized how critical importance of working with farmer co-operatives to help them access to market. It is with this framework that the government established the taskforce, which began operations in August 2005, with the goal of revitalising co-operatives. Approximately 919 co-operatives were identified in 2005 during a study conducted by the taskforce, with 68.7% of them being in the agricultural sector (Sunghye and Sang-ho, 2020; MINICOM, 2005). The following table presents the current overview of co-operative statistics in Rwanda.

Table 1. 1 : Overview of Co-operative Statistics in Rwanda

Economic sector	No. of coops.	Membership			Share capital (Frw)
		Male	Female	Total	
Agriculture	5 050	645 385	506 363	1 151 675	10 621 541 923
Trading	1 687	119 213	145 190	262 722	9 713 468 779
Service	1 830	138 271	126 500	264 747	4 681 731 064
Handcraft	1 195	27 511	65 314	92 840	2 152 279 476
Transformation	189	17 599	11 836	29 435	1 052 318 308
Mining	141	60 999	46 879	107 878	1 346 716 100
Housing	227	30 763	18 842	49 587	537 548 664
Other sector	89	61 965	49 558	111 523	525 591 800
Primary coops	10 408	1 101 706	970 482	2 070 407	35 469 133 114
SACCOs	444	1 641 056	1 299 110	3 220 310	18 459 082 753
Unions	152				212 796 675
Federations	15				61 020 000
Grand Total	11 019	2 742 762	2 269 592	5 290 717	54 202 032 542

Rwanda Co-operative Agency (2022)

The SWOT analysis conducted by RCA pointed out lack of financial resources and ability to effectively manage co-operative operations as one of the weaknesses of the co-operatives in Rwanda, hindering their ability to provide the expected services to their members (MINICOM, 2018). To overcome those weaknesses and improve performance of the co-operatives, capacity building of their members, financial support and infrastructure expansion are required.

1.3 National Policy on Co-operatives in Rwanda

This policy recommends a number of policy options designed to enhance the governance of the co-operative movement in Rwanda and ensuring that co-operatives are financially viable enterprises capable of fostering socio-economic transformation of their members (MINICOM, 2018). This includes the upgrading of the mandate of RCA as the government agency responsible for the development of co-operative sector and the restructuring of the current organisational structure of co-operatives and the promotion of dialogue between government and co-operative movement.

The overriding objective of the policy is to enable the co-operative movement play its vital role towards the transformation of the national economy. The specific objectives of the policy include (i) Promote performance based co-operative management through performance contracts “*Imihigo*”; (ii) Improve the financial sustainability of the co-operative movement through diversified activities; (iii) Promote self-financing of the co-operative movement and reduce its reliance to government and donor financial support; (iv) Improve livelihoods of co-operative members and the community through co-operatives; among others.

The policy highlights a number of actions to ensure that co-operatives are profitable enterprises, which include (i) Measuring the performance of co-operatives based on their business plans and the extent to which they respond to members’ socio-economic needs; (ii) All co-operative organisations need to have their business plans, results-based planning, monitoring and evaluation frameworks, and implement the Co-operative Information Management System (CIMS); (iii) In order to promote self-financing of the co-operative movement and reduce its reliance on government and donor financial support, all co-operatives need to diversify their businesses and thus investments, contribute regularly their membership fees and other contribution, ensure proper management of the resources already acquired and avoid embezzlement, use and benefit from the existing financial facilities such as business grant funds, among others.

The policy describes classification of co-operatives and government support each category needs. Category A is composed by graduated co-operatives which are self-

reliant, run profitable commercial operations and create substantial benefits for their members. No specific support they need. However, they are eligible for supplier upgrade programme and the anchor firm initiative or export growth facility. Growth co-operatives which operate in priority sectors and demonstrate substantial potential to generate benefits for their members, but not yet profitable, are classified in category B. Type of government support include financial, marketing and other business development services. The government also assigns a professional manager to provide technical support to the management of those co-operatives. Category C represents ordinary co-operatives, which may or may not be profitable but fail to generate substantial benefits for their members. They need generic business development services, covering the essential capabilities.

1.4 Co-operative Principles School of Thought

The co-operative principles school of thought mainly focuses on creating co-operatives that, to the highest degree possible, adhere to the international co-operative principles established by the International Co-operative Alliance. Co-operative principles have historically been developed based on the need to satisfy the socio-economic improvement of the members. They have long been known internationally as the Rochdale principles, although, the alliance recognises the contribution of many co-operative founders in different countries, in particular Charles Gide in France, Alphonse and Dorimène in Quebec, Friedrich Wilhelm Raiffeisen and Herman Schulze-Delitzsch in Germany, Horace Plunket in Ireland, Frs. Jimmy Thompson and Moses Xavier of Antigonish movement in Nova Scotia and Father José María Arizmendiarieta in Mondragon, Spain. The human and international nature of the principles is shown by the fact that Rochdale pioneers never claimed ownership of them.

The aforementioned type of school contends that any member organisation is eligible to be a co-operative if it adheres to the following seven normative principles: voluntary and open membership, democratic member control, member economic participation, autonomy and independence, education, training and information, co-operation among co-operatives and concern for the community (ICA, 2015). The co-operative principles do not stand in isolation from each other. They are independent principles which support and strengthen each other. For

instance, if applied, the fifth principle of education, training and information will reinforce and improve the second principle of democratic control. A co-operative organisation will be stronger and more sustainable if all of the guiding principles are followed and applied regularly. In this school, normative judgments take the role of testable hypotheses and conditional predictions are replaced by assertions of ideological convictions and optimism (Acharya, 2010). Co-operative principles are not ethical guidelines valid forever but normative code, which must change with time. Depaoli *et al.* (2020) urged that the need for innovation in co-operative principles is inevitable with the advent of the internet as a means to get proficient and use of virtual business in the digital world. In response to these calls for change, Waring *et al.* (2022) study reported that Rochdale co-operative principles have undergone changes to accommodate the changing environment by various institutions.

1.5 Statement of the Problem

Farmer co-operatives are expected to increase production and satisfy the needs of their members and society at large (Verhofstadt and Maertens, 2014) by offering an extensive range of services to smallholder farmers that could not be available if provided individually. Unless the financial performance of co-operatives is healthy, it may be difficult for co-operative societies to sufficiently serve their members and contribute to their socio-economic transformation (Tekeste *et al.*, 2014). However, despite government initiatives aimed at ensuring that co-operatives are profitable enterprises capable of providing services and creating surpluses for their members, limited financial resources and financial dependence were revealed as significant challenges and constraints for the performance of co-operatives in Rwanda (MINICOM, 2018).

Irish potato production and marketing chain is still facing serious problems, such as insufficient production and poor quality of seeds, losses due to poor post-harvest handling and processing, poor coordination of potato value chain, limited market knowledge and other management inefficiencies (Rukundo, 2019). IPFCs lack bargaining power, information about prices (USAID, 2021) and poor financial performance (Rwibasira, 2019). Due to lack of improved storage facilities in production zones, Irish potato price becomes low during harvest as farmers sell all

their harvest quickly to avoid damages (Agriterria, 2020). Moreover, Irish potato farmers in Northern and Western Provinces lack consistent market for their produce and thus incur losses because there is a lot of speculative pricing by unscrupulous buyers (Mbarushimana, 2018), resulting in poor investment returns for farmers. Notwithstanding the efforts made by Ministry of Trade and Industry (MINICOM) to address this issue by entrusting Agro Processing and Trading Company (APTC Ltd) to organise and control potato value chain, Irish potato farmers, still complain losses.

Several studies report co-operative governance to be the most important factor that affects the performance of co-operatives in terms of their profitability and members' satisfaction with farming services. Drona and Walsh (2018); Tewodros (2017); Hammad *et al.* (2016) found positive and significant influence of governance factors on the performance of co-operatives. Contradicting findings by Omwenga (2017); Okonkwo (2017) reported negative association between governance factors and performance of farmer co-operatives. Others report market orientation as a factor that affects co-operative performance. Saleh *et al.* (2021) found a positive and significant impact of market orientation dimensions on performance of SMEs in South Arabia. Similarly, a study conducted by Meisya and Surjasa (2022) on the effect of market orientation on firm performance in food and beverage sector in Indonesia also revealed a positive impact of market orientation on performance. However, contradicting findings by Ho *et al.* (2018); Homaid *et al.*, (2018); Shehu and Mahmood (2014) reported insignificant and negative correlation between market orientation dimensions and business performance. On the other hand, factors such as leverage, co-operative size, and liquidity (Haat *et al.*, 2008) were identified as crucial determinants of co-operative performance. Additionally, factors such as uncertainty, growth and capital intensity were also reported to influence performance of co-operatives (Singh *et al.*, 2019). In a study by Zelhuda *et al.* (2017), it was found that the financial performance of agricultural co-operatives is influenced by factors such as current ratio, leverage, net fixed asset turnover, investment and co-operative size. Considering contextual differences and contradicting results from previous studies, the determinants of performance of smallholder farmer co-operative studies are inconclusive. It is against this

background that this study analysed the determinants of IPFC performance in Northern and Western Provinces, Rwanda.

1.6. Research Objectives

1.6.1 Main Objective

The main objective of this study was to analyze the determinants of performance of Irish potato farmer co-operatives in Northern and Western Provinces of Rwanda.

1.6.2 Specific objectives

Towards the fulfilment of the main objectives, the study specifically intended to:

- (i) Analyse determinants of members' satisfaction with access to IPFCs services,
- (ii) Examine the influence of co-operative characteristics on financial performance of IPFCs,
- (iii) Examine co-operative governance factors that affect financial performance of IPFCs, and
- (iv) Determine the influence of market orientation dimensions on performance of IPFCs.

1.7 Research Hypotheses

The study tested the following alternative and null hypotheses:

H₁: Demographic and socio-economic characteristics of members have significant effect on their access to IPFCs services

H₀₁: Demographic and socio-economic characteristics of members have no significant effect on their access to IPFCs services

H₂: Co-operative characteristics have significant influence on financial performance of

H₀₂: Co-operative characteristics have no significant influence on financial performance of

H₃: Co-operative governance factors have significant effect on financial performance of

H₀₃: Co-operative governance factors have no significant effect on financial performance of

H₄: Market orientation dimensions have significant influence on financial performance of

H₀₄: Market orientation dimensions have no significant influence on financial performance

1.8 Justification of the Study

Co-operatives in Rwanda are pivotal tool towards the transformation of the national economy in the current national development framework, namely the vision 2050, NST1 and a number of relevant sector strategies (MINCOM, 2018). The government of Rwanda recognises the pivotal role of co-operatives in promoting inclusive, sustainable development and economic transformation. About 45.8% of registered co-operatives are in the agricultural sector (RCA, 2022). Co-operatives are seen as key vehicle for increased market orientation of the smallholder farm sector.

Moreover, co-operatives also play an important role in achieving the SDGs. In light of their cross-cutting nature, co-operatives' activities are linked to all 17 SDGs. Of course, they provide a more direct contribution to SDG 1 on reducing poverty (in endeavour to meet members' social and economic needs), SDG 2 on reducing hunger, achieve food security and improved nutrition and promote sustainable agriculture, SDG 4 on ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all, SDG 5 on achieving gender equality and empower all women and girls, SDG 8 on decent work (supported by co-operative' democratic and member-based approach, coupled with their concern for community), SDG12 on responsible consumption and SDG17 (upheld among others by the principle of co-operation between co-operatives). In general, this study could serve as a framework for policymakers on how co-operatives can be improved and more profitable businesses to achieve Vision 2050, government strategic plans and SDGs. Particularly, findings of this thesis intend to inform policy decisions on how IPFCs should revitalise their operations, enhance their performance and thereby contribute to the socio-economic transformation of their members.

Most studies carried out on determinants of performance in farmer co-operatives were limited to a small area which makes it difficult to generalize and make a conclusion to the whole region and countries (Dube and Ozkan, 2019; Tewodros, 2017; Aini, *et al.*, 2012). Studies conducted in this area also analysed performance

of farmer co-operatives using financial ratios by ignoring the member's satisfaction with the services they get from co-operatives (Singh *et al.*, 2019; Zelhuda *et al.* 2017; Tewodros, 2017; *Hammad et al.*, 2016; Aini *et al.*, 2012). Empirically, the study contributes to the body of knowledge by identifying key determinants of the performance of IPFCs.

1.9 Theoretical Underpinnings

This study was guided by Expectancy Disconfirmation Theory (EDT), Resource-Based Theory (RBT), Pecking Order Theory (POT), Theory of Co-operative (TOC), Agency Theory (AT) and Neo-Classical Theory (NCT). In order to create concrete grounds for the study, it was not possible to find a single theory with adequate constructs that could explain the facts of the phenomena under investigation. Therefore, the study used all of the aforementioned theories in order to compensate for the weaknesses of individual theories. As a result, the study used EDT to analyse the determinants of farmers' satisfaction with access to co-operative services. RBT, POT and TOC were used to examine the influence of co-operative characteristics on co-operative financial performance. AT, TOC and NCT were also used to examine governance factors that affect co-operatives' financial performance, and finally, RBT and NCT were used to determine the influence of market orientation dimensions on financial performance of co-operatives. A description of these theories is presented in the subsequent sections.

1.9.1 Expectancy Disconfirmation Theory

Expectancy Disconfirmation Theory (EDT) is a theory of customer satisfaction developed by Oliver (1977) and originated from a subject of study for antecedents of satisfaction (Anderson and Sullivan, 1993). Basically, the theory was developed to measure the customer's satisfaction from the difference between customer's expectation and experience in perceived products or services (Oliver, 1980; Spreng and Page, 2003). Expectation is defined as customer's anticipations about performance of products or services (Churchill and Surprenant, 1982), while perceived performance examines the customers' experience after using products or services that can be better or worse than their expectation (Spreng *et al.* 1996). Disconfirmation refers to the difference between the customer's initial expectation and observed actual performance (Bhattacharjee and Premkumar, 2004).

When the actual performance of a specific product or service cannot meet the customers' expectations, negative disconfirmation will occur and lead to customer's dissatisfaction (Oliver, 1980a). If this happens, most dissatisfied customers decide not to complain; rather, they exit the service instead (Osarenkhoe and Komunda, 2013; Tronvoll, 2007). Conversely, positive disconfirmation leads to customer's satisfaction if perceived performance of a specific product or service can exceed customer's satisfaction (Santos and Boote, 2003). The theory was used to assess whether perceived services provided by IPFCs met members' expectations. This was important to set a ground for objective one which analyses the determinants of farmers' satisfaction with access to IPFCs services. EDT was also served to discuss both descriptive and inferential results obtained in the study.

1.9.2 Resource-Based Theory

Resource-Based Theory (RBT) examines performance differences of organizations based on their resources (Peteraf and Barney, 2003). In this study, RBT was used to analyse performance differences among IPFCs, something that EDT, which solely measures satisfaction based on the difference between expectations and experiences with perceived goods or services, misses. The theory explains how organizations maintain unique and sustainable positions in competitive environments (Hoopes *et al.*, 2003). RBT asserts that organizational resources are an essential factor influencing performance (Othman *et al.*, 2015).

The central idea in RBT is that organizations compete against others on the basis of their resources and capabilities (Barney, 1991; Wernerfelt, 1984). Resources include any tangible or intangible assets that are semi-permanently tied to the organization (Caves, 1980). Similar to previous studies that elaborate performance of co-operative using RBT (Machado *et al.*, 2017; Othman *et al.*, 2015), the theory was used in objective two to explain the effect of co-operative's specific characteristics, namely liquidity, leverage, co-operative size, age, membership size, number of employees and value of share capital on co-operative performance, unlike other theories of performance such as pecking order, trade-off, and signalling which are restricted on capital structure. Based on RBT, organizations with adequate resources are expected to achieve desired performance and sustain competitive advantages. It was useful in determining which organizational

resources contributed the most to the co-operative's performance. The theory was also used for objective four, which determined the influence of market orientation aspects on performance of IPFCs. This was due to the fact that market orientation is an internal intangible resource that accumulates and uses information to meet the demands of consumers, hence enhancing performance.

1.9.3 Pecking Order Theory (POT)

Pecking Order Theory (POT) developed by Myers and Majluf (1984) was also applied since RBT focuses on the internal resources of co-operatives, but ignores the external factors such as capital structure that may also affect performance. POT affirms that internal financing is preferred to external funding, which can only be used as the last option. Therefore, firms finance new investments by resorting to debt only when internal resources are insufficient (Murray and Goyal, 2003; Graham and Harvey, 2001). This theory basically implies that debt financing is suitable when internal cash flows are not enough to finance the expenditures (Myers, 1984). POT relies upon the concept of asymmetric information between managers and investors that guides the former in their preferences for raising funds (Mateos-Ronco and Guzman, 2018). According to this theory, firms opt for funding from sources with the lowest degrees of asymmetric information (Cole, 2013). In farmer co-operatives, details of this theory differ considerably from what occurs in IOFs, because co-operatives do not have access to outside equity. Therefore, when this option disappears from pecking order theory, decisions are reduced to choosing between members' internal equity or bank loans. Thus, pecking order theory suggests that farmer co-operatives can enhance their financial performance by using internal finance, with meager cost as first priority. POT was used to complement RBT in objective two, which misses capital structure aspect. The theory was used to explain whether IPFCs in the study area have the ability to generate resources through their internal funding.

1.9.4 Theory of Co-operative

Given that co-operatives are mainly managed and controlled by their members, this study applied the co-operative theory to explain performance from a co-operative point of view. Co-operative theory emerged from Adam Smith's idea of co-operation (1776) and developed by students of co-operation, particularly Emelianoff (1942) and Philips (1953), and further propounded by Helmberger and Hoos (1962).

Emelianoff (1942) and Philips (1953) focused on economic function of co-operative, while Helmberger and Hoos strongly viewed co-operatives as special firms, which is the essence of this study. Helmberger and Hoos (1962) assumed that in agricultural co-operatives, the manager would try to maximise member benefits by maximising co-operative profit.

The co-operative enterprise is conventionally held to be a non-profit institution guided by the principle of service at cost for the benefits of patrons. However, Emelianoff (1942) regards a co-operative as an aggregate of economic units, each fully retaining its independence in seeking profits. One of the objectives of co-operatives should be to maximise their net earnings in the same manner as an IOF maximises profits (Royer, 2014). Several reasons have been offered for why co-operatives might seek to maximise profits. By achieving this objective, a co-operative maximise fund available for patronage refunds or for internally financing growth and avoid hostility and retaliatory pricing by rival firms (Enke, 1945). According to Torgerson *et al.* (1998), co-operatives may have increasingly important roles to play in improving agricultural producers' access to markets and capturing value-added. As Georges Fauquet said, co-operative associations combine two elements; an association of persons and a common enterprise. This dual nature defines the social relationship between members in the association and the economic relationship between them and the enterprise (Fauquet, 1965). However, when the members abandon the dual status, it is generally because their co-operative is no longer functioning as a co-operative (Reynaud, 1989). The theory was used to supplement RBT and POT in objective two by explaining financial performance from a co-operative point of view. It was also used to explain co-operative performance in objective three. A combination of the three theories grounded objective two and was used to interpret and discuss descriptive and inferential statistics, from which contextual-based conclusions and suggestions were developed.

1.9.5 Agency Theory

Agency theory developed by Jansen and Meckling (1976), which explains the relationship between the principals and agents was used to supplement the above theories. Pecking order theory explains the financing preferences of co-operatives

while co-operative theory explains financial performance from co-operative point of view, but none account for the role of governance in influencing financing financial performance. Agency relationship is a contract under which one or more persons (the principal/s) engage another person (the agent) to perform some service on their behalf, which involves delegating some decision-making authority to the agent (Clarke, 2004). This is because of the separation of ownership and control when the owner of the company or the board of directors have to employ managers to run the business and need to monitor their performance to ensure they act in the owner's interest (Lan and Heracleous, 2010). Co-operative members (principal) elect board members and managers (agent) to carry out a task on their behalf.

Principal-agent problems occur because the agent's objectives are not the same as those of the principal, and consequently, the agent may not always best represent the principal's interest (Royer, 1999; Sykuta and Chaddad, 1999). It also arises when there is information asymmetry between the principal and the agent in addition to the conflict of objectives between the principal and the agent. According to the general formulation of the principal-agent model, if members cannot monitor managers' behaviour, this can prompt them to behave opportunistically by maximizing their interest (Russo, *et al.*, 2000). When the principal-agent problem occurs in a co-operative, members become dissatisfied with the services they get (Ortmann and King, 2007). To better align the goals of the agent with those of the principal, costs are incurred in structuring, administering, enforcing and adapting the terms of contracts. The primary focus of agency theory is on incentive and measurement problems (Mahoney, 1992). In agency relationship, the agent usually has more information than the principal about the details of individual tasks to be performed, actions to be done, as well as the abilities involved and preferences (Eggertsson, 1990). Mainly, agents often capitalise on the high cost associated with measuring their characteristics and performance, enforcing a contract, and engaging in opportunistic behaviour (Karaan, 1999). Most applications of agency theory focus on the incentive versus risk sharing trade-off of contracts aimed at aligning the agent's interests with those of the principal (Sykuta and Chaddad, 1999). Agent theory is thus very relevant to the institutional structure of co-operatives, because employed agents (managers)

may not act in the best interests of the co-operative principal (members) (Ortmann and King, 2007).

From the agency theory viewpoint, insight can be offered into how controlling critical resources offers better performance of farmer co-operatives. Several studies note that co-operatives experience more principal-agent problems than private-owned companies due to lack of capital market discipline, a clear profit motive, and the transitive nature of ownership (Richards *et al.*, 1998). Co-operatives may also have greater difficulty in designing incentive schemes for managers that will align their personal objectives with those of co-operatives (Ortmann and King, 2007). While governance prescription of agency is to design controls that enforce compliance, the ability of organization to grow and maintain business performance is related to effective governance practices (Nkundabanyanga, 2016). This study focuses on how agency theory can be applicable in farmer co-operatives and used as a theoretical ground and a controlling mechanism for governance through member's participation, accountability, transparency, policy compliance, leadership, and co-operative structure, to minimize the effect of opportunistic behaviour so as to achieve better financial performance. The theory was used in this study to achieve the objective three which examined the co-operative governance factors that affect financial performance of IPFCs

1.9.6 Neo-classical Theory of Co-operatives

Neo-classical theory of co-operatives was appropriate to complement agency theory, which examines the principal-agent relationship in co-operatives, but it assumes that agents are self-interested and opportunistic, which may not reflect the reality of co-operative values and principles. Neo-classical theory of the firm found in most of economic textbooks and papers (Marshall, 1890; Hart, 1989) is appropriate in this study as far as co-operative profitability is concerned. A co-operative must be economically and financially sustainable to achieve its benefits, though all benefits should be aimed at achieving its main objective of maximizing member returns (Royer, 2014). Similar to IOFs, profitability of the co-operative is essential. Both business structures are incorporated and have legal status separate from that of their membership or shareholders with limited liability (Cheong, 2006). In addition to economic benefits, the co-operative principles also promote social

objectives (Mooney and Gray, 2002). It could be challenging for co-operatives to adequately serve their members if their financial performance is not strong (Tekeste *et al.*, 2014). Neo-classical theory has complemented agency and co-operative theories to explain whether the sampled IPFCs are financially stable to improve the socio-economic transformation of their members in objective three. Neoclassical theory, along with resource-based theory, contributed to interpreting and discussing the findings of the fourth objective, which was to determine the influence of market orientation dimensions on the performance of IPFCs.

1.10 Conceptual Framework

The conceptual framework illustrates the relationship between variables and the approach used to connect all aspects that were included in the study. Studies report demographic and socio-economic factors that affect farmers' satisfaction. Some are connected with demographic factors of farmers (Ahmed and Mesfin, 2017; Ma *et al.*, 2018) and others are related to socio-economic status of farmers (Morfi *et al.*, 2021; Ahmed and Mesfin, 2017). Moreover, empirical review has reported the effect of co-operatives' characteristics, namely co-operative size, age, leverage, liquidity, number of employees, value of share capital, and membership size on co-operative financial performance (Singh *et al.*, 2019; Odhiambo, 2019; Muhammad and Diah, 2017; Rabirou *et al.*, 2013). Reviewed studies also found relationship between governance factors of member' participation, accountability, transparency, policy compliance, leadership and co-operative structure (Oyerogba and Oseni, 2021; Mariana *et al.*, 2020; Dayanandan and Huka, 2019; Diminah *et al.*, 2018; Aini *et al.*, 2012; Iliopoulos, 2012) and market orientation dimensions of customer orientation, competitor orientation, inter-functional coordination and customer orientation (Celikyay *et al.*, 2022; Kasim and Mustofa, 2021; Sisay *et al.*, 2017; Agirre *et al.*, 2014) to be the most important factors that affect performance of co-operatives.

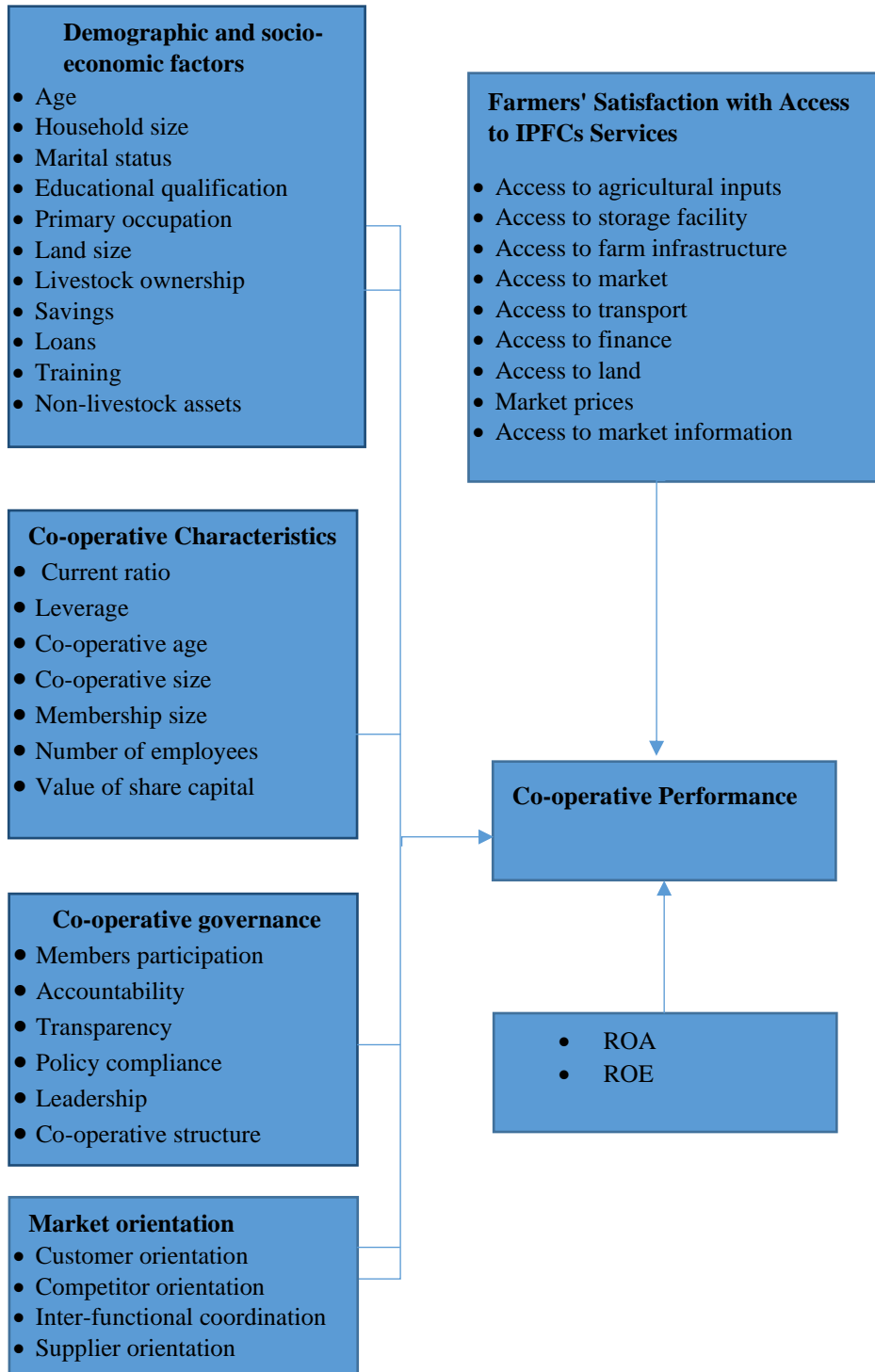


Figure 1.1: Conceptual Framework

1.11 Methodology

1.11.1 Research Philosophy

In view of the nature of the study, it was essential to employ the pragmatism philosophy, which recognises that there are various different approaches of interpreting the world and undertaking research with multiple realities (Saunders *et al.*, 2012). Pragmatism is based on the proposition that researchers should use philosophical approach that works best for the particular research problem that is being investigated (Tashakkori and Teddlie, 1998). In pragmatism, instead of method being dominant, the research problem is viewed as the most important concern (Creswell, 2003). Therefore, the adopted data collection methods and analysis are deemed to be the most likely factors to provide a deep insight into the research problem (Creswell, 2003; Mackenzie and Knipe, 2006). Pragmatism philosophy allows the use of mixed methods in finding answers for a phenomenon which cannot be answered by a single research method (Bentahar and Cameron, 2015). Therefore, pragmatism philosophy was appropriate to allow the use of mixed-method approach employed in this study.

Several researchers have stressed that pragmatism may give a philosophical foundation for the mixed research approach (Morgan 2014; Creswell and Clark, 2011; Biesta 2010), as its underlying assumptions provide the essence for mixing research methods. Moreover, Johnson *et al.* (2007) believe that pragmatism is an advanced philosophy that provides the scientific basis for combining quantitative and qualitative approaches. It is simply oriented toward solving practical problems in the real world rather than being built on assumptions about the nature of knowledge (Hall, 2013; Shannon-Baker, 2016).

1.11.2 Research Design

The study employed mixed-methods sequential explanatory design as recommended by different studies (Creswell, 2013; Creswell and Clark, 2017; Wipulanusat, 2020). This design was appropriate to examine correlation between variables. When used in combination, quantitative and qualitative methods complement each other and allow for more robust analysis, taking advantage of each (Green *et al.*, 1989; Miles and Huberman, 1994; Tashakkori and Teddlie, 1998). This design involves collecting and analysing quantitative data first, followed by qualitative data to

explain and enrich the quantitative findings. It emphasises the quantitative data (Creswell, 2011). The purpose of qualitative data is to discuss the results discovered in quantitative data and serves as means for triangulation and validation purposes (Creswell and Plano, 2011). This design was used in this study to explore the causal relationships between the variables of interest, as well as to understand the underlying factors that influence the performance of Irish potato farmer co-operatives in Rwanda.

1.11.3 Description of the Study Area and Population

The study was conducted in four separate Districts of Musanze and Burera in Northern Province and Nyabihu and Rubavu Districts in Western Province of Rwanda. These districts were selected considering their predominance in Irish potato farming (NISR, 2022). Due to their favourable climatic conditions, they are the most productive, accounting for about 64% of the national Irish Potato production in Rwanda (NISR, 2022). The market difficulties for farmers' production (Mugabo, 2018) and governance problems among IPFCs (Nkurunziza, 2019) reported in the above Provinces also contributed to the choice of the study area. The study targeted a population of 76 co-operatives with 25 332 members in the above Districts (NCCR, 2019).

1.11.4 Sampling and Sample Size

Given the nature of the study, a multistage sampling approach was employed. This method incorporates multiple steps of probability sampling techniques (Zikmund, 2003). Some scholars have used multistage sampling method in conducting research include Elias *et al.* (2016). In the first step, the above districts were selected purposively due to their predominance in Irish potato farming. In step two, a sampling frame was selected from a list of IPFCs obtained from National Co-operative Confederation of Rwanda. All active IPFCs with audited financial reports were chosen purposively in the selected Districts. Only 32 IPFCs satisfied the criteria for sample selection. In step three, using Yamane's (1967) formula, 387 members were computed from the population of 11 878 across 32 IPFCs (NCCR, 2019) as follows:

$$n = \frac{N}{1+N*e^2} \text{-----} (1.1)$$

Where n is the sample size, N is the population size and e is the margin of error (5%).

$$n = \frac{11878}{1 + 11878(0.05)^2} = 386.968 \approx 387$$

The number of members per co-operative selected was based on the proportionate distribution with Probability Proportional to Size (PPS) of co-operative membership (Appendix Table 1.1).

PPS formula (Kothari, 2004) was used as follows: $n_1 = \frac{nN_1}{N}$ ----- (1.2)

Where n_1 = number of samples in each co-operative, n = determined sample size, N = target population, N_1 = total number of population in each co-operative. Simple random sampling was then used to select the members to be included in the sample.

Initially, the sampled co-operative members were 382 from the population of 8 096 across 23 IPFCs. As recommended by Cooper and Schindler (2006), 30% of 76 co-operatives was enough to achieve the first objective, which was to analyse the determinants of farmers' satisfaction with IPFCs services. However, with the second, third and fourth objectives, which were to analyse the financial performance of IPFCs in relation to their co-operative characteristics, governance factors and market orientation dimensions respectively, the sample size was inadequate. In order to get a picture of the financial performance of IPFCs, literature (Riveros, 2020) suggests a sample size greater than 30 to obtain valid results in the regression analysis. Therefore, 23 IPFCs were increased to 32 with 387 sampled members from the population of 11 878. Only IPFCs that complied with audited financial reports were sampled to analyse their financial performance.

1.11.5 Data Collection Method and Tools

This thesis used both primary and secondary data sources. The former employed a structured questionnaire, Key Informants Interviews (KIIs) and Focus Group Discussion (FGD), while the latter was obtained from co-operatives' audited financial reports and administrative documents. As mixed-method research, both quantitative and qualitative data collection techniques and analysis were used, although predominated by quantitative ones. The purpose of this research method is

that both qualitative and quantitative methods, in combination, provide a better understanding of many research problems than either research approach alone. This method aims to provide sufficient information about the focus of the study than either research approach alone. It is also used to avoid biases inherent in a single technique (Creswell, 2009).

A structured questionnaire was designed to collect information from co-operative members. KIIs guide was applied to collect qualitative data from representatives of the National Co-operative Confederation of Rwanda, Irish Potato Federation, Chairpersons of co-operative unions, Districts' Co-operative Officers, Sector Executive Secretaries and all co-operative managers. Concerning FGDs, four were conducted with Board and Supervisory committee members. Two were held in large co-operatives and two in small co-operatives. Each FGD was composed of five Board Members of primary co-operatives and three members of supervisory committee. Furthermore, four FGDs were conducted with co-operative members. Two FGDs were also held in either co-operative size (large and small). Respondents having more ideas were excluded from individual interviews to avoid monotony and formed part of FGD. Secondary data extracted from audited financial reports were collected to analyse financial performance measured in terms of ROA and ROE for selected co-operatives. These ratios were reported by different researchers as the most popular value-based measures for financial performance of agricultural co-operatives (Zelhuda *et al.*, 2017; Taiwo and Adeniran, 2014).

1.11.6 Data Reliability and Validity

To ensure the quality of scales employed, it was checked whether they meet the criteria of reliability and validity. Prior to the actual study, field-testing of the data collection tools to rectify some unfamiliar terms was employed. Some questions were omitted, and the concepts, which were intended to be captured through the questions, were improved. In testing reliability, Cronbach's alpha (α) was employed; and the result indicated a good internal consistency of 0.885, which is above the acceptable standard of 0.7. A general accepted rule is that Cronbach's alpha values of 0.7 or higher indicate acceptable internal consistency (George and Mallery, 2003).

1.11.7 Data Analysis

Due to the fact that the study adopted mixed-methods sequential explanatory design, both qualitative and quantitative data were collected, which prompted the use of different analysis techniques. Each analytical technique applied is described in this section. For the first objective, service accessibility level among IPFCs members was measured by developing an index. In assessing the level of members' satisfaction, the Member Satisfaction Index (MSI) was developed using Factor Analysis (FA) with Principal Components Analysis (PCA) method. In testing the hypothesis, multiple regression analysis was employed to determine the demographic and socio-economic factors that influence members' satisfaction with access to co-operative services.

For the second objective, which was to examine the influence of co-operative characteristics on financial performance of IPFCs, the study employed secondary panel data which had a cross-section unit and time element. Panel regression analysis was used as it is suitable to deal with fixed effects (FE) or random effects (RE) error component presented in the model. Hausman test was used to assess which model is appropriate, FE model or RE (Hausman, 1978). Using panel data, the multiple regression model was employed to capture the relationship between co-operative-specific characteristics variables and financial performance.

For the third and fourth objectives, data were analysed with both descriptive and inferential statistics. To analyze perception of respondents, five-point Likert scale was used. Likert scale responses for each governance practice were converted into composite scores in continuous data, as recommended by Tabachnick and Fidell (1989) and Norman (2010). Interval size was calculated by subtracting the lowest category from the highest category and dividing by the total number of categories (Adel and Nahed, 2016). Moreover, inferential statistics were used to test the formulated hypothesis, including ANOVA, Pearson correlation, and multiple regression. The ideas behind the use of multiple regression analysis are statistical dependence of one variable, the dependent variable (ROA), on more independent variables (governance practices). Statistical assumptions were tested before running multiple linear regression. Using content analysis, qualitative data obtained from KIIs and FGDs were analysed to validate and triangulate quantitative findings. In

this case, the interview data were transcribed, sorted, and arranged. Subsequently, the information obtained was coded into different themes, which were further interpreted into meaningful information. Table 1.2 describes how themes and subthemes were created.

Table 1. 2 : Extract on Results of Thematic Analysis

Objective	Themes	Sub-themes
1	Satisfaction with IPFCs services	Agricultural inputs (cost, quality quantity and availability) Storage facility Farm infrastructure Financial services Market information
2	Co-operative characteristics	Share capital Membership size Age of the co-operative Type and value of asset Number of employees
3	Member participation	Meetings Election and voting Contribution to share capital Approval of bylaws Training and education
	Accountability	Compliance to rules and regulations Evaluation of board performance Code of ethics
	Transparency	Disclosure of financial reports Internal and external audits Availability of audited reports to members Decision making Required documents
	Policy compliance	Bylaws Internal rules and regulations Policies, procedures and guidelines
	Leadership	Election of leaders Leadership skills and experience
	Co-operative structure	Organs Functions, duties and responsibilities Board composition Meeting
4	Customer orientation	Quality, quantity, availability and packaging of products Prices Contract with customers Marketing
	Competitor orientation	Response to strengths and weaknesses of competitors Competitor pricing
	Inter-functional coordination	Discussion of customers' future needs Data on customer satisfaction Inter-committee meetings
	Supplier orientation	Contract with suppliers Capacity of suppliers Communication

1.12 Ethical Considerations

Ethical issues are common concerns in all types of researches (Orb, Eisenhauer, and Wynaden, 2000), particularly for qualitative inquiry practice. In this study, research ethics were observed as required by Moshi Co-operative University (MoCU) guidelines for postgraduate. A research clearance letter for data collection provided from the University (Appendix V) and research permit for data collection from the National Co-operative Confederation of Rwanda were obtained (Appendix VI). The principles of voluntary participation, anonymity and confidentiality, and academic honesty were observed. National Co-operative Confederation of Rwanda was promised to get a copy of the study results.

1.13 Organisation of the Thesis

Apart from preliminary pages, which include the title page, declaration, copyright, certification, dedication, acknowledgements, table of contents, list of tables, list of figures, abbreviations, acronyms and extended abstract, this thesis is organized into six chapters, four derived from publishable manuscripts. Chapter one entails the general overview of the study that formed the foundation of the whole thesis covering the background information, problem statement, study objectives, research hypotheses, justification of the study, theories underpinning the study, conceptual framework, general methodology, ethical consideration and organisation of the thesis. Chapter two is based on the first manuscript, titled “Determinants of Farmers' Satisfaction with Access to IPFCs Services”. It analyses the demographic and socio-economic characteristics of farmers' satisfaction with access to IPFCs services. The article has been published by *Springer International Publishing*, 413-440, 2023. available at https://doi.org/10.1007/978-3-031-25998-2_31.

Chapter three is derived from the second manuscript, titled “Influence of Co-operative Characteristics on Financial Performance of Irish Potato Farmer Co-operatives in Rwanda. It examines the influence of co-operative financial and non-financial characteristics on financial performance of IPFCs. The article has been published by *African Journal of Applied Research (AJAR)*, 8(2), 2020-239. Available at: <https://doi.org/10.26437/ajar.31.10.2022.15>. Chapter four is drawn from the third publishable manuscript, titled "Co-operative Governance and Financial Performance of Irish Potato Farmer Co-operatives in Rwanda". The

chapter examines co-operative governance factors that affect financial performance of IPFCs. The manuscript has been accepted and will be published by *African Journal of Co-operative Development and Technology (AJCDT)* in June, Vol. 7, Issue 1 (See Acceptance letter in Appendix VIII).

Chapter five has been developed from the fourth manuscript titled “Market Orientation and Financial Performance of Irish Potato Farmer Co-operatives in Rwanda. The chapter determines the influence of market orientation dimensions on performance of IPFCs. It is published online by *East African Journal of Science and Technology (EAJST)*, Vol. 12(1), 73-94, available at <http://ejst.unilak.ac.rw:8090/index.php/east/article/view/194>. Chapter six, which is the last, includes a summary of the study findings, conclusions, recommendations, study contribution, limitations, and areas for further research.

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Appendix 1.1: Sampled Co-operatives and Probability Proportionate to Size

Province			Membership Number	Probability Proportionate to Size (PPS)	
	District	Co-operative			
Northern		BUNYENYERI	412	14	
		ABASERUKANASUKA	268	10	
		KOTEMUSHI	150	6	
		KOHINIMU	92	4	
		Twizamure Nyabigoma	225	8	
		Abishyizehamwe	400	14	
		KABUKA	60	2	
		KOTEMUIGA	136	5	
		Musanze	KOJYAMUGA	95	3
			ISHEMA RY'UMUHINZI	205	8
			KTMKI	90	3
			COAIRUGA	480	17
		Burera	KOUGIKA	139	5
			KOABINYA	65	2
			KOAIKAKA	99	3
			KOABUTA	833	27
			COVMB	1 400	46
			KMIRJ	116	8
	Western		KOAIGIRUGA	925	30
			KOAIKAGA	484	16
		KOAIGAMU	128	4	
		CAPR IBIGWI	350	11	
		Nyabihu	KOAIRA	500	16
			KOZAMIR	328	11
			KOAIKARU	970	32
			KOAIBIGM	200	7
			KOZAMIKOKI	300	10
			KOKUMUJE	680	22
			IKEREKEZO	961	31
			KOKIKA	526	17
		KOTUGO	165	5	
	Rubavu	KOABINYARU	96	3	
		Total	11 878	387	

Source: Calculated from Secondary data, NCCR (2019)

CHAPTER TWO

2.0 DETERMINANTS OF MEMBERS' SATISFACTION WITH ACCESS TO IRISH POTATO FARMER CO-OPERATIVES' SERVICES IN NORTHERN AND WESTERN PROVINCES, RWANDA

2.1 Abstract

Satisfaction of members with services offered by co-operatives is key for a co-operative success. However, it remains questionable whether co-operatives have really achieved their expected objectives. This chapter analysed the determinants of members' satisfaction with access to services offered by Irish Potato Farmer Co-operatives in Northern and Western Provinces of Rwanda. The chapter employed mixed-methods sequential explanatory design. Service accessibility level among IPFCs' members was measured by developing an index. In assessing the level of members' satisfaction, satisfaction index was adapted. Demographic and socio-economic factors influencing members' satisfaction with Irish potato farming services were analyzed using multiple linear regression. The regression results indicate that only gender, primary occupation and livestock ownership significantly affected members' satisfaction with co-operative services. Findings reported a low level of members' satisfaction with farming services, and co-operatives in the study area failed to resuscitate their activities, forcing some members' exit from Irish potato farming activities. The findings of this chapter generate facts to inform IPFCs, community development partners, and policymakers about members' satisfaction with co-operative services and how they should be improved. In addition, the chapter contributes to the literature by analyzing members' accessibility to farming services and satisfaction with co-operative services in developing countries.

Keywords: Co-operative, Irish potato, Member' satisfaction, Co-operative services

2.2 Introduction

Worldwide, farmer co-operatives are considered to be the backbone of agricultural development (Ma *et al.* 2021) by offering an extensive range of services to smallholder farmers, including improved access to agricultural inputs, information communication, credit, agro-processing training, and extension (ILO, 2021; Lepe, 2016; Zheng and Song, 2011). Likewise, they serve to organise adequate storage facilities in collection centres, find markets for members' produce, promote improved technologies, and support farmers by strengthening their collective bargaining power (Seneerattanaprayul and Gan, 2021; Abebaw and Haile, 2013). However, smallholder farmers in developing countries face several challenges that include lack of improved technologies, access to agricultural inputs, improved storage facilities, managerial skills, weak bargaining power (Liu *et al.*, 2021; Zheng *et al.*, 2021; Grashuis and Dary, 2021) and poor access to credit services (Ma *et al.*, 2018).

The evolving function of farmer co-operatives has prompted many studies on the members' satisfaction with co-operative services. Morfi *et al.* (2021) and Morfi *et al.* (2015) have proved a strong relationship between co-operative membership and satisfaction with farming services. As stated by Grashuis and Cook (2019) and Tarekegn (2017), satisfaction of members is essential for a co-operative to achieve its goals and objectives. Satisfied co-operative farmers actively participate in their co-operatives' activities, hence the improved performance (Prasertsang *et al.*, 2020). Co-operatives should thus move beyond maximization of financial performance as their sole criteria of success and give priority to maximizing satisfaction of members' needs through offering a range of services that can improve their socio-economic status.

In Rwanda, co-operatives are central to national development (MINICOM, 2018). The government of Rwanda (GoR) expects a significant contribution of co-operatives in achieving Vision 2050 (GoR, 2020) and the National Transformation Strategy 2018-2024, which aims to accelerate the transformation and economic growth with the private sector (MINAGRI, 2018). GoR has established an environment conducive to the development of the co-operative movement. This encompasses law N° 024/2021 governing co-operatives and other regulations for

co-operative governance. The Government has also formulated a national policy of 2018 on the promotion of co-operatives to ensure that they are profitable and productive enterprises capable of delivering services and creating surpluses for themselves and their members. In addition, the Government collaborates with co-operatives in activities such as value chain development, research, and extension (MINICOM, 2018).

Furthermore, in 2002, the GoR launched a Crop Intensification Programme (CIP) to increase national agricultural productivity and food security. Irish potato was prioritised as one of the priority crops (FAO, 2016). Production of Irish potatoes covers 40.6% of the gross agricultural production value and 28.7% of the total cultivated area (NISR, 2016). Irish Potato Farmer Co-operatives (IPFCs) were chosen to be the strategic vehicle in improving the production. Given the Government policy to organize Irish potato farming, every farmer has to join IPFCs. The aim is to make co-operatives stronger to manage collection centers (Mbarushimana, 2018). Within IPFCs, farmers can easily get subsidies, financial credit, training on best farming practices, and storage facilities in collection centers to reduce exploitation by middlemen (MINAGRI, 2018). Despite the above initiatives, IPFCs failed to improve their services in the face of competition from private investors (FAO, 2015). Members of IPFCs in Rwanda are unsatisfied with market for their production due to speculative pricing by unscrupulous buyers. Consequently, they do business with private traders, which strongly affect performance of smallholder farmer co-operatives (Kanamugire, 2017).

While in a considerable number of studies (Grashuis and Cook, 2019; Singh *et al.*, 2019), performance assessment in co-operatives is dominated by financial ratios, researchers use the satisfaction of members with co-operatives services to measure the success of these organizations. Satisfaction of farmers with services offered by co-operatives as key for co-operative success (Sultana *et al.*, 2020; Marete, 2010) is viewed as an important measure of co-operative performance, and target for policy formulation (López-Ridaura *et al.*, 2002). However, there are still limited studies conducted on farmers' satisfaction with co-operative services.

In this perspective, this intended to fill the gap by analysing the determinants of members' satisfaction with the services offered by IPFCs in Northern and Western Provinces, Rwanda. This chapter specifically measured service accessibility level among co-operative members; assessed the level of members' satisfaction with IPFCs services, and determined demographic and social-economic factors influencing members' satisfaction with access to IPFCs' services. The rest of the chapter is organised into theoretical and empirical framework, methodology, results and discussion, and finally, conclusion and recommendations.

2.3 Theoretical and empirical framework

2.3.1 Expectancy Disconfirmation Theory

This chapter was guided by Expectancy Disconfirmation Theory (EDT). The EDT is a theory of customer satisfaction developed by Oliver (1977) and originated from a subject of study for antecedents of satisfaction (Anderson and Sullivan, 1993). Basically, the theory was developed to measure satisfaction of customers based on difference between their expectations and experience in perceived services (Spreng and Page, 2003). When the service or product offered to the customer cannot meet his expectations, negative disconfirmation arises and results in dissatisfaction (Oliver, 1980a). If this happens, most dissatisfied customers decide not to complain; instead, they exit the service (Osarenkhoe and Komunda, 2013). The theory was used to assess whether perceived services provided by IPFCs met members' expectations.

2.3.2 Empirical Review and Hypothesis Development

Access to farm inputs is one of the significant challenges expressed by co-operative and non-co-operative farmers (Ajah, 2015), which negatively impacts the overall agricultural production (Anglade *et al.*, 2021). Several studies (Sultana *et al.*, 2020; Abate, 2018 and Ajah, 2015) report the differences between the two groups of farmers, whereas other studies revealed benefits in favour of co-operative members (Grashuis and Su, 2019; Anderson *et al.*, 2014). A study by Ajah (2015) reported higher members' access level to agricultural inputs. Co-operative membership provides a secured market (Sultana *et al.*, 2020; Giagnocavo *et al.*, 2018), more access to loan and storage facilities (Ajah, 2015), improving bargaining power of smallholder farmers and market information (Serra and Davidson, 2021). In

Ethiopia, Abebaw and Haile (2013) observed a positive impact of co-operative membership on fertilizer adoption. Compared to farmers who are not in co-operative, co-operative farmers are more likely to access agro-chemicals among smallholder farmers in China (Ma *et al.*, 2018). Morfi *et al.* (2021) and Morfi *et al.* (2015) have proved a strong relationship between co-operative membership and satisfaction with farming services. The above discussion leads to the following hypotheses.

H₁ Service accessibility level among members of IPFCs is high

H₀₁ Service accessibility level among members of IPFCs is low

H₂ Members are satisfied with IPFCs services

H₀₂ Members are not satisfied with IPFCs services

There are different factors influencing members' satisfaction (Barham and Chitemi 2009; Hellin *et al.*, 2009). Some are connected with their demographic factors (Ahmed and Mesfin, 2017; Ma *et al.*, 2018) and others are related to their socio-economic status (Morfi *et al.*, 2021; Ahmed and Mesfin, 2017). Comparing older and younger smallholder farmers, the former are more satisfied with farming services than the latter (Lavis and Blackburn, 1990; Terry and Israel, 2004). However, Elias *et al.* (2015) oppose Lavis and Blackburn's study, stating that older farmers are often reluctant to engage in innovative activities fearing of risk. Education background and farm size were also reported as factors that influence farmers' satisfaction (Higuchi *et al.*, 2020; Ma *et al.*, 2018; Bernard and Spielman, 2009).

H₃ There is a relationship between demographic and socio-economic factors with members' satisfaction.

2.4 Methods

2.4.1 Research Design and Target Population

The chapter employed mixed-methods sequential explanatory design as recommended by different studies (Creswell, 2013; Creswell and Clark, 2017). This design involves collecting and analysing quantitative data first, followed by qualitative data to explain and enrich the quantitative findings. The purpose of qualitative data is to discuss the results discovered in quantitative data and serves as

means for triangulation and validation purposes (Creswell and Plano, 2011). This design was used in this chapter to explore the causal relationships between the variables of interest, as well as to understand the demographic and socio-economic factors that influence the members' satisfaction with IPFCs services. The study was conducted in Rwanda in Northern and Western Provinces. It included four separate Districts of Musanze, Burera, Nyabihu and Rubavu. The targeted population of this study was 76 co-operatives which had 25 332 members in the above Districts (NCCR, 2019).

2.4.2 Sampling Techniques and Sample Size

Given the nature of the study, a multistage sampling approach was employed. This method incorporates multiple steps of probability sampling techniques (Zikmund, 2003). In the first step, the above Districts in Northern and Western Provinces were selected purposively due to their predominance in Irish potatoes farming (NISR, 2017). In step two, in selecting IPFCs in the above Districts, 30% were selected as recommended by (Cooper and Schindler, 2006). Hence, a sample of 23 co-operatives out of 76 was selected. Purposive sampling was applied to ensure that large and small co-operatives are included in the sample. This was aimed at generating a real picture of satisfaction among IPFCs members. In this stage, the criterion was based on co-operative share capital, the number of active members and quantity of production. In step three, using Yamane's (1967) formula, 382 members were computed from the population of 8 096 across 23 IPFCs (NCCR, 2019) as follows:

$$n = \frac{N}{1+N*e^2} \text{-----} (2.1)$$

Where n is the sample size, N is the population size and e is the margin of error (5%).

$$n = \frac{8096}{1+8096(0.05)^2} = 381.17 \square 382$$

The number of members per co-operative selected was based on the proportionate distribution with Probability Proportional to Size (PPS) of co-operative membership. PPS formula adopted according to (Kothari, 2004) as presented below:

$$n_1 = \frac{nN_1}{N} \text{-----} (2.2)$$

Where n_1 = number of samples in each co-operative, n = determined sample size, N = target population, N_1 = total number of population in each co-operative. Simple random sampling was then used to select the members to be included in the sample.

2.4.3 Instruments and Data Collection Techniques

Data were collected using a structured questionnaire, Key Informants Interviews (KIIs), and Focus Group Discussion (FGD). A structured questionnaire was designed to collect information from co-operative members on demographic and socio-economic characteristics, accessibility to farming services and their level of satisfaction with co-operative services. KIIs guide was applied to collect qualitative data from representatives of the National Co-operative Confederation of Rwanda, Irish Potato Federation, and Chairpersons of co-operative unions, Districts Co-operative Officers, Sector Executive Secretaries, and all co-operative managers. Concerning FGDs, four were conducted with Board members and Supervisory committee; two were in large co-operatives and two in small co-operatives. Each FDG was composed of five Board Members of primary co-operatives and three members of supervisory committee. Furthermore, four FGDs were conducted with co-operative members (two from large co-operatives and two from small co-operative). The ones having more ideas were excluded from individual interviews to avoid monotony and formed part of FGD. To ensure the quality of scales employed, it was checked whether they meet the criteria of reliability and validity. Cronbach's alpha coefficient was used for that case and the result indicated a good internal consistency of 0.876 which is above the acceptable standard of 0.7.

2.4.4 Analysis and Model Specification

This section discusses the methodological approaches used to describe the services offered by IPFCs, members level of access to farming services, their level of satisfaction with co-operatives' services and analyses the factors influencing members' satisfaction with services provided. Descriptive statistics were used to describe the services offered. Service accessibility level was measured by developing Service Accessibility Index (SAI). The index was derived as follows:

$$SAI = \frac{\sum_{i=1}^t p_i}{t * n} * N \text{-----} (2.3)$$

Where SAI is the Service Accessibility Index, p_i stands for points of a sub-service, t is the number of sub-services, n number of respondents, N is the total number of services. SAI was developed to assess whether members were able to improve their accessibility to farming services.

The response weights were yes (1) and no (0). Thereafter, each service was allocated points, and all the points were summed to get the overall scores for service accessibility. The overall scores ranged from 0 to 23. This measure was finally divided into three categories after computing the mean score (5.3), median (5.0), minimum (1.0), and maximum scores (12). In this context, the categories were high service accessibility (5.1 to 23), moderate service accessibility (5.0), and low service accessibility (1.0 to 4.9). It has to be pointed out that the cut-off points were selected using the computed median.

In assessing the level of members' satisfaction, Member Satisfaction Index (MSI) was adapted from Fornell *et al.* (1996) using Factor Analysis (FA) with Principal Components Analysis (PCA) method. In developing the index, responses were assigned weights, strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1). The responses were thereafter subjected to Principal Component Analysis for data reduction. The respective weights from the set of statements were added up and divided by the number of statements that remained after data reduction to develop the index. Orthogonal Varimax (Variable Maximization) rotation was used to identify and group the causes that explain farmers' satisfaction. Variables with communalities greater than 0.5 and components whose Eigenvalue is at least 1 were selected. Finally, variables to merge were found in the Rotated Component Matrix.

$$MSI = \left(\frac{\sum_j x_{ij}}{X_m} \right) (i = 1, 2, \dots, x; j = 1, 2, \dots, m) \text{-----} (2.4)$$

Where MSI is the member satisfaction index, x_{ij} is the weight by respondent i to statement j on satisfaction, X_m represents the number of statements on each of satisfaction variables after PCA data reduction, and x denotes the total number of respondents.

The level of members' satisfaction was determined by calculating the interval size (Adel and Nahed, 2016). The interval size = $\frac{5-1}{5}=0.8$. Levels of satisfaction are presented below.

Strongly Dissatisfied	Dissatisfied	Moderately Satisfied	Satisfied	Strongly Satisfied
[1.00-1.8 [	[1.8-2.6 [	[2.6-3.4 [	[3.4-4.2 [	[ 4.2-5[

In testing the hypothesis guiding this chapter, multiple linear regression analysis was adopted to determine factors that influence members' satisfaction with the services of IPFCs. Multiple linear regression can be used with Likert scale data by using composite scores for each Likert responses in continuous value as recommended by Tabachnick and Fidell (1989) and Norman (2010). In this chapter, Likert scale responses of each satisfaction variables were transformed in a single composite score, which form continuous data and acceptable in social science research. Before running the model, normality of data was checked using Kolmogorov-Smirnov Test and Shapiro-Wilk Test. The test indicated that the data were not normally distributed. As recommended by Field (2009), data transformation was used to solve the problem. Therefore, data were transformed to the natural logarithm. Moreover, Tolerance and Variance Inflation Factor (VIF) was checked to explore the presence of multicollinearity and indicated that multicollinearity was not a problem in the model.

The following model was estimated:

$$Y = \beta_0 + \sum_{i=1}^{13} \beta_i X_i + \varepsilon \quad \text{-----} \quad (2.5)$$

Where Y denotes members' satisfaction which is measured in terms of five levels (Strongly Dissatisfied, Dissatisfied, Moderately Satisfied, Satisfied, and Strongly Satisfied), X_i are age, gender, household size, marital status, education qualification, primary occupation, land size, livestock ownership, savings, loan service, training, and non-livestock assets respectively, β_i are regression coefficients, and ε is the error term. Concerning description of variables as specified in the regression analysis (see Appendix Table 2.1). Qualitative data obtained from KIIs and FGDs were analysed using content analysis. The interview data were transcribed, sorted, and arranged in this case. Subsequently, the

information obtained was coded into different themes which were further interpreted into meaningful information.

2.5 Results and Discussion

2.5.1 Demographic and Socio-Economic Characteristics

Demographic and Socio-economic characteristics of heads of households are summarized in Appendix Table 2.2. The results indicated that among co-operative members, most of the respondents (69%) were male, while 31% were female. This result is roughly in accordance with what is revealed in Rwanda Co-operative Agency (2018); 60% of agriculture co-operative members are male and 40% are female. This is because most women are involved in housework, while men are interested in remunerated work.

Concerning the age of respondents, the current study was conducted to the population with an age group ranging between 16 and 74 years. The youth population (16-30) represents 7%, while the adults (31-74) represent 93% of the total respondents. Many young people are reluctant to engage in agriculture activities (FAO, 2018) and most of them do not own land. Co-operative members interviewed (61%) have attended at least primary school; 10% of member respondents have no formal education; only 28% have attended secondary schools, vocational training and university. This information concurs with what was revealed by Ministry of Agriculture and Animal Resources (2018), which stated that formal education in Rwanda among farmers is still low. The majority of co-operative members (90%) in the study area are married. This majority is due to the fact that agriculture is the sector absorbing the biggest part of the Rwandan population, and married people are mostly involved in farming activities, as they are responsible for survival of their families.

Regarding dependency ratio, which describes how much pressure working people face in supporting non-productive group, such as the children and elderly, it was revealed from the study area that the child dependency ratio is 98% or 98 children for every 100 co-operative members. Conversely, the elderly dependency ratio was 4.2%. This indicates that there is a little burden to support older people given that they are very few as the life expectancy is 58 years in Rwanda. It was also reported a total dependency ratio of 102.2%. This percentage still indicates how much

pressure working people face in supporting the elderly and the children in the study area. The above percentages are higher than those of the World Bank (2019), which reported the child dependency ratio of 70.3% and 5% for the elderly.

2.5.2 Service Accessibility Level among Members of IPFCs

As mentioned in the background section, co-operative members are expected to get an extensive range of services above what they can achieve individually at a lower cost. However, in spite of eminent benefits associated with membership in smallholder farmer co-operatives, not all smallholder farmers join co-operatives. As reported by different researchers, the reasons for not joining co-operative are linked with farmers' previous experience with co-operative mismanagement, high membership fees, which is a major limitation for poor farmers, delayed payment of members' deliveries, lack of trust for the management, meeting obligations and penalty for not showing up and not aware of membership advantages (Kayitesi, 2019; Balgah, 2019). This chapter measured service accessibility level among co-operative members by employing Service Accessibility Index as presented in Table 2.1.

Table 2.1: Service accessibility Level among members of IPFCs

Services	Accessibility	
	Score Index	Level
Agricultural inputs	7.0	High
Storage facility	1.6	Low
Agricultural implements	2.4	Low
Market	13	High
Transport	2.6	Low
Finance	2.2	Low
Land	2.8	Low
Market information	10.7	High
Extension and training	2.2	Low
Overall	4.9	Low

Results in Table 2.1 indicate that the services accessed by members interviewed were reported by several studies to be important in farming activities (Lepe, 2016; Abebaw and Haile, 2013). It is reported from the study that members have highly accessed agricultural inputs such as seeds, fertilizer, and pesticides with score index of 7. The problem remains the dissatisfaction with cost of inputs, as shown in Table 2.3. This could be explained by small number of co-operatives licensed to sell

agricultural inputs in the study area; only three co-operatives out of twenty-three are licensed to sell farm inputs. The results seem to corroborate with a study by Alemayehu (2008), which urged co-operatives to provide credits for agricultural inputs. Hence, members are supposed to have more access to inputs in their farming activities. However, members bemoan high cost of agricultural inputs compared to the income generated from selling Irish potatoes. One of the farmers in a FGD, elaborated on the issue, saying that:

"... Agricultural inputs are available to the market, but they are costly; in future, only large farmers will afford them. Our co-operatives fail to help us get the inputs at a reasonable price. As a result, we incur losses, and some farmers have shifted to other crops ... (FGD, 18 September, 2019).

This caption indicates that even though agricultural inputs are available to farmers, their cost is still higher than the revenue generated for some farmers. Usually, smallholder farmers join co-operatives with the expectation to get inputs at a lower price than other sources. However, as mentioned above, few co-operatives have managed to comply with conditions to be licensed as sellers of agricultural inputs. This has resulted in a market dominated by private traders imposing prices beyond the capacity of a smallholder farmer to afford.

Concerning storage facilities, the accessibility level is low (1.6), which is a challenge for potato farming in Rwanda. Furthermore, none of the IPFCs in the study area owns cold room storage. Consequently, farmers always rush into selling with no storage option even in case of lower prices. This issue was explained by a member of the supervisory committee who said:

"... As long as we do not have improved storage facilities to keep our harvests for an extended period, farmers will always be susceptible to exploitation by corrupt traders. We are incurring losses because, during harvest, we rush into selling for any price. We do not have financial capacity to construct improved storage; we need support from Government ..." (FGD, 14 October, 2019).

In KII with District Co-operative Officer (DCO), he has explained the mechanisms adopted by local Government to mitigate the problem:

"It is our responsibility to bolster co-operative sector; currently we have linked some of the co-operatives with an NGO called Post-Harvest and

Agribusiness Support Project (PASP) which has agreed to support in constructing storage facilities, and the activities are in progress" (KII, 19 October, 2019).

The above findings concur with FAO (2018), which reports lack of storage facilities in Rwanda. As a result, farmers sell their production at a low price during harvest to avoid damage.

Observations from the study further show the low level of accessibility (2.4 score index) to agriculture implements among co-operative members. None of them owns tractors or animal traction for cultivation in the study area. In contrast to the above services, co-operative members in the study area enjoy market for their production with 13.0 score index. Extension service and training is also an issue noticed in the study area. Generally, the above findings reveal a low level of service accessibility among co-operative members with overall score index of 4.9.

2.5.3 Service Accessibility in Co-operatives Compared with other Sources

Multiple response analysis was used to assess the source of farming services among co-operative members since they can get services from different sources. As presented in Table 2.2, only 15.3% of members have obtained agricultural inputs from co-operatives.

Table 2.2: Service accessibility in co-operatives compared with other sources

Farming services	Co-operative members' access (%)	
	From co-operative	Others sources
Agricultural inputs	15.30	84.70
Storage facility	15.20	84.80
Agricultural implements	0.00	100.00
Market	63.60	36.40
Transport	7.60	92.40
Finance	11.93	88.07
Land	3.70	96.30
Market information	61.67	38.33
Extension and training	33.20	66.80

This dampens members' enthusiasms from co-operatives that they joined with the expectation of obtaining services that could not be affordable from other sources. These findings lead to agree with Lepe (2016) who recommends that farmer co-

operatives should support smallholder farmers by offering an extensive range of services, including improved access to agricultural inputs.

Despite the ministerial order to sell Irish potatoes through co-operatives, as reported in Table 2.2, only 63.6% of co-operative members sell their production through co-operatives. An interviewed co-operative farmer in a FGD has given the reason saying:

"... We do not sell to co-operative due to their mode of payment; most of the time they do not have enough cash to pay immediately. Consequently, we prefer selling to private traders when we urgently need money ..." (FGD, 27 September, 2019).

This implies limited financial capacity among IPFCs in the study area, which constitutes a serious drawback to satisfaction of members.

In some of the co-operatives, it was observed that even when they have cash at bank, cash withdrawal requires permission from a local government authority, thus delaying co-operative activities. In FGD with board members, one said:

"... We are experiencing a big challenge: To withdraw our money from SACCO when we need to carry out any transaction, we are forced to get authorization from Sector Executive Secretary. This delays our activities when he is not in the office to approve. The other issue is that our co-operatives must pay through a bank account; farmers dislike this mode of payment, especially those living far from banks. Consequently, our member farmers decide to sell through private traders who are ready to pay immediately ..." (FGD, 13 October, 2019).

This interference of local authorities within the administration of co-operatives is a serious violation of the co-operative principle of autonomy and independence, which is a real indicator of poor management among IPFCs. Concerning the source of finance, only 11.93% of members have obtained credit through their co-operatives. This is a challenge for members to improve their production since they expect to get credit from their co-operatives at a lower cost than other finance sources. It was also observed in Table 2.2 that only 33.20 of members have accessed extension and training through co-operatives. The findings reveal that

there is much more yet to be done for members to boost their farming practices through provision of due services in accordance with principles and objectives of co-operatives.

2.5.4 Satisfaction Level among Members of IPFCs

In assessing the level of smallholder farmers' satisfaction, the Member Satisfaction Index (MSI) was developed. The level of satisfaction was determined by calculating the interval size as mentioned in data analysis and model specification. The satisfaction with agricultural inputs was assessed by acquisition cost, quality and quantity of inputs, and timeliness.

Table 2. 3: Satisfaction level among members of IPFCs

Service	Norther Province	Western Province
	Index	Index
Access to agricultural inputs	2.49	2.56
Access to storage facility	2.25	1.87
Access to farm infrastructure	1.73	1.68
Access to market	3.13	3.65
Access to transport	2.45	2.36
Access to finance	1.78	2.94
Access to land	1.72	1.91
Market prices	1.74	1.71
Access to market information	3.95	3.47
Extension and training	2.41	2.64
Overall statistics	2.36	2.48

As revealed in Table 2.3, co-operative members in both provinces were dissatisfied with agricultural inputs with 2.49 and 2.56 score indices in Northern and Western Provinces respectively. It was observed that most farmer members are dissatisfied with the availability, quality, and cost of inputs (seeds, fertilizer, and pesticides). As shown above, this issue is explained by a small number of co-operatives licensed to sell agricultural inputs in the study area. As observed, farmers are incurring losses due to high costs and poor quality of inputs. One of board members explained why agricultural inputs are costly and suggested the solution:

"... The cost of inputs is high compared to revenues from our sales. This is due to lack of competition; only one company in our area is authorized for that business. The authority should remove barriers and allow our co-operatives to enter this business; otherwise, we will continue suffering. We

are expected to sell the inputs to our members, but authorities are reluctant to authorize ..." (FGD, 23 September, 2019).

The above caption implies that few companies in the study area monopolize the sale of agricultural inputs. It is further noticed in Table 2.3 that IPFCs' members in both provinces were dissatisfied with storage facility (2.25 score index in Northern compared to 1.87 score index in Western Provinces). As long as there is no intervention to avail improved storage facilities, farmers will always rush into side-selling to avoid damages. Concerning farm infrastructure, findings also report dissatisfaction among members of IPFCs. There are no adequate roads for easy transportation of harvests in some areas. Lack of tractors for cultivation and irrigation facilities constitutes another challenge facing Irish potato farming in Northern and Western Province. Due to the lack of an irrigation system, farmers get losses during heavy rain and drought.

In contrast to the above services, members were satisfied with market for their harvests. However, despite ministerial order requesting all smallholder farmers to sell through co-operatives, some co-operative members are reluctant, as revealed in Table 2.2. Several factors explained the reasons, including lack of members' loyalty to their co-operatives. The interviewed respondents said that they were forced to join co-operatives as a condition to sell Irish potatoes, contrary to the co-operative principle of open and voluntary membership (ICA, 2006). As a result, most farmers lack co-operative ownership; there is no shared vision, and members are not interested in the growth of their co-operatives. It was also observed that some leaders of co-operatives in the study area sell to private traders; they all blame their co-operative for late payment.

The other factor influencing members' reluctance to sell through co-operative was due to dissatisfaction with the price, as indicated in Table 2.3. This dissatisfaction was explained by an interview in FGD with one of the board members, saying that:

"... Farmers are very dissatisfied with the prices of Irish potatoes. MINICOM sets prices, but private traders to whom we sell do not respect that ministerial order. We buy Irish potatoes from members at a price set by MINICOM and we get less than expected when we deliver them to Nzove wholesalers. We thus decide to buy from our members at a lower price to

avoid big losses; some members decide to sell to private traders. Furthermore, the price set by MINICOM is low compared to what a farmer expects, considering the cost of inputs. Again, when MINICOM's price is high, private traders abstain, and co-operatives buy from farmers and, subsequently, private traders buy from the co-operatives at a lower price ...” (FGD, 9 October, 2019).

Irish potato co-operatives operate in a market like any other business where supply and demand very often dictate the price. During April, October, and November, Irish potato production becomes abundant in the market, resulting in a price decrease, which is sometimes overlooked. Generally, both groups of farmers are dissatisfied with farming services. Mainly, the cost of inputs is very high compared with the revenue earned. Consequently, some farmers in both provinces have decided to exit for other businesses. To be successful, a co-operative is expected to perform its functions and strive to provide services for improved member satisfaction (Liebrand and Ling, 2014). The overall statistics in Table 2.3 revealed low level of members’ satisfaction with IPFCs as indicated by score indices of 2.36 and 2.48 in Northern and Western Provinces, respectively.

2.5.5 Regression Results

The main objective of this chapter was to determine the demographic and socio-economic factors influencing members' satisfaction with co-operatives' services. Multiple linear regression was adopted since all assumptions required were not violated. Appendix 2.3 shows that the independent variables statistically and significantly predict the values of dependent variable, $F(13, 529) = 45.983$, $p(0.000) < 0.05$, i.e., the regression model is a good fit of the data.

As revealed by multiple regression output, VIF used to detect multicollinearity among independent variables were less than 10, and all values of tolerance were greater than 0.1, indicating that multicollinearity was not a major problem in the model. Furthermore, results of the regression analysis in Appendix 2.3 indicates that, among demographic and socio-economic factors, only gender of household, primary occupation and livestock ownership significantly affected farmers' satisfaction with co-operative services, as their p value < 0.05 and primary occupation of household is significant at 10%.

The results indicate a negative and statistically significant relationship between gender of household and members' satisfaction with Irish potato farming services at five percent significant level ($p=0.024$). As presented in Appendix 2.2, male and female respondents are 69% and 31%, respectively. Given the small number of female-headed households, the negative relationship shows that females are more effective in managing farming activities than their counterparts in the study area, considering the low level of satisfaction with co-operatives' services observed among co-operative members. Regarding primary household occupation, it also has a negative and significant relationship with members' satisfaction with Irish potato farming services at a 10 percent significant level ($p=0.098$). As shown in Appendix 2.2, among heads of households, 99% practice Irish potato farming as their primary occupation. This implies that being restricted to the farming of Irish potatoes negatively affects the access to farming services since at the time a farmer experience poor production, it limits his/her ability to afford high cost of farming services for the next farming season contrary to the other farmer who adopts crop diversification. According to Elias *et al.* (2015), practicing off-farm activities to earn additional income helps to afford the expenses of service inputs.

The results also indicated a positive and highly significant relationship between livestock ownership and members' satisfaction with co-operative services at a 5 percent significant level ($p=0.010$). This implies that households with livestock are more likely to get cash income easily and improve their satisfaction with farming services than non-livestock assets. This is because, apart from manure to improve soil structure and fertility, as well as water retention, farmers can also get money to buy other agricultural inputs for improved farming satisfaction. According to Jabbar (1996), cash income earned in livestock supports purchasing food and farm inputs, such as fertilizers, pesticides, and seeds.

As shown in Appendix 2.3, loans and savings services among farmers have not significantly affected their satisfaction with co-operative services. This is due to the small number of farmers working with SACCOs and banks. Most of them opt for illegal money lenders, commonly known as Bank Lambert and solidarity tontine, which are informal and unreliable sources of finance, but effective in financing farming activities given their flexibility compared with banks and SACCOs, the

latter being mostly faced with liquidity and cash flow problems to provide demand-driven services to farmers. The effect of family size is negatively insignificant, implying that less satisfied farmers have more family members than highly satisfied ones. This is because a large number of family members increases expenses to sustain the family; hence, a hindrance to satisfaction with co-operative services. Age and educational background are not the factors contributing to farmers' satisfaction. This is explained by a large number of older (93%) and a high level of illiteracy among farmers in the study area. According to Elias *et al.* (2015), older farmers are often reluctant to engage in innovative activities fearing of risk.

2.5.6 Discussion of the Results

As result of the study, the hypotheses formulated were tested. Service accessibility index shows low level of co-operative members' access to farming services (H_1), the hypothesis is not supported, leading to accept null hypothesis (H_{01}). This result does not support the previous studies by Abate (2018), Ajah (2015), and Sultana *et al.*, (2020) who reported higher members' access level to farming services. According to Sultana *et al.* (2020) and Giagnocavo *et al.* (2018), co-operative membership provides a more secure market than non-co-operative farmers. Co-operative members have more access to agricultural inputs, loans, storage, and processing equipment than farmers who are not in co-operatives (Ajah, 2015). Co-operatives help their members to improve their bargaining power, and market information (Serra and Davidson, 2021).

The chapter also hypothesised that co-operative members are satisfied with IPFCs services (H_2). The result shows low level of members' satisfaction. The hypothesis is not supported, failing to reject null hypothesis (H_0), stated that co-operative members are not satisfied with co-operative services. The findings of this chapter do not conform to the study by Morfi *et al.* (2021) and Morfi *et al.* (2015) that proved a strong relationship between co-operative membership and satisfaction with farming services. Finally, in determining demographic and socio-economic factors affecting members' satisfaction (H_2), results indicate that gender, livestock ownership, co-operative membership, and off-farm income significantly affected farmers' satisfaction with access to co-operatives' services. In contrast, age, household size, marital status, educational qualification, land size, savings, loans,

farmers' training, and no-livestock assets do not affect farmers' satisfaction. The above result concurs with the study by Elias *et al.* (2015) who reported a positive and significant effect of off-farm income on farmers' satisfaction. Similar to the results of this chapter, Elias *et al.* further reported that age, education, and training did not significantly affect farmers' satisfaction. However, the findings of this chapter do not conform to the study by Higuchi *et al.* (2020), Ma *et al.* (2018) and Bernard and Spielman (2009) that reported education and farm size as socio-economic characteristics that differentiate satisfied and non-satisfied members, and Elias *et al.* (2015) who found that family size and credit significantly affect members' satisfaction.

In accordance with EDT, when actual performance of products or services does not meet customer's expectation, negative disconfirmation occurs. Findings in this chapter concur with what is hypothesised by EDT, because the study found that there was members' negative disconfirmation, as services offered by IPFCs in the study area did not meet their expectations. Consequently, as noticed, some dissatisfied members decided to exit Irish potato co-operatives for other businesses including a shift to other crops.

2.6 Conclusion and Recommendations

The results of the chapter show a low level of satisfaction with farming services among farmers in Northern and Western provinces. As observed, nothing can motivate non-co-operative farmers to join IPFCs in the study area since they suffer in the same way as co-operative members in accessing farming services. Nevertheless, Irish potato farmers in Western Province strive to be market-oriented compared to their counterparts in Northern Province, who mostly practice subsistence farming. In general, co-operatives in the area failed to resuscitate their activities, resulting in the exit of Irish potato farming activities for some of the farmers, as reported above. If this problem persists, it will negatively impact the overall production of Irish potatoes in Rwanda.

In the endeavour to improve Irish potato farming and enhance the level of farmers' satisfaction, it is recommended to the IPFCs, on the basis of research findings, to be market-oriented so as to be successful and provide the expected services to

members. They should also mobilise their members to work closely with financial institutions to improve their farming activities. Since private traders are the ones enjoying more benefits from Irish potato farming, with government support, co-operatives are finally recommended to change their existing Irish potato market channel by taking control and management of the whole chain of distribution from farm areas through collection centers to wholesale points in the city of Kigali.

It is recommended that the Ministry of Agriculture and Animal Resources provide storage facilities with cold rooms to help IPFCs cope with price fluctuation. Furthermore, Rwanda Agriculture Board is recommended to boost up research on seeds appropriate to a specific area and support Irish potato co-operatives to enjoy the privilege of selling agricultural inputs. On the other hand, Rwanda co-operative Agency is recommended to strengthen IPFCs' capacity building for self-governance to curtail the interference by local authorities within the administration of co-operatives. To deal with inadequate Irish potato seeds, Rwanda Agriculture Board is finally recommended to use the area of *Nyagahinga* in *Butaro* for seed multiplication given its favorable soil.

The findings of this chapter generate facts to inform IPFCs, community development partners, and policymakers about determinants of the farmers' satisfaction with co-operative services and how they should be improved to attract non-co-operative members instead of being forced to join co-operative as a condition to sell their products. In addition, the chapter contributes to the literature by analyzing farmers' accessibility to farming services and satisfaction with co-operative services in developing countries.

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Appendix 2.1: Description of variables as specified in the regression analysis

Variable Category	Variable name (X-covariates)	Variable Description
Demographic and Socio-economic and factors	Age	Age of respondent (in years)
	Gender	Gender of respondent (1=male, 0=female)
	Household size	Household size (in numbers)
	Marital status	Marital status of client (1=married, 0=otherwise)
	Educational qualification	Education of respondent (1 = no formal education, 6 = primary education, 12=secondary education, 13 = vocational training, 15 = tertiary education)
	Primary occupation	Primary occupation of head of household (1= farming, 0=others)
	Land size	Land size used for Irish potatoes (in acres)
	Livestock ownership	Livestock ownership (1= yes, 0= no)
	Savings	Savings per month (1=yes, no=0)
	Loan service	Loan service (1=yes, no=0)
Farmers' Satisfaction with Access to IPFCs Services	Training	Training (1=yes, no=0)
	Non-livestock assets (Radio, bicycle, cell phone, TV, motorcycle, hoes, pangas, rakes, spades, axes, slashers, sickles, watering cane, wheelbarrow, ox-ploughs, chemical sprayer, manual irrigation pumps, other agricultural implements.)	Non-livestock assets owned by farmers (1=yes, 0=no)
	Access to agricultural inputs	Strongly Dissatisfied [1.00-1.8[, Dissatisfied [1.8-2.6[, Moderately Satisfied [2.6-3.4[, Satisfied [3.4-4.2[, Strongly Satisfied [4.2-5[
	Access to storage facility	
	Access to farm infrastructure	
	Access to market	
	Access to transport	
	Access to finance	
	Access to land	
	Market prices	
Access to market information		

Appendix 2.2: Demographic and socio-economic characteristics of respondents

Variable		Frequency	Percentages
Gender	Male	265	69
	Female	117	31
	Total	382	100
Age	16-30	26	7
	31-74	353	93
	Total	379	100
Education level	No formal education	39	10
	Primary	234	61
	Secondary	69	18
	Vocation training	22	6
	University	18	5
	Total	382	100
Marital status	Single	37	10
	Married	345	90
	Total	382	100
Dependency ratio	Child		98
	Aged		4.2
	Total		102.2
Primary occupation of head of household	Farming of potatoes	378	99
	Other	4	1
	Total	382	100
Land size	< 50 acres	112	29
	[50 – 100 acres[	106	28
	≥100 acres	164	43
	Total	382	100
Livestock	Yes	312	82
	No	70	18
	Total	382	100
Savings	Yes	228	59.7
	No	154	40.3
	Total	382	100
Loan service	Yes	92	23.4
	No	302	76.6
	Total	382	100
Training	Yes	289	75.6
	No	93	24.4
	Total	382	100

Source: Survey Data (2019)

**Appendix 2.3: Demographic and Socio-Economic Factors of members'
Satisfaction with access to IPFCs services**

Model	Unstandardized Coefficients		Sig.	Collinearity Statistics	
	B	Std. Error		Tolerance	VIF
(Constant)	2.698	0.104	0.000		
Age	-0.001	0.001	0.494	0.626	1.598
Gender	-0.052**	0.023	0.024	0.750	1.333
Household size	-0.008	0.005	0.114	0.635	1.574
Marital status	-0.002	0.034	0.961	0.843	1.186
Educational qualification	0.002	0.004	0.559	0.659	1.517
Primary occupation of household	-0.087*	0.052	0.098	0.733	1.364
Land size	0.000	0.000	0.268	0.674	1.484
Livestock ownership	0.072**	0.028	0.010	0.768	1.302
Savings	-0.015	0.019	0.410	0.979	1.022
Loan service	-0.017	0.023	0.472	0.910	1.098
Farmers' training	-0.001	0.020	0.976	0.920	1.087
Non-livestock Assets	0.080	0.109	0.446	0.538	1.860
R	0.728 ^a				
R ²	0.531				
Adjusted R ²	0.519				
Df	13				
Residual	529				
F	45.983				
Sig.	0.000 ^b				

* = Significant at 10%, ** = Significant at 5%, *** = Significant at 1%

CHAPTER THREE

3.0 INFLUENCE OF CO-OPERATIVE CHARACTERISTICS ON FINANCIAL PERFORMANCE OF IRISH POTATO FARMER CO-OPERATIVES IN NORTHERN AND WESTERN PROVINCE, RWANDA

3.1 Abstract

The purpose of this chapter was to examine the influence of co-operative characteristics on financial performance of Irish Potato Farmer Co-operatives (IPFCs) in Northern and Western Provinces, Rwanda. The chapter employed mixed-methods sequential explanatory design. Purposive sampling technique was used in selecting IPFCs that comprise the study, only 32 IPFCs of 64 observations complied with audited financial reports for the period 2018 and 2019 were the primary data source used for the research. Key Informants Interviews (KIIs) and Focus Group Discussion (FGD) were employed for data collection. Panel regression analysis was used as it is suitable to deal with fixed effects (FE) or random effects (RE) error component presented in the model. Findings showed that liquidity, leverage, number of employees, value of total assets and value of share capital are significant factors that contribute to financial performance. The chapter reports limited financial capacity for most IPFCs in the study area, challenging their growth. Therefore, IPFCs are recommended to mobilise their members to increase their shareholding so as to raise capital for their co-operatives and thus improve performance level. This chapter generates facts to inform stakeholders such as policymakers and non-governmental organizations. In addition, the recommendations will mainly assist IPFCs in achieving desired financial performance and provision of expected services to members.

Keywords: Farmer co-operatives, financial performance, Co-operative characteristics, Irish Potato, Rwanda.

3.2 Introduction

Farmer co-operatives are the main pillars in facilitating socio-economic development of most countries globally (Sunghye and Sang-ho, 2020) and play an essential economic role in agricultural markets (Franken and Cook, 2015; Verhofstadt and Maertens, 2014). The substantial role of farmer co-operatives sparks intense curiosity about their financial performance. In response to the increasing number of co-operatives and their contribution to the economy, farmer co-operatives must be stable in financial performance for long-term survival (Zelhuda *et al.*, 2017). Unless the financial performance of co-operatives is healthy, it may be difficult for co-operative societies to sufficiently serve their members and contribute to the national economic development (Tekeste *et al.*, 2014). ROA and ROE were reported by different researchers as the most popular value-based measures for financial performance of agricultural co-operatives (Zelhuda *et al.*, 2017; Taiwo and Adeniran, 2014) and are frequently used by financial analysts who perceive that the higher return on equity and assets, the better the financial performance (Azis *et al.*, 2018).

In Rwanda, agriculture is the dominant sector of the economy, contributing a third of the country's GDP and about half of Rwanda's export earnings (NISR, 2017). The expansion of agricultural sector was specifically done through farming intensification and creating solid agricultural co-operatives (Meador and O'Brien, 2019). The Government views co-operatives as an essential vehicle to improve the agriculture sector, and the number of agricultural co-operatives in the country has increased very rapidly (USAID, 2013). In 2022, Rwanda reported approximately 11 019 registered co-operatives with 5 290 717 members, of which agricultural co-operatives cover 45.8% (Rwanda Co-operative Agency [RCA], 2022). The Government of Rwanda has thus established a conducive environment for co-operatives to operate, and this includes laws pertaining to co-operative activities, regulations guiding various governance bodies and entities of the co-operative movement based on hierarchical dependence (MINICOM, 2018). The Government also supports co-operatives in value chain development, research, and extension (ILO, 2017).

Furthermore, the GoR has launched a Crop Intensification Program (CIP) to increase national agricultural productivity and food security. Due to their contribution to the gross agricultural production, Irish potatoes were prioritised as one of the most important crops falling under the crop intensification program (FAO, 2016). Production of Irish potatoes covers 40.6% of the gross agricultural production value and 28.7% of the total cultivated area (NISR, 2016).

Despite various interventions by GoR to strengthen co-operatives, limited financial resources and financial dependence were revealed as significant challenges and constraints for developing co-operatives in Rwanda (MINICOM, 2018). These challenges therefore constitute one of the major concerns for cooperatives to provide the expected services to their members (Kanamugire, 2017; FAO, 2015).

There are many factors that influence financial performance of co-operatives, including leverage, co-operative size, and liquidity (Haat *et al.*, 2008), uncertainty, growth and capital intensity (Singh *et al.*, 2019). Zelhuda *et al.* (2017) have reported current ratio, leverage, net fixed asset turnover, investment, dividend, and co-operative size as factors contributing to financial performance of agricultural co-operatives. The number of board of commissioners, and co-operative age are also the other factors that affect financial performance (Lee, 2014). Several studies about agricultural cooperatives report more on their financial failure than their success (Beranová and Basovníková, 2014). In Europe, some co-operatives experience financial problems such as equity, credit and lack of capital (Ozalp, 2019; Pokharel *et al.*, 2019), while others report stable and satisfactory financial autonomy (Rebelo *et al.*, 2017). In developing countries, co-operatives' performance has proven to be largely poor (Masuku *et al.*, 2016). Generally, results from both developed and developing countries were inconclusive, hence creating a debate that compelled a study to address the gap. There are also limited studies that have taken into account the co-operative non-financial characteristics in the performance evaluation. This has therefore necessitated a study to address the gap by analyzing IPFCs' different financial and non-financial characteristics that influence their performance. Specifically, this chapter sought to: (i) Examine the influence of co-operative size on financial performance of IPFCs in Northern and Western Provinces (ii) Determine the influence of co-operative age on financial

performance of IPFCs in Northern and Western Provinces (iii) Examine the influence of leverage on financial performance of IPFCs in Northern and Western Provinces (iv) Determine the influence of liquidity on financial performance of IPFCs in Northern and Western Provinces (v) Examine the influence of number of employees on financial performance of IPFCs in Northern and Western Provinces (vi) Determine the influence of share capital on financial performance of IPFCs in Northern and Western Provinces and (vii) Examine the influence of membership size on financial performance of IPFCs in Northern and Western Provinces. The rest of the chapter is organised into theoretical and empirical framework, methodology, results and discussion, and finally, conclusion and recommendations.

3.3 Theoretical and empirical framework

3.3.1 Resource-Based Theory

The chapter was guided by Resource-Based Theory (RBT), which examines performance differences of organizations based on their resources (Peteraf and Barney, 2003). The theory explains how organizations maintain unique and sustainable positions in competitive environments (Hoopes *et al.*, 2003). RBT asserts that organizational resources are an essential factor influencing competitive advantage and performance (Othman *et al.*, 2015).

The central idea in RBT is that organizations compete against others on the basis of their resources and capabilities (Barney, 1991; Wernerfelt, 1984). Resources include any tangible or intangible assets that are semi-permanently tied to the organization (Caves, 1980). Similar to previous studies that elaborate performance of co-operative using RBT (Machado *et al.*, 2017; Othman *et al.*, 2015), the theory was used in this chapter to explain the effect of co-operative specific financial and non-financial characteristics, namely liquidity, leverage, co-operative size, age, membership size, number of employees and value of share capital on co-operative performance, unlike other theories of performance such as pecking order, trade-off, and signaling which restrict on capital structure. Based on RBT, organizations with adequate resources are expected to achieve desired performance and sustain competitive advantages. The theory was also used to determine which organizational resources contribute to a cooperative's sustainable competitive advantage.

3.3.2 Pecking Order Theory (POT)

To supplement the RBT, Pecking Order Theory (POT) developed by Myers and Majluf (1984) was also applied. The theory affirms that internal financing is preferred to external funding, which can only be used as the last option. Therefore, firms finance new investments by resorting to debt only when internal resources are insufficient (Murray and Goyal, 2003; Graham and Harvey, 2001; Myers, 2001). This theory basically implies that debt financing is suitable when internal cash flows are not enough to finance the expenditures (Myers, 1984). POT relies upon the concept of asymmetric information between managers and investors that guides the former in their preferences for raising funds (Mateos-Ronco and Guzman, 2018). According to this theory, firms opt for funding from sources with the lowest degrees of asymmetric information (Cole, 2013). In farmer co-operatives, details of this theory differ considerably from what occurs in IOFs because co-operatives do not have access to outside equity. Therefore, when this option disappears from pecking order theory, decisions are reduced to choosing between members' internal equity or bank loans. Thus, pecking order theory suggests that farmer co-operatives can enhance their financial performance by using internal finance, with meager cost as first priority. This theory was used to explain whether IPFCs in the study area have the ability to generate resources through their internal funding.

3.3.3 Theory of Co-operative

To supplement the RBT and POT, theory of co-operative developed by students of co-operation, particularly Emelianoff (1942) and Philips (1953), and further propounded by Helmberger and Hoos (1962) was applied. The theory was applied to explain the co-operative financial performance from a co-operative point of view. Historians have found evidence of cooperation between many groups of people in Europe, Middle East, America and Africa (Thomas and Hangula, 2011). According to Zimbelman (2007), early agriculture would have been impossible without reciprocal aid among farmers.

The co-operative enterprise is conventionally held to be a non-profit institution guided by the principle of service at cost for the benefits of patrons (Helmberger and Hoos, 1962). However, unless the financial performance of co-operatives is healthy, it may be difficult for co-operative societies to sufficiently serve their

members (Tekeste *et al.*, 2014). Several reasons have been offered for why co-operatives might seek to maximise profits. By achieving this objective, a co-operative will maximise funds available for patronage refunds or internally financing growth and avoid hostility and retaliatory pricing by rival firms (Enke, 1945). The theory was applied to explain whether IPFCs in the study area are financially stable for long-term survival.

3.3.4 Empirical Review and Hypothesis Development

This chapter aims at testing the effect of co-operative characteristics, namely co-operative size, age, leverage, liquidity, number of employees, value of share capital, and membership size on co-operative financial performance. Co-operative size is measured in terms of total assets a co-operative owns. Solano and Teruel (2007) reported that the size of a co-operative positively and significantly influences financial performance. Larger co-operatives are more efficient in utilizing their assets than smaller co-operatives; on the other side, smaller co-operatives are found to have higher profitability than larger ones (Singh *et al.*, 2019 and Pokharel, 2016). Previous results suggest that large co-operatives may enjoy the economies of scale in terms of efficiency, but the benefits of size do not necessarily translate into higher profitability (Singh *et al.*, 2019). Furthermore, the literature emphasizes that as co-operative size increases; the co-operative form of organizations becomes relatively less efficient because preferences become more heterogeneous among members (Hart and Moore, 1996). On the other hand, Loderer and Urs (2010) found that company's age influences its financial performance. Muhammad and Diah (2017) stated that any co-operative established for a longer period would be more experienced and usually has excellent performance. Therefore, the foregoing discussion leads to the following hypotheses.

H₀₁: Co-operative size has not significant effect on financial performance

H₁: Co-operative age has significant effect on financial performance

Debt financing is still the most common method co-operatives employ to acquire cash in times of need (Briggeman *et al.*, 2014). Previous studies reported that reliance on debt financing could positively or negatively affect the financial performance of both investor-owned firms and agriculture co-operatives. Boyd *et al.* (2007) find that higher leverage has a negative impact on ROE of agricultural

co-operatives. Larger co-operatives have lower financial leverage as external financing involves higher costs and increases risk; if incomes decline in the future, so will performance (Singh *et al.*, 2019). Moreover, agricultural co-operatives have achieved a higher performance with lower leverage, and they are better prepared to face any future uncertainty (Lerman and Parliament, 1991). According to Muhammad and Diah (2017), the higher rate of debt results in high financial risk, reducing the ROA. On the contrary, when debt is low, the financial risk is also low, leading to increased financial performance (Peni, 2011). The research conducted by Liargovas and Skandalis (2010) shows a correlation between leverage and financial performance. Majumdar and Chhibber (1999) have also found a negative relationship between financial performance and firm leverage. The above discussion leads to the following hypothesis.

H₂: Leverage has a negative and significant effect on financial performance

Liquidity shows the ability of the business to discharge its current liabilities and is measured in terms of Current Ratio (CR). According to Pandey (2010), the industry standard for current ratio is 2:1. If the current ratio is higher, the firm's ability to meet its current liabilities will be higher in terms of the margin of safety. Previous studies report inverse relationship between liquidity and financial performance. Tailab (2014) study found a positive and significant effect of liquidity on financial performance. The findings of Matar *et al.* (2018), Audax (2018), and Matar and Eneizan (2018) reveal a positive relationship between liquidity and financial performance. However, Mirza (2013), and Demirgünes (2016) conclude that liquidity in terms of current ratio has a statistically negative effect on financial performance. Furthermore, Rabirou, *et al.* (2013) report that the number of employees and amount invested influence financial performance. A study by Odhiambo (2019) found that co-operative membership size affects financial performance. The above discussion leads to the following hypotheses.

H₀₂: Co-operative liquidity has no significant effect on financial performance

H₃: Co-operative number of employees has significant effect on financial performance

H₄: Co-operative share capital has significant effect on financial performance

H₅: Co-operative membership size has significant effect on financial performance

3.4 Methodology

3.4.1 Research Design and Target Population

The chapter employed mixed-methods sequential explanatory design as recommended by Creswell (2013) and Creswell and Clark (2017). The study's target population was 76 IPFCs operating in the District of Burera and Musanze in Northern Province and Nyabihu and Rubavu in Western Province (NCCR, 2019). These areas were purposively selected given their predominance in Irish Potatoes farming compared to others. In addition, due to their climatic conditions, they are the most productive, accounting for about 64% of Rwanda's national Irish Potatoes production (NISR, 2022).

3.4.2 Sampling Techniques and Sample Size

Purposive sampling technique was used in selecting IPFCs that comprise the study. Only co-operatives with audited financial reports were taken purposively to examine their financial performance (NCCR, 2019). Given the bookkeeping problem facing co-operatives in the area (FECOPPORWA, 2018), 32 co-operatives have managed to avail their audited financial statements for two years (2018 and 2019). This requirement was essential since most IPFCs in the area were not audited since their establishment, leaving 32 IPFCs of 64 observations complied with audited financial reports for the period 2018 and 2019 were the primary data source (NCCR, 2019). The small number of IPFCs in the area is explained by reforms undertaken by RCA, including merging the co-operatives to improve their performance (Nkurunziza, 2019). Previous studies assessed the financial performance of co-operatives using a small number of observations (Singh *et al.*, 2019; Kagunda, 2018; Xaba *et al.*, 2018) and a period of two years (Dube and Ozkan, 2019; Xaba *et al.*, 2018.).

3.4.3 Instruments and Data Collection Techniques

To complement and validate quantitative findings, key informant interviews (KIIs) and focus group discussions (FGDs) were employed to obtain qualitative data. KII's guide was applied to collect data from all co-operative managers. Concerning FGDs, two were conducted with board members and the supervisory committee. Each FDG was composed of five board members of primary co-operatives and three members of the supervisory committee.

3.4.4 Analysis and Model Specification

The chapter employed secondary panel data which had a cross-section unit and time element. Variables such as co-operative liquidity, leverage, age, size, membership size, number of employees, and value of share capital data obtained from audited financial reports for 2018 and 2019, and administrative documents were analysed.

Panel regression analysis was used as it is suitable to deal with fixed effects (FE) or random effects (RE) error component presented in the model. Hausman test was used to assess which model is appropriate, FE model or RE (Hausman, 1978). This test is translated into the following hypotheses: H_0 : Random effect model is appropriate, H_a : Fixed effect model is appropriate. The results indicate $\text{Chi}^2=5.3$, $p\text{-value} = 0.2703$ for ROE and $\text{Chi}^2= 5.17$, $p\text{-value} = 0.2047$ for ROA, as $p\text{-values}$ are greater than 0.05 (Alpha). As a result, RE model is appropriate for both financial performance measures at the significant level of 0.05, as recommended by (Torres-Reyna, 2007). Using panel data, the following model was employed to capture the relationship between cooperative-specific characteristics variables and financial performance (ROA and ROE).

$$\text{ROA}_{it} = \beta_0 + \beta_1 \text{LIQ}_{it} + \beta_2 \text{DEBT}_{it} + \beta_3 \text{AGE}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{Mem}_{it} + \beta_6 \text{Emp}_{it} + \beta_7 \text{SCAP}_{it} + \varepsilon_{it} \text{-----} (3.1)$$

$$\text{ROE}_{it} = \beta_0 + \beta_1 \text{LIQ}_{it} + \beta_2 \text{DEBT}_{it} + \beta_3 \text{AGE}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{Mem}_{it} + \beta_6 \text{Emp}_{it} + \beta_7 \text{SCAP}_{it} + \varepsilon_{it} \text{-----} (3.2)$$

Where ROA and ROE are the financial performance measures in terms of Return on Assets and Return on Equity respectively, β_0 is a constant, $\beta_1 - \beta_7$ are regression model parameters, LIQ is liquidity, DEBT is leverage, Age is the number of years from the date of establishment of IPFC, SIZE is the value of total assets in \$, Mem is the membership size of IPFC, Emp is the number of employees of IPFC, SCAP is the value of co-operative share capital in \$, ε stands for the error term, i and t denote co-operative and time respectively. To supplement and validate quantitative outcomes, qualitative data obtained from KIIs and FGDs were analysed using content analysis to provide sensible and meaningful results. In this case, the interview data were transcribed, sorted, and arranged. Subsequently, the information obtained was coded into different themes, which were further interpreted into meaningful information.

Table 3.1: Description of variables as specified in the panel regression analysis

Variable Category	Variable name	Symbol	Variable Description	Expected sign
	Current Ratio	LIQ	Current Assets/Current liabilities	+/-
IPFCs Characteristics (Financial and non-financial)	Leverage	DEBT	Total liabilities/Total assets	+/-
	Co-operative age	AGE	Number of years	-
	Co-operative size	SIZE	Total assets in \$	+/-
	Membership size	Mem	Number of co-operative members	-
IPFCS Financial Performance	Number of employees	Emp	Number of employees	+
	Value of share capital	SCAP	The amount of share capital in \$	+
	Return on Equity	ROE	Net profit/total equity	
	Return on Assets	ROA	Net profit/total assets	

In order to deal with the possible problem of heteroscedasticity and serial correlation, the chapter uses robustness standard errors (Huber-White sandwich estimator) similar to previous studies (Avarmaa *et al.*, 2013). In addition, residual normality testing was carried out using Skewness and Kurtosis tests for normality as indicated in Appendix 3.2. This test has shown that the variables were not normally distributed. According to Risnawati *et al.* (2019), the robust method is used when data contain outliers and have abnormal distribution that affects the parameter estimator. After robustness, Skewness and Kurtosis test in Appendix 3.3 has shown the probability of Skewness of 0.8139, meaning that Skewness is asymptotically normally distributed (p-value > 0.05). Similarly, Kurtosis of 0.1767 is also asymptotically normally distributed (p-value > 0.05). Hence, residuals show normal distribution.

3.5 Results and Discussion

3.5.1 Co-operative Financial and Non-Financial Characteristics

Results in Appendix 3.4 indicate that 81.5% of IPFCs in 2018 and 65.62% in 2019 had share capital below \$5 000. This shows how IPFCs in the area suffer a shortage of share capital which is a considerable challenge to their growth, competitive posture and improved performance. During key informant interview, a co-operative manager has provided the following reason: ...*"in some of our co-operatives, it is not possible to increase capital through members' shareholding because our district fixes a maximum amount under the pretext of reported mismanagement..."* (KII, 19

October, 2019). This practice constitutes a big challenge for cooperatives to uphold the principle of autonomy and independence. The preferred way for a co-operative to raise capital is to enable members willing and able to subscribe to additional capital shares without voting rights (ICA, 2015). Lack of sufficient capital will always lead to dependence on government and donors, thus stimulating the interference of local authorities in the co-operative management and administration.

The total assets which measure the size of IPFCs are less than \$20 000 for about 78.12% of IPFCs in 2018 and 34.37% in 2019. As the value of share capital owned by co-operatives is not enough to finance the assets, their size remains small. However, the value of total assets has increased comparing the year 2018 and 2019. As reported in Appendix 3.4, only 6.26% of IPFCs had total assets valued between \$40 000 and 60 000, while in 2019, the number increased to 40.62%. The current ratio ranges between 9.1 and 12.0 for 40.62% of IPFCs in 2018 and 43.75% in 2019. The current ratio above 1 for all co-operatives indicates their ability to cover short-term obligations. As shown in Appendix 3.4, co-operatives in the area are characterised by labour shortages. Results indicate that 84.38% of IPFCs in 2018 and 68.75% only had one employee executing all co-operative managerial and other activities. Results indicate that 84.38% of IPFCs in 2018 and 68.75% in 2019, respectively, had only one employee executing all co-operative managerial and other activities. This could be explained by poor financial capacity among IPFCs to employ the required number of employees, which is a challenge to their performance.

3.5.2 Summary Statistics and Correlation of Variables

Table 3.2 reports the summary statistics of dependent and independent variables for IPFCs. As per the Table, the average ROA and ROE for IPFCs is 18.8% and 28.5%, respectively, which indicates that IPFCs have positive and satisfactory returns. Values for what are considered good levels for ROA and ROE can vary depending upon the farm circumstances and who is evaluating the farm. Generally, in agricultural co-operatives, a common benchmark for the ROA is a minimum of 8% while ROE is 10% (Kenkel, 2021). However, the information provided in Appendix 3.4 and 3.5 shows that 19(59.38%) out of 32 IPFCs reported ROA below 8%, while 18(56.25) reported ROE below 10%. This implies that the big number of IPFCs

reports unsatisfactory returns, which could be attributed to limited financial capacity in most of IPFCs in terms of small value of share capital as indicated in Table 3.2. According to Rabirou *et al.* (2013), the greater share capital held by co-operative, the greater its ability to improve its production and revenues.

In Table 3.2, it is observed that the mean LIQ in terms of current ratio is 6.989. A current ratio of 2:1 is considered normal for most business and acceptable standard universally (Harris and Fulton, 1996). It implies that IPFCs are keeping high liquidity; this is simply because members perform most of the co-operative activities which minimises cash outflow. In addition, the Table reports a lower average DEBT (0.334) than the industry standard (with a mean value of 0.50) showing that most of co-operatives use their internal finance, as reported by Dube (2019). In contrast to pecking order theory which affirms that internal financing is preferred to external funding; most IPFCs do not choose to use only their internal finance because they are sufficient, though their size is too small to comply with loan requirements. The following caption from one of the board members in a FGD said: “...*With a small capital, our co-operative cannot afford valuable non-current assets. Consequently, getting a bank loan is hard since we do not have collateral. As a result, improving our production will always be difficult...*” (FGD, 30 September, 2019).

IPFCs age has a mean of 3.719 from the date of establishment; the small number of years is explained by RCA's different reforms, including merging the co-operatives to improve their performance (Nkurunziza, 2019); some of IPFCs existed before merging. The mean number of IPFCs members is 379 with 60 and 1 400 minimum and maximum, respectively; this number is reasonable given the country's total number of agricultural co-operative members. As reported in the Table, the firm size measured in terms of total assets provides the mean value of \$31 979.21, and the standard deviation of \$44 033.96, which indicates a wide variance among all the IPFCs. Some of the IPFCs in the area do not even have their own building to accommodate their business activities. With a minimum of \$458.42 and a maximum of \$244 750, some IPFCs are large enough to finance their business, whereas others are smaller and cannot afford to achieve the desired performance. The mean value

of share capital of \$4 171.813 indicates a big challenge for IPFCs' performance and growth.

Table 3.2: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	64	0.188	0.189	0.01	0.88
ROE	64	0.285	0.237	0.01	1.21
LIQ	64	6.989	2.310	3.6	11.44
DEBT	64	0.334	0.204	0.06	0.750
AGE	64	3.719	1.061	2	9
Mem	64	379	326.745	60	1 400
Emp	64	1.344	0.623	1	3
SIZE	64	31 979.21	44 033.96	458.42	244 750
SCAP	64	4 171.813	4 880.619	390	28 416

Prior to using the panel regression model, Pearson correlation coefficient for examining the association between independent and dependent variables was applied. As reported in Appendix 3.1, when ROA is considered a measure of performance, Pearson correlation indicates a positive and significant relationship between LIQ, DEBT and IPFCs performance. On the other side, ROA is negatively and significantly correlated with IPFCs AGE and SIZE. LIQ and DEBT are also positively and significantly associated with ROE. The correlation matrix further tested the assumption of multicollinearity using the correlation matrix. As indicated, no multicollinearity problem exists since none of the variables correlate above 0.8 (Senaviratna and Cooray, 2019). Variance Inflation Factor (VIF) and Tolerance (1/VIF) were further used as a diagnostic test to ascertain whether there is any sign of multicollinearity among explanatory variables. When VIF is greater than 10 and 1/VIF is lower than 0.1, it implies poor estimates (Gujarati, 2004). As reported in Appendix 3.1, all VIF values are below 10, while all 1/VIF are greater than 0.1, indicating that multicollinearity among explanatory variables is not a major problem in the model.

3.5.3 Regression Results

This chapter applied regression analysis using data estimators to predict and estimate the effect of some explanatory variables on the dependent variables. Random effect model was used to analyse the impact of IPFCs' specific characteristics on their performance. Table 3.3 and 3.4 reports regression results

which identified the factors that affect the financial performance of IPFCs measured in terms of ROA and ROE, respectively.

Results of the regression analysis in Table 3.3 indicate that the value of overall R-square is 0.60, showing that all seven variables have described 60% disparity in financial performance measured in terms of ROA. Among co-operative specific characteristics, only LIQ, SIZE, and SCAP significantly affected ROA. As revealed, IPFCs leverage measured by total liabilities to total assets (DEBT) that examine the ability of IPFCs to meet their long-term financial obligations showed that DEBT has insignificant effect on ROA. This result supports the study by Singh *et al.* (2019) and Zelhuda *et al.* (2017), which reported that DEBT does not significantly influence ROA. This negative and not statistically significant relationship between DEBT and performance (ROA) supports Ferreira and Vilela (2004) arguments, saying that a higher rate of bankruptcy and default risk would arise due to leverage.

Table 3.3: Financial Performance (ROA)

Hausman test: $\text{Chi}^2=5.17$ (p-value = 0.2047)

ROA	Coef.	Robust Std. Err.	Z	P>|z|
LIQ	.04899***	.0145465	3.37	0.001
DEBT	-.1738274	.1602123	-1.08	0.278
AGE	-.0113764	.0276851	-0.41	0.681
MEM	-3.47e-06	.0000549	-0.06	0.950
EMP	-.0338348	.0259223	-1.31	0.192
SIZE	-1.61e-06***	5.92e-07	-2.72	0.007
SCAP	8.07e-06**	4.87e-06	1.66	0.047
_cons	.0014265	0.1607565	0.01	0.993
R ²	Within (0.55)	Between (0.69)	Overall (0.60)	
Prob (F Statistic)	0.000			

* = Significant at 0.1, **= Significant at 0.05, ***= Significant at 0.01

On the contrary, the result showed that ROA is positively and significantly affected by liquidity (CR), showing that when IPFCs invest their liquid assets efficiently, high returns are generated. The results are consistent with Takon and Ogakwu (2013) studies that support a positive significant relationship between liquidity and ROA. Moreover, these results depict the reality given by Resource-Based Theory (RBT), that firms with higher liquidity ratio have better performance due to the availability of financial resources to conduct business operations.

The negative coefficient of co-operative SIZE indicates that financial performance (ROA) is negatively affected by the value of total assets owned by IPFCs. This indicates that small IPFCs with a low value of total assets yield higher returns than large IPFCs. The literature emphasizes that as co-operative size increases; the co-operative form of organizations becomes relatively less efficient because preferences become more heterogeneous among members (Hart and Moore, 1996). Findings also reported a positive and significant relationship between SCAP and ROA. This result concurs with the study by Rabirou *et al.* (2013). The greater the share capital held by a co-operative, the greater its ability to improve production and revenue, hence the increase ROA.

The regression results in Table 3.4 indicate that the value of overall R-square is 0.76, showing that all seven variables have described 76% disparity in financial performance measured in terms of ROE. The estimated coefficients showed that LIQ, DEBT, EMP, and SCAP significantly affected ROE.

The estimated coefficients in the regression in Table 3.4 show a positive and significant relationship between LIQ and equity performance, indicating that IPFCs in the study area can respond to short-term obligations. This result supports the previous study by Zelhuda *et al.* (2017) and Waleed *et al.* (2016), who reported a positive effect of LIQ and ROE. However, findings from this chapter do not conform to the study by Liargovas and Skandalis (2010) that indicates a negative effect between liquidity and ROE. Furthermore, the results indicate a significant and negative relationship between leverage measured by total liabilities to total assets (DEBT) and ROE, implying that leverage increases the potential reward to the co-operative members, but also increases financial distress and business failure (Ross *et al.*, 2003).

Table 3 4: Financial Performance (ROE)Hausman test: $\chi^2=5.3$ (p-value = 0.2703)

ROE	Coef.	Robust Std. Err.	Z	P>|z|
LIQ	.0635955***	.0193387	3.29	0.001
DEBT	-.3731878**	.2068385	-1.80	0.041
AGE	-.0276797	.0187445	-1.48	0.140
MEM	.0000453	.0000526	0.86	0.389
EMP	.0537073*	.0281201	1.91	0.056
SIZE	-3.60e-07	3.80e-07	-0.95	0.343
SCAP	4.34e-06*	2.55e-06	1.70	0.089
_cons	0.1146658	0.2163748	0.53	0.596
R ²	Within (0.69)	Between (0.83)	Overall (0.76)	
Prob (F Statistic)	0.000			

* = Significant at 0.1, **= Significant at 0.05, ***= Significant at 0.01

The results of this chapter are consistent with Strykova (2017) findings that leverage (Debt ratio) has a substantially negative effect on ROE. Minnema and Andersson (2018) study demonstrates that debt has a significant negative relationship with ROE, meaning that firms which use less debt are generally more profitable. The literature states that a high return on equity results from low indebtedness (Fryndenberg, 2011). The pecking order theory predicts a negative relationship between debt and performance; the more profitable the firm, the better its self-financing capacity, and consequently, less debt will be needed (Mateos-Ronco and Guzman, 2018).

The positive coefficient of EMP indicates that co-operatives with an increased number of employees yield higher ROE. Furthermore, Rabirou *et al.* (2013) also reported that as a co-operative has the required staff, the co-operative increases its financial performance. However, it was observed from the chapter that most of IPFCs have only one employee, which is a big challenge to achieving desired performance. On the other hand, SCAP in (share capital) shows a positive significant relationship with ROE; this implies that IPFCs having higher members' share capital that is used efficiently improve their production and achieve higher ROE, compared to the IPFCs with lower members' share capital. The greater amount of share capital held by the co-operative, the greater its ability to make investments and other improvements to the running of the business. This chapter does not support Buluma *et al.* (2017) findings that found an insignificant effect of

the value of share capital on financial performance measured by ROE. The above findings concur with what was hypothesized by RBT, implying that IPFCs with the required number of employees, large amount of members' share capital, and higher level of liquidity have a better return on their investment.

Table 3.5: Summary of Panel Regression and Hypothesis Results

Hypotheses	Conclusions	
	ROA	ROE
H ₀₁ : Co-operative size has no significant effect on financial performance	Rejected (0.007<0.01)	Accepted (0.343>0.1)
H ₁ : Co-operative age has significant effect on financial performance	Not supported (0.681>0.1)	Not supported (0.140>0.1)
H ₂ : Leverage has a negative and significant influence on financial performance	Not supported (0.278>0.1)	Supported (0.041<0.05)
H ₀₂ : Co-operative liquidity has no significant effect on financial performance	Rejected (0.001<0.01)	Rejected (0.001<0.01)
H ₃ : Co-operative number of employees has significant effect on financial performance	Not supported (0.192>0.1)	Supported (0.056<0.1)
H ₄ : Co-operative share capital has significant effect on financial performance	Supported (0.047<0.05)	Supported (0.089<0.1)
H ₅ : Co-operative membership size has significant effect on financial performance	Not supported (0.950>0.1)	Not supported (0.389>0.1)

3.6 Conclusion and Recommendations

This chapter used panel regression analysis to examine the co-operative specific characteristics that contribute to their financial performance (ROA and ROE). The results showed that LIQ, DEBT, EMP, SIZE, and SCAP are significant factors contributing to the financial performance of IPFCs in Northern and Western Provinces. The findings revealed a limited financial capacity for most IPFCs in the study area, challenging their growth. This issue is explained by the limited amount of members' share capital fixed by the local authority following mismanagement reported from different IPFCs. Consequently, most IPFCs cannot afford the required assets to improve their production, including improved farm infrastructure.

Furthermore, given limited financial capacity, most IPFCs are challenged by the small number of management staff. Given the challenges mentioned above, IPFCs are not able to face competition from the better-prepared private traders. This is,

therefore, a big worry to provide the expected services to their members. Unless co-operatives' financial performance is healthy, it may be difficult for co-operative societies to sufficiently serve their members (Tekeste and Muthyalu, 2014).

In the endeavour to improve the financial performance of IPFCs, a joint effort from both the co-operatives and the Government is required. Based on research findings, IPFCs are recommended to mobilise their members to increase their shareholding, so as to raise capital for their co-operatives and thus improve performance level. IPFCs are also recommended to diversify their sources of revenues by investing in selling agricultural inputs. Furthermore, given that the size of most of IPFCs in terms of total assets is small, the Ministry of Agriculture and Animal resources should provide support by providing improved storage facilities and farm infrastructure to help IPFCs expand their businesses and improve their production for better performance.

Due to the limitation of this chapter, it is recommended that future studies consider other factors like legal, political factors, technological and cultural factors influencing the performance of farmer co-operatives. This chapter generates facts to inform stakeholders such as policymakers and non-governmental organizations. In addition, the recommendations will mainly assist IPFCs in achieving desired financial performance and provision of expected services to members.

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Appendix 3.1: Correlation Matrix and Variance Inflation Factor

	ROA	ROE	LIQ	DEBT	EGE	MEM8	EMP	SIZE	SCAP	VIF	1/VIF
ROA	1										
ROE	0.732**	1									
LIQ	0.681**	0.742**	1							4.02	0.165
DEBT	0.635**	0.714**	0.711**	1						4.02	0.166
EGE	-0.265*	-0.125	0.042	-0.050	1					2.03	0.248
MEM	-0.186	-0.060	0.004	0.016	0.543**	1				1.74	0.574
EMP	0.033	0.125	0.329**	0.303*	0.533**	0.439**	1			1.77	0.564
SIZE	-0.305*	-0.104	0.029	-0.043	0.737**	0.581**	0.408**	1		1.84	0.260
SCAP	0.219	0.218	-0.190	0.220	0.562	0.507**	0.329**	0.569**	1	1.83	0.547

** . Correlation is significant at the 0.01 level (2-tailed); * . Correlation is significant at the 0.05 level (2-tailed).

Appendix 3.2: Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
ROA	64	0.0000	0.0011	23.91	0.0000
ROE	64	0.0000	0.0024	21.11	0.0000
LIQ	64	0.3039	0.0123	6.70	0.0351
DEBT	64	0.0713	0.0795	5.96	0.0508
EGE	64	0.0000	0.0000	45.31	0.0000
MEM	64	0.0001	0.0417	15.66	0.0004
EMP	64	0.0000	0.0417	18.05	0.0001
SIZE	64	0.0000	0.0000	50.92	0.0000
SCAP	64	0.0000	0.0000	43.71	0.0000

Appendix 3.3: Skewness/Kurtosis test for Normality after robustness

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
Resid	64	0.8139	0.1767	1.96	0.3759

Appendix 3.4: IPFCs ROA in 2019

Ratio	Range	Co-operatives	
		Frequency	Percentage
ROA	<0.08	19	59.38
	0.08-0.18	06	18.75
	0.19-0.29	03	9.37
	0.30-0.40	02	6.25
	0.41≤	02	6.25

Source: Calculated from Secondary data, NCCR (2019)

Appendix 3.5: IPFCs ROE in 2019

Ratio	Range	Co-operatives	
		Frequency	Percentage
ROE	< 0.10	18	56.25
	0.10-0.20	02	6.25
	0.21-0.30	04	12.50
	0.31-0.40	04	12.50
	0.41≤	04	12.50

Source: Calculated from Secondary data, NCCR (2019)

Appendix 3.6: Co-operative Financial and Non-Financial Characteristics

Variable	Year 2018		Year 2019			
	Frequency	Percentage	Frequency	Percentage		
Share capital	Less than \$5 000	26	81.25	21	65.62	
	\$5 000-10 000	04	12.50	07	21.87	
	\$10 001-20 000	02	6.25	03	09.38	
	Over \$20 001	00	0.00	01	03.13	
	Total	32	100	32	100	
Total Assets	Less than \$20 000	25	78.12	11	34.37	
	\$20 000-40 000	05	15.62	4	12.50	
	\$40 001-60 000	02	06.26	13	40.62	
	Over \$60 001	00	0.00	04	12.50	
	Total	32	100	32	100	
Current ratio	≤ 3.1	00	0.00	00	0.00	
	3.1-6.0	08	25.00	09	28.12	
	6.1-9.0	11	34.38	09	28.12	
	9.1-12.0	13	40.62	14	43.75	
	12.1-15.0	00	0.00	00	0.00	
	15.1≤	00	0.00	00	0.00	
	Total	32	100	32	100	
Leverage	≤ 0.11	06	18.75	04	12.50	
	0.11-0.20	06	18.75	06	18.75	
	0.21-0.30	03	09.38	05	15.62	
	0.31-0.40	09	28.12	09	28.12	
	0.41-0.51	01	3.12	00	0.00	
	0.51≤	07	21.88	08	25.00	
	Total	32	100	32	100	
	Co-operative Age	Less than 3 years			00	0.00
		3-7			31	96.87
Over 7				1	3.13	
Total				32	100	
Membership size	Less than 200	11	34.38	12	37.50	
	201-400	10	31.26	09	28.12	
	401-600	05	15.62	05	15.62	
	601-800	01	3.12	01	3.12	
	Over 800	05	15.62	05	15.62	
	Total	32	100	32	100	
Number of employees	1	27	84.38	22	68.75	
	2	04	12.50	06	18.75	
	3	01	3.12	04	12.50	
	Total	32	100	32	100	

CHAPTER FOUR

4.0 CO-OPERATIVE GOVERNANCE AND FINANCIAL PERFORMANCE OF IRISH POTATO FARMER CO-OPERATIVES IN RWANDA

4.1 Abstract

Farmer co-operatives are considered the backbone of agricultural development and the main pillars in facilitating socio and economic development. However, their contribution is small in many countries due to governance problems. This chapter investigated the effect of governance on financial performance among Irish potato farmers' co-operatives (IPFCs). To address the objectives of the study, data were collected from 32 primary co-operatives that had complied with audited financial reports in Northern and Western Provinces. Questionnaire, focus group discussions and key informant interviews were used to collect primary data. Secondary data from audited financial statements were collected to analyse selected co-operatives' financial performance in terms of Return On Assets. Pearson correlation and multiple regression were used for data analysis. The results showed that members' participation ($b = 1.456$, $p < 0.001$), accountability ($b = 0.520$, $p < 0.047$), transparency ($b = 1.046$, $p < 0.001$), and leadership ($b = 2.813$, $p < 0.001$) are significant factors contributing to the financial performance of IPFCs. However, the relationship between policy compliance on financial performance, co-operative structure and financial performance was not statistically significant. As revealed, most IPFCs experience poor leadership to run their co-operatives smoothly. Based on the findings, Rwanda Co-operative Agency (RCA) and other community development partners should organise ongoing capacity-building training for IPFCs' leaders, to ensure self-governance and curtail the interference of local authorities within the administration of co-operatives under the pretext of reported mismanagement and poor leadership. This chapter generates facts to inform IPFCs, community development partners, and policymakers about the major factors that can affect the financial performance of farmers' co-operatives. In addition, the chapter contributes to the literature by analysing governance practices that affect the financial performance of agricultural co-operatives in developing countries perspective.

Keywords: Governance, Financial performance, Farmer co-operatives, Irish potatoes, Rwanda

4.2 Introduction

Farmers' co-operatives are considered the backbone of agricultural development (Lepe, 2016) and the main pillars in facilitating the socio and economic development of most countries (Sunghye and Sang-ho, 2020). However, their contribution is small in many countries due to governance problems (Matangaidze *et al.*, 2022; Hussein, 2020; Melak *et al.*, 2018). Lemmi and Nakkiran (2019); Wanyama (2014) reported adverse performance of co-operatives due to ineffective governance practices, which greatly affected the farmers' wellbeing and sustainable development. Governance is the key determinant of farmer co-operatives' performance (Uwaramutse *et al.*, 2021; Drona and Walsh, 2018). With inadequate governance in co-operatives, co-operative performance is impaired (Ricardo and Mery, 2019) and may be difficult for co-operatives to sufficiently serve their members and contribute to their socio-economic transformation.

Co-operatives are affected by both internal and external governance. Internal governance consists of co-operative by-law, policies, structures and decision-making process (Bijman *et al.*, 2014; Chambo and Diyamett, 2010) while external governance entails the process of co-operatives' interaction with their external stakeholders from either public or private sectors (Anania, 2021). This includes co-operative policy, law and regulation. Good governance is determined by how co-operatives retain autonomy and independence, assure mutual benefits, bargain, influence policy and other reforms, and protect co-operative identity and interest. In the Western world, co-operatives are independent of government and govern themselves according to the needs of their members (Johnson and Shaw, 2014). However, in most developing countries, it is different because co-operatives were primarily developed by states which did not prioritize the needs of co-operative members but rather put state interests first (Hammond and Luiz, 2016). Furthermore, inefficient leadership and limited financial control mechanisms among co-operatives in developing countries necessitate government oversight in their management and administration. Cooperatives should ensure effective internal governance and self-financing in order to limit the interference of government entities. Members should also be able to self-govern their cooperative without being influenced by the larger government's legal and policy framework.

Poor performance of co-operatives in different countries has prompted research about the functioning of governance practices within co-operatives. From the research by Drona and Walsh (2018) on governance practices and their impact on performance, legitimacy, participation, professionalization, accountability, and transparency were reported to be contributory factors to performance. Dayanandan and Dagnachew (2015) proved that poor performance of co-operatives depends on inadequate governance practices linked to members' participation, accountability, transparency, predictability, and the rule of law. Musuya's (2014) study on the poor financial performance of farmers' co-operative societies in terms of cash coverage and return on assets (ROA), governance practices challenges related to board size, board composition, and status of chief executive officer are among the factors that have hindered the financial performance of farmers' co-operatives. Lemmi and Nakkiran (2019) reported leadership problems in farmers' co-operatives as one of the challenges to their performance. Okonkwo (2017) has shown a weak relationship between members' participation and co-operative performance. Though, Mmari (2019); Mwendia, 2018; Hammad *et al.*, 2016 reported improved performance due to effective governance practices.

In Rwanda, agriculture is the dominant sector of the economy, contributing 31% of the country's Gross Domestic Product and employing about 70% of the country's working population (National Institute of Statistics Rwanda [NISR], 2018). The agricultural sector development was specifically done by creating strong agricultural co-operatives (Meador and O'Brien, 2019). The Government of Rwanda (GoR) views co-operatives as pivotal tools for achieving Vision 2050 and a number of Sector Strategic Plans (Ministry of Agriculture and Animal Resources [MINAGRI], 2018). GoR has thus established an environment conducive to the development of the co-operative movement. This encompasses law N° 50/2007 of 18/09/2007 determining the establishment, organization, and functioning of co-operative organizations in Rwanda, as amended in 2021, and other regulations guiding various governance bodies and entities of the co-operative movement (Ministry of Trade and Industry [MINICOM], 2018). The government has developed the national policy of 2018 on the promotion of co-operatives to ensure that co-operatives are profitable and productive enterprises capable of delivering services and creating surpluses for themselves and their members. The Government

also supports co-operatives in activities such as value chain development, research, and extension (International Labour Organisation [ILO], 2017). Due to their contribution to the gross agricultural production, Irish potatoes were prioritised as one of the most important crops falling under the crop intensification program (FAO, 2016). Irish Potato production was found to generate in average 57% of gross income per year and per household (Shimira *et al.*, 2020). Rwanda is ranked the third largest potato producer in Sub-Sahara Africa, second in East Africa (US Agency for International Development [USAID], 2016), and one of the top five potato-producing countries in Africa (FAOSTAT, 2015).

Despite the efforts of the government and private sector actors, the financial performance of farmers' co-operatives in Rwanda is questionable (MINICOM, 2018). Most are characterised by limited financial capacity, which challenges their growth, competitive posture, and improved financial performance (Uwaramutse *et al.*, 2022). As a result, there is high dependence on the Government and donor agencies (Niyonzima *et al.*, 2021). Moreover, most farmers' co-operatives face challenges that include low members' participation in decisions affecting their co-operatives, the extent to which local government officials get involved in the co-operative leadership, and mismanagement of co-operative fund (Nkurunziza, 2019). Moreover, lack of managerial skills among the staff and management in most co-operatives and non-compliance with co-operatives laws and regulations are other challenges facing co-operatives in Rwanda (RGB, 2018). These concerns cast doubt on how IPFCs governance is coordinated to ensure improved financial performance. Co-operatives may struggle to adequately serve their members and contribute to their socio-economic transformation unless their financial performance is strong.

Previous research has found that governance factors have a positive and significant impact on co-operative financial performance (Drona and Walsh, 2018; Tewodros, 2017; Hammad *et al.*, 2016; Munyasia, 2016). However, Omwenga (2017); Okonkwo (2017) have reported negative association between governance factors and financial performance of farmers' co-operatives. Furthermore, there are limited studies on co-operative governance and financial performance in Rwanda. As a result, the impact of governance and financial performance studies is inconclusive, given contradictory results from previous studies and contextual differences. This

chapter seeks to fill those gaps by investigating the impact of governance factors on the financial performance of Rwandan IPFCs. It specifically describes governance practices among IPFCs and identifies governance practices that affect the financial performance of IPFCs in the Northern and Western Provinces. The rest of the chapter is organised into theoretical and empirical framework, methodology, results and discussion, and finally conclusion and recommendations.

4.3 Theoretical and empirical framework

4.3.1 Agency theory

The chapter was guided by agency theory developed by Jansen and Meckling (1976). The theory explains the relationship between the principals and agents. Agency relationship is a contract under which one or more persons (the principal/s) engage another person (the agent) to perform some service on their behalf, which involves delegating some decision-making authority to the agent (Clarke, 2004). This is because of the separation of ownership and control when the owner of the company or the board of directors have to employ managers to run the business and need to monitor their performance to ensure they act in the owner's interest (Lan and Heracleous, 2010). In view of this, co-operative members (principal) elect board members and managers (agent) to carry out a task on their behalf.

Principal-agent problems occur because the agent's objectives are not the same as those of the principal, and consequently, the agent may not always best represent the principal's interest (Royer, 1999; Sykuta and Chaddad, 1999). It also arises when there is information asymmetry between the principal and the agent in addition to the conflict of objectives between the principal and the agent. According to the general formulation of the principal-agent model, if members cannot monitor managers' behaviour, this can prompt them to behave opportunistically by maximizing their interest (Russo, *et al.*, 2000). When the principal-agent problem occurs in a co-operative, members become dissatisfied with the services they get (Ortmann and King, 2007). To better align the goals of the agent with those of the principal, costs are incurred in structuring, administering, enforcing and adapting the terms of contracts. The primary focus of agency theory is on incentive and measurement problems (Mahoney, 1992). In agency relationship, the agent usually has more information than the principal about the

details of individual tasks assigned to him and, of course, his own actions, abilities, and preferences (Eggertsson, 1990). Mainly, agents often capitalise on the high cost associated with measuring their characteristics and performance, enforcing a contract, and engaging in opportunistic behaviour (Karaan, 1999). Most applications of agency theory focus on the incentive versus risk sharing trade-off of contracts aimed at aligning the agent's interests with those of the principal (Sykuta and Chaddad, 1999). Agent theory is thus very relevant to the institutional structure of co-operatives because employed agents (managers) may not act in the best interests of the co-operative principal (members) (Ortmann and King, 2007).

From the agency theory viewpoint, insight can be offered into how controlling critical resources offers better performance for farmers' co-operatives. Several studies urge that co-operatives experience more principal-agent problems than private-owned companies due to lack of capital market discipline, a clear profit motive, and the transitive nature of ownership (Richards *et al.*, 1998). Co-operatives may also have greater difficulty in designing incentive schemes for managers that will align their personal objectives with those of co-operatives (Ortmann and King, 2007). While governance prescription of agency is to design controls that enforce compliance, the ability of an organization to grow and maintain business performance is related to effective governance practices (Nkundabanyanga, 2016). This chapter focuses on how agency theory can be applicable in farmers' co-operatives and a theoretical ground for governance through member's participation, accountability, transparency, policy compliance, leadership, and co-operative structure, which is used as a controlling mechanism to minimize the effect of opportunistic behaviour so as to achieve better financial performance.

4.3.2 Theory of Co-operative

Given that co-operatives are mainly managed and controlled by their members, agency theory best fits with Investor-Owned Firms (IOFs). Thus, this chapter applied the co-operative theory to explain governance and financial performance from a co-operative point of view. Co-operative theory emerged from Adam Smith's idea of cooperation (1776) and developed by students of co-operation, particularly Emelianoff (1942) and Philips (1953), and further propounded by Helmberger and Hoos (1962). Emelianoff (1942) and Philips (1953) focused on

economic function of co-operative, while Helmberger and Hoos strongly viewed co-operatives as special firms, which is the essence of this chapter. Helmberger and Hoos (1962) assumed that in agricultural co-operatives, the manager would try to maximise member benefits by maximising co-operative profit.

The co-operative enterprise is conventionally held to be a non-profit institution guided by the principle of service at cost for the benefits of patrons. However, Emelianoff (1942) regards a cooperative as an aggregate of economic units, each fully retaining its independence in seeking profits. One of the objectives of co-operatives should be to maximise its net earnings in the same manner as an IOF maximises profits (Royer, 2014). Several reasons have been offered for why co-operatives might seek to maximise profits. By achieving this objective, a co-operative will maximise fund available for patronage refunds or for internally financing growth and avoid hostility and retaliatory pricing by rival firms (Enke, 1945). According to Torgerson *et al.* (1998), co-operatives may have increasingly important roles to play in improving agricultural producers' access to markets and capturing value-added. As Georges Fauquet said, co-operative associations combine two elements; an association of persons and a common enterprise (Fauquet, 1965). This dual nature defines the social relationship between members in the association and the economic relationship between them and the enterprise. However, when the members abandon the dual status, it is generally because their co-operative is no longer functioning as a co-operative (Reynaud, 1989). The theory was applied to explain the governance of IPFCs in relation to co-operative principles and philosophy.

4.3.3 Neo-classical Theory of Co-operatives

Neoclassical theory of the firm found in most of economic textbooks and papers (Marshall, 1890; Hart, 1989) is appropriate in this chapter as far as co-operative profitability is concerned. A co-operative must be economically and financially sustainable to achieve its benefits, but those benefits can be interpreted as strategies a co-operative might use to achieve its main objective of maximizing member benefits (Royer, 2014). Similar to IOFs, profitability of the co-operative is essential. Both business structures are incorporated and have legal status separate from that of their membership or shareholders with limited liability (Cheong, 2006). In addition

to economic benefits, the co-operative principles also promote social objectives (Mooney and Gray, 2002). By maximizing profit, a co-operative will maximize funds available for paying internally financing growth, and it can avoid hostility and retaliatory pricing by rival forms (Enke, 1945). Unless the financial performance of co-operatives is healthy, it may be difficult for co-operative societies to sufficiently serve their members and contribute to national economic development (Tekeste *et al.*, 2014). Neo-classical theory of co-operatives was applied in this chapter to explain whether IPFCs in the study area are financially stable for the members' benefits.

4.3.4 Empirical Studies and Hypotheses Development

This chapter aims at testing the effect of governance practices, namely members' participation, accountability, transparency, policy compliance, leadership and co-operative structure on co-operative financial performance. Participation of members in co-operative is directed by active participation in the co-operative activities, including attendance at annual meetings, participation in the decision-making process, and supporting business activities (Hammad *et al.*, 2016). It also entails collective leadership, open discussion and interaction. The financial performance of co-operative relies on the active participation of members in co-operative activities (Hammad *et al.* 2016). According to 'Aini *et al.* (2012), members' participation is essential for the financial performance of co-operative; even though members may not be actively involved in the administration, their opinion at annual general meetings is crucial. Harun *et al.* (2012) supported this by stating that the new perspective of the co-operative movement in strong membership contributes to the co-operative performance. Using binary logistic regression analysis, Othman *et al.* (2012) found that co-operative performance depends not only on the efficiency and effectiveness of management, but also on the members' participation, since members provide financial support for co-operative activities. they further stated that members' commitment and support of co-operative activities sustain their performance. The above discussion leads to the following hypotheses.

H₁ There is a statistically significant and positive relationship between member participation and financial performance.

H₀₁ There is no statistically significant and positive relationship between member participation and financial performance.

Gitonga and Miano (2020) describe accountability as the obligation and responsibility to explain actions and conduct. It is a monitoring system to check compliance with rules and regulations, board accountability and responsibility for performance results, and evaluation by the general assembly. Drona and Walsh (2018) examined the impact of good governance on performance of co-operatives in Nepal, employing Pearson correlation and multiple regression analysis. The findings revealed significant and positive relationship between accountability and financial performance of co-operatives. Similarly, Diminah *et al.*, (2018); Khafid and Nurlaili (2017) have also reported significant and positive relationship between accountability and financial performance of co-operatives. Furthermore, among several factors that influence a co-operative performance, co-operative accountability is deemed a strategic factor influencing a co-operative's performance. Based on the above discussion, this chapter hypothesized the following.

H₂ There is a statistically significant and positive relationship between accountability and financial performance.

H₀₂ There is no statistically significant and positive relationship between accountability and financial performance.

Transparency is one of the principles of governance; that means openness and willingness to provide clear information to shareholders and other stakeholders (Gitonga and Miano, 2020). It also involves openness and willingness to disclose timely and relevant financial information that is truthful and accurate, information on existing policies, and transparency on adopting new policies. In their study on the effect of governance on deposit taking savings and credit co-operative societies in Kenya, the above authors, using multiple regression analysis, reported adverse performance of co-operative due to non-disclosure of audit report, which greatly affected the trust of customers and shareholders. On the other hand, transparency promotes successful performance (Mariana *et al.*, 2020). In studies by Mwendia (2018); Mwanja *et al.* (2014), and Mmari (2019), transparency has also shown a positive relationship with the performance of co-operatives. A high level of transparency is fundamental to co-operative performance. The above discussion leads to the following hypotheses.

H₃ There is a statistically significant and positive relationship between transparency and financial performance.

H₀₃ There is no statistically significant and positive relationship between transparency and financial performance.

Co-operatives need a supportive policy framework to be sustainable, since it creates a large and vibrant co-operative sector (Mwanja *et al.*, 2014). They further stated that policy compliance could play a pivotal role in promoting the development of an independent co-operative movement. Kobia (2011) observes that co-operative policies include guidelines on the authority and duties of co-operative members as shareholders, function, and responsibilities of the board/management committee, values and strategies, co-operative communication, and monitoring performance of board/management committee. Additionally, effective co-operative policies involve members' awareness of bylaws, their ability to propose changes in the bylaws, board obligation to operate under a set of policies, procedures, and guidelines. A study by Iliopoulos (2012) found out that policies regarding board composition and member participation, selection of directors on the basis of expertise, all affect performance of co-operatives. He further added that formal institutional environment (laws and regulations) is the most influential factor that affects performance of agricultural co-operatives, and plays an important role in shaping the environment in which co-operatives operate. Mwanja *et al.* (2014) reported positive impact of co-operative policy compliance on financial performance. Wamalwa (2012) concluded that the introduction of regulations positively impacts the financial performance of co-operatives. Therefore, the foregoing discussion leads to the following hypotheses.

H₄ There is a statistically significant and positive relationship between policy compliance and financial performance.

H₀₄ There is no statistically significant and positive relationship between policy compliance and financial performance.

Dimitrios *et al.* (2013) said that leadership is an important driving force in any organisation, because it positively contributes to their success. To ensure that a firm is profitable, leadership is the key to achieving greater performance (Onchieku and Ragui, 2019). Dimitrios *et al.* (2013) put this into perspective by arguing that leadership inspires other members of an organization to reach their wise decisions,

which improves the viability of the business. The leadership capacity in rural co-operatives is directly related to literacy among its members, as leaders are usually elected from the member base (Lemmi and Nakkiran, 2019). Previous studies have reported a positive relationship between leadership and co-operative's performance (Lemmi and Nakkiran, 2019; Gutema, 2014). Dayanandan and Huka (2019) argued that efficient leadership is a cornerstone for the better performance of co-operatives that attract and retain members. They further added that effective co-operative leaders are crucial for determining the co-operative's performance. According to Emanu (2012), one of the problems facing co-operatives in developing countries is the low capacity of co-operative leadership. The above discussion, therefore, leads to the following hypotheses.

H₅ There is a statistically significant and positive relationship between leadership and financial performance.

H₀₅ There is no statistically significant and positive relationship between leadership and financial performance.

Co-operative governance structure specifies the distribution of the duties and responsibilities among different co-operative participants such as board, managers, members, and other stakeholders, and spells out the rules and procedures for making decisions (Musuya, 2014). It includes organs of co-operative and clear functions, duties and responsibilities of leaders, terms of leaders, types, and composition of board committees, nomination of board members, and board meetings. According to Wuryani (2019), within the co-operative organisational structure, there must be a division of tasks and authority so that each function can carry out the work correctly and be accountable for the job. He further stated that clear duties and powers facilitate the evaluation of responsibilities and authorities. Studies conducted by Musuya (2014); Rebelo *et al.* (2017) have revealed improved financial performance as a result of effective co-operative structure. Pang and Jinmeng (2018) argued that the composition of management and commitment of members contribute to better performance. Atty *et al.* (2018); Oyerogba and Oseni (2021) found that the size of the board of directors significantly affected financial performance. He has further concluded a significant relationship between the board of directors' meetings and financial performance. Based on the above discussion, this chapter hypothesized the following.

H₆ There is a statistically significant and positive relationship between co-operative governance structure and financial performance.

H₀₆ There is no statistically significant and positive relationship between co-operative governance structure and financial performance.

4.4 Methodology

4.4.1 Research Design and Target Population

The chapter employed mixed-methods sequential explanatory design as recommended by different studies (Creswell, 2013; Creswell and Clark, 2017). This design was used in this chapter to explore the causal relationships between the variables of interest, as well as to understand the governance factors that influence performance of IPFCs. The study was conducted in Northern and Western Provinces in Rwanda. It included four separate Districts of Musanze and Burera in Northern Province and Nyabihu and Rubavu Districts in Western Province. The targeted population was 76 co-operatives which had 25 332 members in the above Districts (NCCR, 2019).

4.4.2 Sampling Techniques and Sample Size

The Districts were purposively selected because of their predominance in Irish potatoes farming (NISR, 2017). Given that this chapter examined the financial performance of IPFCs, purposive sampling technique was used in selecting IPFCs that comprise the study. Only co-operatives with audited financial reports were taken purposively to examine their financial performance (NCCR, 2019). Given the bookkeeping problem facing co-operatives in the area (FECOPPORWA, 2018), 32 co-operatives have managed to avail their audited financial statements. Yamane's (1967) formula for sample determination was used in determining the sample size of the co-operative members from a population of 11 878 across 32 IPFCs (NCCR, 2019). Using Yamane formula, the sample size of co-operative members was computed as follows:

$$n = \frac{N}{1+N*e^2} \text{-----} (4.1)$$

Where n is the sample size, N is the population size and e is the margin of error (5%).

$$n = \frac{11878}{1 + 11878(0.05)^2} = 386.968 \approx 387$$

The computed sample size of co-operative members was distributed to each co-operative on the basis of Probability Proportional to Size (PPS), which is the quotient between the size of the population and the size of the sample. PPS formula adopted according to (Kothari, 2004) as presented below.

$$n_1 = \frac{nN_1}{N} \text{-----} (4.2)$$

Where n = determined sample size, N = target population, N_1 = total number of population in each co-operative, n_1 = number of samples in each co-operative. In selecting member respondents from the sample, a list of members in the selected co-operative was entered into Microsoft Office Excel to make a random selection.

4.4.3 Instruments and Data Collection Techniques

Given that the chapter used mixed-methods approach, both quantitative and qualitative data collection techniques and analysis were used. This method aims to provide sufficient information about the focus of the study than either research approach alone. It is also used to avoid biases inherent in a single technique (Creswell, 2009).

Data were collected using a structured questionnaire, Key Informants Interviews (KIIs), and Focus Group Discussion (FGD). A structured questionnaire was designed to collect information from co-operative members. KIIs guide was applied to collect qualitative data from representatives of the National Co-operative Confederation of Rwanda, Irish Potato Federation, chairpersons of co-operative unions, Districts' Co-operative Officers, Sector Executive Secretaries, and all co-operative managers. Concerning FGDs, two were conducted with board members and Supervisory committee. Each FDG was composed of five board members of primary co-operatives and three members of the supervisory committee.

Furthermore, two FGDs were also conducted with co-operative members. The ones having more ideas were excluded from individual interviews to avoid monotony and formed part of FGD. Secondary data extracted from the audited financial reports were collected in analysing financial performance measured in terms of ROA for the selected co-operatives. ROA was reported by different researchers as

the most popular value-based measure for financial performance of agricultural co-operatives (Zelhuda *et al.*, 2017; Taiwo and Adeniran, 2014) and is frequently used by financial analysts who perceive that the higher return on assets, the better the financial performance (Azis *et al.*, 2018).

To ensure the quality of scales employed, it was checked whether they meet the criteria of reliability and validity. Prior to the actual study, field-testing of the data collection tools to rectify some unfamiliar terms was employed. Some questions were omitted, and the concepts, which were intended to be captured through the questions, were improved. In testing reliability, Cronbach's alpha (α) was employed; its optimal figure depends on the purpose of the research (Churchill, 1979). Cronbach's alpha coefficient was used for that case, and the result indicated a good internal consistency of 0.885, which is above the acceptable standard of 0.7. A general accepted rule is that Cronbach's alpha values of 0.7 or higher indicate acceptable internal consistency (George and Mallery, 2003).

4.4.4 Analysis and Model Specification

Data were analysed with both descriptive and inferential statistics. The descriptive statistics used include frequency distributions, minimum, maximum, and mean. To analyze the perception of respondents about governance practices, five-point Likert scale was used. Likert scale responses of each governance practices were converted into composite scores in continuous data as recommended by Tabachnick and Fidell (1989) and Norman (2010). Interval size was calculated by subtracting the lowest category from the highest category and dividing by the total number of categories (Adel and Nahed, 2016). The interval size = $\frac{5-1}{5}=0.8$

Poor	Fair	Good	Very good	Excellent
[1.00-1.8 [	[1.8-2.6 [	[2.6-3.4 [	[3.4-4.2 [	[ 4.2-5]

Moreover, inferential statistics were used to test the formulated hypothesis, including ANOVA, Pearson correlation, and multiple regression. To perform multiple regression, the ROA for each of 32 IPFCs was assigned to its sampled corresponding members determined using probability proportional to size from a total of 387. ROA values were later regressed on governance practices converted into summed composite scores in continuous data as recommended by Tabachnick

and Fidell (1989), hence treated with parametric statistics without fear of wrong conclusion (Norman, 2010). This implies that financial performance of IPFCs was measured by comparing the selected co-operatives rather than their performance over a period of time. The following model was estimated to capture the relationship between governance practices and financial performance of sampled IPFCs.

$$\text{Performance} = \beta_0 + \beta_1 \text{MP} + \beta_2 \text{AC} + \beta_3 \text{TP} + \beta_4 \text{PO} + \beta_5 \text{LP} + \beta_6 \text{CS} + \varepsilon \text{ -----(4.3)}$$

Where Performance is co-operative performance; β_0 , Intercept; MP, members' participation; AC, accountability; TP, transparency; PC, policy compliance; LP, leadership; CS, co-operative structure; ε , error term. Qualitative data obtained from KIIs and FGDs were analysed using content analysis. In this case, the interview data were transcribed, sorted, and arranged. Subsequently, the information obtained was coded into different themes, which were further interpreted into meaningful information.

Table 4.1: Description of Variables as Specified in the Regression Analysis

Variable Category	Variable name	Symbol	Variable Description	Expected sign	Existing studies
Co-operative Governance	Members' Participation	MP	Active participation of members in the co-operative in terms of their attendance in meetings, decision-making, and others.	+/-	Okonkwo, <i>et al.</i> (2017); Hammad, <i>et al.</i> (2016); Huang, <i>et al.</i> (2015); Abdulahi and Pethronila (2011)
	Accountability	AC	Monitoring system to check compliance to rules and regulations, Board accountability and responsibility for performance results, and board evaluation by general assembly.	+	Diminah, <i>et al.</i> (2018) and Drona and Walsh (2018)
	Transparency	TP	Information of existing policies, transparency on adoption of new policies, communicating financial information and others.	+	Gitonga and Miano (2020) and Mwendia (2018)
	Policy Compliance	PC	Members' awareness of bylaws, their ability to propose changes in the bylaws, board obligation to operate under a set of policies, procedures, guidelines, and others.	+/-	Mwanja, <i>et al.</i> (2014)
	Leadership	LP	Leadership experience, understanding the concept of co-operative, interpersonal skills, efficient conflict solving abilities, required education level, adequate computer skills, financial management capacity, accounting, leadership, and managerial skills.	+	Lemmi and Nakkiran (2019); Mwanja, <i>et al.</i> (2014); Gutema (2014) and Ssekakubo <i>et al.</i> (2014)
	Co-operative structure	CS	Organs of co-operative and clear functions, duties and responsibilities of leaders, terms of leaders, types and composition of board committees, nomination of board members, and board meetings.	+/-	Musuya (2014) and Franken and cook (2013)
Financial Performance	Return on Assets	ROA	A measure of how efficiently a co-operative uses its assets to generate profits, calculated by Net profit/total assets.		Zelhuda <i>et. al.</i> (2017); Taiwo and Adeniran (2014) and Azis <i>et al.</i> (2018)

Before running multiple regression, the assumption of normality was checked using Kolmogorov-Smirnov and Shapiro-Wilk tests. Both tests indicated that the variables were not normally distributed. Data were transformed to the natural logarithm to solve non-normality issue as suggested by Field (2009) and still were not normally distributed. Though, parametric tests can be used with Likert data with no-normal distributions without fear of coming to the wrong conclusion (Norman, 2010). Furthermore, multiple regression assumes that the errors, which are the residuals between the actual score and the estimated score obtained through the regression equation, are independent, and there is no serial correlation (Stevens, 2009).

Durbin Watson test statistic was used to test the occurrence of serial correlation between residuals. Table 4.3 depicts a model summary table that includes a Durbin-Watson statistic of 1.748, which is between 1.5 and 2.5, as recommended by Garson (2012), and therefore, the data is not auto correlated. The correlation matrix in Appendix 4.1 further tested the assumption of multicollinearity using the correlation matrix. As indicated, no multicollinearity problem exists since none of the variables correlate above 0.8 (Senaviratna and Cooray, 2019). Variance Inflation Factor (VIF) and Tolerance (1/VIF) were further used as a diagnostic test to ascertain any sign of multicollinearity among explanatory variables. When VIF is greater than 10 and 1/VIF is lower than 0.1, it implies poor estimates (Gujarati, 2004). As reported in Appendix 4.1, all VIF values are below 10, while all 1/VIF are greater than 0.1, indicating that multicollinearity among explanatory variables is not a major problem in the model.

4.5 Results and Discussion

4.5.1 Summary Statistics

Table 4.2 reports the summary statistics of governance practices and financial performance of IPFCs obtained from Likert scale with five levels, Poor [1.00-1.8[Fair [1.8-2.6[Good [2.6-3.4[Very good [3.4-4.2[and Excellent [4.2-5[(Adel and Nahed, 2016). It includes minimum, maximum, and mean values. Regarding governance factors, findings reveal member participation mean value (3.8); accountability (3.6); transparency (3.3); policies (3.6); leadership (3.7); and co-operative structure (3.5). Except for transparency, there is an indication of a very good level of governance practices implementation among IPFCs, supported by the

overall mean of 3.6. Considering the maximum and minimum values in Table 4.2, it was observed that some IPFCs implement governance practices effectively while others experience inadequate implementation, which limits and impairs their performance. With inadequate governance in co-operatives, co-operative performance is impaired (Ricardo and Mery, 2019). Finally, summary statistics in Table 4.2 show a minimum value of ROA, which is 0.01 (1%) and a maximum of 0.66 (66%) with a mean value of 0.17 (17%). Consistently, the information provided in Appendix 4.3 shows that 19(59.38%) out of 32 IPFCs have reported the ROA below 8%. Generally, in agricultural co-operatives, a common benchmark for the ROA is a minimum of 8% (Kenkel, 2021). This implies that few IPFCs reports satisfactory returns while others are struggling to achieve desired performance. In a KII, one provided the reason:

“... Most IPFCs are not growing and achieving better financial performance since, during registration, they were not required to present their business plan showing how they will become financially self-reliant. Therefore, economic growth and financial performance are not possible because most are not doing business; they are socially but not business oriented ...” (KII, 19 October, 2019).

The above caption shows that most IPFCs in the study area violated the national policy on co-operatives in Rwanda, which requires all co-operative to have business plans in order to measure their performance.

Table 4 2: Summary Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Members’ participation	387	2.00	5.00	3.8019	0.614 99
Accountability	387	2.00	4.75	3.6176	0.678 88
Transparency	387	1.45	4.55	3.3162	0.796 55
Policies Compliance	386	2.00	5.00	3.5724	0.724 33
Leadership	387	2.43	4.65	3.6861	0.514 67
Co-operative structure	387	2.00	4.30	3.5437	0.526 63
Overall				3.5896	0.642 7
ROA	387	0.01	0.66	0.1688	0.1573 6
Valid N (listwise)	386				

4.5.2 Correlation Analysis

Pearson correlation coefficient was applied to examine the association between governance practices and financial performance of IPFCs. As reported in Appendix

4.1, the result shows a positive relationship between members' participation, accountability, transparency, policies, leadership, and co-operative structure with financial performance. This indicates that increase in member's participation, accountability, transparency, policies, leadership, and co-operative structure increase the financial performance of IPFCs in the study area. Factors of governance practices are positively related to financial performance.

4.5.3 Regression Results

This chapter applied multiple regression analysis to examine the aggregate effect of the independent variables on the dependent variable and determine the most influencing factors that affect the financial performance of IPFCs. The first output of interest was the good fit of the model (Table 4.3). This table presents the R, R², adjusted R² and the standard error of the estimates, which is used to determine how well a regression model fits the data. Results indicate that the value of overall R-square is 0.645, showing all seven variables have described 64.5% disparity in financial performance measured in terms of ROA. Moreover, 35.5% (100%-64.5%) of the variation results from factors other than the predictors included in the model. Adjusted R square is another essential factor to determine how well the model fits. A value of .640 in this chapter indicates that 64.0% of the variation in the outcome variable is explained by the predictors to keep in the model. Results of the F-ratio in the table tests whether the overall regression model is a good fit for the data. The table shows that the independent variables statistically and significantly predict the dependent variables, $F(6, 380) = 115.321, p < .005$, indicating that the regression model is a good fit for data.

Results from the regression analysis in Table 4.3 found that, among governance factors in IPFCs, members' participation, accountability, transparency, and leadership, significantly and positively affected the financial performance of IPFCs. In contrast, the co-operative structure has been found to have insignificant and negative effect on performance.

Table 4.3: Governance Factors Influencing Financial Performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-4.152	0.176		-23.581	0.000
Members' participation	1.456***	0.305	0.223	4.776	0.000
Accountability	0.520**	0.261	0.090	1.995	0.047
Transparency	1.046***	0.272	0.236	3.841	0.000
Policies	0.371	0.292	0.071	1.273	0.204
Leadership	2.813***	0.523	0.349	5.382	0.000
Co-operative structure	-0.535	0.393	-0.073	-1.361	0.174
R	.803				
R ²	.645				
Adjusted R ²	.640				
Durbin-Watson	1.748				
Df	6				
Residual	380				
F	115.321				
Sig.	.000				

* = Significant at 10%, ** = Significant at 5%, *** = Significant at 1%

Among all the explanatory variables, leadership was the most influencing factor that affected the financial performance of IPFCs ($b = 2.813$, $p < 0.001$). This result supports H₅, states that there is a statistically significant and positive relationship between leadership and financial performance, rejecting (H₀₅). The findings are in line with the previous studies that support the theoretical assumption that leadership positively influences financial performance of co-operatives (Lemmi and Nakkiran, 2019; Gutema, 2014). Effective leadership, which emphasises the leaders' technical, human, and conceptual skills, ensures a smooth run of the co-operative and successful performance. However, data from members shows knowledge gap among IPFCs leaders. FGD with a member reveals the following:

"... Leadership in our co-operative is poor; our leaders lack the necessary skills to manage co-operatives. Due to poor leadership and reported cases of mismanagement, we are experiencing a big challenge from government interference in the management of our co-operative. Local authorities are highly involved in decisions made by our co-operatives, including the nomination of leaders and financial decisions" (FGD, 13 October, 2019).

The above caption is supported by the information reported in Table 4.4, which shows that only 9% of supervisory committees have financial management capacity, 10% have managerial capacity; 10% have accounting skills, and only 15% have computer skills. This is a big challenge to the governance of IPFCs, since the

supervisory committee should be able to supervise the management of co-operative, monitor how the internal auditor discharges his/her duties, and check books of accounts in order to accomplish its duties as stipulated by Rwanda co-operative law (GoR, 2021), hence failure to address issues that affect day-to-day management of the co-operative. According to Rwanda Governance Board (RGB), there is lack of skills among the staff and management in most co-operatives, as hiring qualified personnel is not seen as cost beneficial (RGB, 2018).

Table 4.4: Governance Practices among IPFCs

Members' frequency of participation in co-operative activities (#387)	Never		Rarely		Frequently	
	F	%	F	%	F	%
Regular meetings	54	14	61	16	272	70
General assembly	13	3	52	14	322	83
Election and voting process	16	4	31	8	340	88
Discussions and decisions on finance and budget	24	7	76	21	278	72
Discussion on financial audit report	37	10	106	27	244	63
Approving the bylaws	49	13	19	5	319	82
Training and education	163	42	46	12	178	46
Co-operative structure (#32)						
Board members	Co-ops with five board members 24(75%)		Co-ops with below five members 8(25%)			
Supervisory Board	Coops with 3 Supervisory board members 22 (69%)		Coops with below 3 Supervisory board members 10(31%)			
Manager	Co-ops with managers 8(25%)		Co-ops without managers 24(75%)			
Internal Auditor	Co-ops with internal auditor 2(6%)		Co-ops without internal auditor 30(94%)			
Transparency (#32)						
Co-operatives that make their financial reports public on notice board	Co-ops with financial reports made public on notice board 3(9%)		Co-ops which do not make financial reports public on notice board 29(91%)			
Leadership and managerial skills						
Leadership skills	Member of supervisory board (#81)		Managers (#8)			
Computer skills	12(15%)		8(100%)			
Financial management capacity	7(9%)		6(75%)			
Accounting skills	8(10%)		6(75%)			
Managerial skills	8(10%)		6(75%)			
Accountability (#32)						
Number of co-operatives with reported cases of mismanagement and corruption by some of elected officials	None 14(44%)	1-5 Cases 12 (37%)	6-10 Cases 6(19%)	Over 10 Cases 0(0%)		

However, despite poor leadership skills in some IPFCs, government interference is against the co-operative principle of democratic member control. Co-operatives are

democratic organisations controlled by their members, who actively participate in setting their policies and making decisions (International Co-operative Alliance [ICA], 2015). The challenge co-operatives interfacing with government is achieving adequate support without undue government influence over co-operatives. In extremis, co-operative will be challenged to resist the tendency of some politicians, who do not understand the nature and benefits of co-operative society, to seek demutualisation and destruction of co-operatives (ICA, 2015). The major obstacle to co-operative progress in Africa is undue control and interference in the daily running of the business. Government should not interfere but intervene by ensuring that political, legal and administrative platforms are in place to help co-operatives develop (Hammond and Luiz, 2016). Independence from the government does not exclude it from recognizing the value of co-operatives and supporting their development. This can be done by legislation and policies that promote the development of co-operatives while preserving their independence and autonomy (ICA, 2015). As per co-operative principle of education, training and information, IPFCs should keep their members and staff educated, informed and trained to govern their co-operatives without an external influence and make their co-operative successful. One of the Board members further said:

"... Since 2015, our co-operatives experienced the interference of two companies involved in the management of collection centres and sale of Irish potatoes. Initially, they were assigned to deal with the alleged disorganization in selling Irish potato produce, ensuring security, and dealing with unscrupulous buyers. However, it is observed that the companies took over the Irish potato business to the detriment of farmers and co-operatives. This problem has severely hindered the growth of our co-operatives and the individual benefits of farmers ..." (FGD, 13 October, 2019).

This caption indicates that poor leadership among some IPFCs encourages local authorities' involvement in co-operative administration. For co-operatives to be independent, they should ensure effective internal governance and performance in order to limit the interference of government entities. According to Gutema (2014), the performance of farmers' co-operatives depends on effective leadership. Co-operative with poor leadership is more likely to be forced out of the market by more efficient organisations.

The estimated coefficients in Table 4.3 also show a positive and significant relationship between member participation and performance ($b = 1.456$, $p < 0.001$). The result supports H_1 , namely that there is a statistically significant and positive relationship between member participation and financial performance, leading to reject null hypothesis (H_{01}). As observed, co-operative with the active participation of members in co-operative activities, including active attendance at meetings, decision-making process participation, and supporting business activities, showed improved performance (ROA). Findings in Table 4.4 indicate a good level of members' participation in co-operative activities. As revealed in the table 4.4, 70% of members participate frequently in regular meetings, 83% attend general assembly frequently, 88% participate frequently in election and voting process, 72% participate frequently in discussions and decisions on finance and budget, 63% participate in discussions of financial audit report, and 82% frequently participate in approving the bylaws. This result supports the study by Hammad, *et al.* (2016) and Mahazril'Aini, *et al.* (2012), which reports a positive and significant relationship between member participation and ROA, suggesting that active participation of members in co-operative activities would help to maintain the direction of the co-operative and ensure its success in the long term. However, findings from this chapter do not conform to the study by Okonkwo, *et al.* (2017) which indicates a negative effect of member participation on co-operatives financial performance.

Results have also shown a significant and positive relationship between transparency and performance ($b = 1.046$, $p < 0.001$). This result supports H_3 , states that there is a statistically significant and positive relationship between transparency and financial performance, rejecting null hypothesis (H_{03}). IPFCs with high level of transparency are expected to achieve better performance. Transparency involves information about existing policies, transparency on adoption of new polices, and openness and willingness to disclose timely and relevant financial information that is truthful and accurate. The above results concur with the study by Gitonga and Miano (2020); Mwendia (2018) who reported adverse performance of co-operatives due to non-disclosure of audit report, which greatly affected the trust of the customers and members. However, as shown in Table 4.4, only 3(9%) of IPFCs post their financial reports on the notice board, posing a challenge to transparency in most of IPFCs in the study area.

Furthermore, the results in Table 4.3 indicate that co-operative structure does not affect ROA ($b = -.535, p > 0.1$). The result doesn't support H_6 , which states that there is a statistically significant and positive relationship between co-operative structure and financial performance, failing to reject the null hypothesis (H_{06}). This chapter does not support Musuya (2014) findings that reported correlation between co-operative structure and ROA. This negative and not statistically significant relationship between co-operative structure and performance (ROA) may be attributable to what was revealed by some members in the above captions. Local authorities intermeddle with the co-operative structure in the area under the pretext of addressing reported mismanagement and poor leadership problems. There was a time when some co-operative organs were even dissolved and private companies took over their responsibilities. Findings in Table 4.4 indicate that in 32 IPFCs, only 8(25%) have managers, while 10(31%) have below 3 (three) supervisory board members required by Rwanda co-operative law. Contrary to Rwanda co-operative law, 8(25%) IPFCs have below 5 (five) board members. Among 32, co-operatives only 14 (44%) have not reported any case of mismanagement or corruption.

Table 4.5: Summary of Regression and Hypothesis Results

Hypotheses	Conclusions
H_1 There is a statistically significant and positive relationship between member participation and financial performance	Supported (0.000<0.01)
H_{01} There is no statistically significant and positive relationship between member participation and financial performance	Rejected (0.000<0.01)
H_2 There is a statistically significant and positive relationship between accountability and financial performance	Supported (0.047<0.05)
H_{02} There is no statistically significant and positive relationship between accountability and financial performance	Rejected (0.047<0.05)
H_3 There is a statistically significant and positive relationship between transparency and financial performance	Supported (0.000<0.01)
H_{03} There is no statistically significant and positive relationship between transparency and financial performance	Rejected (0.000<0.01)
H_4 There is a statistically significant and positive relationship between policy compliance and financial performance	Not supported (0.204>0.05)
H_{04} There is no statistically significant and positive relationship between policy compliance and financial performance	Accepted (0.204>0.05)
H_5 There is a statistically significant and positive relationship between leadership and financial performance	Supported (0.000<0.01)
H_{05} There is no statistically significant and positive relationship between leadership and financial performance	Rejected (0.000<0.01)
H_6 There is a statistically significant and positive relationship between co-operative structure and financial performance.	Not supported (0.174>0.05)
H_{06} There is no statistically significant and positive relationship between co-operative structure and financial performance.	Accepted (0.174>0.05)

The results are supported by agency theory; according to the general formulation of the principal-agent model, if members are not able to monitor managers' behavior, this can prompt them to behave opportunistically by maximizing their own interest (Russo, *et al.*, 2000). As mentioned above, there were cases of mismanagement that led to poor financial performance for some of the IPFCs, resulting in government interference in their management and administration. The results of the chapter also reported government interference in management and administration of co-operatives which is against the co-operative principle of democratic member control. As mentioned above, members should be able to run their co-operative by self-governing without the influences of wider government policy or other organizations. Furthermore, contrary to the neoclassical theory of co-operative, most IPFCs are not economically and financially sustainable to achieve their members' benefits.

4.6 Conclusion and Recommendations

This chapter aimed to examine the governance factors that affect the financial performance (ROA) of IPFCs in Rwanda. The results showed that member participation, accountability, transparency, and leadership are significant factors contributing to the financial performance of IPFCs. However, the findings revealed that most IPFCs have ineffective leadership to run their co-operatives smoothly. Leadership problems identified among IPFCs include understanding the concept of co-operative, efficient conflict solving abilities, interpersonal skills, managerial skills, technical skills, financial management capacity, accounting skills, and the required education level. IPFCs should be aware that ineffective internal governance encourages government interference in management and administration of their co-operatives. They should thus keep their members and staff educated, informed and trained to govern their co-operatives successfully without an external influence. On the other hand, Rwanda Co-operative Agency (RCA) and other community development partners should organise IPFCs leaders' capacity-building trainings for self-governance to curtail the interference of local authorities within the administration of co-operatives under the pretext of reported mismanagement and poor leadership.

Due to the limitations of the chapter associated with exhausting all factors influencing financial performance of co-operatives, it is recommended that future studies consider other factors like legal, political factors, technological and cultural factors affecting the performance of farmers' co-operatives. This chapter generates facts to inform IPFCs, community development partners, and policymakers to identify the major factors affecting farmers' co-operatives' financial performance. In addition, the chapter contributes to the literature by analyzing governance factors that affect the financial performance of agricultural co-operatives in developing countries' perspective.

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Appendix 4.1: Correlation Matrix and Variance Inflation Factor

	ROA	MP	AC	TP	PO	LP	CS	1/VIF	VIF
ROA	1								
MP	0.688**	1						0.415	2.409
AC	0.611**	0.636**	1					0.460	2.175
TP	0.742**	0.709**	0.698**	1				0.212	4.712
PO	0.663**	0.651**	0.597**	0.770**	1			0.257	3.895
LP	0.734**	0.671**	0.583**	0.792**	0.776**	1		0.212	4.721
CS	0.540**	0.500**	0.409**	0.606**	0.758**	0.774**	1	0.286	3.491

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix 4.2: IPFCs ROA in 2019

Ratio	Range	Co-operatives	
		Frequency	Percentage
ROA	<0.08	19	59.38
	0.08-0.18	06	18.75
	0.19-0.29	03	9.37
	0.30-0.40	02	6.25
	0.41≤	02	6.25

Source: Calculated from Secondary data, NCCR (2019)

CHAPTER FIVE

5.0 MARKET ORIENTATION AND FINANCIAL PERFORMANCE OF IRISH POTATO FARMER CO-OPERATIVES IN RWANDA

5.1 Abstract

Co-operatives are considered key vehicles for increased market orientation among smallholder farmers. However, there are limited studies on the influence of market orientation on the performance of co-operatives in developing and emerging economies. The chapter examines the effect of market orientation dimensions on financial performance among Irish Potato Farmer Co-operatives (IPFCs) in Rwanda. Data were collected by interviewing 387 members from 32 co-operatives. Secondary data from audited financial statements were collected to analyze financial performance among selected IPFCs in terms of Return on Assets (ROA). Pearson correlation and multiple linear regression were used for data analysis. The results showed a positive significant relationship between customer orientation and financial performance ($b = 0.090$, $p < 0.001$), and competitor orientation and financial performance ($b = 0.055$, $p < 0.001$), while supplier orientation has shown a negative correlation ($b = -0.021$, $p < 0.05$). Furthermore, the results revealed a non-significant relationship between inter-functional coordination and financial performance ($b = -0.011$, $p > 0.1$). Based on the findings, the most IPFCs experience ineffective market orientation due to limited financial capacity, which impairs their financial performance. In order to raise capital and implement the market orientation concept, it is recommended that IPFC's leaders address the barriers that prevent members from increasing their shareholdings. This chapter could serve as a framework for IPFCs leaders, policy makers and community development partners to formulate appropriate strategies for IPFCs to be market-oriented.

Keywords: Market Orientation, Financial performance, Farmer co-operatives, Irish potatoes

5.2 Introduction

In a competitive market and era of rapid change, firms face changing technology, evolving customer expectations, and institutional uncertainty and instability, which aggravates uncertainty and dynamics of the external environment (Yi Wang, 2022). These provide serious challenges and also opportunities for firms to develop (De Vos *et al.*, 2015). As a result, business firms need to implement the concept of market orientation, which is a set of activities developed by business entities to permanently monitor, analyse and respond to market changes (Alsadi and Aloulou, 2021; Jiang, *et al.*, 2020). According to Udriyah *et al.* (2019), market orientation is a business strategy that focuses on recognizing customer needs and satisfying them (Gheysari, 2013) better than the competitor (Gheysari, 2013).

Some studies have reported the importance of market orientation in improving business performance (Dickson and Fahad, 2022; Mandal and Saravanan, 2019; Al-Henzab *et al.*, 2018). For a business to successfully overcome changes in external factors, it needs to adopt and promote market orientation by creating superior customer value (Bamfo and Kraa, 2019). Market orientation helps to understand and cope with market dynamics and changes resulting from disturbances and uncertainties in the environment, global economic situation and an increasingly competitive pressure while maintaining business performance (Meisya and Surjasa, 2022). Businesses that adhere to the concept of market orientation develop customer loyalty and satisfaction, create superior customer value, and hence superior performance (Hernandez-Linares *et al.*, 2020). With high market orientation, companies report high business performance compared to businesses with low level of market orientation (Saleh *et al.*, 2021).

Agricultural marketing co-operatives are considered key vehicle for increased market orientation of the smallholder farm sector (Verhofstadt and Maertens, 2014). They play a significant role to help smallholder farmers to overcome market challenges and facilitate the decrease of transaction costs associated with acquisition of agricultural inputs and selling their production (Bernard and Taffesse, 2012). However, smallholder farmer co-operatives, particularly in developing and emerging economies, experience various limitations for their performance (Sisay *et al.*, 2017). Previous studies have reported ineffective governance (Lemmi and

Nakkiran, 2019) and limited financial capacity (Uwaramutse *et al.*, 2022) as the main problems for performance of farmer co-operatives.

The Government of Rwanda (GoR) views co-operatives as pivotal tool for achieving Vision 2050 and a number of Sector Strategic Plans (Ministry of Agriculture and Animal Resources [MINAGRI], 2018). It has thus established an environment conducive to the development of the co-operative movement that includes law N° 024/2021 governing co-operatives in Rwanda and the national policy of 2018 on the promotion of co-operatives “toward private co-operative enterprises and business entities for socio-economic transformation” to ensure that they are profitable enterprise (International Labour Organisation [ILO], 2017). Agricultural policies for agricultural development in Rwanda focus on increased market orientation of the smallholder farm sector (Verhofstadt and Maertens, 2014) and co-operatives are seen as key vehicle (Rwanda Co-operative Agency [RCA], 2020). As part of the crop intensification program, Irish potatoes were considered as one of the most significant crops due to their contribution to agriculture sector [FAO], 2016). Irish potato production was found to generate in average 57% of gross income per year and per household (Shimira *et al.*, 2020).

Despite government initiatives to make co-operatives profitable businesses able to help their members overcome market challenges, Irish Potato Farmer Co-operatives (IPFCs) in Rwanda are characterized by limited financial capacity, which challenges their growth, competitive posture, and improved financial performance (Rwibasira, 2019), resulting in high reliance on the government and donor agencies (Niyonzima *et al.*, 2021). Irish potato farmers are challenged by poor quality of agricultural inputs and weak coordination between IPFCs and potential buyers (FAO, 2019). Consequently, this leads to low yields, high post-harvest losses and, subsequently, low prices on the market. Members of IPFCs are also unsatisfied with the market for their production due to speculative pricing by unscrupulous buyers. As a result, they do business with private traders, which has a significant impact on the performance of smallholder farmer co-operatives. These challenges bring doubt on how market orientation concept is coordinated among IPFCs to face competition with better prepared private traders.

In order to gain a sustainable competitive advantage and achieve better performance, co-operatives must improve their qualities and capacities to respond to customers' demand (Benos *et al.*, 2016; Bijman *et al.*, 2014) by adopting the concept of market orientation (Agirre *et al.*, 2014). Due to globalization and the widespread requirements in cash-based economy, subsistence farming is becoming outmoded and replaced by the need to have cash for meeting the family needs. Smallholder farmers now have to walk the pathway moving from production-driven farming to profit-driven business. Market-oriented farming is primarily concerned with making profit from regular interaction with the markets (Nwafor, 2020).

There are several studies that report the impact of market orientation on performance of Investor-Owned Firms (IOFs). Saleh *et al.* (2021) have reported positive and significant impact of market orientation components on performance of SMEs in South Arabia. In a study conducted by Protcko and Dornberger (2017) in Tatarstan knowledge-intensive companies in Russia, findings also show that market orientation has positive impact on financial and non-financial performance. Meisya and Surjasa (2022) studied the effect of market orientation on firm performance in food and beverage sector in Indonesia. They found positive and significant relationship between market orientation components of customer orientation, competitor orientation, inter-functional coordination and firm performance. However, the influence of market orientation on performance of co-operatives is under-researched (Sisay *et al.*, 2017). Moreover, contradicting findings by Ho *et al.* (2018); Homaid *et al.*, (2018); Shehu and Mahmood (2014) have reported insignificant and negative correlation between market orientation dimensions and business performance. Considering contextual differences and contradicting results from previous studies on the influence of market orientation and organizational performance, the impact of market orientation and business performance studies is inconclusive. It is against this background that this chapter analysed market orientation and its influence on financial performance of IPFCs in Rwanda. It specifically describes market orientation dimensions among IPFCs and determines their effect on financial performance of IPFCs.

5.3 Theoretical and Empirical Framework

5.3.1 Resource-Based Theory in Marketing

This chapter was guided by Resource-Based Theory (RBT) which provides a theoretical foundation describing how marketing activities lead to resources that can improve performance. Marketing investments contribute in the development of resources and capabilities, such as stronger customer relationships, which is referred to as market orientation and can improve firm performance. According to Peteraf and Barney (2003), performance variations among organizations is based on their resources. The theory hypothesises that organisational resources play a significant role for their performance. Resources include any tangible and intangible assets owned by the firm (Caves, 1980). Market orientation is therefore considered as part of the overall firm's intangible resource base. Looking critically at the explanations provided by Tho (2019) and Savabieh et al., 2020, market orientation is a capability-based activity which pertains to the RBT of the firm. Zhou *et al.*, (2008) view market orientation as one of the important firm resources and competencies. According to Tho (2019), market orientation is a valuable, rare, and non-replaceable capability that can generate sustainable competitive advantage. Market orientation is an internal intangible resource that gathers and uses the information to satisfy customer's needs, thereby improving performance. The theory was applied in this chapter to describe the effectiveness of market orientation among IPFCs and its impact on their performance, similar to prior studies that elaborated co-operative performance employing RBT (Raymond and Agus, 2020; Shehu and Mahmood, 2014).

5.3.2 Neo-classical Theory of Co-operatives

Given that RBT deals with firm's resources, neoclassical theory appears to be more appropriate to supplement RBT, as far as co-operative profitability is concerned. Neoclassical theory of the firm developed by Marshall (1890) focuses on profit maximization (Royer, 2014). A co-operative must be financially sustainable to achieve its benefits, though all benefits should be aimed at achieving its main objective of maximizing member returns (Royer, 2014). Similar to IOFs, profitability of the co-operative is essential. Both business structures are incorporated and have legal status separate from that of their membership or shareholders with limited liability (Cheong, 2006). In addition to economic benefits,

the co-operative principles also promote social objectives (Mooney and Gray, 2002). It could be challenging for co-operatives to adequately serve their members if their financial performance is not strong (Tekeste *et al.*, 2014). The Neo-classical theory of co-operatives was applied in this chapter to explain whether the sampled IPFCs are financially stable to improve socio-economic transformation of their members.

5.3.3 Empirical Review and Hypothesis Development

Market orientation is the ability and valuable resources of a business that emphasises the need for creating exceptional customer value (Mostafiz *et al.*, 2021). It assists a business in recognizing and evaluating its rivals, as well as their strengths, weaknesses, and market strategies (Cambra-Fierro *et al.*, 2011). Previous studies report market orientation culture as a predictor of improved business performance (Morgan *et al.*, 2019; Olabode *et al.*, 2018). This chapter employs the market orientation conceptualization of Narver and Slater (1990), which encompasses customer orientation, competitor orientation, and inter-functional coordination. Supplier orientation conceptualized by Sisay (2017) was also adopted.

Customer orientation is described as an organization's insight of customers' needs and ability to consistently deliver higher value for them (Neneh, 2018) and a key factor for superior business performance (Sisay *et al.*, 2017). Using structural equation model, Dickson and Fahad, 2021; Sisay *et al.*, 2017, have reported positive impact of customer orientation on financial performance. Both studies used subjective measures of performance through respondents' perceptions which could be suitable for non-financial data measurement. Sisay *et al.* (2017) explained that they resorted to subjective measures due to the unavailability of financial data in small enterprises. Kasim and Mustofa (2021), using subjective measures of performance examined the impact of market orientation practices on performance of basic co-operative enterprises in Ethiopia. Employing Pearson correlation and multiple regression analysis, the positive impact of customer orientation on performance has been supported. Research in Ghanaian Small and Medium Enterprises (SMEs) reports positive and significant effect of market orientation on their performance level (Bamfo and Kraa, 2019). Conversely, in a study by Ho *et al.* (2018), non-significant relation was found. Homaid *et al.* (2018) study in Yemen

reported also a negative significance between market orientation and performance. The above discussion leads to the following hypotheses.

H₁ Customer orientation has significant and positive relationship with financial performance of IPFCs

H₀₁ Customer orientation does not have significant and positive relationship with financial performance of IPFCs

On the other hand, competitor orientation is the ability of firms to determine, evaluate and respond to weakness and strengths of competitors and to improve their organizational intelligence (Crick, *et al.*, 2020). Previous studies have reported a positive significant relationship between competitor orientation and co-operative's performance (Kasim and Mustofa, 2021; Dickson and Fahad, 2021). However, Ho *et al.* (2018); Sisay *et al.*, 2017 found non-significant relationship between competitor orientation and performance of co-operatives while, Foreman *et al.* (2014) reports a negative relationship between competitor orientation and financial performance. Competitor orientation and profitability-based measures of business performance were found to be positively correlated (Narver and Slater, 1990). Likewise, Kumar *et al.* (2011) findings provide additional support for the positive relationship between competitor orientation and performance. With respect to the above debate, hypotheses are presented:

H₂ Competitor orientation has significant and positive relationship with financial performance of IPFCs

H₀₂ Competitor orientation does not have significant and positive relationship with financial performance of IPFCs

Inter-functional coordination is the other dimension of market orientation that contribute to business performance. It ensures effective departmental collaboration, cohesion, communication, trust, and functional commitment (Auh and Menguc, 2005) and, hence, superior firm's performance. Kasim and Mustofa (2021) examined the impact of market orientation on performance of co-operatives. The findings revealed significant and positive relationship between inter-functional coordination and performance. Similarly, Sisay *et al.*, 2017; Ho *et al.*, 2017; Ingenbleek *et al.*, 2013 have also reported significant and positive relationship

between inter-functional coordination and co-operatives performance. Agirre et al. (2014) also found the positive impact of market orientation on co-operative performance in terms of profitability. However, studies by Ho *et al.* (2018) and Johnson *et al.* (2009) found non-significant relationship between inter-functional coordination and performance. Given the debate:

H₃ Inter-functional coordination has significant and positive relationship with financial performance of IPFCs

H₀₃ Inter-functional coordination does not have significant and positive relationship with financial performance of IPFCs

Finally, supplier orientation refers to an organization's efforts to collaborate with its suppliers and strategic alignment with reference to supply chain outsourcing decisions (Lintukangas *et al.*, 2019) leading to competitive advantages and success of the firm (Stuart *et al.*, 2012). On the basis of Porter's theory, supplier orientation can enhance competitive advantage and business performance (Celikyay *et al.*, 2022). If the supplier orientation is effectively managed by ensuring good relationship, contract and effective communication with suppliers, it is likely that the performance of the firm will be positively affected. The ability of smallholder farmers to establish strong relationships with suppliers determines the extent of their market participation. Co-operatives with strong relationships with their suppliers in supply chain are more likely to succeed than co-operatives that place less emphasis on their suppliers (Frohlich and Westbrook, 2001). Studies by Celikyay *et al.* (2022); Lintukangas *et al.* (2019); Sisay *et al.* (2017) have shown positive significant relationship between supplier orientation and business performance. It can be assumed that supplier orientation affects financial performance. Therefore, the following hypotheses can be put forward:

H₄ Supplier orientation has significant and positive relationship with financial performance of IPFCs

H₀₄ Supplier orientation does not have significant and positive relationship with financial performance of IPFCs

On the basis of reviewed studies, some report that variables are positive, while others report that they are negative. Moreover, most of the studies have used subjective measures of performance and none has collected qualitative data to supplement and validate quantitative outcomes. As a result, this chapter analysed market orientation and its influence on financial performance of famers' co-operatives using objective measures in mixed method approach.

5.4 Methodology

5.4.1 Research Design and Target Population

As proposed by various researchers, the chapter employed mixed-methods sequential explanatory design as recommended by different studies (Creswell, 2013; Creswell and Clark, 2017). This design was used in this chapter to explore the causal relationships between the variables of interest, as well as to understand the market orientation dimensions that affect performance of IPFCs. The study was conducted in four separate Districts of Musanze and Burera in Northern Province and Nyabihu and Rubavu Districts in Western Province of Rwanda, due to their predominance in Irish potatoes farming (NISR, 2022). The market difficulties for members' production reported in the above Provinces also contributed to the choice of the study area (Mugabo, 2018). The population was 76 co-operatives with 25 332 members in the above Districts (NCCR, 2019).

5.4.2 Sampling Techniques and Sample Size

In selecting the IPFCs that comprise the study, purposive sampling strategy was applied. To deliberately evaluate their financial performance, IPFCs with audited financial reports were selected (NCCR, 2019). Out of 76 IPFCs, 32 have been able to provide their audited financial accounts. The sample size of co-operative members was calculated using Yamane (1967) formula. From a population of 11 878 co-operative members across 32 IPFCs (NCCR, 2019), the sample size of co-operative members was computed as follows:

$$n = \frac{N}{1+N*e^2} \text{-----} (5.1)$$

Where n is the sample size, N is the population size and e is the margin of error (5%).

$$n = \frac{11878}{1 + 11878(0.05)^2} = 386.968 \approx 387$$

The computed sample size of co-operative members was distributed to each co-operative on the basis of Probability Proportional to Size.

5.4.3 Instruments and Data Collection Techniques

Since the chapter employed mixed-methods approach, both quantitative and qualitative data collection techniques and analysis were used. This approach was appropriate because it enables to collect data that provide rich information. It also helps to neutralise biases inherent in a single technique (Creswell, 2009). Focus Group Discussions (FGDs), Key Informants Interviews (KIIs) and a structured questionnaire were used as data collection tools. The Secondary data from the audited financial reports were collected to analyse financial performance of the sampled co-operatives in terms of ROA as an indicator of financial success. It could be challenging for co-operative to adequately serve their members if their financial performance is not strong (Tekeste *et al.*, 2014).

This chapter focuses on financial performance to assess whether the IPFCs in the study area are financially sustainable to ensure the socio-economic transformation of their members. According to Shariff *et al.* (2010) measures of performance can be seen from an objective perspective that is more about the financial assessment of a business performance, such as return on equity and return on assets. Objective performance measures are more reliable than subjective measures, since they use quantitative and factual standards. Financial performance of IPFCs was measured among co-operatives rather than their performance over a period of time. Past studies have used one financial ratio to examine the financial performance (Singh *et al.*, 2019; Hussain and Hadi, 2017). ROA was reported by different researchers as the best measurement for performance of farmer co-operatives (Singh *et al.*, 2019; Dursan *et al.*, 2013).

Before actual data collection, research instruments were checked to ensure they meet reliability and validity criteria. Field-testing of data collection tools was used to rectify some unfamiliar terms. Some questions were omitted and minor modifications were done to some questions. In testing reliability, Cronbach's alpha (α) was employed; its optimal figure depends on the purpose of the research

(Churchill, 1979). Cronbach's alpha coefficient was used for that case, and the result indicated a good internal consistency of 0.885, which is above the acceptable standard of 0.7. A general accepted rule is that Cronbach's alpha values of 0.7 or higher indicate acceptable internal consistency (George and Mallery, 2003).

5.4.4 Analysis and Model Specification

Data were analysed with both descriptive and inferential statistics. The former used frequency distributions, minimum, maximum, mean and standard deviation. To analyze the perceptions of respondents about market orientation dimensions, five-point Likert scale was used. Likert scale responses of each market orientation dimension were converted into summed composite scores in continuous data as recommended by Tabachnick and Fidell (1989) and Norman (2010). Interval size was calculated by subtracting the lowest category from the highest category and dividing by the total number of categories (Adel and Nahed, 2016) to determine the levels of market orientation among IPFCs. The interval size = $\frac{5-1}{5}=0.8$. Poor [1.00-1.8 [, Moderate [1.8-2.6 [, Good [2.6-3.4 [, Very Good [3.4-4.2 [and Excellent [4.2-5]. Moreover, inferential statistics were used to test the formulated hypotheses, including ANOVA, Pearson correlation, and multiple linear regression. The idea behind the use of multiple regression analysis among the other parametric tests was statistical dependence of one variable, the dependent variable (ROA), on more independent variables (market orientation dimensions). Composite scores of market orientation were regressed against ROA as recommended by Tabachnick and Fidell (1989), hence, treated with parametric statistics without fear of wrong conclusion (Norman, 2010). Several experts also argue that parametric tests can be employed for Likert scale and they have also demonstrated this with research evidence. Parametric tests can be used not only with ordinal data, but they are generally more robust than non-parametric tests (Sullivan and Artino, 2013). Research affirms the robustness of parametric test for Likert scale when analysed as a scale that is summed composite score, not individual items (Carifio and Perla, 2008). The following is the model used.

$$Y = \beta_0 + \beta_1 \text{CUSOR} + \beta_2 \text{COMPOR} + \beta_3 \text{INTFCO} + \beta_4 \text{SOR} + \varepsilon \text{ -----(5.2)}$$

Where Y is co-operative performance measured in terms of ROA; β_0 , Intercept; CUSOR, Customer orientation; COMPOR, Competitor Orientation; INTFCO, Inter-

functional Coordination; SOR, Supplier Orientation; ε , error term. Using content analysis, qualitative data were analysed to supplement quantitative findings.

Table 5.1: Description of Variables as Specified in the Regression Analysis

Variable Category	Variable Name	Symbol	Variable Description	Expected sign	Existing Studies
Market Orientation	Customer Orientation	CUSOR	Timely and sufficient quantity of products, fair prices, products packaging, increase of production due to market demand, market study to meet client expectations, contract with customers, marketing committee, systematic and frequent measure of customer satisfaction.	+/-	Kasim and Mustofa (2021); Saleh <i>et al.</i> (2021); Ho <i>et al.</i> (2018); Sisay <i>et al.</i> , 2017.
	Competitor Orientation	COMPOR	Analysis of the weaknesses and strengths of competitors, responding to competitor action that threaten the co-operative, concern about what private Irish potato traders are doing in the market, regular discussion of competitors' strengths and strategies, and response to significant changes in the competitors' pricing structures.	+/-	Kasim and Mustofa (2021); Saleh <i>et al.</i> (2021); Crick <i>et al.</i> , (2020); Sisay <i>et al.</i> , 2017; Ho <i>et al.</i> (2018); Foreman <i>et al.</i> (2014).
	Inter-functional Coordination	INTFCO	Co-operative meetings to discuss market trends and development, discussion of customers' future needs with coop management by marketing personnel, dissemination of data on customer satisfaction on regular basis, awareness on the role and contribution of each member and committee for the success of our co-operative, inter-committee meetings to discuss the Irish potato business, sharing the information concerning competitors' strategies.	+/-	Kasim and Mustofa (2021); Saleh <i>et al.</i> (2021); Ho <i>et al.</i> (2018); Sisay <i>et al.</i> , 2017.
	Supplier Orientation	SOR	Contract with suppliers, relationship with suppliers, capacity of suppliers, communication with suppliers, price negotiation.	+	Sisay <i>et al.</i> , 2017.
Financial Performance	Return on Assets	ROA	A measure of how efficiently a co-operative uses its assets to generate profits, calculated by Net profit/total assets.		Zelhuda <i>et al.</i> , (2017); Agirre <i>et al.</i> (2014).

Statistical assumptions were tested before running multiple linear regression. The assumption of multicollinearity was tested using correlation matrix. As shown by appendix 5.1, since none of the variables correlates above 0.8, there is no multicollinearity issue (Senaviratna and Cooray, 2019). To check for any indication of multicollinearity among the independent variables, the Variance Inflation Factor (VIF) and Tolerance (1/VIF) were also applied. As shown in appendix 5.1, multicollinearity among independent variables is not a problem in the model. Heteroscedasticity was tested using Glejser test to check whether there is a constant variance within residual. Based on output coefficients in Appendix 5.2, the obtained p value, all independent variables > 0.05 , it can be concluded that there is no heteroscedasticity problem, as recommended by Glejser (1969).

The assumption of normality was also checked using Kolmogorov-Smirnov tests (Appendix 5.3). The test indicated that the variables were not normally distributed since sig. value is below 0.05. Data were transformed to the natural logarithm to solve non-normality issue as suggested by Field (2009), and still data were not normally distributed. However, parametric tests can be used with Likert data with no-normal distributions without fear of coming to the wrong conclusion (Norman, 2010). In testing the good fit of multiple regression model, R, R^2 , adjusted R^2 and the standard error of the estimates were used to determine how well a regression model fits the data.

Results in Table 5.3 show that the value of overall R-square is 0.373, showing all independent variables have described 37.3% disparity in financial performance. Moreover, 62.7% (100%-37.3%) of the variation results from factors other than the predictors included in the model. Adjusted R square is another essential factor to determine how well the model fits. A value of 0.367 in this chapter indicates that 36.7% of the variation in the outcome variable is explained by the predictors to keep in the model. Results of the F-ratio, $F(4, 382) = 56.834$, $p < 0.005$, shows that the model fit the data.

5.5 Results and Discussion

5.5.1 Descriptive Statistics for Market Orientation Practices and Financial Performance

The results in Table 5.2 report summary statistics of market orientation dimensions and financial performance obtained from Likert scale with five levels. As discussed in the methodology section, responses of each market orientation dimension were converted into composite scores in continuous data. The result shows that mean value of customer orientation, competitor orientation, and inter-functional coordination are 2.04, 2.25, 2.45 and 2.26 respectively. With the overall mean of 2.25, it can be concluded that IPFCs have moderate level of market orientation dimensions.

Table 5.2: Summary Statistics for Market Orientation and Financial Performance

	N	Minimum	Maximum	Mean	Std. Deviation
CUSOR	387	1.00	4.25	2.044 1	0.833 70
COMPOR	387	0.50	4.13	2.252 3	0.703 57
INTFCO	387	0.80	4.10	2.446 0	0.639 99
SUOR	387	0.40	5.00	2.255 3	0.887 53
Overall				2.249 4	0.766 19
ROA	387	0.01	0.61	0.184 4	0.152 77
Valid N (listwise)	387				

Considering the maximum and minimum values in Table 5.2, it was observed that few IPFCs effectively implement the practices of market orientation, while others lack market orientation culture in their activities. This is a challenge to their financial performance and members' benefits. Profitability of the co-operative is essential to achieve social benefits of members (Mooney and Gray, 2002). As shown in Table 5.2, minimum, maximum and mean values of ROA are 0.1(1%), 0.61(61%) and 0.18(18%), respectively. Similarly, the information provided in Appendix 5.4 shows that 19(59.38%) out of 32 IPFCs have reported the ROA below 8%. Generally, in agricultural co-operatives, a common benchmark for the ROA is a minimum of 8% (Kenkel, 2021). This indicates that some IPFCs report satisfactory returns, while others experience inefficiency in the use of co-operative assets to generate profit.

5.5.2 Correlation Analysis

The correlation analysis has been carried out to analyze the magnitude of the relationship between market orientation dimensions and financial performance of IPFCs (Appendix 5.1). It measured the strength of the linear relationship between the variables. The results confirm that the four dimensions of market orientation have positive and significant correlations with financial performance. This indicates that increase in customer orientation, competitor orientation, inter-functional coordination and supplier orientation increase financial performance of IPFCs. Correlation results indicate the relationship between customer orientation and ROA (0.593**), competitor orientation and ROA (0.532**), inter-functional coordination and ROA (0.461**), and supplier orientation and ROA (0.267**). Correlation analysis further tested the assumption of multicollinearity, as discussed in methodology section.

5.5.3 Regression Results

Since the important assumptions of regression were met and the model fit the data as discussed above, multiple regression was employed to examine the aggregate effect of the independent variables on the dependent variable and determine the most influencing factors that affect the financial performance of IPFCs. Multiple linear regression was further employed to test the hypothesis. The results in Table 5.3 indicate significant relationship between customer orientation and financial performance, and competitor orientation and financial performance. Supplier orientation has shown negative relationship with ROA. The table shows a non-significant relationship between inter-functional coordination and financial performance. However, considering the beta coefficients values, the magnitude of influence of market orientation dimensions on performance of IPCs is very low.

Table 5.3: Regression Results for Market Orientation and Financial Performance

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-0.161	0.035		-4.586	.000
CUSOR	0.090***	0.014	0.492	6.632	0.000
COMPOR	0.055***	0.017	0.254	3.242	0.001
INTFCO	-0.011	0.021	-0.044	-0.491	0.624
SOR	-0.021**	0.010	-0.125	-2.048	0.041
R	0.611 ^a				
R ²	0.373				
Adjusted R ²	0.367				
Df	4				
Residual	382				
F	56.834				
Sig.	0.000				

* = Significant at 10%, ** = Significant at 5%, *** = Significant at 1%

5.5.3.1 Customer Orientation and Financial Performance

As revealed in Table 5.3, customer orientation that includes but not limited to timely and sufficient quantity of products to customers, quality products, fair prices, market study to meet customer expectation, contract with customers, and systematic and frequent measure of customer satisfaction has significant and positive effect on ROA ($b = 0.090$, $p < 0.001$). This result supports H_1 , states that customer orientation has significant and positive relationship with financial performance, leading to reject null hypothesis (H_{01}). The findings are in line with the previous studies that support the theoretical assumption that customer orientation positively influences financial performance (Kasim and Mustofa, 2021; Dickson and Fahad, 2021), but contrary to Ho *et al.* (2018) that found non-significant relation between customer orientation and financial performance. Strengthening of customer orientation has been claimed to be essential for the success of co-operatives (Bijman, 2010). It is the key factor for superior business performance, irrespective of economic development of a country (Sisay *et al.*, 2017). However, the mean value of 2.04 shown in Table 5.2, which exhibits ineffective practices of market orientation among IPFCs, along with small beta value of 0.090, is an indication of a weak contribution of customer orientation to the performance of IPFCs.

5.5.3.2 Competitor Orientation and Financial Performance

The results in Table 5.3 also show that ROA is positively and significantly affected by competitor orientation ($b = 0.055$, $p < 0.001$). The result supports H_2 which postulates that competitor orientation has significant and positive relationship with financial performance, the null hypothesis (H_{02}) is rejected. Explicitly, when IPFCs effectively implement competitor orientation practices, such as analysis of the weaknesses and strengths of private Irish potato traders, and respond to their actions that threaten the co-operative, high returns are generated. Results are consistent with Dickson and Fahad (2021) study that supports a positive significant relationship between competitor orientation and ROA. However, findings from this chapter do not conform to the study by Ho *et al.* (2018); Sisay *et al.*, 2017 that displays inconsistency with the body of literature that established a non-significant relationship between competitor orientation and performance of co-operatives. In spite of the benefits associated with competitor orientation, excessive concentration on competitors may inhibit the ability to innovation, leading to mediocrity (Augusto and Coelho, 2009).

5.5.3.3 Inter-Functional Coordination and Financial Performance

The result in Table 5.3 showed a non-significant relationship between inter-functional coordination and financial performance ($b = -0.011$, $p > 0.1$). The result does not support H_3 which states that inter-functional coordination has significant and positive relationship with financial performance, leading to accept null hypothesis (H_{03}). The finding disagrees with similar studies that found positive significant relationship between inter-functional coordination and financial performance of co-operatives (Kasim and Mustofa, 2021; Sisay *et al.*, 2017). The non-significant contribution may be attributable to inadequate consideration towards discussion of customers' future needs, dissemination of data on customer satisfaction on a regular basis, awareness on the role and contribution of each member and committee for the success of the co-operative, inter-committee meetings to discuss the Irish potato business, sharing the information concerning competitors' strategies, and especially, limited financial capacity among IPFCs to have a strong management team to enhance the flow of information and knowledge to help the co-operative generate new insights from market knowledge. Lack of a

strong team to facilitate the sharing of information between different co-operative organs was explained by one of the co-operative member in a FGD:

“... *In our co-operatives, we have challenges to comply with the required number of members in all co-operative organs, as required by co-operative law. Moreover, due to limited financial capacity, few co-operatives have managers. The ones with managers don't have accountants. This is a big issue in competing with better-prepared and market-oriented private traders...*” (FGD,13 October, 2019).

Co-operatives, unlike organised firms, hardly operate in line with the principles of division of labor with clear cut special activities. Rather, overlapping functions thrive in the system (Nnadi *et al.*, 2020). Benos *et al.* (2016) also reported co-operative organisational attributes that contribute to the implementation of market orientation. The above discussions explain less concern shown for the implementation of inter-functional coordination among IPFCs.

5.5.3.4 Supplier Orientation and Financial Performance

The estimated coefficients in Table 5.3 show that ROA is negatively and significantly correlated with supplier orientation ($b = -0.021$, $p < 0.05$). This result does not support H₄ which states that supplier orientation has significant and positive relationship with financial performance, failing to reject null hypothesis (H₀₄). The results do not conform to the study by Sisay *et al.* (2017) that indicates significant and positive influence of supplier orientation on financial performance of co-operatives. Farmer co-operatives are dependent on suppliers for key inputs, such as quality seeds and fertilizers. Co-operatives with good relationship, contract and effective communication with suppliers are expected to report improved performance (Sisay *et al.*, 2017). Negative and significant correlation among IPFCs was explained by few companies in the area that monopolize the sale of agricultural inputs, which limits co-operative bargaining power. Based on Porter's theory in the research, it is explained that supplier orientation can affect competitive advantage and the performance of business firms (Celikyay *et al.*, 2022). If the supplier orientation is effectively managed, it is likely that the performance of the firm will be positively affected. Frohlich and Westbrook stated that the scope of smallholder farmers to participate in market depends on their own ability to create good relationship with suppliers. Co-operative with solid relationship with suppliers in

the supply chain have better chances for success than less supplier oriented co-operatives (Frohlich and Westbrook, 2001). Findings from the chapter indicate that IPFCs experience challenges in creating solid relationship with suppliers in, which impairs their production and desired financial performance.

As per the results, lower mean values for all dimensions of market orientation in Table 2 and small beta coefficients that show small magnitude of contribution of market orientation to financial performance in Table 5.3 is a clear indicator of ineffective market orientation practices among IPFCs. This can be explained by limited financial capacity to perform the practices associated with market orientation. Uwaramutse *et al.* (2022) reported financial constraints among IPFCs in Rwanda, challenging their financial performance. This issue can be explained by the following caption from one of the board members in a FGD:

“... small capital presents a barrier in some of our co-operatives. Since our District sets a maximum amount of members’ share capital due to the alleged mismanagement in some of co-operatives, it is not possible to raise capital through members’ shareholding, which is a big challenge for our co-operatives growth and performance...” (FGD, 30 September, 2019).

This implies that limited financial capacity among IPFCs constitutes a serious drawback to the implementation of market orientation activities.

During an interview, ineffective market orientation was also explained by a key informant, who provided the following reason:

“... Most IPFCs are not growing and achieving better financial performance, since, they were not required to present their business plan during registration to show how they will become financially self-reliant. Therefore, economic growth and financial performance are not possible because, most of them are not doing business; they are rather socially oriented than business oriented ...” (KII, 19 October, 2019).

Contrary to neo-classical theory of co-operative which affirms that a co-operative must be economically and financially sustainable to achieve its benefits, mainly maximizing member returns (Royer, 2014), most of IPFCs experience lack of financial capacity, which is a problem to achieve socio-economic transformation of their members. The results are also supported by RBT. According to the general

formulation of RBT, market orientation is an internal intangible resource and capability based activity which pertains to the RBT of the firm (Savabieh et al., 2020) and an essential factor influencing its performance (Othman *et al.*, 2015). From the results, weak market orientation resulted to lack of financial capacity in most of IPFCs, which led to their poor financial performance, given that 59.38% of sampled IPFCs have reported ROA below 10%.

Table 5.4: Summary of Regression and Hypothesis Results

Hypotheses	Conclusions
H ₁ Customer orientation has significant and positive relationship with financial performance of IPFCs	Supported (b = 0.090, p < 0.001)
H ₀₁ Customer orientation does not have significant and positive relationship with financial performance of IPFCs	Rejected (b = 0.090, p < 0.001)
H ₂ Competitor orientation has significant and positive relationship with financial performance of IPFCs	Supported (b = 0.055, p < 0.001)
H ₀₂ Competitor orientation does not have significant and positive relationship with financial performance of IPFCs	Rejected (b = 0.055, p < 0.001)
H ₃ Inter-functional coordination has significant and positive relationship with financial performance of IPFCs	Not supported (b = -0.011, p > 0.1)
H ₀₃ Inter-functional coordination does not have significant and positive relationship with financial performance of IPFCs	Accepted (b = -0.011, p > 0.1)
H ₄ Supplier orientation has significant and positive relationship with financial performance of IPFCs	Not supported (b = -0.021, p < 0.05).
H ₀₄ Supplier orientation does not have significant and positive relationship with financial performance of IPFCs	Accepted (b = -0.021, p < 0.05).

5.6 Conclusion and Recommendations

This chapter examined market orientation dimensions that contribute to financial performance (ROA) of IPFCs. The results show positive significant relationship between customer orientation and financial performance; competitor orientation and financial performance, while supplier orientation has shown negative correlation. Furthermore, the results reveal a non-significant relationship between inter-functional coordination and financial performance. As noticed from the findings, most of IPFCs are characterised by lack of market orientation culture, which impairs their financial performance. Lower mean values for all dimensions of market orientation, along with small beta coefficients that show small magnitude of contribution of customer orientation to financial performance, is a clear indicator of ineffective customer orientation practices among IPFCs. As mentioned above, this is attributed to limited financial capacity to implement the concept of market orientation. Based on the findings, in order to raise capital and implement the market orientation concept, it is recommended that IPFC's leaders address the

barriers that prevent members from increasing their shareholdings. On the other hand, RCA and other community development partners should organize capacity building training on market orientation among IPFCs.

This chapter could serve as a framework for IPFCs leaders, policy makers and community development partners to set up strategies at ensuring that IPFCs are more market oriented. To do that, development policies should encourage IPFCs to engage in coordinating supply and increase their capacity to access information on customers and competitors. The chapter contributes to the literature by analyzing market orientation dimensions that affect the financial performance of agricultural co-operatives in developing and emerging economies. This chapter used objective performance approach. Future research should investigate both objective and subjective approaches by analysing the influence of market orientation on co-operative performance and members' satisfaction.

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Appendix 5.1: Correlation Matrix and Variance Inflation Factor

	CUSOR	COMPOR	INTFCO	SO	ROA	1/VIF	VIF
CUSOR	1	.				0.298	3.359
COMPOR	0.797**	1				0.268	3.731
INTFCO	0.792**	0.717**	1			0.204	4.902
SOR	0.538**	0.628**	0.739**	1		0.441	2.267
ROA	0.593**	0.532**	0.461**	0.267**	1		

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix 5.2: Heteroscedasticity

Model	Unstandardized Coefficients		Standardized Coefficients		T	Sig.
	B	Std. Error	Beta			
1 (Constant)	3.305E-16	0.036			0.000	1.000
CUSOR	0.000	0.014	0.000		0.000	1.000
COMPOR	0.000	0.018	0.000		0.000	1.000
INTFCO	0.000	0.022	0.000		0.000	1.000
SOR	0.000	0.011	0.000		0.000	1.000

a. Dependent Variable: AbsUt

Appendix 5.3: Tests of Normality^a

Kolmogorov-Smirnov ^b			
	Statistic	Df	Sig.
ROA	0.450	12	0.000

a. CUSOR = 1.00, COMPOR = 2.00, INTFOR = 2.00, SO= 1.80

b. Lilliefors Significance Correction

Appendix 5.4: IPFCs ROA in 2019

Ratio	Range	Co-operatives	
		Frequency	Percentage
ROA	≤ 0.08	19	59.38
	0.08-0.18	06	18.75
	0.19-0.29	03	9.37
	0.30-0.40	02	6.25
	0.41≤	02	6.25

CHAPTER SIX

6.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Findings

6.1.1 Determinants of members' Satisfaction with Access to IPFCs Services

The first objective analysed the demographic and socio-economic characteristics of members' satisfaction with access to IPFCs services. Descriptive statistics were used to describe the services offered. Service accessibility level among members of IPFCs was measured by developing Service Accessibility Index (SAI). In assessing the level of members' satisfaction, the Member Satisfaction Index (MSI) was developed using Factor Analysis (FA) with Principal Components Analysis (PCA) method. In testing the hypothesis guiding this objective, multiple regression analysis was used to determine factors that influence members' satisfaction with the services of IPFCs.

As a result of the study, the hypotheses formulated were tested. Service accessibility index shows low level of co-operative members' access to farming services (H_1), the hypothesis is not supported, leading to accept null hypothesis (H_{01}). Normally, co-operative members are expected to get an extensive range of services above what they can achieve individually at a lower cost than non-members. However, in spite of eminent benefits associated with membership in smallholder farmer co-operatives, not all smallholder farmers join co-operatives. The chapter also hypothesised that co-operative members are satisfied with IPFCs services (H_2). The result shows low level of members' satisfaction with IPFCs services. The hypothesis is not supported, failing to reject null hypothesis (H_0), stated that co-operative members are not satisfied with co-operative services. Finally, in determining demographic and socio-economic factors affecting members' satisfaction (H_3), results indicate that gender, livestock ownership and off-farm income significantly affected farmers' satisfaction with access to co-operatives' services.

6.1.2 Influence of Co-operative Characteristics on Financial Performance of IPFCs

Panel regression analysis was used as it is suitable to deal with fixed effects (FE) or random effects (RE) error component presented in the model. Using panel data, multiple linear regression model was employed to capture the relationship between cooperative-specific characteristics and financial performance (ROA and ROE). Among co-operative specific-characteristics, only LIQ, SIZE, and SCAP significantly affected ROA while the estimated coefficients showed that LIQ, DEBT, EMP and SCAP significantly affected ROE. Findings also reported poor financial capacity among IPFCs, which is a big challenge to improve the socio-economic transformation of members. This was explained by maximum amount of share capital in some of IPFCs fixed by the local authorities under pretext of reported mismanagement. This violates the principle of member economic participation and national policy on co-operatives in Rwanda, which requires co-operatives to regularly contribute their membership fees and other contributions to promote self-financing and reduce their reliance on government and donor financial support.

6.1.3 Effect of Co-operative Governance Factors on Financial Performance of IPFCs

The study examined governance factors that affect financial performance measured in terms of ROA. Data were analysed with both descriptive and inferential statistics. To analyze the perception of respondents about governance practices, five-point Likert scale was used. Moreover, inferential statistics were used to test the formulated hypothesis, including ANOVA, Pearson correlation, and multiple regression. The idea behind the use of multiple regression analysis was statistical dependence of one variable, the dependent variable (ROA), on more independent variables.

Findings showed that among governance factors in IPFCs, members' participation, accountability, transparency, and leadership, significantly and positively affected the financial performance. Among all the explanatory variables, leadership was the most influencing factor that affected the financial performance of IPFCs ($b = 2.813$, $p < 0.001$). This result supports H_5 which states that there is a statistically significant

and positive relationship between leadership and financial performance, rejecting (H_{05}). The estimated coefficients also showed a positive and significant relationship between member participation and performance ($b = 1.456, p < 0.001$). The result supports H_1 , postulating that there is a statistically significant and positive relationship between member participation and financial performance, leading to reject null hypothesis (H_{01}). Results have also shown a significant and positive relationship between transparency and performance ($b = 1.046, p < 0.001$). This result supports H_3 , stating that there is a statistically significant and positive relationship between transparency and financial performance, the null hypothesis (H_{03}) is rejected. Furthermore, the results in Table 4 indicate that co-operative structure does not affect ROA ($b = -.535, p > 0.1$). The result does not support H_6 which states that there is a statistically significant and positive relationship between co-operative structure and financial performance, failing to reject the null hypothesis (H_{06}).

6.1.4 Influence of Market Orientation Dimensions on Performance of IPFCs

The fourth objective aimed to determine the influence of market orientation dimensions on performance of IPFCs. Data were analysed with both descriptive and inferential statistics. The former used frequency distributions, minimum, maximum, mean and standard deviation. To analyze the perceptions of respondents about market orientation dimensions, five-point Likert scale was used. Likert scale responses for each market orientation dimension were converted into summed composite scores in continuous data. Inferential statistics were used to test the formulated hypothesis, including ANOVA, Pearson correlation, and multiple linear regression. Composite scores of market orientation were regressed against ROA as recommended by different statisticians and, hence, treated with parametric statistics without fear of wrong conclusion. Several experts also argue that parametric tests can be employed for Likert scale and demonstrated this with research evidence. Parametric tests can be used not only with ordinal data, but they are generally more robust than non-parametric tests.

The results report significant relationship between customer orientation and financial performance, and competitor orientation and financial performance. Supplier orientation has shown negative relationship with ROA. Given the beta

coefficients values, the magnitude of influence of market orientation dimensions on performance of IPCs is very low. Findings showed significant and positive effect of customer orientation on ROA ($b = 0.090$, $p < 0.001$). This result supports H_1 which states that customer orientation has significant and positive relationship with financial performance, leading to reject null hypothesis (H_{01}). The results also show that ROA is positively and significantly affected by competitor orientation ($b = 0.055$, $p < 0.001$). The result supports H_2 which postulates that competitor orientation has significant and positive relationship with financial performance. The null hypothesis (H_{02}) is rejected. Unlike customer and competitor orientation, the result showed a non-significant relationship between inter-functional coordination and financial performance ($b = -0.011$, $p > 0.1$). The result does not support H_3 which states that inter-functional coordination has significant and positive relationship with financial performance, leading to accept null hypothesis (H_{03}). The estimated coefficients indicated that ROA is negatively and significantly correlated with supplier orientation ($b = -0.021$, $p < 0.05$). This result does not support H_4 which states that supplier orientation has significant and positive relationship with financial performance, failing to reject null hypothesis (H_{04}).

6.2 Conclusions

6.2.1 Determinants of Farmers' Satisfaction with Access to IPFCs Services

The study concludes that there is a low level of satisfaction with farming services among IPFCs members in Northern and Western provinces. As observed, nothing can motivate non-co-operative farmers to join IPFCs in the study area. Nevertheless, Irish potato farmers in Western Province try hard to be market-oriented unlike their counterparts in Northern Province, who mostly practice subsistence farming. In general, IPFCs in the area failed to revive their operations, resulting in the exit from Irish potato farming activities for some of their members. If this problem persists, it will have a detrimental impact on the overall production of Irish potatoes in Rwanda.

6.2.2 Influence of Co-operative Characteristics on Financial Performance of IPFCs

On the basis of the findings, the study concludes that there is a limited financial capacity for most IPFCs in the study area, which is a challenge for their growth.

The issue may be explained by limited amount of members' share capital fixed by local authority as a result of mismanagement reported in several IPFCs. Consequently, most IPFCs cannot afford the necessary equipment to improve their production, including improved farm infrastructure. Moreover, given their limited financial capacity, most IPFCs are constrained by a small number of managerial personnel. Due to the aforementioned limitations, IPFCs are unable to compete with better-prepared private traders. As a result, providing the required services to their members is a significant concern. Unless co-operatives' financial performance is healthy, it may be difficult for co-operative societies to sufficiently serve their members.

6.2.3 Effect of Co-operative Governance Factors on Financial Performance of IPFCs

The study reports leadership problems among IPFCs in running their co-operatives successfully. Leadership problems identified among IPFCs include understanding the concept of co-operative, efficient conflict-solving abilities, interpersonal skills, managerial skills, technical skills, financial management capacity, accounting skills and the required education level. Due to poor leadership and reported cases of mismanagement, IPFCs experience a big challenge of government interference in their management and administration.

As per co-operative policy, most IPFCs in the study area fall under category B. They are growth co-operatives that operate in priority sector and demonstrate substantial potential to generate benefits for their members, but not yet profitable. In this category, type of government support should be limited to an extensive high quality support programme, tailored to the individual growth co-operative's need, which includes financial, marketing and other business development services. Additionally, throughout the length of the program, the government assigns a professional manager to provide technical support to the management of the co-operative. However, what is happening goes against the policy; local authorities are highly involved in decisions made by co-operatives, including the nomination of leaders and financial decisions. Despite poor leadership skills in some IPFCs, government interference is against the co-operative principles of democratic member control and autonomy and independence. Co-operatives are democratic

organisations controlled by their members, who actively participate in setting their policies and making decisions. The government should not interfere but intervene by ensuring that political, legal and administrative platforms are in place to help co-operatives develop. It should be noted that any member organisation is eligible to be a co-operative if it adheres to the co-operative principles.

6.2.4 Influence of Market Orientation Dimensions on Performance of IPFCs

By examining the influence of market orientation dimensions of customer orientation, competitor orientation, inter-functional coordination and supplier orientation on financial performance, this study concluded that there is lack of market orientation culture among IPFCs, which impairs their financial performance since 19 (59.38%) out of 32 IPFCs have reported ROA below 10%. This was associated with limited financial capacity among IPFCs, creating a serious drawback to the implementation of market orientation activities.

6.3 Recommendations

6.3.1 Determinants of Farmers' Satisfaction with Access to IPFCs Services

In order to address the issues reported in the study in relation to demographic and socio-economic characteristics of members' satisfaction with access to IPFCs services, as well as to improve Irish potato farming and enhance the level of members' satisfaction, the study recommends IPFCs to mobilise their members to work closely with financial institutions to improve their farming activities. Given that private traders benefit more from Irish potato farming, co-operatives are also advised, to change their existing Irish potato market channel by taking control and management of the entire chain of distribution from farm areas through collection centers to wholesale points in Kigali. On the basis of the findings, the study recommends the Ministry of Agriculture and Animal Resources establish storage facilities with cold rooms to help IPFCs cope with price fluctuations. Moreover, the Rwanda Agriculture Board is recommended to back up IPFCs to secure the right to commercialise agricultural inputs. To address lack of Irish potato seeds, Rwanda Agriculture Board is finally recommended using the area of *Nyagahinga* in *Butaro* for seed multiplication given its favorable soil.

6.3.2 Influence of Co-operative Characteristics on Financial Performance of IPFCs

For the improved financial performance of IPFCs, a joint effort from both the co-operatives and the government is required. In response to the research findings, IPFCs should encourage their members to increase their shareholdings in order to raise capital for their co-operatives and enhance performance. In accordance with the national policy on co-operatives in Rwanda, in order to promote self-financing and reduce their reliance on government and donor financial support, IPFCs are also advised to diversify their revenue streams by engaging in the sale of agricultural inputs. Given that the size of most IPFCs in terms of total assets is small, the Ministry of Agriculture and Animal Resources should provide assistance by providing improved storage facilities and farm infrastructure to assist IPFCs in expanding their businesses and improving their production for better performance.

6.3.3 Effect of Co-operative Governance Factors on Financial Performance of IPFCs

On the basis of research findings, IPFCs should be wary of how weak internal governance encourages government interference in the management and administration of their co-operatives, which violates the principle of autonomy and independence. As per the principle of education, training and information, IPFCs should therefore keep their members and staff educated, informed and trained to govern their co-operatives successfully without external influence. Besides, Rwanda Co-operative Agency (RCA) and other community development partners should organize capacity-building trainings for IPFCs' leaders in self-governance to limit the interference of local authorities in co-operative's administration under the guise of reported mismanagement and poor leadership.

6.3.4 Influence of Market Orientation Dimensions on Performance of IPFCs

As noticed from the findings, most IPFCs practice subsistence farming and characterised by lack of market orientation culture. This was attributed to their limited financial capacity for the implementation of market orientation dimensions, which impaired their financial performance. Therefore, to raise capital and implement the market orientation concept, it is recommended that IPFC's leaders get rid of restrictions that limit members from increasing their shareholdings. On

the other hand, RCA and other community development partners should organise capacity-building training on market orientation among IPFCs.

6.4 Contribution of the study

6.4.1 Theoretical Contribution

The study used six theories, namely Expectancy Disconfirmation Theory, Resource-Based Theory, Pecking Order Theory, Theory of Co-operative, Agency theory, and Neo-classical Theory of Co-operatives. Expectancy Disconfirmation Theory was used to analyse demographic and socio-economic characteristics of members' satisfaction with access to IPFCs services. The study tests the applicability of the theories in the context of a developing country and in a specific sector of agriculture. The study also shows how the theories complement each other in addressing the research objectives and hypotheses. Additionally, the study provides empirical evidence to support or challenge some of the theoretical assumptions. In line with Expectancy Disconfirmation Theory, negative disconfirmation develops when the actual performance of a product or service fails to meet the customers' expectations. The findings of this study support what is hypothesised by this theory, since the study reported farmers' negative disconfirmation, as services provided by IPFCs did not meet their expectations. As a result, some unsatisfied farmers decided to withdraw from Irish potato co-operatives in search of alternative opportunities, including a shift to other crops.

Resource-Based Theory guided to examine the influence of co-operative characteristics on financial performance, it examined performance differences of organizations based on their resources. Findings depict the reality given by Resource-Based Theory, that organizations with adequate resources are expected to achieve desired performance. When compared to IPFCs with insufficient resources, IPFCs with adequate resources reported improved performance. On the other hand, Pecking Order Theory also was used to examine the influence of co-operative characteristics on financial performance. The theory affirms that internal financing is preferred to external funding which can only be used as the last option. It suggests that farmer co-operatives can enhance their financial performance by using internal finance, with meagre cost as first priority. In contrast to pecking order

theory which affirms that internal financing is preferred to external funding, based on the findings, most IPFCs do not choose to rely solely on internal financing.

Theory of co-operative was applied to explain the co-operative financial performance from a co-operative point of view. The co-operative enterprise has traditionally been viewed as a non-profit organisation directed by the principle of providing service at low cost for the benefits of patrons. Unless co-operatives' financial performance is strong, it may be difficult for co-operative societies to sufficiently bolster their members' socio-economic transformation. However, findings from the study report poor financial performance among IPFCs, which is a challenge to serve their members. Agency theory was adopted to examine co-operative governance factors that affect their financial performance. In line with the general formulation of the principal-agent model, if members are unable to oversee managers' behaviour, this might lead them to behave opportunistically by maximizing their own interests. Agency theory supports the study findings given the reported cases of mismanagement that led to poor financial performance of some IPFCs, prompting government interference in their management and administration, which violates the co-operative principles of democratic member control and autonomy and independence.

Concerning Neo-classical Theory of Co-operatives used to determine the influence of market orientation dimensions on performance, the findings obtained violate the postulation that a co-operative must be economically and financially sustainable to achieve its benefits, mainly by maximizing member returns. Findings report lack of financial capacity in most IPFCs, which is a major challenge to the implementation of market orientation activities and, hence, a problem for the improved performance and socio-economic transformation of their members.

6.4.2 Contribution to the Academic Literature

Most studies on the determinants of performance of farmer co-operatives either employed objective measures using financial ratios or subjective measures by analysing members' livelihood. This study contributes to the literature by using both objective and subjective measures of performance. The former was measured using financial ratios appropriate to farmer co-operatives, while the latter was

determined by members' satisfaction with access to IPFCs services, taking a holistic perspective to cover all services that members expect from their co-operatives. Moreover, most of the reviewed literature on determinants of performance of farmer co-operatives were conducted in developed countries and large co-operatives. This study, therefore, contributed to the literature by broadening the understanding of determinants of performance of smallholder farmer co-operatives in developing economies, taking Rwanda as a case study.

6.4.3 Methodological Contribution

Unlike previous studies on determinants of performance of farmers' co-operatives, which were restricted either to primary or secondary data using qualitative or quantitative approaches, this study adopted mixed-methods sequential explanatory design whereby both quantitative and qualitative data collection techniques and analysis were used for both primary and secondary data. This method aims to provide sufficient information about the focus of the study than either research approach alone. It is also used to avoid biases inherent in a single technique. The obtained qualitative data were used to validate and triangulate quantitative outcomes to provide sensible and meaningful results. Furthermore, among estimation models, in this study, service accessibility and farmer satisfaction indices were developed in contrast with previous studies.

6.4.4 Policy Implication

This study recommends several policy implications. MINAGRI, MINICOM, RCA, NCCR and community development partners should bolster IPFCs by providing necessary farming infrastructure to attract non-co-operative farmers instead of forcing them to join co-operative as a sole condition of selling their products, which violates the principle of voluntary and open membership.

RCA and other community development partners should organise IPFCs leaders' capacity-building trainings for self-governance to curtail the interference of local authorities within the administration of co-operatives. On the basis of the findings and in accordance with the national policy on co-operatives in Rwanda, during registration, RCA should also check if all co-operatives present their business plan, showing how they will become financially self-reliant. On the other hand, local authorities should remove all barriers that limit co-operative members to increase

their shareholdings. This is against national policy on co-operatives in Rwanda, which requires co-operatives to regularly contribute their membership fees and other contributions to promote self-financing and reduce their reliance on government and donor financial support. Policy makers and community development partners should set up strategies to ensure that IPFCs are more market-oriented by encouraging them to engage in coordinating supply and increasing their capacity to access information on customers and competitors. Finally, given that IPFCs are not benefiting from the existing Irish potato market channel, with government intervention, IPFCs should take control and management of the whole chain of distribution from collection centers to wholesale points in the city of Kigali.

6.5 Limitations of the Study

The main challenges were experienced during data collection. First, respondents were reluctant to provide research information due to the population culture of lack of openness. To address this issue, respondents were given incentives for their participation in the study. Secondly, during the collection of qualitative data, it was difficult for key informants to keep their appointments, which disrupted the researcher's timetable. Social networking was employed to insure that participants in key informant interviews were available for the interview.

6.6 Areas for Further Research

The study analysed the determinants of performance of IPFCs in Rwanda with experience from Northern and Western provinces. It investigated governance and market orientation as factors of performance of IPFCs. It is recommended that future studies consider other factors like legal, political factors, technological and cultural factors influencing the performance of IPFCs.

APPENDICES

Appendix I : Household Questionnaire

Questionnaire Number	
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DETERMINANTS OF PERFORMANCE OF IRISH POTATO FARMER CO- OPERATIVES IN RWANDA: EXPERIENCE FROM NORTHERN AND WESTERN PROVINCES
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The researcher is a Ph. D candidate at Moshi Co-operative University (MoCU), Tanzania. This research is part of the requirements for the award degree of Doctor of Philosophy. Responses provided will be treated with utmost confidentiality and will be used exclusively for academic purposes and future interventions that will benefit Irish Potato Co-operatives.

Instructions:

- (i) Fill the empty space or Circle the answer that matches your perception
- (ii) Only one household member is allowed to participate in this survey

Name of the data collector:

Name of the supervisor:

Date of interview:

District:

Sector:

Cell:

Co-operative:

Code	Questions	Codes	Response
PART ONE: HOUSEHOLD DEMOGRAPHICS			
HD1	Gender	Male (1), Female (2)	
HD2	Age	Years	
HD3	Education level	None (1)	
		Primary (2)	
		Secondary (3)	
		Vocational training (4)	
		University (5)	
HD4	Relationship to head of household	Self (1), Spouse (2), Child (3)	
HD5	Marital Status	Single (1), Married (2), Divorced (3), Widow/widower (4)	
HD6	Children under five in the household	Number	
HD7	Children between 5-15 years of age	Number	
HD8	Adults between 16-64 years	Number	
HD9	Elders 65+	Number	
HD10	Primary Occupation of Head of Household	Farming (1), Salaried employment (2) Employment on farm (3), Self-employed off-farm (4), Household keeping (5), Other (88)	
Information on crop production			
HD11	How many Acres do you farm?	#	
HD12	How many acres used but not owned (rented)?	#	
HD13	On average how many acres of land do you use for Irish potato farming?	#	
HD14	What type of technology do you use in the farm?	Hand hoe (1), Animal traction (2) Tractor (3)	
HD15	Name in order of importance four main crops you cultivated in last 12 months	Main crop	Amount harvested (indicate units)
		Cropping system	
		Area cultivated (indicate units)	
		Type of inputs used	
		Source of inputs	
<p>Main crop: Irish potato (1), Sweet potato (2) Coffee (3), Maize (4), Groundnuts (5), Cassava (6), Rice (7), Beans (8), Sorghum (9), Bananas (10); Cotton (11), Soya beans (12), Vegetables (13), Fruits (14), Others (88) specify</p> <p>Cropping system: Single crop (1), Intercrop (2), Other (88) specify</p> <p>Inputs: None (0), Local seed (1), Recycled seed (2), Improved seed (3), Hybrid seed (4), Fertilizers (5), Manure (6), Pesticides (7), Fungicides (8), Herbicides (9), Others (88) specify</p> <p>Source of inputs: Own stock (1), Used own money (2), Cash loan from co-operative (3), In kind from co-operative (4), Given by relative (5), Government subsidiary program (6), NGO (7), Others (88) specify</p>			
HD16	Of the major crops mentioned above, are there any crops that you grow because of support influence from producer group, co-operative or organization?	No (0), Yes (1)	
HD17	If yes, provide the following information		

Main crop (use crop code from above)	Source of support/influence		Type of support/influence from coop				
<p>Source of influence: None (0), Producer organization (1), SACCO (2), Community/fellow villagers (3), NGO (4), Local government (5), Others (88) specify</p> <p>Type of support: None (0), Inputs (1), Cash credit (2), Markets (3), Storage (4), Processing (5), Transportation (6), Extension and training (7), Other (88) specify</p>							
HD18	Is the Irish potato farming the predominant activity?	No (0), Yes (1)					
HD19	Give information about Irish potato yield in the last 12 months.						
Area planted	Producti on per acre	Total production	Quantity sold	Price per kg	Total earning		
HD20	Did you experience any severe constraints in producing Irish potato last year?	No (0), Yes (1)					
HD21	If yes, mention the severe constraints you experienced and indicate if you received assistance for coping with the constraints.	Cons traint	Type of assistance	Source of assistance			
<p>Constraint: 1= Low soil fertility, 2= Pests, 3= Diseases, 4= Weeds, 5= Vermin/rodents, 6= Lack of improved varieties, 7= Extreme weather changes, 8= Small land holding, 88= Other</p> <p>Type of assistance: 1= None, = Loan, 2= Donation cash, 3= Donation food, 4= Donation inputs, 5= Donation farm tools and implements, 6= Extension advice, 88 = Other</p> <p>Source of assistance: 0= None, 1= producer organization, 2= my co-operative, 3= Community/fellow villagers, 4= NGO, 5= Local Government, 88= Other</p>							
Market access							
HD22	Did you sell any crops in the last 12 months?	No (0) Yes (1)					
HD23	If yes provide the following information on crops you sold in the last 12 months (list all markets were a single crop was sold)						
	Main crop (name)	Where Sold	Dista nce	Qty sold	Price per unit (Frw)	Total amount (Frw)	Who sold?
<p>Main crop: Main crop: Irish potato (1), Sweet potato (2) Coffee (3), Maize (4), Groundnuts (5), Cassava (6), Rice (7), Beans (8), Sorghum (9), Bananas (10); Cotton (11), Soya beans (12),</p>							

Vegetables (13), Fruits (14), Others (88) specify			
Where sold: 1= Co-operative, 2= Private trader on farm/home, 3= Private trader away from farm/home, 4= NGO, 5= Open market, 6= Fellow villagers, 7= Government strategic grain reserve 88= Other.....			
Who sold: 1= Husband, 2= Wife, 3= Daughter, 4= Son, 5= Family, 6= Worker, 88= other			
HD24	If you sell crops through a co-operative, are there benefits that you enjoy?	No (0) Yes (1)	
HD25	If yes, what are they? Please explain your answer	1= Quantity/volume-related benefits, 2= Quality-related benefits, 3= Marketing cost-related benefits, 4= Storage-related benefits, 5= Market search-related benefits, 6= Price-related benefits, 7= Payment terms-related benefits, 88=Others (specify)	
HD26	If you sell crops through a co-operative, are there constraints that you face?	No (0), Yes (1)	
HD27	If yes, what are they? Please explain your answer	1= Quantity/volume-related benefits, 2= Quality-related benefits, 3= Marketing cost-related benefits, 4= Storage-related benefits, 5= Market search-related benefits 6= Price-related benefits, 7= Payment terms-related benefits, 88=Others (specify)	
Information on livestock			
HD28	Do you keep livestock?	No (0), Yes (1)	
HD29	What are the major types of livestock kept in this household?		
	Livestock	Breed	Number
Type of livestock: chicken (1), pigs (2), goats (3), sheep (4), cows (5), fish (6), bees (7), others (88) specify			
Breed of livestock: local breed (1), local breed/exotic			
HD30	What is the purpose of keeping the livestock	(1) Draft power (2) Manure (3) Threshing (4) for sale (5) dairy (6) others (88)	

	k?				
Access to labor for production					
<i>Labor for main crop production</i>					
HD31	Where do you source labor for production of your main crop last year (tick appropriate activity)				
Activity	Tick	Crop (s)	Source of labor: Family (1), communal (2), hired (3)	Mode of payment for hired labor: Cash (1), In kind (2)	
1. Land clearing and preparation					
2. Planting					
3. Weeding					
4. Chemical application					
5. Harvesting					
6. Storage					
7. Processing					
8. Transportation					
9 Marketing					
Main crop: Irish potato (1), Sweet potato (2) Coffee (3), Maize (4), Groundnuts (5), Cassava (6), Rice (7), Beans (8), Sorghum (9), Bananas (10); Cotton (11), Soya beans (12), Vegetables (13), Fruits (14), Others (88) specify					
<i>Labor for main livestock production</i>					
HD32	Where do you source labor for livestock production in the last 12 months (tick appropriate activity)				
Activity	Tick	Livestock (s)	Source of labor : Family (1), communal (2), hired (3)	Mode of payment for hired labor: Cash (1), In kind (2)	
1. Feeding e.g. trekking, grazing etc					
2. Milking					
3. cleaning					
4. Processing e.g. slaughter					
5. Marketing					
Type of livestock: chicken (1), pigs (2), goats (3), sheep (4), cows (5), fish (6), bees (7), others (88) specify					
Household Income And Assets Owned					
HD33	Income earned in the last 12 months.	Source	Tick source	Estimated amount	Who benefits?
		1. Irish potato sales			
		2. Livestock and poultry sales			
		3. Fish sales			
		4. Bee farming			
		5. Sale of other products (firewood/ch arcoal/crafts)			
		6. Casual employment (agricultural			

		related)			
		7. Casual employment (non-agricultural related)			
		8. Rentals			
		88. Other			
Who benefits from income from this source? Codes: (1) Men, (2) Women, (3) Children, (4) Grandchildren, (5) All household members, (6) Relatives and friends, (88) Others (Specify)					
Did your income cover the following in the last 12 months?			Response		
HD34	Mosquito net	No (0), Yes (1)			
HD35	Medical Insurance	No (0), Yes (1)			
HD36	Business/Agriculture Insurance	No (0), Yes (1)			
HD37	School Fees	No (0), Yes (1)			
HD38	Household clothing needs	No (0), Yes (1)			
HD39	Housing needs	No (0), Yes (1)			
HD40	Meals per day	Number			
HD41	Balanced diet	No (0), Yes (1)			
HD42	Radio	No (0), Yes (1) if yes #			
HD43	Clock	No (0), Yes (1)			
HD44	Bicycle	No (0), Yes (1) if yes #			
HD45	Cell Phone	No (0), Yes (1) if yes #			
HD46	TV	No (0), Yes (1) if yes #			
HD47	Computer	No (0), Yes (1) if yes #			
HD48	Cupboard	No (0), Yes (1) if yes #			
HD49	Motorcycle	No (0), Yes (1) if yes #			
HD50	Motor vehicle	No (0), Yes (1) if yes #			
HD51	Sofa sets	No (0), Yes (1) if yes #			
HD52	Sewing machine	No (0), Yes (1) if yes #			
HD53	How many of the following agriculture implements do you possess?				
	Item	Number	Item	Number	
	Hoe		Wheelbarrow		
	Panga		Ox-Plough		
	Rake		Chemical sprayer		
	Spade		Motor irrigation pump		
	Axe		Manual irrigation pump		
	Slasher		Tractor		
	Sickle		Power tillers		

	Watering cane		Other, mention	
HD54	Types of wall for your home		Brick walls-plastered (1), Brick walls-unplastered (2), Mud poles plastered (3) Mud poles unplastered (4)	
HD55	Type of roof		Iron sheet (1), Tile (2), Grass thatched (3)	
HD56	Cemented floor		No (0), Yes (1)	
HD57	Number of rooms in your home		#	
HD58	Does your household have a toilet		No (0), Yes, inside the house (1), Yes a pit latrine outside the house (2), Yet both inside the house and pit latrine outside the house	
HD59	Where does your household collect water (tick response)	Source		Distance (Km)
		Protected well		
		Unprotected well		
		Borehole		
		River		
		Lake		
		Dam		
		Tap water		
		Other		
HD60	If other, specify			
HD61	Energy supply for cooking		Wood (1), Charcoal (2), Gas (3), Bio-gas (4), Electricity (5), Solar (6), Other (88) mention	
HD62	Energy for lighting		Kerosene lamp (1), Candle (2), Electricity (3), Solar (4), None (5), Other (88) mention	
Savings				
HD63	Do you actively save money?		No (0) (skip to 67), Yes (1)	
HD64	Where do you save?		Bank (1), SACCO (2), Other (88)	
HD65	Savings per month		No savings (0), <500 Frw (1), 500-1000 Frw (2), 1000-5000 Frw (3), >5000 Frw (4)	
HD66	Did you make any other form of savings apart from cash?		No (0), Yes (1)	
HD67	What type of savings		Crops (1) livestock (2) trees (3) Other (4) specify	
HD68	Did you experience any severe constraints in saving cash?		No (0), Yes (1)	
HD69	If yes, what are the severe constraints that you faced in cash saving?		Distance to place of savings(1), Process required (2), High charges (3) Other (88) specify	
Credit services				
HD70	Do you or any member in your household borrow		No (0), Yes (1)	

	money in the last 5 years?		
HD71	If yes please provide the following information		
	Source	Amount borrowed	Purpose for borrowing
			Interest rate (%)
			Period of repayment (indicate time)
	Source: Bank (1), SACCO (2), Community bank (3), commercial bank (4), NGO (5), Government (6), Relatives and friends (7), Other (88) Codes for purpose of borrowing: Purchase food (1), Purchase household assets (2), school fees (3), Buy crop inputs (4), Buy livestock inputs (5), invest in business (6), Construction (7), Buying land (8), Others (88)		
HD72	If you or any member in your household ever borrowed money from one source, which source was the easiest to borrow from?		
	Easiest source	Why was source easy?	
	Source: Bank (1), SACCO (2), Community bank (3), commercial bank (4), NGO (5), Government (6), Relatives and friends (7), Other (88)		
HD73	Did you experience any severe constraints in accessing credits?	No (0) Yes (1)	
HD74	If yes which ones?		
	Credit sources not available (1)		
	Not aware of credit sources (2)		
	Lengthy application process (3)		
	Limited maximum of credit offered(4)		
	High interest rate (5)		
	High collateral (6)		
	Short period for repayment (7)		
	Long distance to credit source (8)		
	Failed to repay credit on time (9)		
	Others (88)		
Food security			
HD75	Did/do you worry that your household would not have enough food?	0 = No (skip to 76), 1=Yes	
HD75a	How often did/does this happen in last month?	1 = Rarely, 2 = Sometimes 3 = Often	
HD76	Were/are you or any household member not	0 = No (skip to 77), 1=Yes	

	able to eat the kinds of foods you preferred because of a lack of resources?		
HD76a	How often did/does this happen?	1 = Rarely, 2 = Sometimes 3 = Often	
HD77	Did/do you or any household member have to eat a limited variety of foods due to a lack of resources?	0 = No (skip to 78), 1=Yes	
HD77a	How often did/does this happen?	1 = Rarely, 2 = Sometimes , 3 = Often	
HD78	Did/Do you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	0 = No (skip to 79), 1=Yes	
HD78a	How often did/does this happen?	1 = Rarely, 2 = Sometimes 3 = Often	
HD79	Did/do you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	0 = No (skip to 80), 1=Yes	
HD79a	How often did/does this happen?	1 = Rarely, 2 = Sometimes 3 = Often	
HD80	Did/do you or any other household member have to eat fewer meals in a day because there was not enough food?	0 = No (skip to 81), 1=Yes	
HD80a	How often did/does this happen?	1 = Rarely, 2 = Sometimes 3 = Often	
HD81	Was/is there ever no food to eat of any kind in your household because of lack of resources to get food?	0 = No (skip to 82), 1=Yes	
HD81a	How often did/does this happen?	1 = Rarely, 2 = Sometimes 3 = Often	
HD82	Did/do you or any household member go to sleep at night hungry because there was not enough food?	0 = No (skip to 83), 1=Yes	
HD82a	How often did/does this happen?	1 = Rarely, 2 = Sometimes 3 = Often	
HD83	Did/do you or any household member go a whole day and night without eating anything because there was not enough food?	0 = No, 1=Yes	
HD83a	How often did/does	1 = Rarely, 2 = Sometimes	

	this happen?	3 = Often			
Human Capital					
HD84	Have you improved your education since joining co-operative?	No (0), Yes (1)			
HD85	If yes, at what level.	Primary (1), Secondary (2), Tertiary (3) Professional/Technical training (4)			
HD86	As a member have you taken any training related to your profession?	No (0), Yes (1)			
HD87	If yes specify				
HD88	Who provided the training?				
Health care service					
HD89	Does your household have access to health care?	No (0), Yes (1)			
HD90	What type of health care service?	Traditional health care (1), Modern health care (2), Both (3)			
HD91	If yes, provide this information	Source of health care Service	Distance to health center	Means of transport to the health center	
	Source of health care center: Health care center (1), Dispensary/clinic (2), District hospital (3), Regional/ National referral hospital (4), Herbalist/traditional doctor (5) Means of transport to the health center: public vehicles (1), ambulance (2), motorcycle (3), bicycle (4), walking (5), Traditional stretcher (6), Other (88)				
HD92	Are you able to afford medical expenses?	No (0), Yes (1)			
HD93	If yes, how much have you spent on healthcare for the household in the last 12 months?				FRW
HD94	To what extent has your co-operative income contributed to the above expenses? <i>(if you are non-co-operative member skip this question)</i>	Very low (1), Low (2), High (3), Very high (4)			
HD95	Are you able to seek preventative care without worry of the financial burden?	No (0), Yes (1)			
Social Cohesion <i>(if you are non-co-operative member skip question 97-101)</i>					
HD96	Does your co-op organize social activities to build social cohesion among your co-op members?	No (0), Yes (1)			

HD97	If yes, how often per year?					
HD98	Do you have a special fund for social activities?	No (0), Yes (1)				
HD99	Does your co-op encourage members to engage in social events outside co-operative organization (i.e. attending marriage ceremonies)	No (0), Yes (1)				
HD100	Do you think social events are tools for conflict prevention and resolution?	No (0) Yes (1)				
Co-operative membership and member experience						
HD101	Are you or any adult in this household a member of a co-operative society?	No (0), Yes (1)				
HD102	If no, why are you not a member of any co-operative?	----- ----- -----				
HD103	If yes how did you become a member?	Entrance fee				
		Share				
		Annual subscription				
HD104	Are you a member of other organizations other than the Irish potato co-operative?	No (0), Yes (1)				
HD105	If you are a member provide the following information	Who is a member	Type of cops	Year of joining	Paid membership fee when joining 0=no, 1= yes	Amount paid (Frw)
<p>Who is member: 1= Husband, 2 =Wife, 3= Single/widower/divorced man, 4= Single/widow/divorced woman, 5=Son, 6= Daughter, 7= Nephew, 8= Niece, 9= Brother, 10=Sister, 88= other (specify)</p> <p>Type of cooperative: 1= Production coop, 2= SACCOS, 3= Consumer coop, 4= Housing coop, 5= Transportation coop, 88= other (specify)</p>						
HD106	If you are a member, why did you choose to be a member of the co-operative (s)	Code	Type of co-operative	Reasons for joining		
		1	Production			
		2	SACCO			
		3	Consumer			
		4	Housing			
		5	Transport			

		88	Other			
HD107	Are you aware about shareholding in your co-operative society (s)?	No (0), Yes (1)				
HD108	Do you have shares in your co-operative?	No (0), Yes (1) if yes move to question 112				
HD109	If no, why don't you hold shares in your cooperative society (s)?	----- ----- -----				
HD110	If you don't have shares, would you like to buy them in your co-operative society (s)?	No (0), Yes (1)				
HD111	If you own shares, how much did you have when joining the co-operative and how much do you have now? Please tick appropriate		Co-op	Tick	Amount of shares owned in year of joining	Amount of shares Owned now (2019)
		1	Producti on			
		2	SACCO			
		3	Consum er			
		4	Housing			
		5	Transpo rtation			
		88	Other...			
HD112	If you have shares, would you like to buy more in your co-operative society (s)?	No (0) Yes (1)				
HD113	If no, why wouldn't you like to increase your shareholding in your co-operative?	----- ----- ----- -----				
HD114	If yes, how much more shares would you like to buy (increase)?	Amount of shares in Frw <input type="text"/>				
HD115	Why would you like to increase your shareholding in the co-operative?	----- ----- ----- -----				
PART TWO: LEVEL OF MEMBERS SATISFACTION WITH CO-OPERATIVE SERVICES						
II a. Members access to farming services						
Have you accessed the following services in the last 12 months? No (0), Yes (1)						
	Services		Response		Where do you get the service?	
LMS1	Access to agriculture inputs	Seeds				
		Fertilizer				
		Pesticides				
		Agro-chemicals				
LMS2	Access	At home				

	to storage facility	Co-op warehouse		
		Co-op refrigerated room		
		Co-op ventilated cold room		
		Bulk storage facilities		
		Jacketed storage		
LMS3	Access to farm infrastructure	Tractor for cultivation		
		Irrigation facility		
		Animal traction		
LMS4	Access to produce processing services			
LMS5	Access to produce market			
LMS6	Access to transport	Co-operative truck		
		Own truck		
		Rented truck		
		Bicycle		
LMS7	Access to financial services	Loan		
		Savings		
		Business advise		
LMS8	Access to land			
LMS9	Access to market information	Price of the produce		
		Cost of inputs		
		Quality and standard of produce		
LMS10	Access to extension and training	Crop production		
		Crop marketing		
		Crop processing		
		Farm business and entrepreneurship		
<p>Where agriculture, storage facility, and farm infrastructure services are obtained: Co-operative (1), Private traders (2), Others (88) specify</p> <p>Where financial services are obtained: Co-operative (1), Village community services (2), SACCOS (3), Banks (4)</p> <p>Where market information is obtained: Co-operative (1), Traders (2), neighbours (3), friends and relative (4) Radio (5), internet (6), magazines (7), others (88)</p> <p>Where extension and training services are obtained: Coop. (1) NGO (2) GOV (3) Others (specify) (88)</p>				
II. b. Satisfaction with farming services				
Are you satisfied with the following in the past 12 months?				
Improved access to agriculture inputs				
Indicate your level of agreement with the following statements using <i>1 = Strongly Disagree</i> , <i>2 = Disagree</i> , <i>3 = Neutral</i> , <i>4 = Agree</i> , <i>5 = Strongly Agree</i>				
LMS11	I get all seeds on correct time and quantity			
LMS12	I get all fertilizer on correct time and quantity			
LMS13	I get all pesticides on correct time and quantity			
LMS14	I get all agro-chemicals on correct time and quantity			
LMS15	I appreciate the quality of agriculture input I use in Irish potato farming			
LMS16	The cost for seeds is not affordable			
LMS17	The cost for fertilizer is not affordable			
LMS18	The cost for pesticides is not affordable			
LMS19	The cost for agro-chemicals is not affordable			
LMS20	How do you perceive	Types of	High	Low

	the price of the agricultural inputs set by the co-operative?	agriculture inputs			
		Seeds			
		Fertilizer			
		Pesticides			
		Agro chemicals			
LMS21	What amount of money did you spend in last 12 months on inputs in Frw?				
LMS22	What proportion of the inputs do you obtain through the co-operative?	<25% (1), 25-50% (2), 50-75% (3), >75% (4)			
Improved access to storage facility					
Indicate your level of agreement with the following statements using 1 = <i>Strongly Disagree</i> , 2 = <i>Disagree</i> , 3 = <i>Neutral</i> , 4 = <i>Agree</i> , 5 = <i>Strongly Agree</i>					
LMS23	Storage facility for Irish potatoes is always available				
LMS24	We don't have modern storage facility for our produce				
LMS25	I travel a long distance to get storage for my Irish potato produce				
LMS26	The cost for storage is affordable for Irish potato farmers				
LMS27	If storage facility is available, have you ever availed this facility?	No (0), Yes (1)			
LMS28	If no then what is the main reason for not availing the facility?	It is not large enough for all of our produce (1)			
		Cold storage is too far (2)			
		It is expensive (3)			
		Others (4) specify			
LMS29	How lack of storage facility disrupts your Irish potato farming?	----- ----- -----			
Improved access to farm infrastructure					
Indicate your level of agreement with the following statements using 1 = <i>Strongly Disagree</i> , 2 = <i>Disagree</i> , 3 = <i>Neutral</i> , 4 = <i>Agree</i> , 5 = <i>Strongly Agree</i>					
LMS30	I am satisfied with the accessibility of tractor for cultivation				
LMS31	I am satisfied with the accessibility of irrigation facility				
LMS32	I am satisfied with the accessibility of animal traction				
LMS33	I am satisfied with the accessibility of road				
LMS34	Are you satisfied with the cost of farm infrastructure?	No (0), Yes (1)			
LMS35	How much did you spend in last 12 months for farm infrastructure in Frw?				
Improved access to produce processing services					
LMS36	Does your co-operative	No (0), Yes (1)			

	process your own produce?				
Improved access to produce market					
LMS37	When do you sell Irish potato?	Before harvest (1), After harvest (2)			
LMS38	Have you sold your produce to private traders other than your co-operative in the preceding year?	No (0), Yes (1)			
LMS39	If the answer is yes, what is the reason?	----- -----			
LMS40	If you sell to private traders, do you get any form of services?	Loan (1) information on price (2) farm inputs (3) training (4)			
LMS41	Do private traders give better price than co-operative?	No (0) Yes (1)			
LMS42	What price do they give (Frw/kg)?	<input type="text"/>			
LMS43	What percentage of your Irish potato produce do you sale through your co-operative?	0%	25%	50%	100%
Indicate your level of agreement with the following statements using 1 = <i>Strongly Disagree</i> , 2 = <i>Disagree</i> , 3 = <i>Neutral</i> , 4 = <i>Agree</i> , 5 = <i>Strongly Agree</i>					
LMS44	My co-operative is the best choice to sell my produce				
LMS45	My co-operative has helped to in eliminating exploitation by private traders				
LMS46	I am satisfied with price for my produce				
LMS47	I don't get market for all of my produce				
Improved access to transport					
Indicate your level of agreement with the following statements using 1 = <i>Strongly Disagree</i> , 2 = <i>Disagree</i> , 3 = <i>Neutral</i> , 4 = <i>Agree</i> , 5 = <i>Strongly Agree</i>					
LMS48	The co-operative assist in transporting my produce				
LMS49	The truck come to pick my produce from the farm				
LMS50	The distance from my farm to produce market is not far				
LMS51	I am satisfied with cost charged to transport my produce				
LMS52	What is the cost of transporting one bag of Irish potato from the farm to the market in Frw?	<input type="text"/>			
Increased access to financial services					
Indicate your level of agreement 1 = <i>Strongly Disagree</i> , 2 = <i>Disagree</i> , 3 = <i>Neutral</i> , 4 = <i>Agree</i> , 5 = <i>Strongly Agree</i>					
LMS53	I am satisfied with the loan lending and recovery process				
LMS54	I am satisfied with the interest rate charged				
LMS55	The loan given is enough to help in my farming practices				
LMS56	If you are not satisfied with loan lending and recovery process, what steps are being taken to improve the process of loan leading and recovery	----- ----- ----- -----			

LMS57	Have you borrowed loan from commercial banks and financial institutions?	No (0), Yes (1)	
LMS58	If yes, what is the reason for borrowing loan from other commercial banks and financial institutions? (tick the appropriate answer)	a) Simple loan applicable process b) Lower rate of interest c) Less documents d) Repayment of duration e) Huge loan amount	
Improved access to land			
LMS59	Is your land enough for Irish potato farming?	No (0) Yes (1)	
LMS60	Kindly indicate acres of land that you own by ticking the appropriate group.	Item	Tick
		Less than 1 acre	
		1 acre to 4.9 acres	
		5 acres to 9.9 acres	
		10 acres to 14.9 acres	
LMS61	In your own opinion, would you want to have more land for farming?	No (0), Yes (1)	
LMS62	Does your co-operative assist if you need more land? (<i>if you are non-co-operative member skip this question</i>)	No (0), Yes (1)	
LMS63	If not, how can you get it?	----- -----	
Increased market prices			
LMS64	What is your opinion (perception) on the price offered by co-operative to your agricultural produce as compared to other private traders?	High (0), low (1)	
LMS65	My co-operative does not pay me a fair price for Irish potato I supply	1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree	
Improved access to market information			
LMS66	Do you have a problem in getting market information?	No (0), Yes (1)	
LMS67	If no where do you get market information?	Co-operative (1), Traders (2), neighbours (3), friends and relative (4) Radio (5), internet (6), magazines (7), others (88) (specify).....	
LMS68	What type of information do you get?	Price of the produce (1), Cost of inputs (2), Quality and standard of produce (3), others (88) (specify).....	

Please indicate your level of agreement on the following statements using 1 = <i>Strongly Disagree</i> , 2 = <i>Disagree</i> , 3 = <i>Neutral</i> , 4 = <i>Agree</i> , 5 = <i>Strongly Agree</i>						
LMS69	My co-operative keeps me well informed about the market situation					
LMS70	My coop is willing to inform me about agriculture inputs and their prices to be used in Irish potato production.					
LMS71	My coop is always willing to inform me the price of Irish potatoes					
LMS72	My co-op has benefited from my membership to this co-operative by providing misinformation					
LMS73	Sometimes my co-op lie about the quality of Irish potatoes I supply in order to protect their interest.					
LMS74	I always get the information on quality standard of Irish potato produce					
Improved access to extension and training						
LMS75	Have you acquired extension service from your coop in the last 12 months?	No (0), Yes (1)				
LMS76	If yes, specify types of extension acquired	Crop production (1) Crop marketing (2) Crop storage (3) Crop processing (4) Farm business and entrepreneurship (5) others (88)				
LMS77	Have you attended any seminar/training on potato farming in the last 12 months?	No (0) Yes (1)				
LMS78	If yes, please indicate types of training	Crop production (1) Crop marketing (2) Crop storage (3) Crop processing (4) Farm business and entrepreneurship (5) others (88)				
LMS79	Who supported the training?	Coop. (1) NGO (2) GOV (3) Others (specify) (88)_____				
Please indicate your level of agreement on the following statements using 1 = <i>Strongly Disagree</i> , 2 = <i>Disagree</i> , 3 = <i>Neutral</i> , 4 = <i>Agree</i> , 5 = <i>Strongly Agree</i>						
LMS80	My co-operative have a training fund					
LMS81	Extension and training services acquired have improves my farming practices					
LMS82	My co-operative conduct ToT for potential member-trainers					
LMS83	Co-operative member-trainers train other members					
Improved Payment terms						
LMS84	How would you rate the following on the basis of your satisfaction level? (Please tick the appropriate box)	Highly satisfied (5)	Satisfied (4)	Neither satisfied nor dissatisfied (3)	Dissatisfied (2)	Highly dissatisfied (1)
	Mode of payment of produce					
	Time taken for money collection					
	Procedure for weighing of produce					
Transaction cost (the efforts takes to sell Irish potatoes)						
LMS85	Does the coop set requirements before you can sell Irish potato to them?			No (0) skip next question Yes (1)		
LMS86	If yes, what requirements are to be met? (tick)			Membership (1)		
				Quality requirements (2)		
				Quantity		

		requirements (minimum) (3)	
		Other (88) (specify)	
LMS87	Do private traders (besides the coop) set requirements to sell your Irish potatoes?	No (0) Yes (1)	
LMS88	If yes, which requirements?	Quality requirements (1)	
		Quantity requirements (2)	
		Buying farm inputs from them (3)	
		Others (88) (specify)	
Indicate your level of agreement with the following statements using 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree			
LMS89	My coop makes efforts to come and buy from our farm		
LMS90	Our coop make transaction arrangements for us to get all necessary farm inputs		
LMS91	Transporting the harvest to the collection center of the coop within the required time after harvest is difficult and limits my income		
LMS92	The nature of the loads complicate the delivery of our products		
LMS93	I have difficulties in acquiring farm inputs in time		
LMS94	The perishability of my produce increases the uncertainty of my income		
LMS95	The mode and speed of payment in the sales to the coop are slower compared to the other channels		
LMS96	In 2018, how long do you have to wait between the time of sales and the time of final payment (days)?		

PART III: CO-OPERATIVE GOVERNANCE			
Members participation			
GV1	Are you aware of the committees that are in your co-operative?	No (0) Yes (1)	
GV2	If yes, mention type of committees	----- -----	
GV3	Have you been a member of any committee?	No (0) Yes (1)	
GV4	If yes, specify the types of committees and indicate number of years you have been a member in the respective committees.	Type of committee	Number of years
GV5	Have you ever been a board member of your co-operative	No (0) Yes (1)	
GV6	If yes, how many years?		
How often do you participate in the following activities?			
	Activity	Frequency of participation never (0), rarely (1), frequently (2)	
GV7	Regular meetings		
GV8	General assembly		
GV9	Election and voting process		

GV10	Discussions and decisions on finance and budget		
GV11	Discussion on financial audit report		
GV12	Approving the bylaws		
GV13	Training and education		
Please indicate your level of agreement on the following statement 1 = Strongly Disagree , 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree			
GV14	Opinion from members during annual meeting contributes towards co-operative success		
GV15	Members are not given the opportunity to become one of the elected committee		
GV16	Members do not have much influence on co-operative decision making		
GV17	Active participation and loyalty among the members is important in determining the success of my co-operative		
GV18	Opinion from members are considered when implementing any activity		
GV19	I actively participate in social gathering organized by my co-operative		
Accountability			
Indicate your level of agreement on the following: 1 = Strongly Disagree , 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree			
GV20	My co-operative has effective monitoring in place to check compliance to rules and regulations		
GV21	In my co-operative there is a code of ethics which include a conflict of interest provision		
GV22	In my co-operative, the board is not always evaluated by the general assembly		
GV23	Board is not accountable and responsible for performance results		
GV24	Do you have supervisory committee?	No (0) Yes (1)	
GV25	If yes, what the number of supervisory committee members?	#	
GV26	Who elect members of supervisory committee?	Board (1) Management (2) General Assembly (3)	
GV27	Do you normally have collusions between board members and supervisory committee to protect one another's interest, e.g. insider loans and high managers' salaries?	No (0) Yes (1)	
GV28	If yes how often does it happen?	Every month (1), Once a year (2), More than once in a year (3)	
GV29	How many cases of corruption, mismanagement and misappropriation of funds by some elected officials do you have in a year?	None (0), 1 - 5 cases (1) , 6 – 10 cases (2) Over 10 cases (3)	
Transparency			
GV30	Has the annual report been produced at right time?	No (0) Yes (1) Comment: ----- ----- -----	
GV31	Does your co-operative distribute the annual report every year to the members?	No (0) Yes (1)	
GV32	Are the accounts externally audited?	No (0) Yes (1)	
GV33	If yes, how often is this done? And who are the auditors?	----- ----- -----	
GV34	Were there any recommendations from the	No (0) Yes (1)	

	<i>audit to resolve any financial issues prevailing?</i>		
GV35	<i>If yes, what were those significant issues?</i>	----- ----- -----	
<i>Please indicate your level of agreement on the following statements: 1 = Strongly Disagree , 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree</i>			
GV36	The adoption of policies and rules within my co-operative is an open and transparent process		
GV37	The development of strategic plan is reviewed and endorsed by the general assembly		
GV38	The strategic plan, annual plan and budget are prepared/reviewed and endorsed to GA for approval		
GV39	My co-operative has a financial performance system in place		
GV40	Financial reporting and disclosure of financial information are included in the routine meeting agenda of the board of directors		
GV41	There is a regular analysis and interpretation of the financial statements during the board of directors meeting		
GV42	There is a non-transparent decision-making process within my co-operative		
GV43	There is a limited information and awareness of existing policies, laws and internal rules and regulations, and even decisions made within my co-operative		
GV44	The interpretations of financial reports are shared with the general assembly		
GV45	Audited reports are made open to members		
GV46	Audited reports in my co-operative are regularly made public on notice board		
Policies/Guidelines			
GV47	Which policies to you have? (tick)	Policies	Tick
		Election of leaders	
		Distribution of dividend	
		Minimum farm gate price	
		Access to credit	
		Internal accountability (regular accounting audit)	
		Payment of members of the executive committee	
		Participation of special categories of people (women, youth and disabilities)	
		Recruitment	
		Suspension of leaders	
		Disputes settlement	
GV48	Are the policies formulated and implemented in accordance with laws, rules and regulation and bylaws?	No (0), Yes (1)	
GV49	Are the policies regularly reviewed?	No (0), Yes (1)	
GV50	Does your co-operative have bylaws in place	No (0), Yes (1)	
GV51	If yes, who drafted the bylaws?	Co-operative officers (1), consultants (2), Leaders only (3), Members (4), Others (88) specify	
GV52	What happens in your co-operative if a member does not follow bylaws?	----- ----- ----- -----	
GV53	Are the bylaws formulated in accordance with RCA policies?	No (0), Yes (1)	
GV54	Do you engage experts in designing internal rules and regulations?	No (0), Yes (1)	

GV55	Do the bylaws designed effectively in helping to achieve overall goals?	No (0), Yes (1)		
GV56	Do the bylaws accurately describe the following information (tick)	Membership		
		Meetings of members		
		Directors and officers		
		Directors' duties		
		Officer duties		
		Equity capital and redemption		
		Consent		
		Nonmember business		
		Non-patronage income		
		Handling losses		
		Dissolution		
		Indemnification		
Amendment				
Please indicate your level of agreement on the following statements 1 = <i>Strongly Disagree</i> , 2 = <i>Disagree</i> , 3 = <i>Neutral</i> , 4 = <i>Agree</i> , 5 = <i>Strongly Agree</i>				
GV57	I know what bylaws in my co-operative contain			
GV58	The bylaws support the business of my co-operative			
GV59	Members can propose changes in the bylaws			
GV60	The board operates under a set of policies, procedures, and guidelines with which all members are familiar.			
GV61	I am not aware and familiar of existing bylaws in my co-operative			
GV62	I am not aware of my co-operative policies			
Leadership				
GV63	Are the functions, duties and responsibilities of managers well defined, segregated and duly approved?	No (0), Yes (1)		
GV64	Are managers performing their duties and responsibilities?	No (0), Yes (1)		
GV65	Do you trust your co-operative leaders?	No (0), Yes (1)		
GV66	Is there any case of suspension from their duties due mismanagement issue in the last 12 months?	Board member	No (0), Yes (1) not aware (2)	
		Supervisory committee	No (0), Yes (1) not aware (2)	
		Staff	No (0), Yes (1) not aware (2)	
		Coop member	No (0), Yes (1) not aware (2)	
GV67	If yes, please comment:	----- ----- -----		
GV68	Is the oversight function performed by the Board of Directors (BOD) supported by written policy?	No (0), Yes (1) not aware (2)		
GV69	Are meetings conducted regularly by the BOD committees?	No (0), Yes (1) not aware (2)		
GV69a	The strategic plan, annual plan and budget are prepared and endorsed to the general assembly for approval	No (0), Yes (1) not aware (2)		
GV70	Have you attended training conducted by the co-operative society in the last year?	No (0), Yes (1)		
GV71	If yes, provide the following information	Types of training	Who provided training	Number of trainings last

				year
		Crop production		
		Crop marketing		
		Crop storage		
		Crop processing		
		Farm business and entrepreneurship		
		Management		
		Governance		
		Audit		
		Others (specify)		
Who provided training: Rwanda Co-operative Agency (1), UNILAK (2), Other organization (3) mention				
Please indicate your level of agreement on the following statements <i>1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree</i>				
GV72	Leaders are elected after every 3 years			
GV73	Members are aware of the types and composition of board committees			
GV74	Women and youth are committee members			
GV75	The committees conduct meetings as scheduled			
GV76	Nomination of board members follow clearly established procedures using known criteria			
GV77	Board election is free and fair in my co-operative			
GV78	The board size is adequate to effectively govern the co-operative			
GV79	The board makeup is diverse with		Experience	
			Skills	
			Gender	
			Age group	
GV80	Do you know and familiar with each of the board members of your co-operative?			
GV81	The board fully understands and is supportive of the strategic planning process of the cooperative			
GV82	The board adequately oversees the financial performance and fiduciary accountability of the organization			
GV83	The board actively engages in discussion around strategic issues			
GV84	The board chair effectively and appropriately leads and facilitates the board meetings			
GV85	The board chair effectively and appropriately leads and facilitates governance work of the board			
GV86	Statements of the co-operatives mission are well-understood and supported by the board			
GV87	The board exercises its governance role			
GV88	The board evaluates the organization's performance on a regular basis			
GV89	The board periodically reviews, and is familiar with, the organization's partnership core documents			
GV90	The board reviews its own performance and measures its own effectiveness in governance work			
GV91	Board members are responsive to member's questions and concerns			
Managerial and board Chair Person skills				
In my co-operative, Managers and Board Chair Person have the following skills: <i>1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree</i>				
	Type of skills	Managers	Board chair person	
GV92	Interpersonal skills			
GV93	Understanding the concept of co-operative			
GV94	Efficient conflict solving abilities			
GV95	The required education level			
GV96	Adequate computer skills			
GV97	Financial management capacity			

GV98	Accounting skills		
GV99	Leadership skills		
GV100	Managerial skills		
GV101	Technical skills		
GV102	Is there any case of mismanagement of resources in your co-op resources due to lack of the above skills	No (0) Yes (1)	
Co-operative ownership			
GV103	Who is the owner of this co-operative? Please tick	Co-op owner	Tick
		Government	
		Board members	
		District	
		Members	
GV104	Who follows mandate of leaders in your c-operative?		
Co-operative Structure			
Please indicate your level of agreement on the following statement <i>1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree</i>			
GV105	The organization structure of my co-operative is in accordance with the provision of the laws, rules and regulations and bylaws		
GV106	Does your co-operative have 4 organs of co-operative? (Members, Board of Directors, Management staff and Supervision committee) in accordance with the provision of laws, rules and regulations of RCA?		
GV107	The functions, duties and responsibilities of leaders are clearly defined in the organizational chart		
GV108	In my co-op there is an election committee that oversees the process of electing of board members		
GV109	In my co-operative there is distribution channel adapted to member needs		
GV110	In my co-operative, management gives priority to members needs		
GV111	The board structure logically addresses the co-operatives areas of operation		
GV112	All committees address issues raised by co-operative members		
GV113	Board meetings are frequent enough to ensure effective governance		
GV114	In my co-operative board members are responsible to supervise managers, ensure integrity and safeguard the interest of members		
PART IV: CO-OPERATIVE MARKET ORIENTATION			
Customer orientation			
MO1	Does your co-operative production satisfy market needs?	No (0), Yes (1) not aware (2)	
MO2	Does your co-operative provide products at fair price	No (0), Yes (1) not aware (2)	
MO3	Does your co-operative provide timely and sufficient quantity of products?	No (0), Yes (1) not aware (2)	
MO4	Does your co-operative procure members' products?	No (0), Yes (1) not aware (2)	
MO5	Does your co-operative process Irish potatoes from members' production?	No (0), Yes (1) not aware (2)	
MO6	Does your co-operative help in packaging Irish potatoes?	No (0), Yes (1) not aware (2)	
MO7	Does your co-operative collect products on behalf of its members?	No (0), Yes (1) not aware (2)	
MO8	Does your co-operative market products on behalf of its members?	No (0), Yes (1) not aware (2)	
MO9	Did your production increase due to market demand?	No (0), Yes (1) not aware (2)	
MO10	Does your co-operative update its market study to meet client expectations?	No (0), Yes (1) not aware (2)	
MO11	Does your co-operative conduct a market study?	No (0), Yes (1) not aware (2)	

MO12	Does your co-operative have contract with clients?	No (0), Yes (1) not aware (2)	
MO13	Does your co-operative have a market plan?	No (0), Yes (1) not aware (2)	
MO14	Does your co-operative adjust its production to market?	No (0), Yes (1) not aware (2)	
MO15	Does the co-operative have a marketing committee?	No (0), Yes (1) not aware (2)	
Please indicate your level of agreement on the following statements <i>1 = Strongly Disagree</i> , <i>2 = Disagree</i> , <i>3 = Neutral</i> , <i>4 = Agree</i> , <i>5 = Strongly Agree</i>			
MO16	Our co-operative objectives are driven primarily by customer satisfaction		
MO17	Our co-operative leaders meet with customers at least once a year to find out what products they will need in the future		
MO18	In our co-operative, we do a lot of in-house market research		
MO19	Our co-operative leaders constantly monitor the level of commitment and orientation to serving customer's needs		
MO20	Our co-operative leaders measure customer satisfaction systematically and frequently		
MO21	Our co-operative leaders assess feedback from our customers with Irish potatoes they bought		
MO22	Our co-operative leaders visit customers		
MO23	Our business strategies are driven by our beliefs about how we can create greater value for customers		
MO24	Customer complaints doesn't fall on deaf ears in this co-operative		
MO25	When our co-operative leaders find out that customers are unhappy with the quality of Irish potatoes, they take corrective action immediately.		
MO26	My co-operative has proper distributional channels for products		
MO27	Our produce are easily available to customers		
Competitor orientation			
Please indicate your level of agreement on the following statements <i>1 = Strongly Disagree</i> , <i>2 = Disagree</i> , <i>3 = Neutral</i> , <i>4 = Agree</i> , <i>5 = Strongly Agree</i>			
MO28	Our co-operative has created strong brand image than competitors by providing quality products.		
MO29	Our co-operative rapidly respond to competitive actions that threaten us		
MO30	Our co-operative target customers where we have an opportunity for competitive advantage		
MO31	Our co-operative leaders are concerned about what private Irish potato traders are doing in the market		
MO32	Co-operative leaders and other committees share information concerning private Irish potato traders		
MO33	Co-operative leaders regularly discuss competitors' strengths and strategies		
MO34	If a major competitor were to launch an intensive campaign targeted at our customers, our co-operative would implement an immediate response		
MO35	Our co-operative is quick to respond to significant changes in our competitors 'pricing structures		
Inter-functional coordination			
Please indicate your level of agreement on the following statements <i>1 = Strongly Disagree</i> , <i>2 = Disagree</i> , <i>3 = Neutral</i> , <i>4 = Agree</i> , <i>5 = Strongly Agree</i>			
MO36	In our co-operative, we have co-operative meetings at least once a quarter to discuss market trends and development		
MO37	In our co-operative, marketing personnel allocate time for discussing customers' future needs with coop management		
MO38	Data on customer satisfaction is disseminated on a regular basis		
MO39	We all know the role and contribution of each member and committee for the success of our co-operative		
MO40	We have inter-committee meetings at least once a month to discuss on Irish potato business		
MO41	Our co-operative leaders discuss customers' need and preference		

MO42	All co-operative functions share information concerning competitors' strategies	
MO43	We freely communicate information about our successful and unsuccessful customer experiences across all business functions	
MO44	All co-operative functions are integrated in serving the needs of our target markets	
MO45	All coop functions understand how everyone in our co-operative can contribute to creating customer value	
Supplier orientation		
MO46	In our co-operative, we feel that suppliers have been on our side	
MO47	In our co-operative we have contract with our suppliers	
MO48	We work together with suppliers to be successful	
MO49	We communicate with inputs suppliers	
MO50	Our suppliers do have experts about what they supply	

Appendix II : Focus Group Discussion Questions

A. - Board members and members of supervisory committee

Functions, composition and qualification of board members

1. Functions of Board members
2. How board members are selected in your co-operative? How long is board term?
3. Requirements for being a member of Board of Directors
4. Are you able to prepare strategic plan for your co-operative?
5. Composition of board members and their qualification
6. Do you evaluate the co-operatives performance on a regular basis?
7. How do you oversee the financial performance and fiduciary accountability of your co-operative?
8. Do you periodically review and familiar with the co-operatives partnership core documents?

Leadership

9. How do you elect leaders in your co-operative?
10. Functions, duties and responsibilities of managers
11. Is the oversight function performed by the Board of Directors supported by written policy?
12. Are meetings conducted regularly by the BOD committees?
13. Do members and leaders regularly attend training?
14. Is your co-operative composed of all organs in accordance with co-operative law?

Transparency and accountability

15. Do you have effective monitoring to check compliance to rules and regulations
16. Do you have a system of accountability in your co-operative?
17. Are the accounts externally audited?
18. Do you have an internal auditor in your co-operative?
19. Do members involve in audit of their co-operatives, if yes how?
20. How many times do you carry out audit in your co-operative?
21. Does your co-operative keep all the required documents including financial reports?

Market orientation

22. What is your co-operative do to satisfy customers than private traders?
23. What is your co-operative do to outcompete the Irish potato private traders?
24. How is the relationship with your suppliers? And what do you do to maintain the good relationship?
25. Do you have contract with your customers and suppliers?

Member Participation

26. How do you engage members in co-operative activities?
27. Relationship with members

Functions, composition and qualification of supervisory committee

28. Members of supervisory committee and their term of office
29. Conditions to serve as the member of supervisory committee
30. Duties and functions of supervisory committee
31. Meeting of supervisory committee

General questions

1. What type of services does your co-operative provide to the members? And what are the challenges facing in provision of those services?
2. What types of supports do you receive from government?
3. What are the major challenges facing Irish potato farmers in your co-operative?
4. What factors influence Irish potato farmers to join co-operative?
5. Do you think the existing market channel suitable to your co-operative?

B. Co-operative members

1. Are you satisfied/interested to be a co-operative member?
2. Do you actively participate in co-operative activities?
3. Are you satisfied with access to farming services? Do you get access to improved storage facility?
4. How do you perceive the quality and quantity of agricultural inputs?
5. Are you satisfied with the cost of agricultural inputs?

6. What is your opinion on the price offered by co-operative and their mode of payment to your production as compared to the private traders?
7. Relationship with leaders (perception of members to co-operative leaders), Do you trust the ability of your co-operative leaders?

Appendix III : Key Informants Interview Questions

A. National Co-operative Confederation of Rwanda (NCCR) representative

1. Statistics on co-operative production and membership
2. Co-operative model of operation
3. Government support

B. Irish Potato Federation representative

1. Statistics on co-operative production and membership
2. Co-operative model of operation
3. Administrative and financial system
4. Market channel
5. Links with external actors
6. Government support

C. Chairmen of co-operative unions

1. Leadership
2. Membership
3. Model of operations
4. Market channel
5. Links with external actors
6. Expected services to the members
7. Co-operative employees
8. Challenges
9. Government support

D. District Co-operative Officer

1. Statistics
2. Reports
3. Co-operative policies
4. The roles and support to promote co-operative society
5. Co-operative market orientation and governance

E. Sector Executive Secretaries

1. Role of Irish farmer co-operative in the community development
2. How community view co-operatives?

F. Co-operative managers*Co-operative experience*

1. Age of the co-operative
2. Share capital
3. Membership size
4. Increase of members from the start
5. The value of share
6. Number of employees

Managerial skills

7. Understanding the concept of co-operative
8. Education level
9. Computer skills
10. Leadership skills
11. Managerial skills
12. Conflict solving ability
13. Accounting and financial management ability

Co-operative governance

14. To what extent do members participate in co-operative activities?
15. Do co-operative members participate in designing bylaws?
16. Do you have effective monitoring system in place to check compliance to rules and regulations in your co-operative?
17. Co-operative policies
18. Co-operative structure
19. Documents kept by co-operative

Co-operative market orientation

20. What strategies do you employ as managers to meet customer expectations?
21. Does your co-operative provide members products at fair price?
22. Does your co-operative procure all members' products?
23. Does your co-operative process Irish potatoes from members' production?
24. Does your co-operative help in packaging Irish potatoes?
25. How do you respond to competition from private traders?
26. Do you have inter-committee meetings to discuss on Irish potato business?


27. What is your co-operative do to improve and maintain good relationship with suppliers?

General questions to all key informants

1. In general, how do you perceive performance of Irish potato farmer co-operative in Rwanda?
2. What is your point of view in governance of Irish potato farmer co-operatives in Rwanda?
3. Are Irish potato farmer co-operatives in Rwanda market oriented?
4. Why some of Irish potato farmers are reluctant to join co-operatives?
5. Do you think the existing co-operative model of operation beneficial to Irish potato farmers and co-operatives?
6. How do you perceive the existing market channel for Irish potatoes?
7. What are the challenges facing the Irish potato farmer co-operatives and how do you expect to support them?
8. Value addition to Irish potato production

Appendix IV : Research clearance letter

MOSHI CO-OPERATIVE UNIVERSITY (MoCU) CHUO
KIKUU CHA USHIRIKA MOSHI

Sokoine Road, P.O. Box 474, Moshi, Tanzania. Tel:+255 272754401 Fax:+255 272750806 E-mail: info@mocu.ac.tz Website: www.mocu.ac.tz		OFFICE OF THE VICE CHANCELLOR P.O. Box 474, Moshi, Tanzania. Tel: +255 27 2751833 Fax: +255 27 2750806 E-mail:vc@mocu.ac.tz
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our Ref. No: MoCU/UGS/3/41
2019

Date: 10th June,

Your Ref. No:

The Chairman,
 National Co-operatives Confederation of Rwanda (NCCR),
 KIGALI-RWANDA.



RE: RESEARCH ASSOCIATES, STAFF AND STUDENTS CLEARANCE

The purpose of this letter is to introduce to you Mr. Uwaramutse Charles who is a Student of the Moshi Co-operative University (MoCU). The person mentioned above is planning to undertake research activities in your areas as part of the requirements for his studies at this University.

This request is in accordance with the Government Circular No. MPEC/10/1 of 7 July, 1980 read together with Article 5(2) (e) of the Moshi Co-operative University (MoCU) Charter, which empowers the Vice Chancellor of the Moshi Co-operative University (MoCU) to issue permit(s) for undertaking research in the country to University students, staff, and research associate(s) on behalf of the Government and Commission for Science and Technology in Tanzania.

I, therefore, request that the student named above be given the necessary assistance so that he can accomplish his research undertakings. The main assistance he needs is permission to meet different people from your area so that he can interview them.

The main objective of his research is: To Determine Performance for Irish Potato Farmer Co-operatives in Rwanda: Experience from Northern and Western Provinces."

The areas selected for conducting the research are: RWANDA. If there are restricted areas, it is upon you to restrict the researcher from visiting them.

The expected date of commencement is 7/06/2019 and 30/12/2019. If there are any queries, please contact the undersigned.

Looking forward to your kind co-operation.

Sincerely yours,

c.c. Researcher

ation.



Appendix V : Research Permit



NCCR

National Cooperatives Confederation of Rwanda

P.O. Box: 6699 Kigali. Rwanda Tel: +250 788 450 568 nccrrwanda@gmail.com

TO WHOM IT MAY CONCERN

June, 28th 2019

Subject: Research Associates Staff and Students Clearance

Dear Sir/Madam

With reference to the Memorandum of understand between National Cooperatives Confederation of Rwanda (NCCR) and UNILAK as well the letter from Moshi Cooperative University, introducing Mr. UWARAMUTSE Charles who is planning to undertake research activities in the area of Potatoes Farmer Co-operatives in Rwanda: Experience from Northern and Western Provinces.

NCCR hereby is requesting you to facilitate him to carry out his Academic research in your Cooperatives of potatoes growers. Without hesitation his research will be beneficial to the cooperative movement and Irish potato cooperative growers' in particular.

We thank you for your good collaboration.

Faithfully,

NGABONZIZA Gerald

Executive Secretary

Appendix VI : Abstracts of Published Manuscripts in Various Peer Reviewed Journals

Paper 1: Detailed in Chapter Two



Determinants of Farmers' Satisfaction with Access to Irish Potato Farmer Co-operatives' Services in Northern and Western Provinces, Rwanda

C. Uwaramutse^(✉), E. N. Towo, and G. M. Machimu

Moshi Co-Operative University, Moshi, Tanzania
uwachar10a3@yahoo.fr

Abstract. Purpose: Satisfaction of members with services offered by co-operatives is key for a co-operative success. However, it remains questionable whether co-operatives have really achieved their expected objectives. This paper analysed the determinants of farmers' satisfaction with access to services offered by Irish Potato Farmer Co-operatives in Northern and Western Provinces of Rwanda.

Design/Methodology/Approach: The study employed descriptive design in cross-sectional research. Data were analysed descriptively and inferentially. Service accessibility level among Irish potato farmers was measured by developing an index. In assessing the level of farmers' satisfaction, satisfaction index was adapted. Demographic and socio-economic factors influencing farmers' satisfaction with Irish potato farming services were analyzed using multiple linear regression.

Findings: The regression results indicate that only gender, primary occupation, livestock ownership, and co-operative membership significantly affected farmers' satisfaction with co-operative services. Findings reported a low level of farmers' satisfaction with farming services, and co-operatives in the study area failed to resuscitate their activities, forcing some farmers' exit from Irish potato farming activities.

Practical Implications: The findings of this study generate facts to inform IPFCs, community development partners, and policymakers about farmers' satisfaction with co-operative services and how they should be improved. In addition, the paper contributes to the literature by analyzing farmers' accessibility to farming services and satisfaction with co-operative services in developing countries.

Originality/Value: This paper took a holistic perspective to cover all services that members expect from their co-operatives.

Keywords: Co-operative · Co-operative services · Farmers · Satisfaction · Irish potato · Rwanda

Paper 2: Detailed in Chapter Three



African Journal of Applied Research
 Vol. 8, No. 2 (2022), pp. 216-239
<http://www.ajaronline.com>
<http://doi.org/10.26437/ajar.31.10.2022.15>

INFLUENCE OF CO-OPERATIVE CHARACTERISTICS ON FINANCIAL PERFORMANCE OF IRISH POTATO FARMER CO-OPERATIVES IN NORTHERN AND WESTERN PROVINCE RWANDA

Uwaramutse, C.¹, Towo, E. N.² and Machimu, G. M.³

¹*Department of Co-operative Development and Management, Moshi Co-operative University, Tanzania.*

²*Department of Economics and Statistics Moshi Co-operative University, Tanzania.*

³*Department of Community Development and Gender, Moshi Co-operative University, Tanzania.*

¹*uwacharies3@yahoo.fr*

²*awaichisaria@gmail.com*

³*gmthe38@gmail.com*

ABSTRACT

Purpose - The purpose of this paper is to examine the influence of co-operative characteristics on the financial performance of Irish Potato Farmer Co-operatives (IPFCs) in Northern and Western Provinces, of Rwanda.

Design/Methodology/Approach - The study employed a relational research design in cross-sectional research. A purposive sampling technique was used in selecting 32 IPFCs out of 64 observations that complied with audited financial reports for the period 2018 and 2019 were the primary data used for the research. Key Informants Interviews (KIIs), and Focus Group Discussions (FGDs) were employed for data collection. Panel regression analysis was used as it is suitable to deal with fixed effects (FE) or random effects (RE) error components presented in the model.

Findings - The paper results showed that liquidity, leverage, the number of employees, the value of total assets and the value of share capital are significant factors that contribute to financial performance measured in terms of Return on Assets (ROA) and Return on Equity (ROE). The paper also revealed a limited financial capacity for most IPFCs in the study area, challenging their growth.

Research Limitation: Legal, political factors, technological and cultural factors influencing the performance of farmer co-operatives were not considered in this paper.

Practical Implications - The recommendations will mainly assist IPFCs in achieving desired financial performance and provision of expected services to members. IPFCs are recommended to mobilise their members to increase their shareholding, to raise capital for their co-operatives and thus improve performance levels.

Social Implication: This paper generates facts to inform stakeholders such as policymakers and non-governmental organizations.

Originality/Value - This paper took a holistic perspective to cover all the co-operative-specific characteristics in the performance evaluation.

Keywords: *Co-operatives, farmer, financial performance, irish potato, Rwanda.*

ISSN: 2408-7920

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Paper 4: Detailed in Chapter Five

East African Journal of Science and Technology, Vol.12 Issue 1, 2022 Uwaramutse et al., (P.73 – 94)

Market Orientation and Financial Performance of Irish Potato Farmer Co-operatives in Rwanda

Name of authors: Charles Uwaramutse^{1*}, Esther N. Towo² and Gervas M. Machimu²

^{1*} Lecturer, University of Lay Adventists of Kigali, Correspondence author:

uwacharles3@yahoo.fr

²Senior Lecturer, Moshi Co-operative University, Tanzania, awaichisaria@gmail.com

² Senior Lecturer, Moshi Co-operative University, Tanzania, gmthe38@gmail.com

Abstract

Co-operatives are considered key vehicles for increased market orientation among smallholder farmers. Nonetheless, there are limited studies on its influence on the performance of co-operatives in developing and emerging economies. The paper examined the effect of market orientation dimensions on financial performance among Irish potato farmer co-operatives (IPFCs) in Rwanda. Data were collected by interviewing 387 members from 32 co-operatives. Secondary data from audited financial statements were collected to analyze financial performance between selected IPFCs in terms of Return on Equity (ROE). Pearson correlation and multiple linear regression were used for data analysis. The results showed a positive significant relationship between customer orientation and financial performance ($b = 0.091$, $p < 0.001$), and competitor orientation and financial performance ($b = 0.065$, $p < 0.001$), while supplier orientation has shown a negative correlation ($b = -0.023$, $p < 0.05$). Furthermore, the results revealed a non-significant relationship between inter-functional coordination and financial performance ($b = 0.03$, $p > 0.001$). Based on the findings, the most IPFCs experience ineffective market orientation due to limited financial capacity, which impairs their financial performance. In order to raise capital and implement the market orientation concept, it is recommended that IPFC's leaders address the barriers that prevent members from increasing their shareholdings. This study could serve as a framework for IPFCs leaders, policy makers and community development partners to formulate appropriate strategies for IPFCs to be market-oriented. The study contributes to the literature by analyzing market orientation dimensions that affect the financial performance of agricultural co-operatives in developing and emerging economies.

Keywords: Market Orientation, Financial performance, Farmer co-operatives, Irish potatoes

1.0 Introduction

In a competitive market and the era of rapid change, firms face growing technology, evolving customer expectations, and institutional uncertainty and instability, which aggravates the uncertainty and dynamics of the external environment (Yi Wang, 2022). These create both critical challenges and opportunities for businesses to capitalise on their abilities for development (De Vos, *et al.*, 2015). As a consequence,

businesses must apply the concept of market orientation, which is a set of activities developed by business entities to permanently monitor, analyse and respond to market changes (Alsadi & Aloulou, 2021; Jiang, *et al.*, 2020). Market orientation is a business philosophy that focuses on identifying consumer needs and desires and satisfying them through products and services (Udriyah *et al.*, 2019) better than the competitor (Gheysari, 2013).

Appendix VII : AJCDT Acceptance Letter for Paper Four

African Journal of Co-operative Development and Technology (AJCDT)
 P.O Box 24814 - 00502 Along Ushirika Road, Hardy Karen Nairobi.
 Kenya Email: editor.ajcdt@cuk.ac.ke website: www.journals.cuk.ac.ke/index.php/
A Publication by the Co-operative University of Kenya

OFFICE OF THE EDITOR-IN-CHIEF – EDITORIAL BOARD**Notification of Formal Acceptance**

Date: 19 April, 2023

ATT: Charles Uwaramutse*; Esther N. Towo and Gervas M. Machimu

Dear, Charles Uwaramutse, uwacharles3@yahoo.fr ,

Thank you for your cooperation in performing all the changes requested by our reviewers. We are pleased to inform you that your manuscript titled “*Co-operative Governance and Financial Performance of Irish Potato Farmers’ Cooperatives in Northern and Western Provinces, Rwanda*” has been deemed suitable for publication in AJCDT by the Editorial Board. Congratulations!

Your manuscript is now with our production section and will be published in the following issues (June Issue 1 (Vol. 7) 2023), of the Journal, according to the publishing priorities.

Thank you for submitting your work to AJCDT and supporting open access. If we can help with anything else, please email us at editor.ajcdt@cuk.ac.ke

Kind regards.

AJCDT Editorial Office Staff on behalf of Editor-in-Chief
**African Journal of Co-operative Development and Technology (AJCDT) Prof
 Isaac K. Nyamongo**