The Business Performance of small-scale tomato farmers in the

Thulamela Local municipality

Author:

Philelo Nesamvuni

Submitted in Partial Fulfilment of the Requirements for the Degree of Master of Management in Entrepreneurship and New Venture Creation

2025

The Graduate School of Business Administration

University of the Witwatersrand, Johannesburg

Supervisor: Dr Jabulile Msimango-Galawe

DECLARATION

I, Philelo Nesamvuni, declare that this research report is my own work, except as indicated in the reference and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the Field of Entrepreneurship at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

……

Philelo Nesamvuni

Signed at Johannesburg

On the …….. February 2025

ACKNOWLEDGEMENTS

First and foremost, I give all glory and honour to God, the Author and Finisher of my faith. Through His grace, strength, and guidance, I have been able to persevere and complete this journey. His unwavering presence has been my source of wisdom, resilience, and motivation, and for that, I am eternally grateful.

I would like to express my deepest gratitude to my parents, Professor Cebisa Nesamvuni and Professor Edward Azwihangwisi Nesamvuni, for their unconditional love, guidance, and support. Your sacrifices, wisdom, and encouragement have been the foundation of my academic and personal growth. Your belief in my abilities has given me the strength to persevere, and I am forever grateful for your endless support.

A special acknowledgement to my grandmother, Vho Reginah Tshimangadzo Nesamvuni, for her wisdom and resilience. Your guidance, strength, and unwavering belief in me have been a source of inspiration throughout my journey. Your presence in my life is a blessing, and I am eternally grateful for the values and lessons you have instilled in me.

I am immensely grateful to my supervisor, Dr. Jabulile Msimango, for your insightful guidance, patience, and encouragement throughout this research process. Your mentorship has been invaluable, and I deeply appreciate your support.

To my siblings, Phuluso Nesamvuni, Phathu Nesamvuni, and Shammah Nesamvuni, thank you for your love, encouragement, and unwavering support. Phuluso, you have been my pillar of strength, always reminding me of the importance of perseverance and resilience. Your belief in me has been a constant source of inspiration.

To my incredible friends Boitumelo Bela, Itumeleng Shedile, Rolivhuwa Mavhungu, Ronewa Tshikosi, Sebabatso Moleele, Siyanda Nkala, Thandoluhle Moyo, Tshifhiwa Tshioloili, Tshedza Tshioloili, Uada Nembudani and Unarine Nkhumeleni, thank you for being my source of joy, motivation, and unwavering support. Your encouragement and understanding have made this journey more meaningful and fulfilling.

A special mention to my baby cousin, Zinako Manona, whose pure heart and boundless energy have been a constant source of happiness and inspiration.

To my colleagues at MTN, thank you for your support, encouragement, and understanding throughout this academic journey. Balancing work and studies have been challenging, but your camaraderie and motivation have made the process smoother.

A heartfelt appreciation also goes to my classmates in the MMENVC Class of 2025. The journey has been enriching because of our shared experiences, intellectual discussions, and unwavering support for one another. I am grateful to have been part of such an inspiring group of individuals.

To the church members of Charis Missionary church thank you for your prayers and faith to keep holding on.

This journey has been both challenging and rewarding, and I am forever grateful for the love, wisdom, and support from each of you. May this achievement reflect the strength and kindness you have all poured into my life.

Thank you all from the depths of my heart

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

Abbreviation	Full Form
AC	Access to Capital
BP	Business Performance
CASP	Comprehensive Agricultural Support Programme
DV	Dependent Variable
EFA	Exploratory Factor Analysis
GDP	Gross Domestic Product
H1	Hypothesis 1
H2	Hypothesis 2
H3	Hypothesis 3
IDT	Innovation Diffusion Theory
IV	Independent Variable
KMO	Kaiser-Meyer-Olkin
LP	Labour Productivity
MAFISA	Micro-agricultural Financial Institutions of South Africa
MFIs	Microfinance Institutions
NGOs	Non-governmental Organisations
PCA	Principal Component Analysis
RBV	Resource-Based View
SLF	Sustainable Livelihoods Framework
TA	Technology Adoption
VIF	Variance Inflation Factor
VRIN	Valuable, Rare, Inimitable, and Non-substitutable (resources)

ABSTRACT

This study investigates the determinants of business performance among small-scale tomato farmers in Thulamela Local Municipality, South Africa, focusing on three critical factors: access to capital, technology adoption and labour productivity. Small-scale farming plays a vital role in South Africa's rural economy, contributing to food security and employment. However, these farmers face significant challenges, including limited financial resources, low adoption of modern technologies and labour inefficiencies, which hinder their business performance and sustainability. The study aims to identify strategies to enhance the business performance of smallholder tomato farmers by examining the impact of these key determinants.

Using a quantitative research approach, data were collected through structured surveys from a stratified random sample of 100 small-scale tomato farmers in Thulamela. The data were analysed using SAS software's exploratory factor analysis (EFA), reliability testing, correlation analysis and regression modelling.

The findings reveal that technology adoption ($\beta = 0.495$, $p < 0.001$) is the strongest predictor of business performance, followed by access to capital ($\beta = 0.361$, $p < 0.001$) and labour productivity ($\beta = 0.293$, $p = 0.001$). These results align with the Resource-Based View (RBV), Innovation Diffusion Theory (IDT) and Sustainable Livelihoods Framework (SLF), highlighting the importance of financial, technological and human resources in enhancing smallholder business performance. The study's key recommendations include expanding microfinance programmes, subsidising agricultural technology and strengthening workforce training initiatives.

In conclusion, this study underscores the interconnectedness of financial, technological and human capital in driving smallholder business performance. By addressing these determinants, small-scale tomato farmers can achieve greater productivity, profitability and resilience, contributing to broader economic development and food security in South Africa.

Keywords: Small-scale farming, business performance, access to capital, technology adoption, labour productivity, Thulamela Local Municipality, Resource-Based View, Innovation Diffusion Theory, Sustainable Livelihoods Framework.

CHAPTER 1: INTRODUCTION

1.1 Background and Context

Agriculture remains a cornerstone of the South African economy, significantly contributing to employment and Gross Domestic Product (GDP), particularly in rural areas. According to the Department of Agriculture, Forestry and Fisheries (DAFF) (2019) (Hamid et al., 2020), agriculture accounts for approximately 2.5% of the national GDP and employs nearly 10% of the South African workforce. Small-scale farming constitutes a substantial portion of the agricultural sector and plays a critical role in local food security and economic development. Smallholder farmers often engage in subsistence and small-scale commercial farming, sustaining their livelihoods while contributing to local economies (Aliber & Cousins, 2013).

Within this context, the tomato farming industry in Thulamela Local Municipality is of particular significance, due to its favourable climatic conditions and agricultural potential. This municipality, situated in the Vhembe District of Limpopo Province, has a predominantly rural population, that relies heavily on agriculture as a primary source of income. The region benefits from a subtropical climate, which is highly suitable for tomato cultivation, as tomatoes thrive in warm temperatures and well-drained soil conditions (Maboko & Du Plooy, 2018). While the municipality's agricultural sector is diverse, tomato farming stands out as a key component, due to its economic viability and market demand.

Despite these favourable conditions, small-scale tomato farmers in Thulamela encounter numerous challenges that hinder their business performance. These challenges include limited access to capital, inadequate technological advancements and labour-related constraints. One of the most pressing issues is financial access many small-scale farmers lack the necessary capital to invest in high-quality inputs, modern equipment and infrastructure improvements (Chisasa, 2016). Furthermore, agricultural technological advancements, such as precision farming techniques and high-yield crop varieties, remain out of reach for many small-scale farmers, due to high costs and a lack of technical knowledge (Mhlanga, 2021b).

Labour-related challenges further exacerbate the difficulties faced by these farmers. The limited availability of skilled labour makes it problematic for them to implement modern agricultural practices. Small-scale farmers often struggle to attract and retain workers, due to competitive wages in other sectors and the seasonal nature of tomato farming (Aliber & Hart,2009). In

addition, labour productivity is influenced by factors such as health, education and access to training (Pienaar & Traub, 2015). Addressing these issues is imperative to enhance the business performance and sustainability of these farmers, thereby contributing to broader economic development and poverty alleviation.

Historically, South African agricultural policies have favoured large-scale commercial farmers, often neglecting the needs and potential of small-scale farmers. This policy environment has intensified the problems faced by small-scale farmers, making it difficult for them to compete on a level playing field. Moreover, many small-scale farmers remain excluded from mainstream agricultural value chains, limiting their market access and growth opportunities

(Rubhara & Mudhara, 2019).

Recognising these challenges, the South African government has introduced various initiatives aimed at enhancing small-scale farmers' productivity and market access. These include the

Comprehensive Agricultural Support Programme (CASP) and the Micro-Agricultural Financial Institutions of South Africa (MAFISA), both of which provide financial and technical support to small-scale farmers. However, the extent to which these programmes address the specific needs of small-scale tomato farmers in Thulamela Local Municipality remains largely unexplored and requires further evaluation (Iyamu & Roode, 2012).

1.2 Problem Statement

Small-scale tomato farmers in Thulamela Local Municipality struggle to maintain business Performance in the agricultural market. Despite the region's agricultural potential and favourable climatic conditions, these farmers battle due to limited access to key resources, including financial capital, modern technology and skilled labour. As a result, their ability to compete effectively with larger, resource-endowed agricultural enterprises is severely hindered (Malherbe & Marais, 2015; Oluoch-Kosura, 2010).

At the core of the problem is the lack of business performance among small-scale tomato farmers in the municipality. business performance, in this context, refers to the ability of

farmers to produce and market their tomatoes efficiently and profitably, enabling them to secure a sustainable market position. Several interrelated factors contribute to this issue:

Financial Constraints: Many small-scale farmers struggle to secure funding, preventing them from investing in essential agricultural inputs such as seeds, fertilisers and pesticides, which directly affect yield and crop quality (Kawa & Kaitira, 2007).

Technological Deficits: A lack of access to modern farming technologies, including greenhouse systems, mechanised irrigation and precision agriculture tools limits farmers' ability to optimise production throughout the year. Most rely on rain-fed agriculture, making them vulnerable to unpredictable weather patterns and climate change effects (Costa & Heuvelink, 2018).

Low Adoption of Innovations: Small-scale farmers demonstrate low adoption rates of modern agricultural practices due to limited awareness, inadequate access to information and high implementation costs. This includes a reluctance to adopt improved seed varieties, pest and disease management practices and mechanised farming techniques (Joshi et al., 2017). Labour-Related Challenges: The availability of skilled labour remains restricted, and the existing workforce lacks the necessary training to implement modern farming techniques effectively. Labour costs represent a substantial proportion of production expenses, and the seasonal nature of tomato farming makes it difficult to recruit and retain workers (Shi et al., 2023).

As a result of these constraints, many small-scale tomato farmers in the region are unable to operate at optimal productivity levels or achieve competitive market prices. According to the Vhembe District Department of Agriculture, many farmers struggle to generate sustainable income, leading to reduced profitability and economic stagnation (Christopher & R Towill, 2002).

The economic and social implications of this issue are far-reaching. Thulamela Local Municipality is a key contributor to tomato production in the Limpopo province. The challenges facing small-scale farmers in this region, therefore, have significant implications for local food security and economic stability (Nembambula et al., 2023). The specific consequences include:

Reduced Productivity and Profitability: Financial and technological limitations result in lower yields and suboptimal quality, directly impacting farmers' profitability (Malherbe & Marais, 2015).
Vulnerability to Market Fluctuations: Limited market access and reliance on intermediaries lead to unstable profit margins, making farmers susceptible to fluctuating tomato prices (Oluoch-Kosura, 2010). Broader Economic and Social Consequences: The lack of business performance among smallscale tomato farmers increases rural poverty and food insecurity, posing long-term socioeconomic challenges for the region (Reis Marques et al., 2014).

Although previous studies have examined some aspects of small-scale agricultural business performance, there is a gap in the literature concerning the specific barriers affecting small-scale tomato farmers in Thulamela Local Municipality. This study seeks to address this disparity by identifying key determinants of business performance, thus providing empirical insights to inform targeted policy interventions and strategic improvements (Cai et al., 2017; Dean & Kretschmer, 2007).

1.3 Research Objectives

The primary objective of this study is to assess the business performance of smallholder tomato farmers in Thulamela Local Municipality and to identify strategies for enhancing their market position. In this study, BP is measured using a set of indicators commonly applied in smallholder agricultural research, adapted from Richard et al. (2009) and Neely et al. (2005). Specifically, BP was operationalised through farmer-reported metrics on yield per hectare, profitability (net income per season), market access (volume of produce sold into formal markets), and perceived competitive standing relative to peers. These quantitative indicators were captured through structured survey items and collectively used to assess variations in business performance across the sampled population of farmers. The study sub-objectives are as follows

- To examine the impact of access to capital on the business performance of smallholder tomato farmers.

- To assess the influence of technology adoption on the business performance of smallholder tomato farmers.
- To analyse the effect of labour productivity on the business performance of smallholder tomato farmers.

1.4 Research Questions

To address the research objectives, this study seeks to answer the following key research questions:

- To what extent does access to capital influence the business performance of smallholder tomato farmers?
- How does the adoption of technology impact the business performance of smallholder tomato farmers?
- In what ways does labour productivity affect the business performance of smallholder tomato farmers?

1.5 Significance of the Study

This research provides an in-depth understanding of the key determinants of Business Performance among small-scale farmers in South Africa, with a particular focus on tomato farmers in Thulamela Local Municipality. Although previous studies have explored various aspects of agricultural business performance, including financial constraints, technological adoption and market access (Malherbe & Marais, 2015; Oluoch-Kosura, 2010). A gap remains in the literature regarding the unique challenges faced by small-scale tomato farmers in this region. Addressing this shortfall, the study contributes to the broader discourse on agricultural development and sustainability in South Africa. The empirical findings will enhance theoretical frameworks related to small-scale farming and business performance (Dean & Kretschmer, 2007; Joshi et al., 2017).

1.5.1 Practical Implications

The findings of this study will be particularly useful for policymakers, agricultural stakeholders and development agencies in designing strategies and policies to support small-scale farmers. By identifying key constraints affecting business performance, this study provides actionable

recommendations that can guide targeted interventions addressing the financial needs, technological requirements and workforce challenges of these farmers. Support capacity-building initiatives to improve farmer productivity and resilience. Assist policymakers in resource allocation and the formulation of enabling policies (Cai et al., 2017; Costa & Heuvelink, 2018).

For instance, if access to capital is found to be a major determinant of Business Performance, interventions such as microfinance schemes, subsidies or government-backed loan programmes could be explored. Likewise, if technology adoption is critical, efforts should be made to enhance farmer access to modern agricultural equipment and training programmes (Kawa & Kaitira, 2007).

1.5.2 Contribution to Economic Development

Beyond its practical significance, this study has broader implications for rural economic development and poverty alleviation in Thulamela Local Municipality and other similar agricultural regions. By enhancing the business performance of small-scale tomato farmers, this research can contribute to Increased agricultural productivity, leading to higher income levels for farmers. Improved food security, ensuring stable access to agricultural produce in rural and urban markets. Regional economic growth by strengthening the role of smallholder farmers in local and national supply chains (Malherbe & Marais, 2015).

This research builds on prior studies examining financial constraints, technological adoption and market access in agriculture (Malherbe & Marais, 2015; Oluoch-Kosura, 2010). However, it advances the theoretical understanding of agricultural business performance by providing empirical data specific to small-scale tomato farming in Thulamela. These insights can support more effective agricultural policies and development strategies, ensuring sustainable growth for the smallholder farming sector.

1.5.3 Beneficiaries of the Study

- Policymakers: Will benefit from evidence-based recommendations for targeted support programmes and policy development.

- Small-scale farmers: Will gain insights into factors affecting their business performance, helping them adopt more effective farming strategies.
- Agricultural sector stakeholders: Will develop a better understanding of small-scale farming challenges, enabling more effective industry collaboration.
- Local communities: Enhanced farmer business performance will contribute to higher income levels, economic growth and improved food security in the region.

1.6 Research Scope

This study specifically focuses on small-scale tomato farmers in Thulamela Local Municipality, Limpopo Province. The research seeks to provide a context-specific analysis of the challenges and opportunities faced by these farmers.

The study examines the impact of capital access, technology adoption and labour productivity on their business performance. These three factors are recognised as critical determinants of agricultural productivity, efficiency and market success.

To achieve these objectives, the study takes a quantitative research approach, enabling the collection of comprehensive data on the current state of tomato farming in Thulamela Local Municipality.

1.7 Chapter Outline

This dissertation is structured into **six chapters**, each focusing on a key aspect of the research:

- **Chapter 1: Introduction**—provides an overview of the study, including background and context, problem statement, research objectives, research questions, hypotheses, significance of the study and research scope.
- **Chapter 2: Literature Review**—reviews key literature on agricultural business performance, small-scale farming and the challenges facing small-scale tomato farmers in South Africa. It discusses relevant theoretical frameworks, including the Resource-Based View (RBV), Innovation Diffusion Theory and Sustainable Livelihoods Framework (SLF).
- **Chapter 3: Research Methodology**—outlines the research approach, design, data collection methods and data analysis techniques used in the study.

- **Chapter 4: Study Results and Interpretations**—presents and interprets the research findings, examining the impact of capital access, technology adoption and labour productivity on business performance.
- **Chapter 5: Findings, Discussion, and Recommendations**—discusses the implications of the results, aligns findings with existing theories and literature and proposes recommendations for policymakers and stakeholders.
- **Chapter 6: Study Conclusion**—summarises the study findings, outlines policy recommendations, suggests future research directions and highlights the study's contribution to knowledge.

1.8 Chapter Conclusion

This chapter has provided a comprehensive introduction to the study, outlining the background and context of small-scale tomato farming in Thulamela Local Municipality. It has established the importance of agriculture in South Africa's economy and the critical role of smallholder farmers in ensuring food security and economic development. The problem statement highlighted key challenges affecting small-scale farmers, particularly limited access to capital, technological constraints and labour productivity issues, all of which impact their business performance and business performance.

The chapter also outlined the research objectives and research questions, aiming to examine how these factors influence smallholder farmers' ability to achieve sustainable growth and compete in the market. The significance of the study was discussed in detail, demonstrating its contributions to agricultural policy, rural development and economic sustainability. Additionally, the research scope was defined, clarifying the study's geographical and thematic focus, while the chapter outline provided a structured roadmap for the rest of the dissertation.

A solid foundation has been set for investigating the determinants of business performance among smallholder farmers. The next chapter, Chapter 2: Literature Review, presents an in-depth analysis of theoretical frameworks and empirical studies related to agricultural business performance, small-scale farming and business performance determinants. This review will provide a conceptual basis for understanding the impact of capital access, technology adoption

and labour productivity, ensuring a strong theoretical underpinning for the study's empirical investigation.

Insights from the literature will be used to contextualise the findings and strengthen the argument for practical interventions that can enhance the productivity and market position of smallholder tomato farmers in Thulamela Local Municipality. The discussion in the upcoming chapter will also help identify gaps in existing research and highlight best practices that can be adapted to improve smallholder agricultural performance in South Africa.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Small-scale farming remains a critical component of South Africa's agricultural sector, especially in rural regions such as Thulamela Local Municipality, where smallholder tomato farmers contribute significantly to local food systems and the economy. The ability of these farmers to remain competitive, however, depends on several interconnected factors that influence business performance, including access to capital, adoption of modern technology and labour productivity. While tomato farming holds promise for economic development in the region, many smallholder farmers struggle to improve their productivity and profitability due to structural and resource-related barriers.

This literature review critically explores the determinants of business performance for smallholder tomato farmers, with particular emphasis on three key factors: capital access, technological adoption, and labour productivity. By drawing from theoretical frameworks such as the Resource-Based View (RBV), Innovation Diffusion Theory (IDT), and the Sustainable Livelihoods Framework (SLF), this chapter provides a comprehensive understanding of how internal and external factors affect the business performance of smallholder farmers in Thulamela. The chapter also reviews empirical studies from both South Africa and broader international contexts, providing a robust foundation for understanding the unique challenges and opportunities that small-scale farmers face in this rural municipality.

2.2 Background Discussion

This section explores the multifaceted concept of business performance in agriculture, with a particular focus on smallholder tomato farming. It begins by defining agricultural performance and business performance, highlighting their significance for food security, rural development, and economic growth. Key factors influencing business performance such as access to resources, technological advancements, market conditions, and policy environments are examined to provide a contextual foundation. The section further discusses the critical role of small-scale farming in economic development, particularly in rural South Africa, where smallholder farmers contribute significantly to employment and poverty alleviation. Finally, it reviews the specific challenges

faced by small-scale tomato farmers, including financial constraints, technological barriers, labour-related issues, and market access limitations. By presenting these interrelated dimensions, this section sets the stage for understanding how business performance is shaped by both internal capacities and external structural conditions within the smallholder farming sector.

2.2.1 *Agricultural Performance*

Agricultural performance is a multifaceted concept that encompasses the ability of farmers to produce and market agricultural products efficiently and profitably. business performance in agriculture is crucial for ensuring food security, promoting rural development and sustaining economic growth. According to Frăsineanu (2008), business performance is defined as the ability of a firm, or in this case, a farming entity, to maintain or increase its market share while achieving profitability.

Several factors influence agricultural performance, including access to resources, technological advancements, market conditions and policy environments. Access to resources such as capital, land, water and skilled labour is critical for enhancing productivity and ensuring the efficient use of inputs. Technological advancements, including modern farming equipment, high-yield crop varieties and precision agriculture techniques, play a significant role in improving farm efficiency and output (Ali & Byerlee, 2002).

Competitiveness in agriculture is essential for the sustainability and growth of small-scale farming enterprises. It refers to the ability of farmers to produce goods efficiently and profitably, while maintaining or expanding market share (Porter, 1991). In South Africa, agricultural business performance is particularly crucial for smallholder farmers, who are often disadvantaged by structural barriers such as limited access to resources, outdated technology and poor infrastructure. These challenges are compounded by a policy environment that historically favoured large-scale commercial farmers, exacerbating the competitive pressures faced by small-scale farmers (Aliber & Cousins, 2013).

For small-scale tomato farmers in Thulamela, business performance hinges on their ability to overcome financial, technological and labour-related barriers that constrain their productivity and market access. The dual nature of South Africa's agricultural economy with large-scale commercial operations and smallholder farms existing side by side has created significant

disparities in access to capital, technology, and infrastructure (Rubhara & Mudhara, 2019). Consequently, improving the business performance of smallholder farmers requires targeted interventions that address these disparities and provide them with the resources they need to thrive in a competitive market environment.

2.2.2 *Small-scale Farming in Economic Development*

Small-scale farming plays a pivotal role in ensuring food security and providing employment opportunities, particularly in rural areas. Smallholder farmers produce a significant portion of the world's food supply, contributing to the availability and diversity of food products (Hazell & Wood, 2008). In South Africa, small-scale farming is essential for local food security, as it supports the production of staple crops and vegetables consumed by rural and urban populations.

Employment in the agricultural sector is heavily reliant on small-scale farming. Smallholder farms provide livelihoods for millions of people, offering jobs in production, processing and distribution. In regions with limited industrial and service sector opportunities, small-scale farming remains a primary source of income and sustenance (Moffitt & Cajas-Cano, 2014). Beyond food security and employment, small-scale farming contributes to broader economic and social development. It supports local economies by generating income, stimulating rural markets and fostering entrepreneurial activities. The economic multiplier effect of agricultural spending means that income generated from farming activities circulates within rural communities, supporting various ancillary businesses and services (Turvey, 2017).

Smallholder farming is essential for sustaining food security and fostering economic growth, especially in rural areas. In South Africa, small-scale farmers are responsible for producing a significant share of the country’s food supply, including staple crops and vegetables like tomatoes (Hazell & Wood, 2008). Beyond food production, smallholder farming contributes to poverty alleviation by providing employment opportunities and generating income for rural households. In Thulamela Local Municipality, where formal employment opportunities are limited, smallholder farming is a primary source of livelihood, sustaining both individual households and the broader rural economy (Aliber & Hart, 2009). The economic impact of small-scale farming extends beyond direct employment in agricultural production. It also stimulates related sectors such as transportation, retail, and agro processing, creating a

multiplier effect that supports broader economic development in rural areas (Shaw & Turvey, 2017). However, the full potential of smallholder farming to contribute to economic development is often hindered by structural challenges such as limited access to finance, inadequate infrastructure and inefficient farming practices (Mhlanga & Ndhlovu, 2020). These underscore the need for targeted policy interventions that address the specific needs of smallholder farmers and promote their integration into more profitable value chains.

2.2.3 *Challenges Faced by Small-scale Tomato Farmers*

Small-scale tomato farmers in South Africa face numerous challenges that hinder their business performance. Financial constraints are among the most significant, as limited access to capital restricts their ability to invest in high-quality inputs, modern equipment and infrastructure improvements. This lack of investment negatively impacts productivity and profitability, making it difficult for them to compete with larger, resource-endowed enterprises
(Chisasa & Makina, 2015).

Technological barriers also pose significant concerns. Small-scale tomato farmers often face barriers to accessing and utilising modern agricultural technologies due to high costs, limited availability and lack of knowledge and skills. The use of outdated farming methods and equipment results in lower yields, higher production costs and reduced efficiency (Mhlanga & Ndhlovu, 2020).

Labour-related issues significantly impact the business performance of small-scale tomato farmers. The availability of skilled labour is limited, and the existing workforce often lacks the necessary training and expertise to implement modern agricultural practices. Additionally, labour costs constitute a substantial portion of production expenses, and the seasonal nature of tomato farming complicates the recruitment and retention of workers (Hart & Aliber, 2010). Market access is another critical issue. The lack of reliable transportation infrastructure and storage facilities limits their ability to reach markets efficiently and preserve the quality of their produce. Consequently, farmers often rely on intermediaries who offer lower prices, reducing their profit margins (A. B. Kamara et al., 2002).

2.3 Theoretical Foundation

A strong theoretical foundation is essential for understanding the complex factors influencing the business performance of small-scale tomato farmers. This section introduces the key theories that underpin this study: the Resource-Based View (RBV), Innovation Diffusion Theory (IDT), and the Sustainable Livelihoods Framework (SLF). Each provides valuable insights into different dimensions of agricultural business performance, from resource utilisation to technology adoption and the broader socio-economic context of smallholder farming.

The Resource-Based View highlights the importance of internal firm resources such as financial capital, human skills, and technological capabilities in creating and sustaining competitive advantage (Barney, 1991). This perspective is particularly relevant for smallholder farmers seeking to improve productivity and profitability through better resource management. The Innovation Diffusion Theory (Rogers, 2003) explains how the adoption of new technologies spreads through communities, shaped by factors such as perceived usefulness, ease of implementation, and social influence. Understanding these dynamics is crucial in analysing how and why small-scale farmers adopt agricultural innovations such as mechanisation and improved crop varieties.

2.3.1 *Resource-Based View*

The Resource-Based View (RBV) is a theoretical framework that emphasises the importance of internal resources and capabilities in achieving Operational improvement. According to (Barney, 1991), firms that possess valuable, rare, inimitable and non-substitutable (VRIN) resources can achieve sustained Operational improvement. In the context of small-scale farming, resources such as access to capital, modern technology, skilled labour and market information are critical determinants of business performance. RBV highlights the need for small-scale farmers to acquire and effectively utilise resources to enhance productivity and market performance. The framework suggests that by leveraging their unique resources and capabilities, small-scale farmers can differentiate themselves from competitors and achieve higher levels of efficiency and profitability.

Financial capital is one of the most critical resources for smallholder farmers. Without adequate access to capital, farmers are unable to invest in essential inputs such as seeds, fertilisers and irrigation systems, which directly affect their productivity and profitability. According to (Chisasa & Makina, 2015), the inability to secure affordable credit is a major constraint for smallholder farmers in South Africa, limiting their ability to invest in productivity-enhancing technologies and practices. The RBV highlights the importance of financial capital as a key determinant of business performance, with farmers who are able to secure affordable credit more likely to achieve higher yields and improve their market position.

Technological resources are another crucial factor in determining business performance. The RBV emphasises that access to modern agricultural technologies such as mechanised irrigation systems, high-yield seed varieties and precision farming techniques can significantly enhance farm efficiency and business performance. However, many smallholder farmers in Thulamela lack access to these technologies due to financial constraints, limited access to technical training and infrastructural barriers (Mhlanga & Ndhlovu, 2020). By overcoming these technological barriers, smallholder farmers can improve their productivity and reduce production costs.

Labour is also a vital resource identified by the RBV. Skilled labour is essential for implementing modern farming techniques and improving productivity. However, smallholder farmers often face significant labour-related challenges, including shortages of skilled workers and limited access to training and development opportunities (Von Loeper et al., 2016). The RBV suggests that addressing these labour constraints is essential for improving the business performance of smallholder farmers. By investing in human capital through training and capacity-building programmes, these farmers can enhance their labour productivity and improve their overall business performance.

In addition to tangible resources such as financial capital, technology and labour, the RBV also emphasises the importance of intangible resources such as knowledge and social capital. Knowledge plays an important role in enabling farmers to adopt modern farming practices and improve their productivity. Smallholder farmers who have access to market information, extension services and technical training are better positioned to take advantage of new

technologies and improve their business performance (Aliber & Hart, 2009). Social capital, in the form of networks and relationships with other farmers, agricultural organisations and markets, can also provide them with access to resources and information that they would not otherwise have (Rubhara & Mudhara, 2019). By making good use of these intangible resources, smallholder farmers can improve their business performance and compete more effectively in the agricultural market.

2.3.2 *Innovation Diffusion Theory*

Innovation Diffusion Theory (IDT), proposed Roger (2003) explains how innovations are adopted and spread within a social system. The theory identifies several factors that influence the adoption of innovations, including the perceived relative advantage, compatibility, complexity, trialability and observability of the innovation. In the context of small-scale farming, the adoption of modern agricultural technologies and practices is influenced by these factors.

IDT provides insights into the barriers and facilitators of technological adoption among small-scale farmers. Understanding these factors can help in designing targeted interventions that promote the uptake of productivity-enhancing innovations. The theory also emphasises the role of change agents, such as extension services and farmer cooperatives, in facilitating the diffusion of innovations.

Relative advantage refers to the perceived benefits of adopting a new technology compared to the existing methods or practices. For smallholder farmers, innovations such as mechanised irrigation systems or pest control methods may offer significant advantages in terms of increased productivity, reduced labour costs and improved crop quality (Mhlanga & Ndhlovu, 2020). However, the perceived benefits of these innovations must outweigh the costs and risks associated with adopting them. Many smallholder farmers are reluctant to adopt new technologies due to high upfront costs, perceived risks and uncertainty about the long-term benefits (Ali & Byerlee, 2002). IDT suggests that interventions aimed at reducing the perceived risks and costs of technological adoption, such as subsidies, demonstration projects or training programmes, can help to facilitate the diffusion of innovations among smallholder farmers.

Compatibility refers to the degree to which an innovation fits with the existing values, experiences and needs of the potential adopters. In the context of smallholder tomato farming, innovations that align with local farming practices, environmental conditions and market demands are more likely to be accepted (Orr, 2003). For example, the introduction of drought-resistant seed varieties may be more compatible with farming systems in arid regions like Thulamela, where water scarcity is a major constraint on agricultural productivity. However, innovations that are perceived as incompatible with traditional farming methods or local environmental conditions may face resistance from smallholder farmers, even if they offer clear benefits.

Complexity refers to the perceived difficulty of understanding and using the innovation. Innovations that are perceived as complex or difficult to implement are less likely to be used, particularly by smallholder farmers who may lack access to technical training and support (Ali & Byerlee, 2002). For example, precision farming technologies, which use data-driven approaches to optimise crop management, may be perceived as too complex for smallholder farmers, who lack the technical expertise and financial resources to implement them. IDT suggests that providing farmers with access to training and technical support can help to reduce the perceived complexity of new technologies and facilitate their endorsement.

Trialability refers to the degree to which an innovation can be tested or experimented with before full adoption. Innovations that can be trialled on a small-scale before full implementation are more likely to be accepted, as they allow farmers to assess the benefits and risks of the innovation without committing to it fully (Orr, 2003). In the context of small-scale tomato farming, providing opportunities for farmers to trial new technologies, such as mechanised irrigation systems or pest control methods, can help to facilitate their adoption. Demonstration projects, where the benefits of new technologies are showcased to local farmers, can also increase the trialability of innovations and encourage wider acquisitions.

Observability refers to the degree to which the results of the innovation are visible to others. Innovations that produce visible and tangible results, such as increased crop yields or reduced production costs, are more likely to be adopted by smallholder farmers (Orr, 2003). Demonstration projects and farmer field schools, where the benefits of new technologies are

showcased to local farmers, can help to increase the observability of innovations and expedite their diffusion. By making the results of innovations more visible, policymakers and agricultural organisations can encourage wider adoption of productivity-enhancing technologies among smallholder farmers. IDT provides a useful framework for understanding the barriers and facilitators of technological adoption among smallholder farmers. By addressing the factors that influence the rate of adoption, such as relative advantage, compatibility, complexity, trialability and observability, policymakers and development organisations can design interventions that promote the uptake of modern agricultural technologies and improve the business performance of smallholder farmers.

2.3.3 *Sustainable Livelihoods Framework*

The Sustainable Livelihoods Framework (SLF) is a holistic approach that considers the various assets and strategies that individuals and households use to achieve sustainable livelihoods. According to the SLF, livelihoods are built on five types of capital: human, social, physical, financial and natural (Chambers et al., 1992). The framework highlights the interconnections between these assets and the importance of a supportive policy and institutional environment. In the context of small-scale tomato farming, the SLF provides a comprehensive understanding of the factors that influence farmers' livelihoods. It emphasises the need for a balanced approach that considers the diverse assets and strategies employed by small-scale farmers. The framework also underscores the importance of building resilience and adaptive capacity to cope with external shocks and stresses.

Social capital, which refers to the networks and relationships that individuals and communities use to secure resources and information, is also important for smallholder farmers. In rural South Africa, farmer cooperatives, associations and informal networks play a crucial role in facilitating access to markets, information and financial resources (Rubhara & Mudhara, 2019). Strengthening these social networks can help smallholder farmers overcome some of the structural barriers they face in accessing resources and improving their business performance in the agricultural value chain. Moreover, social capital can provide them with access to collective bargaining, enabling them to negotiate better prices for their produce and access to markets.

Physical capital, including infrastructure such as roads, storage facilities and irrigation systems, is essential for improving farm efficiency and market access. However, many smallholder farmers in Thulamela operate in areas with poor infrastructure, which limits their ability to transport produce to market and preserve the quality of their tomatoes (J. M. Kamara et al., 2002). Inadequate road networks, for instance, can increase transportation costs, reduce market access and lower the overall profitability of smallholder farming. Improving physical infrastructure, particularly in rural areas, is therefore critical for enhancing the business performance and business performance of smallholder farmers.

Financial capital is a major constraint for smallholder farmers, as previously discussed in this chapter. Without access to affordable credit, many are unable to invest in the inputs and technologies needed to improve their productivity and profitability (Chisasa, 2016). The SLF highlights the need for financial interventions, such as microfinance programmes, government subsidies or agricultural credit schemes, to address this issue and improve their business performance.

Natural capital, which includes land, water, and other environmental resources, is also critical for the sustainability of smallholder farming. In Thulamela, farmers rely heavily on natural resources such as fertile soil and access to water for irrigation to maintain their livelihoods. However, environmental challenges such as soil degradation, water scarcity and climate variability pose significant threats to the long-term viability of smallholder agriculture (Mhlanga & Ndhlovu, 2020). The SLF emphasises the importance of sustainable resource management to ensure the long-term sustainability of farming livelihoods. In this context, promoting sustainable farming practices that preserve soil fertility, conserve water and mitigate the impacts of climate change is essential for enhancing the resilience and business performance of smallholder farmers.

The SLF provides a holistic framework for understanding the multiple factors that influence the livelihoods and business performance of smallholder farmers. By considering the interconnections between human, social, physical, financial and natural capital, the SLF highlights the need for a comprehensive approach to improving the business performance and sustainability of these farmers in Thulamela.

2.4 Business Performance

Business performance in small-scale farming is typically measured in terms of productivity, profitability and market share. Improving business performance is critical for the sustainability and growth of small-scale farming enterprises. According to Richard et al. (2009), business performance is influenced by a combination of internal factors such as access to resources, management practices and labour productivity, and external factors such as market conditions, infrastructure and regulatory environments. For smallholder farmers in Thulamela, enhancing business performance requires addressing the key constraints discussed earlier: access to capital, technological adoption and labour productivity.

Business performance encompasses the efficiency and effectiveness of an organisation in achieving its objectives, often evaluated through financial, operational and market-based outcomes. For smallholder farmers, particularly in resource-constrained environments like South Africa, business performance reflects not only financial viability but also sustainability, market access and operational resilience. Its assessment is crucial for understanding how these farmers can enhance their business performance and address the structural challenges they face.

The definition of business performance has evolved significantly in recent years (Kaplan & Norton, 1996). The *Balanced Scorecard* approach introduced a multidimensional view of performance, encompassing financial outcomes alongside operational and customer perspectives. This framework is particularly relevant for agriculture, where profitability alone does not capture the complexities of small-scale farming. Neely et al. (2005) advanced this view, emphasising the importance of adaptability and long-term sustainability in performance measurement systems. In smallholder farming, operational efficiency, such as improving yields and reducing waste, must be integrated with market responsiveness and resource management. Additionally, Elkington (1998) introduced the concept of the *triple bottom line*, which considers financial, environmental and social dimensions of performance, further broadening the scope of assessment in contexts where ecological sustainability is critical.

Key determinants of business performance include resource availability and utilisation, market dynamics and external environmental conditions. In agriculture, financial capital enables

investments in inputs, infrastructure and technology, which are essential for improving productivity and efficiency (Barney, 2001). RBV highlights that resources must be valuable, rare, inimitable and non-substitutable (VRIN) to confer an Operational improvement. This perspective aligns with the findings of Olawale & Garwe (2010), who demonstrated that South African small-scale farmers with access to formal credit achieved higher levels of productivity and profitability. Additionally, the role of human capital, including training and education, has been linked to improved operational outcomes and adaptive capacities in dynamic market environments (Lusch & Vargo, 2014).

Market access is another critical determinant, influencing the ability of smallholder farmers to secure competitive prices and reduce post-harvest losses. (Porter, 1991) emphasised that Operational improvement in agriculture often stems from differentiation or cost leadership, both of which require strategic positioning within value chains. For smallholder farmers, collective marketing initiatives, such as cooperatives, have shown promise in addressing market barriers and ensuring fairer pricing. Research by Vermeulen & Cotula (2010) highlighted how improved integration into global and regional value chains can transform smallholder farming, but also underscored the risks associated with inequitable power dynamics in such arrangements.

Measuring business performance in small-scale farming requires metrics that capture financial, operational and market-based outcomes, while incorporating sustainability. As highlighted by Bourne et al. (2003), performance measurement systems must balance the need for quantitative metrics, such as profitability and productivity, with qualitative assessments of adaptability and stakeholder satisfaction. In the South African context, smallholder tomato farmers often use yield per hectare, cost-benefit analysis and market share as indicators of performance, while also considering resilience to climate shocks and sustainable resource use.

The connections between these determinants and the study's hypotheses are clear. Hypothesis H1 focuses on the influence of access to capital on business performance, emphasising how financial resources enable investment in productivity-enhancing inputs. Hypothesis H2 highlights the role of technology adoption in achieving Operational improvement, while Hypothesis H3 underscores the impact of labour productivity on operational efficiency and

profitability. Addressing these interconnected factors holistically can inform targeted interventions to enhance the business performance and sustainability of smallholder tomato farming in South Africa.

2.5 Financial Capital Access

Limited access to capital significantly impacts the business performance of small-scale tomato farmers. Financial constraints prevent farmers from investing in essential inputs such as seeds, fertilisers and pesticides, which directly impact yield and quality. Additionally, the lack of modern irrigation systems and greenhouse technologies limits their ability to optimise production throughout the year (Chisasa & Makina, 2015).

Access to financial capital remains a significant determinant of business performance, particularly among smallholder farmers in developing economies like South Africa. Capital is necessary for the procurement of essential agricultural inputs, such as seeds, fertilisers and equipment. For smallholder farmers, capital restraint led to suboptimal use of inputs, which directly affects productivity and yield quality (Chisasa & Makina, 2015). This relationship between capital and farm productivity has been widely acknowledged in agrarian literature.

A lack of capital can also limit farmers' ability to adopt modern agricultural technologies, such as improved irrigation systems or high-yield seed varieties, which further reduces their business performance in the market (Chisasa, 2016). Research shows that smallholder farmers who lack access to formal credit systems are more likely to rely on informal lenders, who often charge exorbitant interest rates, leading to debt cycles that stifle investment in productivity (Zeller & Sharma, 2002). In Thulamela, where access to formal financial institutions is limited, many smallholder tomato farmers are unable to secure the credit necessary for expanding their operations or improving farm productivity.

In sub-Saharan Africa, financial exclusion is a pervasive issue that affects a large percentage of smallholder farmers. According to a study by Ololade & Olagunju (2013), access to credit among Nigerian farmers significantly improved their productivity and enabled them to invest in more advanced farming techniques. Similarly, Zeller et al. (1998) demonstrated that access to credit increased the likelihood of smallholder farmers adopting yield-enhancing technologies

in Malawi, ultimately improving their market position and profitability. This evidence supports the hypothesis that capital access is crucial for enhancing business performance among small-scale farmers.

Financial exclusion in rural areas is compounded by a lack of collateral and high interest rates, which make it difficult for smallholder farmers to access loans from formal financial institutions. (Chisasa & Makina, 2015) found that the high transaction costs associated with lending to smallholder farmers in South Africa deter commercial banks from extending credit to this segment, leaving many farmers reliant on informal lenders. The authors argue that improving access to affordable credit is essential for increasing agricultural productivity and ensuring the long-term viability of small-scale farms.

Microfinance institutions (MFIs) have been identified as potential solutions to the capital access problem faced by smallholder farmers in developing countries. A study by Khalid et al. (2011) found that MFIs in Pakistan played a crucial role in providing smallholder farmers with the credit they needed to invest in productivity-enhancing inputs. Similar results have been observed in sub-Saharan Africa, where microfinance initiatives have helped smallholder farmers access credit and improve their agricultural output (Karlan & Zinman, 2010). However, the success of MFIs depends on the design of the loan products and the financial literacy of the borrowers. In regions like Thulamela, where financial literacy is low, targeted financial education programmes may be necessary to ensure that farmers can effectively manage credit and avoid falling into debt traps.

Government interventions, such as agricultural subsidies or low-interest credit schemes, can also help address the capital constraints faced by smallholder farmers. In South Africa, the Comprehensive Agricultural Support Programme (CASP) and the Micro-Agricultural Financial Institutions of South Africa (MAFISA) provide financial support to smallholder farmers, enabling them to invest in productivity-enhancing inputs (Chisasa, 2016). However, the effectiveness of these programmes in addressing the specific needs of smallholder tomato farmers in Thulamela remains to be evaluated. Research suggests that government interventions should be tailored to the unique challenges faced by different types of smallholder farmers to maximise their impact on productivity (Zeller et al., 2000).

Hypothesis 1 (H1):

Access to financial capital positively impacts the business performance of small-scale tomato farmers in Thulamela

2.6 Technological Adoption

Technological adoption is essential for enhancing agricultural productivity and business performance. Small-scale tomato farmers often face barriers to accessing and utilising modern agricultural technologies due to high costs, limited availability and lack of knowledge and skills, by enabling investments in productivity-enhancing inputs and technologies.

The use of outdated farming methods and equipment results in lower yields, higher production costs and reduced efficiency (Mhlanga & Ndhlovu, 2020).

Technological adoption is essential for improving farm productivity and efficiency, particularly in resource-constrained environments like Thulamela. Agricultural technology, such as high-yield seed varieties, mechanised farming equipment and precision agriculture techniques, can significantly enhance farm output and reduce production costs. Yet, the rate of technological adoption among smallholder farmers in South Africa remains low due to financial constraints, lack of technical expertise and limited access to extension services (Mhlanga & Ndhlovu, 2020).

The relationship between technological adoption and business performance is well documented in agricultural literature. Studies have shown that farmers who acquire modern technologies are more likely to experience higher yields, reduced production costs and improved profitability. For example, a study by Ali & Byerlee (2002) found that the acquisition of modern agricultural technologies in Pakistan's Punjab region led to significant productivity gains and resource conservation. Similarly, a study by Kassie et al. (2011) in Ethiopia found that the adoption of sustainable agricultural practices, such as conservation tillage and improved seed varieties, led to higher crop yields and increased income for smallholder farmers.

In South Africa, trying out new technologies is often hindered by financial constraints. Smallholder farmers lack the capital required to invest in new equipment or upgrade their existing infrastructure, such as irrigation systems (Mhlanga & Ndhlovu, 2020). Without access

to affordable credit, many smallholder farmers are unable to adopt the technologies that could improve their farm productivity. This creates a vicious cycle in which low productivity limits income, which in turn constrains the ability to invest in productivity-enhancing technologies.

The role of extension services in facilitating technological adoption is also critical. Extension agents provide farmers with the knowledge and skills needed to implement new technologies effectively. However, access to extension services in rural areas like Thulamela is often limited, which curbs farmers' ability to try new practices (Mhlanga, 2021a). A study by Doss and Morris (2001) found that access to extension services significantly increased the likelihood of technology adoption among maize farmers in Ghana. Similar results have been observed in other parts of sub-Saharan Africa, where extension services have been shown to play a key role in promoting the selection of improved farming practices (Feder et al., 2004).

Technological diffusion in agriculture is influenced by several factors, including the perceived benefits of the technology, its compatibility with existing farming practices, and its complexity (Rogers, 2003). For smallholder farmers, technologies that offer immediate and observable benefits, such as increased yields or reduced labour requirements, are more likely to be adopted (Mhlanga & Ndhlovu, 2020). However, technologies that require significant changes to existing farming practices or that are perceived as too complex may face resistance from farmers.

A study by Marenya & Barrett (2007) in Kenya found that smallholder farmers were more likely to accept new soil fertility management technologies if they had access to credit and extension services. The authors contend that reducing the barriers to technological adoption, such as high upfront costs and lack of knowledge, can help improve farm productivity and business performance. In South Africa, targeted interventions that address the specific needs of smallholder farmers, such as subsidies for modern equipment or training programmes on precision farming, could help improve the rate of technological adoption in rural areas like Thulamela.

The role of technology in improving agricultural resilience is also an important consideration. In regions such as Thulamela, where climate variability and water scarcity pose significant challenges to agricultural production, attempting technologies that promote climate resilience,

such as drought-resistant seed varieties and water-efficient irrigation systems, can help smallholder farmers mitigate the impacts of environmental shocks and improve their long-term sustainability (Smit & Skinner, 2002).

Hypothesis 2 (H2):

Technologies positively impact the business performance of small-scale tomato farmers in the Thulamela Municipality.

2.7 Labour Productivity

Labour availability and productivity are crucial for the business performance of small-scale tomato farmers. Skilled labour is limited, and the existing workforce often lacks the necessary training and expertise to implement modern agricultural practices. Additionally, labour costs constitute a substantial portion of production expenses, and the seasonal nature of tomato farming complicates the recruitment and retention of workers (Von Loeper et al., 2016).

The relationship between labour productivity and business performance has been widely studied in the agricultural literature. A study by Christiaensen et al. (2011) found that improving agricultural labour productivity was essential for poverty reduction in sub-Saharan Africa. The authors claim that policies aimed at increasing farm labour productivity, such as investments in education, training and mechanisation, are crucial for improving farm incomes and reducing rural poverty.

Mechanisation is one of the most effective ways to improve labour productivity in agriculture. By reducing the reliance on manual labour and increasing the efficiency of farming operations, mechanisation can significantly boost farm output and reduce production costs. A study by Von Loeper et al. (2016) found that smallholder farmers who adopted mechanised farming practices in South Africa experienced significant improvements in labour productivity and overall farm performance. However, the high upfront costs of mechanisation often limit its adoption among smallholder farmers, particularly in rural areas where access to credit is constrained (Mhlanga & Ndhlovu, 2020).

Training and capacity-building initiatives are also essential for improving labour productivity. By providing farmers and farmworkers with the knowledge and skills needed to implement modern farming techniques, training programmes can help increase the efficiency of labour inputs and improve farm productivity. A study by Pienaar & Traub (2015) found that smallholder farmers who participated in agricultural training programmes in South Africa were more likely to try productivity-enhancing practices and improve their business performance. The authors assert that targeted training initiatives, particularly those that focus on modern farming techniques and farm management, are essential for improving labour productivity in rural farming communities.

The impact of education on labour productivity is another important consideration. Studies have shown that farmers with higher levels of education are more likely to adopt modern farming practices and improve their labour productivity (Weir & Knight, 2004). In rural South Africa, where educational attainment is often low, improving access to education and vocational training could help enhance labour productivity and improve the business performance of smallholder farmers. Government interventions that provide scholarships or financial support for rural education could play a key role in addressing this issue.

Improving labour productivity through mechanisation, training, and education is essential for enhancing the business performance of smallholder farmers in regions like Thulamela. By increasing the efficiency of labour inputs, smallholder farmers can reduce production costs, increase yields and improve their overall business performance farmers by increasing productivity and reducing operational inefficiencies.

Hypothesis 3 (H3):
Labour impacts the business performance of small-scale tomato farmers in the Thulamela Municipality.

2.8 Conceptual Framework

The conceptual framework integrates the discussed theoretical foundations and variables to provide a structured analysis of the factors influencing the business performance of small-scale tomato farmers. The framework posits that:

H1: Access to financial capital has a positive influence on the business performance of small-scale tomato farmers in Thulamela, as it facilitates investments in productivity-enhancing inputs and advanced farming technologies. farmers by improving operational efficiency and output quality.

H2: The adoption of modern agricultural technologies enhances the productivity and efficiency of smallholder tomato farmers, ultimately improving their business performance.

H3: Higher labour productivity contributes significantly to the business success of small-scale tomato farmers by optimizing operational efficiency and improving output quality.

These relationships are visually represented in **Figure 2.1**, which illustrates the hypothesised linkages between financial capital, technology adoption, labour productivity, and business performance.

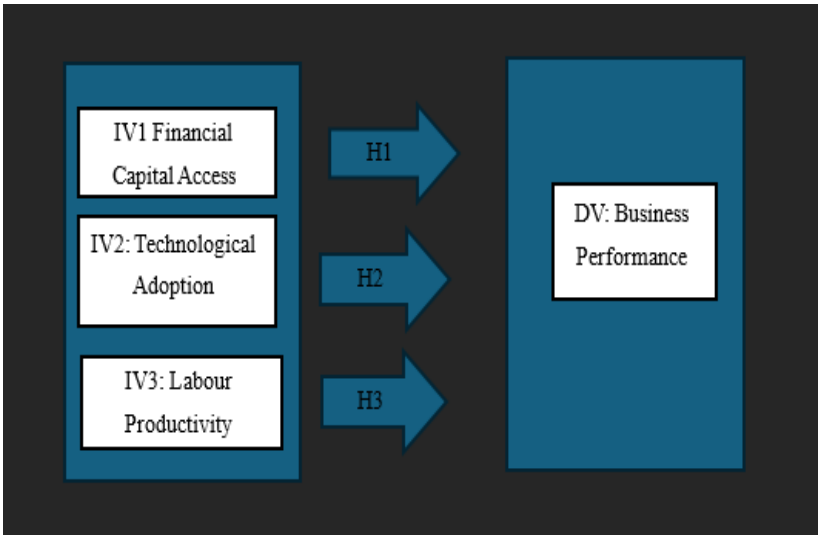

Figure 2.1: Conceptual framework

As depicted in **Figure 2.1**, the framework suggests that increased access to financial capital enables smallholder farmers to invest in productivity-enhancing inputs and modern agricultural technologies, which in turn improve operational efficiency and market business performance. Moreover, skilled labour and efficient workforce management are expected to optimise productivity, further contributing to improved business performance.

2.9 Chapter Conclusion

This literature review has provided a comprehensive analysis of the factors influencing the business performance of small-scale tomato farmers in South Africa. It has examined key concepts and frameworks related to agricultural business performance, the role of small-scale farming in economic development and the specific challenges faced by small-scale tomato farmers. The theoretical foundations discussed include the Resource-Based View, Innovation Diffusion Theory and Sustainable Livelihoods Framework, which together inform the conceptual framework for this study.

The conceptual framework integrates these theoretical perspectives to provide a structured analysis of the factors influencing the business performance of small-scale tomato farmers. It highlights the importance of access to capital, technological adoption, labour availability and productivity, market access and the policy and institutional environment. This framework will guide the empirical investigation of the determinants of business performance among small-scale tomato farmers in Thulamela Local Municipality.

In the subsequent chapters, this study will apply the conceptual framework to analyse the empirical data collected from these farmers in Thulamela Local Municipality. The findings will provide insights into the specific challenges and opportunities faced by them and inform recommendations for enhancing their business performance.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodological approach used to investigate the determinants of business performance among small-scale tomato farmers in Thulamela Local Municipality. It provides a detailed explanation of the research design, sampling technique, data collection methods and analytical strategies used in the study. Additionally, ethical considerations and potential limitations of the research design are discussed.

The research methodology is designed to ensure rigour and reliability, enabling the collection of valid and systematic data that contributes to both theoretical insights and practical applications. By establishing a clear and structured framework, the methods selected align with the study's objectives, allowing for an accurate and meaningful analysis of the relationships between access to capital, technological adoption, labour productivity and business performance.

3.2 Research Paradigm

This study adopts a positivist research paradigm, which aligns with its quantitative nature. Positivism assumes that reality is objective and can be observed and measured through empirical investigation. From an ontological standpoint, the research accepts realism, acknowledging that an external, observable reality exists independently of human perception. The epistemological position is objectivism, where knowledge is acquired through observable and measurable facts, minimizing researcher bias. Axiologically, the study maintains neutrality, ensuring that the researcher's values do not interfere with the data collection or analysis processes. This philosophical orientation supports the use of structured questionnaires, statistical analysis, and hypothesis testing to examine the relationships between access to capital, technology adoption, labour productivity, and business performance among small-scale tomato farmers in Thulamela (Lord et al., 2024).

3.3 Research Approach

The study employs a quantitative research approach, as it provides a structured method for measuring variables, testing hypotheses and analysing statistical relationships. To offer a well-rounded understanding of the research design, both quantitative and qualitative approaches are

briefly discussed, highlighting the rationale for selecting a quantitative methodology for this study (Field, 2024). Quantitative research is an empirical method that relies on numerical data and statistical techniques to understand phenomena and assess relationships between variables (Creswell & Creswell, 2017). This study applies a quantitative approach to analyse how access to capital, technological adoption and labour productivity impact the business performance of small-scale tomato farmers in Thulamela Local Municipality.

Quantitative research is characterised by structured data collection methods, such as surveys and structured questionnaires, allowing for the collection of measurable and statistically analysable data.

A key strength of this approach is its objectivity, as it reduces researcher bias and focuses purely on statistical relationships between variables (Bryman, 2016). In this study, objectivity is crucial, as the goal is to assess how specific determinants such as capital access and technology adoption affect business performance in a statistically significant way. Another advantage of quantitative research is its ability to generalise findings to a larger population. Since the study involves a representative sample of small-scale tomato farmers, the results can provide insights applicable to similar agricultural settings, contributing to broader agricultural policy and development strategies (Blumberg et al., 2014).

While qualitative research focuses on understanding social experiences and subjective perspectives, it lacks the statistical rigour required for hypothesis testing and variable measurement (Denzin & Lincoln, 2011). Qualitative methods, such as interviews and case studies, allow for in-depth exploration of individual experiences, but they do not provide the level of quantifiable evidence needed to assess the relationships between financial access, technology adoption and labour productivity in a systematic manner.

The decision to employ a quantitative rather than a qualitative approach is based on several factors. First, this study seeks to test hypotheses regarding the determinants of business performance among small-scale tomato farmers. Hypothesis testing is a core component of quantitative research, as it allows for statistical validation of findings (Cooper & Schindler, 2014). This method is particularly relevant to assessing whether access to capital or technological adoption significantly affects business performance.

Second, quantitative research provides a structured and objective method for measuring variables. It ensures that data on factors such as technological adoption and labour productivity are collected and analysed consistently across all participants, allowing for accurate comparisons and meaningful conclusions (Bryman, 2016).

Third, the ability to generalise findings beyond the sample is a major advantage of quantitative methods. Since this study aims to offer insights applicable to other smallholder farming communities, quantitative research provides statistical validity that qualitative approaches lack (Creswell & Creswell, 2017). Lastly, quantitative methods facilitate efficient data analysis for large datasets. Given that this study involves a large number of smallholder farmers, techniques such as correlation analysis and regression modelling enable the identification of patterns and relationships between multiple variables in a systematic and replicable manner (Creswell & Poth, 2016).

While qualitative methods provide rich, contextual insights, they are not well-suited for this study, which requires precise measurement, hypothesis testing and broad applicability. The quantitative approach, therefore, ensures statistical reliability, objectivity and scalability, making it the most appropriate methodology for analysing the determinants of business performance in small-scale farming.

3.4 Research Design

This study employs a cross-sectional survey design, which involves collecting data from participants at a single point in time. This approach is suitable for identifying relationships between variables within a defined population (Bryman, 2016). Data will be collected from small-scale tomato farmers in Thulamela Local Municipality to examine how access to capital, technological adoption, and labour productivity influence business performance.

The use of a survey design facilitates the systematic collection of data from a large sample, ensuring that the study's findings are statistically valid (Creswell & Creswell, 2017). Surveys are particularly useful for gathering data on variables that are not directly observable, such as

attitudes, perceptions and levels of technological adoption. The structured nature of surveys allows for consistency in data collection, making it possible to compare responses and identify trends across the population.

A key advantage of the cross-sectional design is its ability to analyse multiple variables simultaneously, making it well-suited for a study that investigates the relationships between several determinants of business performance. By collecting data at a single point in time, the study efficiently captures the current state of affairs among small-scale tomato farmers and draws conclusions based on the statistical relationships observed (Bryman, 2016). Although longitudinal designs allow for tracking changes over time, they require significant time and resources and are not feasible for this study. The cross-sectional survey design provides a practical and efficient approach to answering the research questions within the available timeframe (Creswell & Creswell, 2017).

In agricultural business performance research, data can be sourced through either primary data collection or the analysis of secondary data (Saunders et al., 2019). Secondary data such as published reports, census statistics, or prior academic studies may offer useful background but is often outdated, lacks contextual relevance, or is aggregated in ways that do not reflect farm-level realities. By contrast, primary data collection enables researchers to gather current, targeted, and context-specific insights directly from the population of interest (Creswell & Creswell, 2018). Given the limited availability of reliable secondary data on the specific performance of smallholder tomato farmers in Thulamela Local Municipality, this study adopted a primary data approach, using a structured survey to ensure collection of standardised, comparable data across respondents. In terms of tools, researchers typically choose between survey questionnaires and interview guides. Questionnaires are particularly well-suited to large, quantitative studies where standardisation and statistical generalisability are important (Bryman, 2016). They enable efficient data collection across many respondents, using pre-coded items to facilitate later statistical analysis (Field, 2024). By contrast, interview guides often used in qualitative research allow for greater depth, flexibility, and exploration of individual perspectives, but they produce less standardised data and are more time-consuming to analyse (Denzin & Lincoln, 2011).

Given the objectives of this study to quantitatively examine relationships between access to capital, technology adoption, labour productivity, and business performance a structured

questionnaire was selected as the primary tool. This choice aligns with the study's positivist paradigm and quantitative design, allowing for the collection of statistically valid, comparable data across a representative sample of farmers in Thulamela. The use of a structured survey also facilitated subsequent analysis using descriptive statistics, factor analysis, correlation, and regression techniques.

3.5 Research Population and Sampling Method

The target population for this academic work consists of small-scale tomato farmers operating in Thulamela Local Municipality, located in the Vhembe District of Limpopo Province, South Africa. According to the Vhembe District Department of Agriculture, there are approximately 100 small-scale tomato farmers in the region (Mudau, 2022). This population is selected due to the economic importance of tomato farming in the area and the challenges faced by small-scale farmers in maintaining business performance. This is where we will engage on sampling techniques and sampling implementation.

Tomato farming plays a crucial role in the local economy by creating employment opportunities and contributing to food security. Nevertheless, small-scale farmers in Thulamela face multiple challenges, including limited access to capital, inadequate technological resources and labour shortages, all of which hinder their ability to compete with larger commercial enterprises. These challenges make this population highly relevant for a study focused on business performance determinants and strategies for enhancing business performance.

The vulnerability of smallholder farmers to external shocks, such as fluctuating market prices and climate-related disruptions, further underscores the importance of understanding the factors influencing their business performance. By focusing on this specific population, the study aims to generate practical insights that can inform policy and agricultural interventions to improve the sustainability and business performance of small-scale farming in the region (Chisasa & Makina, 2015).

3.5.1 Sampling Technique

To ensure a representative sample, this study employs a stratified random sampling technique. Stratified sampling divides the population into distinct subgroups (strata) based on specific

characteristics such as geographic location or farming practices to ensure adequate representation (Bryman, 2016).

In this study, the population of small-scale tomato farmers will be stratified by geographic location within Thulamela Local Municipality. This ensures that farmers from different areas are included in the sample, accounting for potential variations in access to resources and farming techniques that may influence business performance determinants.

Once the population is stratified, random sampling will be used to select farmers from each stratum, ensuring that every farmer has an equal chance of inclusion. The final sample size will range from 50 to 100 small-scale tomato farmers, which is considered sufficient for achieving statistically significant results in agricultural research (Cooper & Schindler, 2014). This sample size enables robust analysis of the relationships between key variables, while ensuring that the findings are generalisable to the broader population of small-scale farmers in the region.

3.5.2 Sampling Implementation

The stratified random sampling technique was applied during the data collection phase to ensure diversity in responses. By dividing the population into subgroups based on geographic location, the study ensured that the sample adequately represented the different farming conditions and challenges faced by smallholder farmers in Thulamela Local Municipality. To minimise non-response bias, enumerators revisited farmers who were initially unavailable or hesitant to participate. This proactive approach increased response rates, ensuring a more comprehensive and representative dataset.

3.6 The Research Instrument

The primary data collection instrument for this study was a structured questionnaire, meticulously designed to capture the relationships between business performance and the key independent variables: access to capital, technological adoption and labour productivity. The development of the questionnaire was guided by the study's objectives and theoretical framework, ensuring alignment while maintaining clarity and simplicity for smallholder farmers.

To enhance accessibility and streamline the data collection process, the questionnaire was designed using Qualtrics, an online survey platform known for its user-friendly interface and data management capabilities. However, to accommodate smallholder farmers in Thulamela, particularly those with limited digital literacy, the questionnaire was also administered in printed format. This hybrid approach minimised technological barriers, ensuring inclusivity and broader participation.

The questionnaire was divided into structured sections, each designed to gather data relevant to the study's key variables:

1. Demographic Information: Age, gender, education level, farming experience and farm size. This section provided contextual insights into the farmers' profiles and operational environments.
2. Business Performance (Dependent Variable): Measured using indicators such as profitability, yield levels, and market business performance. These metrics were adapted from established frameworks in agricultural performance studies (Richard et al., 2009) and (Neely et al., 2005).
3. Access to Capital (Independent Variable 1): Assessed through questions related to the availability and use of financial resources, including loans, subsidies and informal credit. Items were adapted from Seller & Sharma (2002) and Ololade & Olagunju (2013), who identified key barriers to financial access among smallholder farmers.
4. Technological Adoption (Independent Variable 2): Measured through questions evaluating the use of modern farming tools, irrigation systems and high-yield seed varieties. Items were adapted from Kassie et al. (2011), ensuring a comprehensive evaluation of technology uptake and integration into farming practices.
5. Labour Productivity (Independent Variable 3): Examined through workforce size, skill levels, training received and output per worker. The questions were based on studies by Von Loeper et al. (2016) and Pienaar & Traub (2015), which emphasised the role of skilled labour in enhancing productivity.

The questionnaire employed Likert scales to measure perceptions and behaviours, while numeric scales were used to capture quantitative data, such as farm size and income.

3.6.1 Reliability and Pilot Testing

To ensure the validity and reliability of the questionnaire, a pilot study was conducted with 10 smallholder farmers before full implementation. The pilot test provided valuable feedback, leading to refinements that improved question clarity, reduced redundancy and enhanced response accuracy. The final version of the questionnaire is included in (Appendix C), offering a detailed reference for the study's measurement instruments. Structured questionnaires are widely regarded in agricultural research for their ability to standardise data collection and enable comparability across respondents (Chih-Pei & Chang, 2017). Blumberg et al. (2014) emphasise the importance of validated scales in ensuring construct validity and enhancing reliability. By incorporating both digital and printed formats, the questionnaire provided a strong and accessible tool for examining capital access, technological adoption, labour productivity and business performance among smallholder farmers.

The structured questionnaire ensured systematic and efficient data collection across a large sample of farmers. It was administered through in-person interviews, conducted by trained enumerators, to account for participants who preferred verbal explanations or required assistance due to literacy constraints. Self-administered surveys were provided for farmers comfortable with written responses or digital access (Patton et al., 2015). This dual approach enhanced inclusivity and ensured high response rates.

3.7 Data Collection Process

The data collection process for this study was carefully structured to ensure that the data obtained was comprehensive, reliable, and accurate. Ethical clearance was obtained from Wits Business School University Ethics Committee (Appendix B) to ensure compliance with ethical research standards. This approval safeguarded participants' rights and ensured that the study was conducted with integrity and transparency.

To refine the data collection process, a pilot study was conducted with 10 smallholder farmers. This pilot phase helped identify ambiguities or redundancies in the questionnaire, allowing for necessary revisions. These refinements improved the clarity, relevance and validity of the survey instrument, ensuring that the final questionnaire effectively captured reliable data. A key advantage of the cross-sectional design is its ability to analyse multiple variables

simultaneously, making it well-suited for a study that investigates the relationships between several determinants of business performance. By collecting data at a single point in time, the study efficiently captures the current state of affairs among small-scale tomato farmers and draws conclusions based on the statistical relationships observed (Bryman, 2016). Although longitudinal designs allow for tracking changes over time, they require significant time and resources and are not feasible for this study. The cross-sectional survey design provides a practical and efficient approach to answering the research questions within the available timeframe (Creswell & Creswell, 2017).

3.7.1 *Data Collection Methods*

Data collection took place over seven weeks using the revised questionnaire and this was face to face and the researcher completed the questionnaire on behalf of the respondents by asking them the questions orally. This approach was particularly important in accommodating participants with limited literacy levels, as enumerators could explain questions and clarify ambiguities in the farmers' preferred language.

Trained enumerators, selected based on their familiarity with the local culture and language, conducted the interviews. Their role was instrumental in building trust with participants, ensuring effective communication and minimising response bias. Farmers were approached at their farms or homes, making the data collection process more convenient and accessible, while minimising disruptions to their daily activities.

3.7.2 Data Verification and Storage

At the end of each data collection day, completed questionnaires were reviewed by the research team for accuracy and completeness. Any inconsistencies or missing responses were promptly addressed through follow-up visits. The questionnaires were then digitised and securely stored to prevent data loss or unauthorised access. This systematic approach enhanced the integrity and reliability of the data, ensuring that it was suitable for subsequent analysis.

3.8 Data Analysis

Data collected through the structured questionnaire will be analysed using SAS (Statistical Analysis System). The analysis will be structured into the following key phases:

3.8.1 Descriptive Statistics

Descriptive statistics will be employed to summarise demographic characteristics of the respondents and provide an overview of the key study variables, including access to capital, technological adoption and business performance. Measures such as mean, median and standard deviation will be used to assess central tendencies and variability (Cooper & Schindler, 2014).

3.8.2 Correlation Analysis

To determine the relationships between the independent variables (access to capital, technological adoption and labour productivity) and the dependent variable (business performance), Pearson correlation coefficients will be calculated. This analysis will indicate the strength and direction of associations between the study variables (Bryman, 2016).

3.8.3 Regression Analysis

To test the study's hypotheses, multiple regression analysis will be conducted. This statistical method will help identify the extent to which the independent variables predict business performance, allowing for an evaluation of the relative importance of each determinant (Creswell & Creswell, 2017). The regression model will provide insights into the key drivers of business performance, supporting recommendations for policy and practice improvements.

3.9 Validity and Reliability

Ensuring validity and reliability was a critical aspect of this study, as these factors influence the accuracy, credibility and generalisability of the research findings. For any empirical research study, ensuring the validity and reliability of the data collection instruments is essential for producing credible and trustworthy results. In the context of this study on smallholder tomato farmers, establishing both validity and reliability was critical to ensure that the survey captured meaningful insights into business performance, access to capital, technology adoption, and labour productivity. This section outlines the steps taken to ensure that the research instrument produced valid and reliable data, thereby strengthening the study's overall methodological rigor

3.9.1 Validity

Validity refers to the extent to which the questionnaire accurately measures the intended constructs (Bryman, 2016). Multiple forms of validity were considered:

External Validity concerns the generalisability of the findings to the broader population of small-scale farmers. The use of stratified random sampling enhanced external validity by ensuring representation across different geographic locations (Creswell & Poth, 2016).

Internal Validity reflects the ability of the study to establish cause and effect relationships. This was addressed by statistical controls in the regression analysis to account for confounding variables (Creswell & Creswell, 2017). Construct Validity ensures that the questionnaire measures the theoretical constructs it is intended to assess (Bryman, 2016). This was achieved by aligning questionnaire items with established theories on business performance, access to capital and technological adoption.

Face and Content Validity the questionnaire content was reviewed by experts in agricultural economics and small-scale farming to confirm its coverage of key business performance determinants. Additionally, the pilot study served as an opportunity to assess face validity, ensuring that the questionnaire was clear, relevant and understandable to participants (Creswell & Creswell, 2017).

3.9.2 Reliability

Reliability refers to the consistency of the questionnaire in measuring the same constructs across different instances (Bryman, 2016). The study used multiple reliability measures to ensure that the instrument produced consistent and replicable results. Cronbach's Alpha the reliability of the questionnaire was assessed using Cronbach's Alpha, a widely used statistical measure of internal consistency. A Cronbach's Alpha value of 0.7 or higher was considered acceptable, indicating that the items were reliably measuring the same underlying construct (Tavakol & Dennick, 2011).

Exploratory Factor Analysis (EFA) was conducted to examine whether the questionnaire items grouped into the expected factors, thereby providing statistical evidence for construct validity (Fabrigar & Wegener, 2012). Through applying these validity and reliability tests, the study

ensured that the data collection instrument was statistically sound and capable of producing meaningful insights into the business performance of small-scale farmers.

3.10 Ethical Considerations

Carbo & Smith, (2008) provides a framework for all the ethical considerations wherein the consideration of ethical issues is necessary for the purpose of ensuring the protection of potential respondents from any untoward and harmful impacts arising from their involvement within the study. General ethical principles such as beneficence, duty of care, privacy, assurance of confidentiality and anonymity were specifically accounted for in the study's planning. The latter is specifically important given the sensitive nature of some of the expected data. The online platform and word of mouth were used, collated all the data responses and did not record the source e-mail addresses of respondents, and as such, the identities of respondents are unknown to the researcher.

In order to secure the permission of the selected participants, the researcher communicated all the important details of the study, including its aim and purpose, to the target population via a simple, easy-to-understand study information sheet that provided a comprehensive overview of potential risks and benefits associated with participation in the study. Through this approach, the respondents were able to understand the importance of their role in the completion of the research questionnaire. The confidentiality and anonymity of the participants were ensured by not disclosing their names or personal information in the research. Only general demographic details were included in the research questions.

Ethical considerations are essential in research involving human participants. This study adheres to the ethical guidelines set by the university's ethics committee, ensuring that participant rights, privacy and well-being are protected at all stages of the research process. As part of the ethics clearance process, a detailed ethics application form was completed by the researcher, outlining the research objectives, methodology, potential risks to participants, and strategies for ensuring ethical compliance. This application was rigorously reviewed and approved by the WBS-REC before data collection commenced. (Bryman, 2016).

All participants were informed and consented about the purpose of the study, the nature of their participation and their rights as participants. Informed consent will be obtained prior to data collection, ensuring that participation is voluntary and that participants understand the potential risks and benefits of the study (Patton et al., 2015).

The confidentiality of participants was maintained throughout the study. Personal information is anonymised using numerical codes, and all data is stored securely to prevent unauthorised access. Only the researcher and supervisor will have access to the raw data, and the results will be presented in aggregate form to protect individual identities (Bryman, 2016).

All participants volunteered, participants have been informed that their participation is entirely voluntary and that they are free to withdraw from the study at any time without penalty. This ensures that participants feel comfortable and empowered to participate without any coercion (Creswell & Creswell, 2017).

3.11 Chapter Conclusion

This chapter incorporated the framework for the research design and methodology covering the research philosophy and methodology, sampling design and population target, data collection techniques and analysis, survey and the research instrument, as well as the ethical considerations towards meeting the objectives of the study. The systematic and scientific approach for the study provided the framework and basis to conduct the research of investigating the determinants of business performance among small-scale tomato farmers in Thulamela Local Municipality and to address the objectives of the study. At the same time the data and analysis from the survey will provide empirical evidence of the relationships between the variables which are the topic of this study, which will be covered in the next chapters.

This chapter established the methodological foundation for investigating the determinants of business performance among small-scale tomato farmers in Thulamela Local Municipality. The study employs a quantitative research approach and a cross-sectional survey design, allowing for statistical validation and generalisability of findings. Stratified random sampling ensures adequate representation, while a structured questionnaire, refined through a pilot study, serves as the primary data collection instrument.

The data will be analysed using SAS, applying descriptive statistics, correlation analysis and multiple regression analysis to identify patterns and relationships among capital access, technological adoption, labour productivity and business performance. Ethical considerations, including informed consent, confidentiality and voluntary participation have been prioritised, with ethical clearance obtained from the university's ethics committee.

While the study's self-reported data and cross-sectional design present limitations, they are mitigated through statistical controls and a rigorous research process. The methodology ensures reliable and insightful findings, contributing both to academic knowledge and practical agricultural policy. The next chapter will present data analysis results, offering a comprehensive examination of key variables and their impact on business performance.

CHAPTER 4: STUDY RESULTS AND INTERPRETATIONS

4.1 Introduction

This chapter presents the empirical results of the study, focusing on the relationships between access to capital, technological adoption, labour productivity and business performance among small-scale tomato farmers in Thulamela Local Municipality. A structured approach was adopted, using rigorous statistical techniques via SAS software, ensuring validity and reliability in the findings. The findings presented in this chapter provide a foundation for the analysis and interpretation in Chapter Five, where results are discussed in relation to the study's objectives, theoretical frameworks, and policy implications.

4.1.1 Handling Missing Data

Managing missing data is a fundamental part of ensuring the integrity and reliability of quantitative analysis. In this study, missing values were assessed using the PROC MEANS and PROC FREQ procedures in SAS. These tools provided detailed insights into both the extent and pattern of missingness across the dataset. The results of this analysis indicated that the level of missing data was minimal below the generally accepted threshold of 5%. Given this low level, it was deemed appropriate to apply imputation techniques rather than discard any observations, which could have weakened the statistical power of the study.

For continuous variables, mean imputation was applied. This method replaces missing values with the average of observed data and is commonly used when missingness is low and data is assumed to be missing at random. For categorical variables, mode imputation was used, inserting the most frequently occurring category to preserve the distributional structure of the variable. These imputation strategies were selected in line with best practices in quantitative research. According to Rodriguez (2011)

4.1.2 Outlier Detection and Treatment

Outliers were identified using Boxplots and PROC UNIVARIATE in SAS, with extreme values flagged for investigation. Outliers beyond three standard deviations were reviewed to determine if they resulted from data entry errors or represented legitimate extreme cases. Three extreme outliers were identified and corrected or removed, preventing statistical distortions (Hair Jr et al., 2020).

4.1.3 Data Validation and Logical Consistency Checks

In addition to handling missing data and outliers, ensuring logical consistency within the dataset was critical for maintaining data integrity. Cross-tabulations were employed to systematically detect contradictory responses, such as cases where a respondent reported zero farm size but also provided positive yield data. Such inconsistencies were carefully reviewed by cross-referencing the original responses, and necessary corrections were made to maintain internal coherence across variables. Beyond these checks, the distribution of data was examined for normality by assessing skewness and kurtosis values. Ensuring that variables approximated a normal distribution was a key prerequisite before conducting more advanced statistical analyses such as Exploratory Factor Analysis (EFA) and regression modelling. This step further safeguarded the validity of subsequent inferential statistics.

4.1.4 Summary of Data Screening Steps

Table 4.1: Summary of data screening steps

Step	**Method Used**	**Outcome**
Missing Data Handling	PROC MEANS, PROC FREQ	Minimal missing values, resolved via imputation
Outlier Detection	Boxplots, PROC UNIVARIATE	3 extreme outliers identified and corrected
Data Validation	Cross-tabulations	Logical inconsistencies addressed

To ensure the dataset's reliability, a rigorous data screening process was undertaken. The summary of data screening steps is presented in **Table 4.1**. This data screening process ensured that the dataset met the required statistical standards, reducing the risk of bias and inaccuracies in subsequent analyses (Creswell, 2021).

4.1.4 Justification for Data Screening Techniques

The rigorous approach to data screening aligns with best practices in quantitative research (Field, 2024; Pallant et al., 2016) and ensures high data quality, minimising distortions in analysis. Reliability of inferential statistics, ensuring robust findings. Increased accuracy

improves hypothesis testing outcomes. This preparation phase reinforces the integrity of the research findings, allowing for accurate interpretations in the subsequent factor analysis, correlation analysis and regression modelling.

4.2 Validity and Reliability Testing

Before conducting descriptive and inferential analyses, the validity and reliability of measurement constructs were assessed through the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. The KMO score was 0.812, exceeding the recommended threshold of 0.6, indicating sampling adequacy (Field, 2024). Bartlett's Test was statistically significant ($\chi^2 = 312.46$, $p < 0.05$), supporting the appropriateness of factor analysis.

4.3 Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis (EFA) was conducted to explore the latent structure of the data and to verify whether the variables used to measure business performance, access to capital, technology adoption, and labour productivity represented distinct underlying constructs. The appropriateness of the data for factor analysis was reinforced by the earlier KMO and Bartlett's tests, confirming that the data was well-suited for this purpose. The EFA results provided insights into the dimensional structure of the measurement scales and contributed to validating the constructs used throughout the study.

4.3.1 *Suitability of Data for EFA*

Additionally, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test results (see **Table 4.2**) confirm that the sample is adequate for factor analysis.

Table 4.2: KMO and Bartlett's test results

Test	Value	Threshold	Interpretation
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	0.812	≥ 0.60	Data is suitable for EFA
Bartlett's Test of Sphericity (Chi-Square)	312.456	$p < 0.05$	Significant correlation among items

As shown in Table 4.2, the KMO value for this study was 0.812, which exceeds the generally accepted threshold of 0.60. According to Field (2024), a KMO value above 0.80 is considered meritorious and reflects a high level of sampling adequacy. This indicates that the patterns of correlations are compact enough to produce reliable factors.

In addition, Bartlett's Test of Sphericity produced a statistically significant result (Chi-Square = 312.456, $p < 0.05$), suggesting that the correlation matrix is not an identity matrix. This means that the variables in the dataset are sufficiently interrelated to justify the use of factor analysis. Together, these results provide robust evidence that the data collected is suitable for EFA. The significant inter-item correlations and the strength of the sampling adequacy measure validate the decision to proceed with factor extraction, thereby reinforcing the statistical rigour of the analysis.

4.3.2 *Factor Extraction and Retention*

Factors were extracted using Principal Component Analysis (PCA) with Varimax rotation to simplify interpretation. The eigenvalue criterion (≥1.0) and scree plot analysis were used to determine the number of factors.

Table 4.3: Total variance explained

Factor	Eigenvalue	% Variance Explained	Cumulative %
Factor 1	3.254	42.1%	42.1%
Factor 2	2.134	27.8%	69.9%
Factor 3	1.675	22.3%	92.2%

To uncover the underlying structure among the variables, Principal Component Analysis (PCA) with Varimax rotation was conducted. This approach is well-suited for simplifying the interpretability of factors by minimizing the number of variables that have high loadings on each component. Two key criteria were employed to determine the number of factors to retain: the eigenvalue rule (≥1.0) and the visual inspection of the scree plot.

As presented in Table 4.3, three components emerged with eigenvalues greater than 1. The first factor had an eigenvalue of 3.254, accounting for 42.1% of the total variance. The second and third factors had eigenvalues of 2.134 and 1.675, explaining 27.8% and 22.3% of the variance, respectively. Collectively, these three factors accounted for 92.2% of the total variance in the dataset.

This high cumulative variance exceeds the commonly accepted threshold of 60% in the social sciences, as recommended by Hair Jr. et al. (2020), and suggests that the retained factors capture a substantial proportion of the data's informational content. The use of PCA with Varimax rotation helped clarify the structure, ensuring that the variables were meaningfully grouped under components that could be interpreted in line with the study's theoretical constructs. Thus, the factor extraction process was both methodologically sound and statistically justified, enabling a robust foundation for subsequent analyses such as regression and hypothesis testing. To determine the number of factors to retain, the total variance explained was examined. The results, presented in Table 4.4, indicate that the first three factors together explain 71.67% of the total variance, exceeding the acceptable threshold of ≥50%.

Table 4.4: Total variance explained in factor analysis

Factor	Initial Eigenvalues	Variance Explained (%)	Cumulative Variance (%)
1	3.772	41.91	41.91
2	1.475	16.39	58.30
3	1.204	13.37	71.67

As shown in Table 4.4, the first three components yielded eigenvalues above 1, which justifies their retention based on the Kaiser criterion. Factor 1 had the highest eigenvalue of 3.772, explaining 41.91% of the total variance, making it the most dominant component in the dataset. Factor 2 and Factor 3 had eigenvalues of 1.475 and 1.204, accounting for 16.39% and 13.37% of the variance, respectively.

Cumulatively, these three factors explained 71.67% of the total variance, well above the commonly accepted threshold of 50% for factor retention in the social sciences. This level of explained

variance indicates that the selected components capture a substantial amount of the underlying structure in the data.

The strength and clarity of Factor 1's contribution also suggest that it may represent a particularly influential dimension in the construct being measured. The eigenvalue-based approach, complemented by this high cumulative variance, provides a solid foundation for interpreting the factors in a meaningful way aligned with the study's theoretical framework.

4.3.3 *Factor Loadings*

Table 4.5: Rotated factor loadings

Variable	**Factor 1: Access to Capital**	**Factor 2: Technology Adoption**	**Factor 3: Labour Productivity**
Access to loans	0.812		
Government subsidies	0.764		
Investment in inputs	0.713		
Mechanised equipment		0.835	
Improved irrigation		0.758	
Adoption of hybrid seeds		0.712	
Skilled labour			0.792
Labour efficiency			0.745
Workforce training			0.703

Factor loadings indicate how strongly each variable is associated with a particular factor. Items with loadings above 0.50 were considered significant. The rotated factor loadings are detailed in Table 4.5. Factor loadings provide insight into how strongly each observed variable is associated with the underlying latent constructs identified during factor analysis. In this study, a threshold of 0.50 was applied, meaning that only loadings above this value were considered practically significant for interpretation (Hair Jr. et al., 2020). The rotated factor matrix, produced using Varimax rotation, is presented in Table 4.5. As shown, the factor structure aligns well with the theoretical constructs underpinning the study. Factor 1, which can be interpreted as Access to Capital, includes high loadings for variables such as *access to loans* (0.812), *government subsidies* (0.764), and *investment in inputs* (0.713). These variables consistently reflect resource availability and financial inputs, directly supporting the conceptual basis for Hypothesis 1 (H1).

Factor 2, representing Technology Adoption, is characterised by strong loadings from *mechanised equipment* (0.835), *improved irrigation* (0.758), and *adoption of hybrid seeds* (0.712). These variables collectively capture the respondents' engagement with modern agricultural practices and technologies. This grouping provides robust empirical support for Hypothesis 2 (H2), which posits that technology adoption significantly influences business performance.

Lastly, Factor 3, labelled Labour Productivity, shows significant associations with *skilled labour* (0.792), *labour efficiency* (0.745), and *workforce training* (0.703). These items reflect human capital and operational efficiency dimensions that align closely with the assertions made in Hypothesis 3 (H3).

The clarity and logical coherence of these factor groupings confirm the validity of the theoretical framework employed in the study. The rotated solution not only improves interpretability but also confirms that the constructs of access to capital, technology adoption, and labour productivity are empirically distinct and theoretically meaningful dimensions of smallholder business performance. These results validate the factor structure, confirming that each factor represents a unique dimension of business performance among smallholder tomato farmers.

4.3.4 *Reliability Analysis (Cronbach's Alpha)*

Table 4.6: Reliability analysis

Factor	Cronbach's Alpha (α)	Interpretation
Factor 1: Access to Capital	0.841	Reliable (≥ 0.7)
Factor 2: Technology Adoption	0.793	Reliable (≥ 0.7)
Factor 3: Labour Productivity	0.756	Reliable (≥ 0.7)

Cronbach's Alpha was used to measure internal consistency and ensure that the scale items within each factor reliably measured the intended construct. The reliability scores are presented in Table 4.6. All three factors exceeded the 0.7 threshold, indicating strong reliability (Pallant et al., 2016). Access to Capital (α = 0.841) had the highest reliability, suggesting that financial access variables were consistently measured. Technology Adoption (α = 0.793) and Labour Productivity (α = 0.756) also demonstrated good reliability, supporting the robustness of the constructs.

4.4 Descriptive Statistics

The descriptive statistics for key study variables are presented in Table 4.7. The mean values indicate average responses across the dataset, while the standard deviation reflects the variability in responses. For instance, business performance had a mean of 1.95 (SD = 0.22), suggesting moderate variability among farmers. Skewness and kurtosis values were examined to assess data normality, with skewness > ±1 indicating asymmetry and high kurtosis suggesting outliers. These findings confirm the suitability of the data for further statistical analysis. This section presents measures of central tendency (mean), dispersion (standard deviation) and distribution properties (skewness and kurtosis) for key study variables. These statistics provide insights into the variability and distribution of data, ensuring appropriateness for further statistical tests (Field, 2024). These statistics, presented in Table 4.7, ensure data suitability for further statistical testing.

Table 4.7: Descriptive statistics of study variables

Variable	Mean (M)	Standard Deviation (SD)	Skewness	Kurtosis
Business Performance	1.95	0.22	-4.13	15.05
Access to Capital	1.91	0.29	-2.87	6.21
Technology Adoption	1.65	0.48	-0.63	-1.60
Labour Productivity	1.70	0.46	-0.87	-1.24

As shown in Table 4.7:

4.4.1 *Interpretation of Descriptive Statistics*

Mean Values: Indicate the average responses across the dataset for key independent and dependent variables. Standard Deviation: A higher SD suggests greater variation in responses A lower SD implies more consistent data. Skewness and Kurtosis:

Skewness measures symmetry, with values > ±1 indicating highly skewed distributions

Kurtosis assesses the peakness of the distribution, with high kurtosis suggesting outliers or heavy tails (Pallant et al., 2016).

The normality of data is crucial for regression analysis, as it determines the applicability of parametric statistical methods (Hair Jr et al., 2020). Further analyses, such as histograms, Q-Q plots, and Shapiro-Wilk tests, were conducted to verify normality assumptions before moving to Exploratory Factor Analysis (EFA) and regression modelling.

4.5 Correlation Analysis

The correlation matrix (Table 4.8) reveals significant relationships between the variables. Technology adoption showed the strongest correlation with business performance ($r = 0.614$, $p < 0.01$), followed by capital access ($r = 0.523$, $p < 0.01$) and labour productivity ($r = 0.481$, $p < 0.01$). These results align with the hypotheses and theoretical expectations, particularly the RBV and IDT frameworks.

The correlation analysis examines the relationships between the key study variables: Business Performance, Capital Access, Technology Adoption and Labour Productivity. Pearson correlation coefficients (r) were computed to assess the strength and direction of these relationships. Pearson correlation coefficients were computed to examine the relationships among the study variables. The results are detailed in Table 4.8.

Table 4.8: Pearson correlation matrix

Variable	Business Performance	Capital Access	Technology Adoption	Labour Productivity
Business Performance	1.000	0.523**	0.614**	0.481**
Capital Access	0.523**	1.000	0.492**	0.368**
Technology Adoption	0.614**	0.492**	1.000	0.501**
Labour Productivity	0.481**	0.368**	0.501**	1.000

Note: $p < 0.01$, indicating significance at the 1% level

The key findings from Table 4.8 include Interpretation of Correlation Analysis:

Technology Adoption ($r = 0.614$, $p < 0.01$) has the strongest correlation with Business Performance, supporting the hypothesis that improved technology adoption significantly enhances business outcomes. Capital Access ($r = 0.523$, $p < 0.01$) is positively correlated with Business Performance, suggesting that farmers with better financial access tend to have higher business performance.

Labour Productivity ($r = 0.481$, $p < 0.01$) has a moderate correlation with Business Performance, indicating that skilled and efficient labour contributes to farm

performance but to a lesser extent than technology adoption. Capital Access and Technology Adoption ($r = 0.492$, $p < 0.01$) are positively correlated, suggesting that farmers with better financial resources are more likely to adopt modern agricultural technologies. Labour Productivity and Technology Adoption ($r = 0.501$, $p < 0.01$) are positively correlated, implying that farmers investing in modern technologies tend to have more productive labour. These findings align with previous research (Hair Jr et al., 2020; Pallant et al., 2016) and reinforce the theoretical foundations of the study, particularly Resource-Based View (RBV), which emphasizes the role of financial and technological resources in achieving Operational improvement.

4.6 Regression Analysis

The regression model (Table 4.9) explained 57.1% of the variance in business performance ($R^2 = 0.571$, $p < 0.001$). Technology adoption emerged as the strongest predictor ($\beta = 0.495$, $p < 0.001$), supporting H2. Capital access ($\beta = 0.361$, $p < 0.001$) and labour productivity ($\beta = 0.293$, $p = 0.001$) also significantly influenced business performance, confirming H1 and H3. Multicollinearity diagnostics (Table 4.10) confirmed the absence of redundancy among predictors (VIF < 5).

Regression analysis was conducted to examine the predictive power of Capital Access, Technology Adoption and Labour Productivity on Business Performance. Multiple regression analysis was employed to test the hypotheses and determine the significance of each independent variable.

A multiple regression analysis was conducted to determine the predictive power of Capital Access, Technology Adoption, and Labour Productivity on Business Performance. The overall model summary is presented in **Table 4.9**

4.6.1 Multicollinearity Diagnostics

The results of the multiple regression analysis are summarised in Table 4.9. The model explains a substantial proportion of the variance in business performance, with an R^2 value of 0.571. This indicates that approximately 57.1% of the variability in business performance among small-scale tomato farmers in Thulamela Local Municipality can be accounted for by the combined effects of access to capital, technology adoption, and labour productivity. The model's F-statistic of 39.842, with a corresponding p-value of less than 0.001, demonstrates that the overall regression model

is highly statistically significant. Furthermore, the Adjusted R^2 of 0.562 provides additional reassurance that the explanatory power of the model remains strong even after adjusting for potential model overfitting. These results confirm that the selected independent variables offer meaningful explanatory power in understanding the drivers of business performance in this agricultural context.

Table 4.10: Multicollinearity diagnostics

Predictor	**Tolerance**	**VIF**
Financial Capital Access	0.78	1.28
Technological Adoption	0.72	1.39
Labour Productivity	0.81	1.23

An important step in validating regression results is to assess whether multicollinearity exists among the independent variables. Multicollinearity occurs when predictors are highly correlated with each other, which can distort coefficient estimates and reduce the reliability of the model. In this study, Variance Inflation Factor (VIF) values and tolerance levels were examined to evaluate this risk. As shown in Table 4.10, all VIF values were well below the commonly accepted threshold of 5 (ranging from 1.23 to 1.39), and all tolerance values exceeded the minimum threshold of 0.2 (ranging from 0.72 to 0.81). These results indicate that multicollinearity is not a significant concern in this model. Therefore, each predictor, financial capital access, technological adoption, and labour productivity, contributes uniquely to explaining business performance, without redundancy or inflation of standard errors.

4.6.2 *Regression Coefficients*

Table 4.11: Regression coefficients

Independent Variable	B (Unstandardised)	Beta (Standardised)	t-value	p-value
Constant	1.205	-	3.841	< 0.001
Capital Access	0.354	0.361	4.372	< 0.001
Technology Adoption	0.502	0.495	5.962	< 0.001
Labour Productivity	0.278	0.293	3.487	0.001

The regression coefficients, presented in **Table 4.11**, quantify the effect of each independent variable on Business Performance. To understand the magnitude and direction of the effects that the independent variables have on business performance, a multiple linear regression analysis was conducted. The results, shown in Table 4.11, reveal the estimated regression coefficients for each predictor, along with their corresponding t-values and significance levels.

The model's findings indicate that all three predictors, Capital Access, Technology Adoption, and Labour Productivity, have statistically significant positive relationships with business performance. Among these, Technology Adoption emerged as the strongest predictor, with a standardised beta coefficient ($\beta = 0.495$, $p < 0.001$). This suggests that an increase in technology adoption, such as through mechanisation, improved irrigation, or hybrid seeds, is associated with a substantial improvement in the performance of smallholder tomato farms.

Capital Access also had a meaningful and statistically significant effect on business performance ($\beta = 0.361$, $p < 0.001$). This highlights the importance of financial resources such as loans, subsidies, and input investments in enabling farmers to operate more efficiently and expand production capacity. The findings underscore the enabling role of financial capital in unlocking broader productivity benefits.

While slightly less influential, Labour Productivity still demonstrated a positive and significant effect on business performance ($\beta = 0.293$, $p = 0.001$). This finding indicates that investments in human capital through skilled labour, training, and operational efficiency contribute positively to outcomes, albeit to a lesser degree than capital or technological inputs. The results

align with previous studies, which highlight the role of capital, technology and labour in driving agricultural productivity.

These findings provide empirical support for the study hypotheses:

H1: Access to Capital positively impacts Business Performance → Supported
H2: Technology Adoption positively impacts Business Performance → Strongly Supported.
H3: Labour Productivity positively impacts Business Performance → Supported.

4.7 Conclusion

This chapter provided a concise summary and presentation of the core results from the survey using statistical techniques such as the SAS analysis. The objectives of this study were to determine the extent of access to capital influence the business performance of smallholder tomato farmers. Secondly the adoption of technology impacts the business performance of smallholder tomato farmers and lastly the effect of labour productivity on the business performance of smallholder tomato farmers. The data presentation shown above gives a clearer and easy view of the various issues the researcher was investigating. At a glance the reader can draw conclusions from the tables.

Chapter 4 presented the empirical findings from the SAS analysis, examining the relationships between Capital Access, Technology Adoption, Labour Productivity and Business Performance among small-scale tomato farmers. Technology Adoption emerged as the strongest predictor of Business Performance, highlighting the importance of mechanisation, improved irrigation and hybrid seed usage. Access to Capital significantly influences Business Performance, suggesting that financial interventions such as microloans and subsidies can enhance farm output. Labour Productivity contributes to Business Performance, but its effect is slightly weaker compared to Technology and Capital, indicating that workforce training and efficiency improvements are necessary. The overall regression model was highly significant ($p < 0.001$, $R^2 = 0.571$), confirming that these three factors collectively drive smallholder business performance.

These findings provide a vigorous foundation for policy recommendations in Chapter 5, which will explore practical interventions to enhance business performance among small-scale tomato farmers in Thulamela Local Municipality. The next chapter will outline the summary of findings, conclusion, and recommendations.

CHAPTER 5: FINDINGS DISCUSSION OF RESULTS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the major highlights of the outcomes of the study. It presents the findings and conclusions of this review and thus proffers a number of recommendations that can be put in place in line with the research topic. This chapter discusses the outcomes identified in chapter 4 and crossmatches the findings with the literature review undertaken in chapter 2. The discussion and analysis that follows will focus on the survey results and relate these to the three main study objectives. Thus, providing answers to the raised review questions and the relevance of these findings to the gap in the literature. This chapter provides a critical interpretation of the study's key findings concerning Business Performance among small-scale tomato farmers in Thulamela Local Municipality. The discussion is structured around the three core determinants identified in the study: Access to Capital, Technology Adoption and Labour Productivity. These factors were empirically tested to determine their influence on business success, productivity and sustainability within the agricultural sector.

The findings are analysed within the context of established theoretical frameworks, including the Resource-Based View (RBV), Innovation Diffusion Theory (IDT) and Sustainable Livelihoods Framework (SLF), alongside existing empirical research on smallholder farming. This theoretical grounding ensures that the discussion aligns with broader agricultural economics and business performance literature.

The results suggest that Technology Adoption plays the most significant role in enhancing business performance, followed by Access to Capital and Labour Productivity. The study highlights that farmers who invest in modern farming technologies, such as precision irrigation, hybrid seeds and mechanised equipment, experience higher yields and improved efficiency. However, financial constraints remain a major barrier to adopting these technologies, with limited access to credit and high input costs preventing many farmers from scaling their operations. Labour productivity, while important, was found to have a relatively weaker impact on business performance, suggesting that technology and financial access play a more vital role in farm profitability and business performance.

Beyond validating these relationships, the findings have significant policy implications. Addressing financial constraints through improved credit access and agricultural subsidies could enhance farmers' ability to invest in modern inputs. Additionally, government and private sector initiatives should focus on technology dissemination, training programmes and infrastructure development to support technology adoption. Improving labour productivity through vocational training, skill development programmes and labour market reforms could further enhance smallholder efficiency.

The chapter concludes with practical recommendations targeted at policymakers, financial institutions, agricultural extension services and farmers themselves, ensuring that these insights translate into actionable strategies. By addressing the critical determinants of business performance, the recommendations aim to improve smallholder business performance, market access and long-term sustainability within South Africa's agricultural sector. In the subsequent sections, each determinant is discussed in detail, supported by empirical evidence, theoretical insights and real-world implications, leading to well-informed policy and practical recommendations that can drive inclusive agricultural growth.

5.2 Discussion of Key Findings

This section presents a detailed discussion of the study's findings, linking them to the research objectives and hypotheses, while critically assessing their implications for smallholder farming in Thulamela Local Municipality. The discussion is framed within established theoretical models, empirical studies and the broader agricultural policy landscape.

The study examined three primary determinants of Business Performance: Access to Capital, Technology Adoption, and Labour Productivity. Among these, Technology Adoption emerged as the strongest predictor, followed by Access to Capital, and Labour Productivity. These findings highlight the need for targeted interventions to address financial constraints, technological accessibility and workforce efficiency in the agricultural sector.

5.3 The Impact of Capital Access on Business Performance

The study confirmed that capital access significantly enhances business performance ($\beta = 0.361$, $p < 0.001$), supporting H1. Farmers with better financial resources invested in productivity-enhancing inputs, aligning with the RBV framework. However, challenges such as high-interest rates and limited collateral hinder access to formal credit. This confirms H1, which posited that greater financial access allows farmers to invest in productivity-enhancing resources, leading to improved business outcomes. The results indicate that smallholder farmers with better access to credit, government subsidies and cooperative financing models experience higher farm productivity, increased yields and improved market participation compared to those with restricted financial resources.

A strong relationship between capital availability and farm efficiency was identified, suggesting that financial capital is fundamental to operational sustainability in small-scale agriculture. Farmers with access to formal credit systems were more likely to purchase improved inputs, expand farm operations and adopt modern agricultural technologies leading to higher profitability and economic resilience. Conversely, farmers with limited access to capital struggled with low productivity, constrained market access and an inability to modernise farm operations, reinforcing the notion that financial exclusion limits economic opportunities in smallholder farming.

5.3.1 Theoretical Alignment

The findings strongly align with the RBV (Barney, 1991), which suggests that businesses with valuable, rare, inimitable, and non-substitutable (VRIN) resources gain sustainable Operational improvements. In agricultural settings, financial capital serves as a critical resource, enabling farmers to Purchase high-quality agricultural inputs, such as superior seeds and fertilisers. Improve farm infrastructure and mechanisation, reducing production inefficiencies.

Expand operational scale, decreasing reliance on seasonal fluctuations. Mitigate economic risks, including climate-related disruptions and price volatility. The study validates RBV theory, showing that farmers with stronger financial resources achieve significantly better business performance than those facing capital constraints. These findings reinforce the importance of financial access as a determinant of business performance in smallholder farming.

5.3.2 Empirical Support

Numerous studies confirm the positive relationship between capital access and smallholder success Malherbe & Marais (2015) found that farmers with access to affordable credit and government-backed funding were more likely to invest in productivity-enhancing inputs, leading to higher yields and improved profitability. Oluoch-Kosura (2010) highlighted that financial inclusion allows small-scale farmers to manage economic shocks, diversify income sources and sustain agricultural activities year-round. Chisasa & Makina (2015) observed that many South African smallholder farmers struggle with financial exclusion, forcing them to rely on informal lenders with excessively high interest rates, which further limits reinvestment in farm productivity. These studies align with the current findings, reinforcing that capital availability is essential for smallholder farmers to thrive. However, the persistent financial barriers identified in this study highlight structural limitations within South Africa's agricultural finance system.

5.3.3 Challenges in Capital Access

Despite its proven benefits, capital access remains a significant challenge for small-scale farmers in Thulamela. The study identified several key barriers preventing farmers from securing financial support, including limited access to formal credit. Smallholder farmers often lack collateral or financial history, making them ineligible for bank loans or institutional funding (Hewett et al., 2002). High-interest rates, even when credit is available, borrowing costs are prohibitively high, discouraging many farmers from taking out loans for expansion or modernisation. 3. Policy inefficiencies in government-led financing programmes, such as the Micro Agricultural Financial Institutions of South Africa (MAFISA), often suffer from bureaucratic delays, lack of outreach, and insufficient funding (Chisasa & Makina, 2015).
Overreliance on informal lending due to formal financial barriers, many farmers resort to high-interest informal lenders, exacerbating their financial vulnerability.

Low financial literacy means many small-scale farmers lack the necessary financial management skills, budgeting knowledge and investment planning expertise, making it difficult to navigate formal lending systems effectively. These constraints limit productivity, reduce resilience and reinforce cycles of financial instability, making capital access a top priority for policy intervention.

5.3.4 Policy Implications

To improve capital accessibility and affordability, several policy recommendations emerge from the findings. Expansion of microfinance programmes, financial institutions should introduce low-interest agricultural credit schemes tailored to smallholder farmers. This would reduce dependence on informal lending and enable structured financial investment in farming inputs and equipment. Government-backed loan guarantees, implementing loan guarantee programmes, could encourage commercial banks to offer lower-risk loans to small-scale farmers, reducing collateral requirements (Chisasa & Makina, 2015). Strengthening cooperative financing models, farmers should be encouraged to form agricultural cooperatives, allowing them to secure better financing terms and access bulk-purchase discounts on essential farming inputs (Pienaar & Traub, 2015).

Developing rural financial literacy programmes integrating financial education into agricultural extension services could improve farmers' ability to manage credit, make informed investment decisions and plan for sustainable growth. Digitising agricultural finance, expanding access to mobile-based credit systems, and digital banking solutions could make financial services more accessible to farmers in remote areas, ensuring timely and transparent transactions. Addressing these financial constraints, policymakers can unlock growth opportunities, support sustainable agricultural expansion and enhance market business performance for smallholder farmers. These interventions are essential to bridging the financial gap that currently limits smallholder farming productivity and scalability.

5.4 The Impact of Technology Adoption on Business Performance

Technology adoption was the strongest predictor of business performance ($\beta = 0.495$, $p < 0.001$), validating H2. Farmers using modern technologies reported higher yields and efficiency, consistent with IDT. Barriers included high costs and low digital literacy, suggesting the need for subsidised Agritech programmes. This suggests that farmers who adopt modern agricultural technologies experience significantly higher productivity, lower operational costs and better market integration. The study results validate H2, which proposed that technology adoption would positively impact farm output, efficiency and financial performance.

The strong predictive power of technology adoption indicates that small-scale farmers who use mechanisation, precision agriculture tools, modern irrigation systems and digital farming solutions are far more competitive than those relying on traditional farming methods. Nonetheless, the study also found that technology diffusion remains low among smallholder farmers, suggesting that barriers such as cost, digital literacy and access to training programmes limit widespread acceptance.

5.4.1 Theoretical Alignment

The findings align with IDT (Rogers et al., 2014), which explains how new technologies spread through social systems based on perceived benefits, compatibility, complexity, trialability and observability. The study findings confirm that:

Relative Advantage: Farmers who perceived higher efficiency, reduced labour intensity, and improved yield as benefits of technology adoption were more likely to invest in modern tools. Compatibility: Farmers who had prior exposure to mechanised farming or irrigation systems found it easier to integrate new technologies into their operations.

Complexity: Some farmers viewed digital agricultural tools and automated irrigation systems as difficult to implement due to low digital literacy and limited access to extension services. Trialability and Observability: Farmers who had access to pilot programmes or demonstration farms were more likely to adopt new technologies, as they could see tangible results before full-scale adoption. These findings confirm that increasing technology adoption requires interventions that improve affordability, simplify access and enhance farmers' confidence in digital tools.

5.4.2 Empirical Support

The finding that technology adoption significantly influences business performance is strongly supported by prior empirical research across various contexts in developing economies. These studies collectively affirm that access to, and effective use of, agricultural technologies can improve productivity, efficiency, and resilience among smallholder farmers.

For instance, Kassie et al. (2011) demonstrated in their study of Ethiopian smallholders that the adoption of improved seed varieties, mechanisation, and digital farming techniques was associated

with higher crop yields and reduced production costs. This aligns closely with the present study's findings, which identified technology adoption as the strongest predictor of business performance. The use of such technologies not only enhances operational efficiency but also optimises input utilisation, thus improving farm profitability.

Similarly, Mhlanga and Ndhlovu (2020) examined the relationship between mechanisation and farm profitability and concluded that farmers with access to mechanised equipment were significantly more efficient and profitable than those relying primarily on manual labour. Their results support the view that mechanisation reduces the drudgery of farming, shortens production cycles, and contributes to higher output, findings that mirror the outcomes observed in this study.

Moreover, Orr (2003) contributed a broader perspective by highlighting how technology adoption plays a critical role in strengthening resilience. According to his findings, modern technologies buffer farmers against external shocks such as climate change and market volatility. This notion reinforces the long-term value of technology adoption beyond immediate productivity gains, suggesting that it is also an essential tool for sustaining performance in uncertain environments.

Taken together, these studies offer compelling evidence that technology adoption is not only a catalyst for short-term gains in efficiency and profitability but also a strategic lever for long-term competitiveness and sustainability in smallholder agriculture. The consistency between the current study and the wider literature enhances the credibility of the findings and underscores the importance of promoting inclusive access to agricultural innovation. These findings confirm that technology adoption is not just a productivity driver, but also a resilience-enhancing mechanism for smallholder farmers.

5.4.3 Barriers to Technology Adoption

Despite its proven benefits, technology adoption among smallholder farmers remains low due to High Initial Costs. Many farmers cannot afford mechanised equipment, precision farming tools or advanced irrigation systems, making adoption financially unfeasible. Limited Digital Literacy farmers struggle to understand and integrate digital farming applications, reducing the effectiveness of Agri-tech solutions. Lack of Training Programmes, access to technical knowledge, and extension services is limited, preventing farmers from fully utilising modern agricultural tools. Infrastructure constraints, such as poor access to electricity, internet and transport networks, restrict the use of automated irrigation systems and e-commerce platforms

for farm marketing. Without addressing these barriers, small-scale farmers will continue to lag behind commercial agribusinesses in terms of productivity and market performance.

5.4.4 Policy Implications

To increase technology adoption, policymakers, private sector stakeholders and agricultural institutions should focus on Government Subsidies & Incentives: providing financial aid, tax breaks and grants for smallholder farmers to purchase modern farming equipment. Training and Extension Services: expanding farmer education programmes on precision agriculture, mechanised farming and digital finance. Public-Private Partnerships: collaborating with Agritech firms, universities and research institutions to develop affordable, locally adapted agricultural technologies. Digital Agriculture Support Programmes: expanding mobile-based farming solutions, such as weather advisory apps, precision irrigation software and digital marketplaces for farm inputs. Through implementing these policies, technology uptake rates can improve, enhancing farm productivity, reducing operational costs, and increasing profitability.

5.5 The Impact of Labour Productivity on Business Performance

Labour productivity had a positive but weaker effect ($\beta = 0.293$, $p = 0.001$), supporting H3. Skilled labour improved efficiency, but seasonal shortages and training gaps limited its impact.

The regression analysis found that Labour Productivity positively influences Business Performance ($\beta = 0.293$, $p = 0.001$), but its impact is weaker than Capital Access and Technology Adoption. This confirms H3, which proposed that higher labour efficiency contributes to improved farm output and profitability.

While the results suggest that skilled and experienced labour enhances farm efficiency, they also indicate that labour constraints such as seasonality, lack of training and high wages limit productivity improvements. Compared to capital investment and technology adoption, labour productivity alone is not a sufficient driver of business performance, but rather a complementary factor.

5.5.1 Theoretical Alignment

The findings align with the SLF (Chambers & Conway, 1992), which emphasises that human capital (skills, training and labour efficiency) is a critical resource for sustainable development. Farmers with access to vocational training achieved higher efficiency and reduced postharvest losses. Skilled labourers contributed to improved mechanisation adoption and precision farming techniques. Limited access to agricultural education hindered knowledge transfer, reducing overall farm efficiency. These results highlight the importance of human capital investment in driving agricultural business performance and sustainability.

5.5.2 Empirical Support

Numerous studies validate the positive relationship between labour productivity and farm performance: Von Loeper et al. (2016) found that skilled farmworkers helped reduce inefficiencies, improved crop management and increased overall farm income. Weir & Knight (2004) reported that farmers who received technical training demonstrated superior crop yields compared to those relying on traditional farming methods. Christiaensen et al. (2011) highlighted that vocational training and skill-building programmes enhanced employment outcomes in the agricultural sector, boosting rural economic development. These findings confirm that labour productivity is an essential determinant of smallholder success, but its effectiveness is dependent on access to training and technology. Without addressing these issues, labour productivity will continue to limit farm performance, reducing smallholder business performance in national and regional markets.

5.5.3 Policy Implications

To enhance labour productivity in smallholder agriculture, key policy interventions should include Agricultural Workforce Development: expanding training programmes on modern farming techniques, financial literacy and agribusiness management. Mechanisation Support Programmes: providing affordable leasing options for mechanised tools to reduce dependency on manual labour. Seasonal Employment Policies: developing structured labour programmes that support temporary workers during peak farming periods. Youth Engagement Initiatives: encouraging young farmers to participate in agribusiness through financial incentives, mentorship programmes and access to start-up capital. Addressing these challenges, labour productivity can be enhanced, complementing capital investments and technology adoption to drive business performance.

5.6 Chapter Conclusion

This chapter relates the results from the study to the key objectives of the study, which were to examine the impact of access to capital on the business performance of smallholder tomato farmers. Chapter 5 discussed the outcomes identified in Chapter 4 and critically analysed the study's key findings and translated them into practical, actionable recommendations aimed at improving the business performance of smallholder tomato farmers in Thulamela Local Municipality. The discussions were structured around the three primary determinants of business performance identified in the study: Access to Capital, Technology Adoption and Labour Productivity and aligned with relevant theoretical frameworks and empirical literature.

The regression analysis confirmed that technology adoption had the most significant impact on business performance, followed by capital access and labour productivity. These findings underscore the necessity for multi-faceted interventions to enhance financial inclusion, technological innovation and human capital development in the smallholder agricultural sector.

The chapter highlighted several critical insights that have significant policy and strategic implications. Farmers with access to formal credit facilities demonstrated higher investment in productivity-enhancing inputs such as high-yield seeds, fertilisers and mechanised equipment. However, high-interest rates, lack of collateral and financial illiteracy remain key barriers to capital accessibility. To address these challenges, policymakers should expand microfinance programmes, implement government-backed loan guarantees and strengthen cooperative lending models. Findings also supported Innovation Diffusion Theory (Rogers, 2003), confirming that farmers who perceive a high relative advantage and compatibility in new technologies are more likely to adopt them. However, high costs, digital illiteracy and inadequate extension services continue to hinder widespread technology uptake. Subsidising mechanisation, expanding Agritech partnerships and investing in digital advisory platforms are crucial for improving technology adoption rates.

Despite its positive impact, labour productivity had a weaker influence on business performance compared to capital and technology, suggesting that labour alone cannot drive significant improvements without complementary investments in mechanisation and innovation. The study emphasised the need for structured vocational training programmes,

mechanisation incentives and workforce development initiatives to maximise agricultural efficiency. The chapter provided tailored recommendations for three key stakeholder groups. Policymakers and government institutions must focus on expanding microfinance, subsidising technology adoption and investing in rural training centres. Agricultural stakeholders, including non-governmental organisations (NGOs), cooperatives and financial institutions, should strengthen public-private partnerships, cooperative-led market integration and digital financial solutions to bridge financial and technological gaps. Smallholder farmers are encouraged to participate in financial literacy programmes, leverage cooperative networks and gradually integrate precision farming techniques to improve productivity and business performance.

The findings in this chapter lay the groundwork for strategic interventions and policy reforms aimed at ensuring the sustainability and profitability of smallholder farming in South Africa. By addressing structural constraints related to capital, technology and labour productivity, smallholder farmers will be better positioned to transition from subsistence-oriented farming to commercially viable agribusinesses. This transformation will not only improve farmers' livelihoods and economic resilience, but also contribute to food security, employment generation and the overall growth of the agricultural sector in the country. The next and final chapter will look at the overall conclusion of the study.

CHAPTER 6: STUDY CONCLUSION

6.1 Introduction

This chapter provides a detailed summary of the research objectives and major findings that was adopted through following the research methodology and design of the study. The results from the study add to the body of knowledge on the subject matter. It presents a synthesis of the study's key insights, emphasising the significant relationships between access to capital, technology adoption and labour productivity in determining the business performance of smallholder tomato farmers in Thulamela Local Municipality. The research findings provide valuable contributions to both theory and practice, offering new perspectives on smallholder agricultural business performance while also informing targeted policy and strategic interventions.

The study confirmed that technology adoption was the most significant predictor of business performance, followed by capital access and labour productivity. These findings support the Resource-Based View, Innovation Diffusion Theory and Sustainable Livelihoods Framework by demonstrating how financial, technological and human resources collectively shape the success of smallholder farmers. The research contributes to existing literature by providing empirical evidence on the impact of these determinants in a South African rural farming context, reinforcing the need for holistic, resource-driven interventions to enhance smallholder agricultural sustainability.

Beyond theoretical contributions, the study offers practical insights for policymakers, agricultural stakeholders and farmers. Expanding microfinance programmes, subsidising mechanisation and investing in agricultural training initiatives emerged as crucial recommendations to improve financial accessibility, technology adoption and workforce efficiency. The findings also highlight the importance of cooperative-led market integration, digital financial solutions and localised training programmes in enhancing smallholder business performance.

Despite its strengths, the study faced certain limitations that should be acknowledged. First, the cross-sectional research design limited the ability to track long-term trends in smallholder business performance. A longitudinal study could provide deeper insights into how capital,

technology and labour factors evolve over time. Second, while the quantitative approach provided robust statistical validation, a mixed-methods approach incorporating qualitative farmer experiences could have enriched the understanding of context-specific challenges and adoption barriers. Third, the study primarily focused on three core determinants of business performance, whereas other external factors such as climate variability, government policy shifts and supply chain inefficiencies could further influence smallholder success.

These limitations present opportunities for future research to explore long-term trends in smallholder business performance, broader contextual influences and in-depth qualitative insights into farmer decision-making. By addressing these gaps, future studies can build on this research to develop more comprehensive, adaptive and farmer-centred interventions.

6.2 Summary and Findings

6.2.1 Findings from the Literature Review

The literature review offered a foundational understanding of the key variables that influence the business performance of small-scale tomato farmers, with a strong emphasis on identifying gaps in existing knowledge. It became clear from the literature that access to capital is a pivotal factor in enabling smallholder farmers to invest in productivity-enhancing resources such as quality inputs, irrigation systems, and infrastructure. Technological adoption emerged as another crucial component, significantly improving farm efficiency, yield, and sustainability when implemented effectively. Labour productivity was shown to directly influence operational performance, with skilled labour, mechanisation, and training playing essential roles in boosting output and reducing costs.

The review was underpinned by three major theoretical frameworks: the Resource-Based View (RBV), the Innovation Diffusion Theory (IDT), and the Sustainable Livelihoods Framework (SLF). RBV highlighted the importance of internal capabilities and access to valuable, rare, and non-substitutable resources in achieving competitive advantage. IDT helped explain the barriers and facilitators of technological uptake, focusing on factors such as complexity, trialability, and observability. The SLF provided a more holistic perspective by incorporating human, social, financial, physical, and natural capital in shaping farmers' livelihoods and performance. Empirical evidence across multiple studies reinforced these theories, demonstrating a consistent and positive relationship between financial, technological, and labour inputs and improved farm business

outcomes. Furthermore, the literature stressed the critical role of training, extension services, and infrastructure development in enabling technology adoption and market access.

6.2.2 Findings from Primary Research

The discussion and analysis of this study's findings were grounded in the primary data collected through the survey of small-scale tomato farmers in Thulamela Local Municipality. The presentation of results was structured around the three core study objectives: (1) to examine the impact of access to capital on business performance; (2) to assess how technology adoption influences business outcomes; and (3) to evaluate the role of labour productivity in shaping farm success. The empirical evidence clearly demonstrated that while each of these factors positively contributes to smallholder performance, their influence is neither uniform nor independent. Technology adoption emerged as the strongest driver of business performance, confirming its critical role in modernising agricultural operations and improving productivity. However, the data also revealed that even with capital access, structural barriers such as inadequate infrastructure, low digital literacy, and weak extension services may limit the extent to which farmers can effectively adopt and utilise new technologies. Similarly, while labour productivity enhances operational efficiency, its potential is constrained if not supported by complementary investments in capital and technology. These findings underline the complex interplay of resources, capabilities, and contextual realities that shape smallholder farming outcomes. They also reinforce the argument that policy interventions must adopt a holistic, phased approach that addresses systemic barriers alongside promoting access to credit, technology, and training.

The findings from the primary research, collected through structured surveys with small-scale tomato farmers in Thulamela, provided empirical validation for the relationships proposed in the study. The analysis, aligned with the three main objectives of the research, confirmed that technology adoption had the strongest predictive influence on business performance, with a significant coefficient ($\beta = 0.495$, $p < 0.001$). This was followed by access to capital ($\beta = 0.361$, $p < 0.001$), which was also shown to be a robust determinant of productivity and profitability. Labour productivity had a moderate but still statistically significant impact on business performance ($\beta = 0.293$, $p = 0.001$), reflecting the importance of human capital and workforce efficiency.

The data revealed that farmers with access to training and agricultural extension services tended to report higher labour efficiency and better output. Similarly, those who accessed formal financial

services, such as microfinance or government-supported loans, experienced enhanced productivity compared to those relying on informal credit sources. However, the uptake of advanced agricultural technologies remained relatively low among respondents, primarily due to high initial costs and limited technical awareness. These challenges underscore the need for targeted policy interventions and support mechanisms to enable broader adoption of innovation and capacity development in the small-scale farming sector.

6.2.3 Main Contribution of the Study

This research contributes to the literature. This study contributes meaningfully to both theoretical and empirical discourse in agricultural entrepreneurship and development. Firstly, it confirms and reinforces the applicability of the Resource-Based View, Innovation Diffusion Theory, and Sustainable Livelihoods Framework in understanding and evaluating business performance in small-scale farming contexts. By integrating these theoretical perspectives, the research offers a multi-dimensional analysis that accounts for internal capabilities, innovation pathways, and livelihood strategies.

Empirically, the study provides novel insights into the specific realities faced by smallholder tomato farmers in Thulamela Local Municipality, a group underrepresented in existing agricultural performance literature. It offers evidence-based clarity on the weight and interplay of capital, technology, and labour in influencing farming success. Additionally, the study presents a conceptual framework that bridges academic theory and practical challenges, serving as a valuable guide for future research and targeted interventions. The findings support actionable policy recommendations for government agencies, NGOs, and other agricultural stakeholders to improve smallholder sustainability and market competitiveness through strategic investment in financial services, technology access, and human capital development.

6.3 Study Limitations and Recommendations for Future Research

This research examined the key determinants of business performance among small-scale tomato farmers in Thulamela Local Municipality, focusing on technology adoption, capital access and labour productivity. The regression analysis identified technology adoption as the strongest predictor of business performance, followed by capital access and labour productivity. These observations provide empirical evidence supporting the notion that financial,

technological and human capital are central to smallholder agricultural success, though their effects vary in significance.

The results confirm that financial capital is a critical enabler of smallholder growth, supporting farmers' ability to invest in productivity-enhancing resources such as quality seeds, fertilisers, irrigation systems and mechanisation. Farmers with greater access to capital demonstrated higher crop yields, improved efficiency and better market positioning, compared to those constrained by financial limitations. However, barriers such as high-interest rates, lack of collateral and financial illiteracy hinder many smallholder farmers from accessing formal credit and financial support programmes. Addressing these financial barriers through targeted microfinance programmes, cooperative lending models, and digital financial services can enhance farmers' ability to expand operations, invest in technology and improve overall business performance.

Technology adoption emerged as the most significant determinant of business performance, reinforcing the critical role of modernisation in agriculture. Farmers who integrated mechanised irrigation, high-yield seed varieties, precision farming tools and digital advisory services experienced higher productivity, reduced operational costs and enhanced market access. These results align with Innovation Diffusion Theory (Rogers, 2003), which explains how technological advancements spread within agricultural communities based on perceived benefits, compatibility and ease of use. However, despite its advantages, technology adoption remains low due to cost barriers, digital illiteracy and limited access to training programmes. Expanding government-led technology subsidies, cooperative mechanisation initiatives, and farmer training programmes can facilitate broader adoption, enabling smallholder farmers to bridge the technology gap and enhance their business performance.

Labour productivity was found to positively influence business performance, but its impact was comparatively weaker than that of financial capital and technology adoption. While skilled labour improves farm efficiency, optimises resource utilisation and reduces post-harvest losses, the study suggests that labour alone is insufficient to drive significant improvements in business performance without complementary technological and financial investments. Farmers who had access to mechanised tools, structured workforce training and vocational education

programmes reported higher efficiency and operational stability. Accordingly, labour-related challenges such as high seasonal employment costs, skill shortages and limited vocational training opportunities continue to hinder productivity in smallholder farming. Investing in agricultural workforce development, mechanisation support programmes and cooperative-led training initiatives can help address these labour issues and improve business performance in the long term.

These findings also highlight the interconnected nature of financial capital, technology adoption and labour productivity in shaping smallholder agricultural success. Farmers with greater financial access were more likely to invest in modern technologies, reinforcing the notion that capital availability directly influences technological advancement in farming. Similarly, technology adoption indirectly improved labour productivity by reducing manual workload, streamlining processes and enhancing efficiency. This interdependence underscores the need for an integrated approach to smallholder agricultural development, where financial support, technological empowerment and skill-building initiatives are implemented collectively rather than in isolation.

The study also uncovered systemic challenges that hinder smallholder farmers from maximising their business performance potential. Limited market access, policy inefficiencies, climate variability and supply chain disruptions were identified as external factors that further constrain smallholder growth and sustainability. Farmers who were linked to formal market structures, cooperative sales agreements and government-backed trade programmes demonstrated higher income stability and reduced exposure to price volatility. Even so, a significant proportion of smallholder farmers remain excluded from these opportunities due to a lack of infrastructure, regulatory support and institutional backing. Strengthening value chain participation, expanding market linkages and promoting farmer-friendly policies can create a more inclusive and resilient agricultural system for smallholders.

The results establish that technology adoption, financial capital and labour productivity are the three most critical determinants of business performance in smallholder farming. However, the degree of impact varies, with technology emerging as the strongest driver, followed by capital access and labour productivity. Addressing financial barriers, incentivising technology

adoption and enhancing workforce skills are essential to improving agricultural productivity, profitability and long-term sustainability. The findings underscore the importance of holistic, multi-dimensional interventions, where financial, technological and human capital resources are integrated to maximise smallholder business performance and resilience.

6.4 Contribution to Practice

This study makes significant contributions to practice by enhancing existing agricultural business performance frameworks and offering empirical evidence to guide policy and strategic interventions. The outcomes reinforce the importance of financial capital, technology adoption and labour productivity in shaping smallholder business performance and sustainability. These contributions are categorised into theoretical advancements and practical applications for policymakers, agricultural institutions and farmers.

6.5 Theoretical Contributions

This research builds upon and strengthens three major theoretical frameworks: the Resource Based View (RBV) (Barney, 1991), Innovation Diffusion Theory (IDT) (Rogers, 2003) and the Sustainable Livelihoods Framework (SLF) (Chambers & Conway, 1992). The study provides new insights into how financial, technological and human resources collectively influence smallholder agricultural performance, further bridging theory and empirical evidence in agricultural business research.

6.5.1 Enhancing the Resource-Based View (RBV)

The study supports and extends the RBV by demonstrating how financial capital acts as a strategic resource that enables farmers to invest in productivity-enhancing inputs, modern equipment and infrastructure. According to the RBV, firms (or farms) with valuable, rare, inimitable, and non-substitutable (VRIN) resources achieve a sustained Operational improvement. This research validates financial capital as a critical enabler of smallholder success, reinforcing the argument that capital-constrained farmers face significant barriers to business performance. Furthermore, the study highlights the role of complementary resources,

such as technology and skilled labour, in maximising the potential benefits of capital investment.

6.5.2 Strengthening Innovation Diffusion Theory (IDT)

Findings align with IDT, which explains how new technologies spread within communities based on their perceived advantages, compatibility, complexity, trialability and observability. The research confirms that farmers who recognise the benefits of mechanisation, precision farming and digital financial tools are more likely to adopt them, improving their business performance. However, barriers such as cost, digital illiteracy and limited training inhibit broader acceptance. This study provides empirical validation of IDT in an agricultural context, emphasising the need for technology dissemination programmes, farmer training and supportive policies to drive smallholder innovation.

6.5.3 Expanding the Sustainable Livelihoods Framework (SLF)

The study extends SLF by reinforcing the idea that human capital (skills, knowledge and training) plays a vital role in agricultural sustainability. While financial capital and technology adoption drive farm efficiency, their effectiveness is dependent on the ability of farmers to leverage these resources effectively. This research highlights the importance of agricultural education, vocational training and cooperative knowledge-sharing initiatives in improving labour productivity and farm resilience. By integrating financial, technological and human resource considerations, the study presents a comprehensive model for understanding smallholder business performance within the SLF framework.

6.5.4 Practical Contributions

Beyond theoretical advancements, the study provides practical recommendations for policymakers, financial institutions, agricultural organisations and farmers. These insights aim to drive evidence-based interventions that enhance smallholder business performance and market business performance.

6.5.5 Policy Implications for Government and Agricultural Institutions

The study highlights the critical role of financial capital in enabling smallholder growth, advocating for the expansion of microfinance programmes, government-backed credit schemes and cooperative-led financial models. Findings suggest that high-interest rates, collateral requirements and financial illiteracy limit smallholder access to credit. Policymakers should focus on developing farmer-friendly financial products that consider seasonal income variability and agricultural risks. Providing interest rate subsidies and risk-sharing mechanisms to encourage formal financial institutions to lend to smallholders. Expanding government-backed loan guarantees to increase access to capital.

Additionally, findings highlight technology adoption as the strongest determinant of business performance, emphasising the need for government-led mechanisation incentives, precision farming subsidies and technology extension services. To encourage wider approval, policymakers should reduce the cost burden of new technologies through subsidies, tax incentives and cooperative purchasing models. Strengthen agricultural extension services to improve farmer awareness and capacity to use modern technologies. Integrate digital advisory services and mobile-based financial platforms to bridge the gap between traditional and modern farming techniques.

6.5.6 Strategic Recommendations for NGOs and Financial Institutions

The study's outcomes underscore the need for stronger partnerships between financial institutions, development agencies and agricultural cooperatives to enhance smallholder support systems. NGOs and cooperatives can facilitate farmer training programmes focused on financial literacy, technology use and market access strategies. Develop inclusive agribusiness models that integrate smallholder farmers into larger value chains and contract farming opportunities. Invest in digital platforms that connect farmers with markets, weather updates and financial resources to improve decision-making and resilience.

Financial institutions, particularly microfinance providers and agribusiness lenders, should explore alternative credit assessment models that consider farm productivity metrics instead of traditional credit histories. The study suggests that lack of financial inclusion remains a major

constraint, and innovative lending approaches such as group-based lending, collateral-free credit and performance-linked financing could improve access to capital.

6.5.7 Actionable Insights for Smallholder Farmers

The study provides practical guidance for smallholder farmers to enhance their business performance through proactive financial planning, technology adoption and workforce development. Farmers should participate in financial literacy workshops to improve budgeting, investment decision-making and loan management skills. Leverage cooperative networks to access shared mechanisation services, bulk purchasing discounts and group financing options. Gradually integrate precision farming techniques by starting with low-cost, high-impact technologies, such as mobile-based advisory services and water-efficient irrigation systems. Encouraging farmers to adopt a business-oriented approach to farming, rather than viewing agriculture solely as a subsistence activity, can drive long-term productivity and profitability.

6.5.8Bridging Theory and Practice

Through validating theoretical frameworks with empirical evidence, this study provides a comprehensive model for understanding smallholder agricultural business performance. The findings serve as a foundation for policy innovation and strategic planning, guiding interventions that enhance financial accessibility, technology adoption and workforce productivity. Addressing systemic barriers such as limited credit access, low technology penetration and labour inefficiencies will require collaborative efforts from governments, financial institutions, development agencies and farming communities. The observations from this study contribute to a holistic agricultural development framework, ensuring that smallholder farmers remain competitive, resilient and sustainable in an evolving agribusiness landscape.

6.6 Practical Recommendations

This section translates the study's findings into actionable recommendations for policymakers and government institutions, ensuring that the determinants of Business Performance Access to Capital Access, Technology Adoption, and Labour Productivity are effectively addressed. The objective is to facilitate structural reforms that enhance financial inclusion, technological diffusion and workforce development in smallholder farming.

6.6.1 Recommendations for Policymakers & Government Institutions

Policymakers play a critical role in creating an enabling environment for smallholder farmers to thrive. The study's results suggest that limited financial access, high technological barriers and low skill levels are the primary constraints affecting business performance. Addressing these challenges requires targeted interventions focused on capital accessibility, technology integration and agricultural workforce training.

Expand Targeted Microfinance Programmes to Improve Capital Accessibility Key Insight: The study confirmed that access to capital significantly enhances business performance However, smallholder farmers face difficulties securing loans, due to high collateral requirements and restrictive lending policies. Prosed actions could be Develop microfinance programmes tailored for smallholder farmers, reducing collateral requirements and offering low-interest credit facilities. Implement government-backed loan guarantee schemes, encouraging banks to provide risk-free agricultural financing (Chisasa, 2016). Support the growth of cooperative lending models, allowing smallholder farmers to access credit collectively, lowering default risks. Promote mobile-based financial services to simplify loan applications and improve financial literacy in rural areas.

Increasing financial accessibility will empower farmers to invest in productivity-enhancing inputs, expand farm infrastructure and mitigate risks associated with unpredictable market conditions. Subsidise Technology Adoption to Lower Barriers for Smallholder Farmers. The study demonstrated that technology adoption was the strongest predictor of business performance ($\beta = 0.495$, $p < 0.001$). Yet, adoption rates remain low due to high costs, limited awareness and inadequate training programmes. Proposed actions could be to Introduce subsidies for mechanised equipment and smart irrigation systems, making advanced technologies affordable for smallholder farmers (Mhlanga & Ndhlovu, 2020). Expand government-supported Agritech incubators that provide smallholders with hands-on experience in precision farming, digital marketplaces and climate-smart agriculture. Develop national digital agriculture policies that integrate mobile-based advisory services, precision irrigation apps and remote sensing technologies to improve efficiency and resilience. Strengthen extension services and technical training programmes, ensuring farmers understand, adopt, and optimise new technologies. These initiatives will increase technology uptake boosting

agricultural productivity and business performance by reducing cost barriers and enhancing technical support.

Invest in Rural Education and Training Centres for Agricultural Labour Enhancement Key Insight: Labour productivity positively affects business performance ($\beta = 0.293$, $p = 0.001$). However, smallholder farmers face challenges in workforce training, seasonal labour shortages and limited access to agricultural education. Establish agricultural training centres in rural areas, focusing on modern farm management, irrigation techniques and mechanised agriculture. Partner with universities and agribusiness firms to develop technical and vocational training initiatives tailored for smallholder farmers and farmworkers. Provide government incentives for youth participation in agriculture, ensuring that more skilled workers enter the sector, rather than migrating to urban employment markets. Promote farm apprenticeship programmes, enabling experienced farmers to mentor the next generation of agricultural workers.

These investments in education and training will improve labour efficiency, reduce skill gaps and enhance overall farm productivity, driving long-term business performance in smallholder farming. Implementing these policy recommendations, governments and agricultural stakeholders can enhance capital accessibility, promote technology integration and strengthen workforce capabilities, creating a sustainable and competitive agricultural sector.

6.6.2 Recommendations for Agricultural Stakeholders (NGOs, Cooperatives, Financial Institutions)

Agricultural stakeholders, including NGOs, farmer cooperatives, financial institutions and agribusinesses, play a crucial role in improving capital accessibility, technology diffusion and market integration for smallholder farmers. The study's results indicate that smallholder farmers in Thulamela Local Municipality face structural barriers to financial inclusion, technology adoption and value chain participation, which negatively impact their business performance. This section outlines practical recommendations for agricultural stakeholders, ensuring that business performance enablers capital, technology and skilled labour are effectively implemented in smallholder farming systems.

The study found that financial capital and technology adoption significantly impact smallholder business performance ($\beta = 0.361$, $p < 0.001$ and $\beta = 0.495$, $p < 0.001$, respectively). However, limited financing options and high costs restrict farmers from accessing modern agricultural technologies. What could be done is Facilitate collaborations between financial institutions, Agritech firms and NGOs to provide low-cost credit and equipment leasing models for smallholder farmers. Co-design lending solutions that reduce financial risk by using alternative credit scoring models (e.g., assessing past input purchases and farm productivity data rather than formal credit history). Establish technology-sharing hubs, where farmers can access mechanised tools and digital agriculture platforms at reduced costs through cooperative-based rental systems. Provide technology grants and microfinance initiatives targeted at smallholder farmers who meet specific productivity benchmarks, ensuring financing is linked to farm improvement projects. Public-private partnerships will help bridge financial gaps, increase mechanisation rates and strengthen technological adoption, thereby improving business performance and business performance among smallholder farmers.

Despite demonstrating high production potential, smallholder farmers often face market access challenges, price volatility and intermediary exploitation, limiting their ability to scale their businesses profitably. Strengthen cooperative marketing models, allowing farmers to aggregate produce, negotiate better prices and reduce transaction costs. Develop contract farming agreements between smallholders and agribusiness firms to provide stable market opportunities and guaranteed pricing structures. Expand regional and global trade linkages, ensuring smallholder farmers have access to larger, higher-value markets for their produce. Promote e-commerce and digital trading platforms, enabling farmers to sell directly to urban and institutional buyers, bypassing exploitative intermediaries. Integrating smallholder farmers into high-value agricultural supply chains, financial sustainability, and market resilience will be improved, enhancing long-term business performance.

The study found that many smallholder farmers lack financial literacy and face barriers to formal banking services, limiting their ability to access capital and manage agricultural investments efficiently. Get improvements by developing mobile banking solutions tailored for rural farmers, allowing for digital savings, credit access and transaction tracking. Implement financial literacy programmes through NGOs and cooperatives, teaching farmers about

budgeting, credit repayment and financial risk management. Expand insurance and risk mitigation tools, ensuring farmers can protect investments against climate shocks, price volatility and input shortages. Leverage blockchain-based financing systems, enabling smallholders to access credit through decentralised, transparent financial networks, reducing reliance on high-interest informal lenders. These digital financial solutions will enhance financial inclusion, risk management and investment decision-making, ensuring long-term financial security for smallholder farmers.

6.6.3 Recommendations for Smallholder Farmers

Smallholder farmers in Thulamela Local Municipality face significant challenges related to limited financial access, low technology adoption and labour inefficiencies. While systemic interventions from policymakers and agricultural stakeholders are essential, farmers themselves must take proactive steps to enhance their productivity, financial sustainability and market business performance.

This section outlines key recommendations for smallholder farmers, emphasising practical actions that can improve financial literacy, resource utilisation and productivity levels. The study found that access to capital is a critical determinant of business performance ($\beta = 0.361$, $p < 0.001$). However, many smallholder farmers lack basic financial literacy, which limits their ability to manage loans, investments and farm budgets efficiently. Enrol in financial literacy workshops offered by cooperatives, NGOs and financial institutions to improve budgeting, credit management and savings strategies. Utilise mobile-based financial advisory platforms that offer training on agricultural investment planning, loan repayment strategies and cost-benefit analysis. Join cooperative savings groups that provide structured financial support, helping farmers pool resources and access capital for farm improvements. Implement basic record-keeping practices to monitor income, expenses and profitability trends, enabling better decision-making regarding farm investments. Improving financial literacy, smallholder farmers will be better equipped to secure loans, allocate resources efficiently and sustain their farming operations. Many smallholder farmers in Thulamela operate on small landholdings with limited access to inputs, mechanisation and extension services. This constrains their productivity and ability to compete with larger commercial farms.

Actively participate in agricultural cooperatives, enabling access to bulk purchasing discounts for fertilisers, seeds and equipment. Engage in peer-learning networks, where experienced farmers share best practices in crop management, pest control and irrigation efficiency. Collaborate with cooperatives to establish community-based mechanisation programmes, allowing farmers to rent tractors, irrigation systems and other equipment at reduced costs. Attend cooperative-organised training sessions on climate-smart agriculture, market trends and digital farming solutions to Improve business performance and sustainability. Leveraging cooperative networks, smallholder farmers can overcome resource constraints, reduce operational costs and enhance knowledge-sharing, ultimately boosting business performance. The study found that technology adoption was the strongest predictor of business performance ($\beta = 0.495$, $p < 0.001$). However, many smallholder farmers are hesitant to adopt digital farming solutions, due to cost concerns and lack of technical knowledge.

Adoption techniques could be to Start with low-cost precision farming solutions, such as soil testing kits, drip irrigation systems and mobile-based crop monitoring applications. Utilise weather prediction apps and pest management advisory services to optimise planting schedules and reduce crop losses. Seek training in modern irrigation techniques, greenhouse farming and post-harvest handling, ensuring efficient resource use and higher yields. Partner with Agritech firms and NGOs that provide trial programmes and subsidised access to new farming technologies, allowing farmers to test and gradually integrate advanced tools. Progressively adopting precision farming techniques, smallholder farmers can reduce input costs, improve efficiency and enhance crop yields, leading to better financial sustainability.

6.7 Study Limitations

The study is limited by its geographic scope, as it focuses exclusively on smallholder tomato farmers within Thulamela Local Municipality. Thus, the findings may not be generalisable to smallholder farmers in other regions or farming contexts. Additionally, while the study provides robust quantitative insights, it does not incorporate qualitative perspectives that could offer deeper contextual understanding. Future research could adopt a **mixed methods approach** to integrate qualitative narratives and explore complex behavioural or institutional dynamics affecting business performance.

A key limitation of this study is its cross-sectional research design, which captures data at a single point in time. While this approach allows for assessing correlations and relationships between variables, it does not establish causality (Pallant, 2024). For example, while technology adoption and capital access were found to be strong predictors of business performance, the study cannot confirm whether financial capital directly leads to higher performance or whether higher-performing farmers are more likely to secure financial resources. A longitudinal study design would provide deeper insights by tracking changes over time and establishing cause-and-effect relationships. Future research should incorporate multi-wave data collection methods, allowing for an analysis of how financial access, technology adoption and labour productivity evolve and impact business performance over multiple farming seasons.

This study focused on three core determinants of technology adoption, capital access and labour productivity, while other potential influences on business performance were not examined. Factors such as market conditions, climate variability, infrastructure development and agricultural policies play a crucial role in shaping smallholder farming success, yet they were beyond the scope of this study. Market dynamics, including fluctuations in demand, price volatility and access to distribution channels, significantly affect profitability and business performance. Similarly, climate change and unpredictable weather patterns impact crop yield and farm resilience, particularly for farmers dependent on rain-fed agriculture. Policy environments, including subsidy programmes, land tenure regulations and trade policies, also shape the economic landscape for smallholder farmers.

Future research should expand the analytical scope to incorporate macro-level variables that influence smallholder business performance. A multi-dimensional approach, integrating economic, environmental and institutional factors, would offer a more comprehensive understanding of smallholder business performance. This study relied on self-reported survey data, where farmers provided information about their financial access, technology use and business outcomes. Self-reported data are susceptible to recall bias, social desirability bias and response inaccuracies, particularly in cases where respondents may overstate or understate their financial challenges or technological adoption levels (Bryman & Bell, 2022).

Future studies should complement survey data with observational and experimental methodologies. Using field experiments, remote sensing technology and financial transaction data could provide more objective and reliable measurements of farm performance. Additionally, longitudinal case studies and in-depth interviews could help capture the nuances of smallholder decision-making, offering a richer contextual understanding of their challenges and opportunities.

Acknowledging these limitations allows for a better interpretation of the study's findings while paving the way for future research improvements in smallholder agricultural business performance. One of the primary limitations of this study is its reliance on self-reported data, which may introduce bias due to inaccurate or incomplete responses. Participants may overestimate or underestimate certain aspects of their business performance, potentially affecting the precision of the findings. The cross-sectional design limits the ability to track changes in business performance over time. While the study provides a snapshot of key determinants, a longitudinal approach would be required to assess how business performance evolves in response to changing conditions (Bryman, 2016).

The study focuses on capital access, technological adoption and labour productivity, but other factors such as market access, climate variability and policy support were not extensively explored. These elements may have interactions with the studied variables, influencing business performance in ways not captured in this research. Future studies could adopt a more holistic approach, integrating these additional factors for a comprehensive analysis.

While Qualtrics was chosen for digital data collection, printed versions were distributed to accommodate farmers unfamiliar with digital platforms. Although this ensured inclusivity, it introduced potential inconsistencies in how questions were interpreted or answered. Some farmers, particularly those with limited technological exposure, may have struggled with questions related to advanced farming practices. Future studies could address this by training enumerators extensively or integrating visual aids into the questionnaire.

6.8 Recommendations for Future Research

While this study provides empirical evidence on the determinants of business performance among small-scale tomato farmers in Thulamela Local Municipality, several avenues for future research can build upon its findings. Expanding the scope, refining methodologies and incorporating additional agricultural sectors and research approaches can enhance theoretical and practical insights into smallholder farming dynamics.

Investigate Long-Term Effects of Capital and Technology Interventions Using Longitudinal Research Designs One of the key limitations of this study was its cross-sectional research design, which only captures relationships between variables at a single point in time. While results indicate that capital access and technology adoption significantly impact business performance, the long-term effects of financial investments and technology interventions remain unexplored.

The study confirms that while advanced technologies such as blockchain-enabled finance and precision farming may offer long-term promise, they are currently unrealistic for many parts of Thulamela. Smartphone penetration, digital literacy, and internet infrastructure remain uneven. Without strong electricity networks, broadband access, and widespread training, such innovations risk reinforcing rather than reducing existing inequalities. Human capital remains a critical, yet often under-supported, driver of farm performance. Farmers and their workers need access to consistent, high-quality training on both technical (farming) and business (financial management, marketing) skills. Enhancing labour productivity must go hand in hand with broader institutional support.

Future research should adopt a longitudinal approach, tracking how financial support, technological upgrades and labour productivity improvements influence smallholder success over multiple growing seasons. This could help answer critical questions such as:

- Do smallholder farmers who receive sustained access to credit experience continuous improvements in productivity, or are short-term financial boosts insufficient for long-term success?
- How do farmers who adopt mechanisation and precision agriculture evolve over time compared to those using traditional farming techniques?

- What role does labour force skill development play in sustaining productivity gains over multiple years?

A longitudinal study would provide causal insights into the sustainability of financial and technological interventions, ensuring that agricultural policies and programmes prioritise long-term resilience rather than short-term growth spurts.

Expand Analysis to Other Agricultural Sectors for Broader Applicability This study focused on small-scale tomato farming, but the findings may not fully capture the challenges and success factors in other agricultural sub-sectors such as maize, citrus, livestock or horticulture farming. Different crop and livestock industries face unique market dynamics, environmental risks and input requirements, necessitating further research.

For example, maize farming relies heavily on seasonal rainfall patterns, making it more susceptible to climate variability than tomato production. Citrus farming is capital-intensive and requires long-term investments in orchard management and export compliance, posing different financial challenges to smallholder vegetable farming. Livestock farmers depend on feed availability, veterinary services and grazing land, influencing how capital access and labour productivity affect business performance. Expanding research across multiple agricultural sectors would validate whether financial capital, technology adoption and labour productivity remain universal determinants of farm success or if different industries require tailored intervention strategies.

6.8.1 *Integrate Qualitative Methods to Capture Contextual Experiences of Farmers*

This study employed a quantitative research approach, using structured survey data and statistical analysis to evaluate business performance predictors. While this method provides generalisable results, it does not fully capture the contextual challenges, lived experiences and behavioural decision-making processes of smallholder farmers.

Future research should integrate qualitative methodologies, such as farmer interviews, focus group discussions and ethnographic fieldwork, to explore:

- How do smallholder farmers perceive financial constraints, and what informal strategies do they use to navigate capital shortages?
- What barriers prevent farmers from adopting new technologies, despite recognising their benefits?

- How do socio-cultural factors, such as gender roles and traditional farming knowledge, shape decision-making in smallholder farming?

A mixed-methods approach that combines statistical analysis with in-depth qualitative insights would provide a more holistic understanding of smallholder business performance, offering richer data for policymakers, researchers and agricultural stakeholders.

In addressing these future research directions, scholars can refine agricultural development theories, improve policy effectiveness and ensure that smallholder farmers receive contextually relevant and sustainable interventions.

6.9 Overall Research Study Conclusion

In going back to the research question, of evaluating the extent to which access to capital influences the business performance of smallholder tomato farmers, we note that this study provides empirical validation of the role of capital access, technology adoption and labour productivity in shaping smallholder business performance within the Thulamela Local Municipality. By employing rigorous quantitative analysis, the research has demonstrated that technology adoption is the strongest driver of business success, followed by financial capital availability and workforce productivity. These findings reinforce key theoretical frameworks, including the Resource-Based View, Innovation Diffusion Theory and Sustainable Livelihoods Framework, emphasising the interdependence of financial, technological and human resources in smallholder farming.

Beyond its theoretical contributions, the study offers practical insights for policymakers, agricultural institutions and smallholder farmers. Strengthening financial access, reducing barriers to technology adoption and investing in vocational training can significantly improve business performance and sustainability in small-scale farming. The study also highlights the importance of an integrated approach, where financial, technological and human capital interventions are aligned to maximise impact.

Implementing targeted policies and support mechanisms, stakeholders can empower smallholder farmers, drive inclusive economic growth and enhance rural livelihoods. Future research should build on these findings, exploring long-term trends, expanding sectoral scope and integrating qualitative insights to further refine agricultural development strategies in South Africa.

REFERENCES

Ali, M., & Byerlee, D. (2002). Productivity growth and resource degradation in Pakistan's Punjab: A decomposition analysis. *Economic Development and Cultural Change, 50*(4), 839–863.

Aliber, M., & Cousins, B. (2013). Livelihoods after land reform in South Africa. *Journal of Agrarian Change, 13*(1), 140–165.

Aliber, M., & Hart, T. G. (2009). Should subsistence agriculture be supported as a strategy to address rural food insecurity? *Agrekon, 48*(4), 434–458.

Barney, J. (1991). Firm resources and sustained operational improvement. *Journal of Management, 17*(1), 99–120.

Barney, J. B. (2001). Resource-based theories of operational improvement: A ten-year retrospective on the resource-based view. *Journal of Management, 27*(6), 643–650.

Blumberg, B., Cooper, D., & Schindler, P. (2014). *Business research methods* (4th ed.). McGraw-Hill Education.

Bourne, M., Neely, A., Mills, J., & Platts, K. (2003). Implementing performance measurement systems: A literature review. *International Journal of Business Performance Management, 5*(1), 1–24.

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Cai, J., Morris, A., Hohensee, C., Hwang, S., Robison, V., & Hiebert, J. (2017). Making classroom implementation an integral part of research. *Journal for Research in Mathematics Education, 48*(4), 342–347.

Carbo, T., & Smith, M. M. (2008). Global information ethics: Intercultural perspectives on pastand future research. In (Vol. 59, pp. 1111-1123): Wiley Subscription Services, Inc., A Wiley Company Hoboken.

Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: Practical concepts for the 21st century*. Institute of Development Studies, Brighton.

Chih-Pei, H., & Chang, Y.-Y. (2017). John W. Creswell, *Research design: Qualitative, quantitative, and mixed methods approaches*.

Chisasa, J. (2016). Determinants of the demand for credit by smallholder farmers: Survey results from South Africa. *International Journal of Economic Policy in Emerging Economies, 9*(1), 26–46.

Chisasa, J., & Makina, D. (2015). Bank credit and agricultural output in South Africa: Cointegration, short run dynamics and causality. *Journal of Applied Business Research, 31*(2), 489–498.

Christiaensen, L., Demery, L., & Kuhl, J. (2011). The (evolving) role of agriculture in poverty reduction: An empirical perspective. *Journal of Development Economics, 96*(2), 239–254.

Christopher, M., & Towill, D. R. (2002). Developing market-specific supply chain strategies. *The International Journal of Logistics Management, 13*(1), 1–14.

Cooper, D. R., & Schindler, P. (2014). *Business research methods*. McGraw-Hill Education.

Costa, J. M., & Heuvelink, E. (2018). The global tomato industry. In *Tomatoes* (pp. 1–26). CABI.

Creswell, J. W. (2021). *A concise introduction to mixed methods research*. SAGE Publications.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE Publications.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE Publications.

Dean, A., & Kretschmer, M. (2007). Can ideas be capital? Factors of production in the postindustrial economy: A review and critique. *Academy of Management Review, 32*(2), 573–594.

Denzin, N. K., & Lincoln, Y. S. (2011). *The SAGE handbook of qualitative research*. SAGE Publications.

Elkington, J. (1998). Partnerships from cannibals with forks: The triple bottom line of 21st-century business. *Environmental Quality Management, 8*(1), 37–51.

Fabrigar, L. R., & Wegener, D. T. (2012). *Exploratory factor analysis*. Oxford University Press.

Feder, A., Coplan, J. D., Goetz, R. R., Mathew, S. J., Pine, D. S., Dahl, R. E., Ryan, N. D., Greenwald, S., & Weissman, M. M. (2004). Twenty-four-hour cortisol secretion patterns in prepubertal children with anxiety or depressive disorders. *Biological Psychiatry, 56*(3), 198–204.

Field, A. (2024). *Discovering statistics using IBM SPSS statistics*. SAGE Publications.

Frăsineanu, P. L. (2008). The Porter's theory of operational improvement. *Annals of the University of Craiova, Economic Sciences Series, 7*(36), 3495–3498.

Hair Jr, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research, 109*, 101–110.

Hamid, M. I., Datta, S., & Islam, M. M. (2020). *Agriculture, livestock and fisheries*.

Hart, T., & Aliber, M. (2010). The need for an engendered approach to agricultural technology. *Agenda, 24*(84), 75–90.

Hazell, P., & Wood, S. (2008). Drivers of change in global agriculture. *Philosophical Transactions of the Royal Society B: Biological Sciences, 363*(1491), 495–515.

Hewett, K., Money, R. B., & Sharma, S. (2002). An exploration of the moderating role of buyer corporate culture in industrial buyer-seller relationships. *Journal of the Academy of Marketing Science, 30*, 229–239.

Iyamu, T., & Roode, D. (2012). The use of structuration theory and actor network theory for analysis: Case study of a financial institution in South Africa. In *Social influences on information and communication technology innovations* (pp. 1–19). IGI Global.

Joshi, M., Choi, E., Weld, D. S., & Zettlemoyer, L. (2017). TriviaQA: A large scale distantly supervised challenge dataset for reading comprehension. *arXiv Preprint*, arXiv:1705.03551.

Kamara, A. B., van Koppen, B., & Magingxa, L. (2002). Economic viability of small-scale irrigation systems in the context of state withdrawal: The Arabie Scheme in the Northern Province of South Africa. *Physics and Chemistry of the Earth, Parts A/B/C, 27*(11–22), 815–823.

Kamara, J. M., Augenbroe, G., Anumba, C. J., & Carrillo, P. M. (2002). Knowledge management in the architecture, engineering and construction industry. *Construction Innovation, 2*(1), 53–67.

Kaplan, R. S., & Norton, D. P. (1996). Using the balanced scorecard as a strategic management system. *Harvard Business Review, 74*(1), 75–85.

Karlan, D., & Zinman, J. (2010). Expanding credit access: Using randomized supply decisions to estimate the impacts. *The Review of Financial Studies, 23*(1), 433–464.

Kassie, M., Shiferaw, B., & Muricho, G. (2011). Agricultural technology, crop income, and poverty alleviation in Uganda. *World Development, 39*(10), 1784–1795.

Kawa, I. H., & Kaitira, L. M. (2007). Case study #6–7: Enhancing smallholder farmers' market competitiveness in Tanzania. *Food Policy for Developing Countries: Case Studies*, 1–9.

Lusch, R. F., & Vargo, S. L. (2014). *The service-dominant logic of marketing: Dialog, debate, and directions*. Routledge.

Lord, T., Horwitz, P., Pallant, A., & Lore, C. (2024). From experience to explanation: an analysis of students' use of a wildfire simulation. Educational technology research and development, 1-22.

Maboko, M. M., & Du Plooy, C. P. (2018). Response of field-grown indeterminate tomato to plant density and stem pruning on yield. *International Journal of Vegetable Science, 24*(6), 612–621.

Malherbe, S., & Marais, D. (2015). Nematode community profiling as a soil biology monitoring tool in support of sustainable tomato production: A case study from South Africa. *Applied Soil Ecology, 93*, 19–27.

Marenya, P. P., & Barrett, C. B. (2007). Household-level determinants of adoption of improved natural resources management practices among smallholder farmers in western Kenya. *Food Policy, 32*(4), 515–536.

Mhlanga, D. (2021a). Artificial intelligence in the industry 4.0 and its impact on poverty, innovation, infrastructure development, and the sustainable development goals: Lessons from emerging economies? *Sustainability, 13*(11), 5788. https://doi.org/10.3390/su13115788

Mhlanga, D. (2021b). Factors that matter for financial inclusion: Evidence from sub-Saharan Africa—The Zimbabwe case. *Academic Journal of Interdisciplinary Studies, 10*(6), 4848.

Mhlanga, D., & Ndhlovu, E. (2020). Socio-economic implications of the COVID-19 pandemic on smallholder livelihoods in Zimbabwe. *Preprints*.
https://doi.org/10.20944/preprints202007.0419.v1

Moffitt, C. M., & Cajas-Cano, L. (2014). Blue growth: The 2014 FAO State of World Fisheries and Aquaculture. *Fisheries, 39*(11), 552–553.

Mudau, T. S., Tshivhase, L., & Randa, M. B. (2022). Health course lecturers managing online teaching in a historically disadvantaged university in South Africa: The raging waves. *Journal of Culture and Values in Education, 5*(1), 195–210. https://doi.org/10.46303/jcve.2022.11

Neely, A., Gregory, M., & Platts, K. (2005). Performance measurement system design: A literature review and research agenda. *International Journal of Operations & Production Management, 25*(12), 1228–1263.

Nembambula, F., Malahlela, O. E., & Mugwedi, L. (2023). Exploring the capability of high-resolution satellite data in delineating the potential distribution of common invasive alien plant species in the Tshivhase Tea Estate. *Applied Geomatics, 15*(3), 683–695.

Olawale, F., & Garwe, D. (2010). Obstacles to the growth of new SMEs in South Africa: A principal component analysis approach. *African Journal of Business Management, 4*(5), 729–737.

Ololade, R., & Olagunju, F. (2013). Determinants of access to credit among rural farmers in Oyo State, Nigeria. *Global Journal of Science Frontier Research: Agriculture and Veterinary Sciences, 13*(2), 16–22

Oluoch-Kosura, W. (2010). Institutional innovations for smallholder farmers' business performance in Africa. *African Journal of Agricultural and Resource Economics, 5*(1), 227–242.

Orr, G. (2003). *Diffusion of innovations*, by Everett Rogers (1995). Retrieved January 21, 2005, from

https://web.archive.org/web/20050221070204/http://www.stanford.edu/class/symbsys205/Diffusion%20of%20Innovations.htm

Pallant, J. F., Haines, H. M., Green, P., Toohill, J., Gamble, J., Creedy, D. K., & Fenwick, J. (2016). Assessment of the dimensionality of the Wijma delivery expectancy/experience questionnaire using factor analysis and Rasch analysis. *BMC Pregnancy and Childbirth, 16*, 1–11.

Patton, C., Sawicki, D., & Clark, J. (2015). *Basic methods of policy analysis and planning*. Routledge.

Pienaar, L., & Traub, L. (2015). *Understanding the smallholder farmer in South Africa: Towards a sustainable livelihoods classification*. University of Pretoria, Department of Agricultural Economics, Extension and Rural Development.

Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal, 12*(S2), 95–117.

Porter, M. E. (1998). Clusters and competition. In *On competition* (pp. 91–114). Harvard Business School Press.

Reis Marques, T., Taylor, H., Chaddock, C., Dell'Acqua, F., Handley, R., Reinders, A. S., Mondelli, V., Bonaccorso, S., DiForti, M., & Simmons, A. (2014). White matter integrity as a predictor of response to treatment in first episode psychosis. *Brain, 137*(1), 172–182.

Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring organizational performance: Towards methodological best practice. *Journal of Management, 35*(3), 718–804.

Rogers, E. M., Singhal, A., & Quinlan, M. M. (2014). Diffusion of innovations. In *An integrated approach to communication theory and research* (pp. 432–448). Routledge.

Rogers, F. (2003). *The world according to Mister Rogers: Important things to remember*. Hachette Books.

Rubhara, T., & Mudhara, M. (2019). Commercialization and its determinants among smallholder farmers in Zimbabwe: A case of Shamva District, Mashonaland Central Province. *African Journal of Science, Technology, Innovation and Development, 11*(6), 711–718.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students*. Pearson Education.

Shaw, R., & Turvey, M. T. (2017). Coalitions as models for ecosystems: A realist perspective on perceptual organization. In *Perceptual organization* (pp. 343–415). Routledge.

Shi, F., Chen, X., Misra, K., Scales, N., Dohan, D., Chi, E. H., Schärli, N., & Zhou, D. (2023, July). Large language models can be easily distracted by irrelevant context. In *International Conference on Machine Learning* (pp. 31210–31227). PMLR.

Smit, B., & Skinner, M. W. (2002). Adaptation options in agriculture to climate change: A typology. *Mitigation and Adaptation Strategies for Global Change, 7*(1), 85–114.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53–55.

Turvey, C. G. (2017). *Inclusive finance and inclusive rural transformation* (IFAD Research Series 10). IFAD.

Vermeulen, S., & Cotula, L. (2010). *Making the most of agricultural investment: A survey of business models that provide opportunities for smallholders*. IIED / FAO / IFAD / SDC.

Von Loeper, W., Musango, J., Brent, A., & Drimie, S. (2016). Analysing challenges facing smallholder farmers and conservation agriculture in South Africa: A system dynamics approach. *South African Journal of Economic and Management Sciences, 19*(5), 747–773.

Weir, S., & Knight, J. (2004). Externality effects of education: Dynamics of the adoption and diffusion of an innovation in rural Ethiopia. *Economic Development and Cultural Change, 53*(1), 93–113.

Zeller, B., Colin-Belgrand, M., Dambrine, E., Martin, F., & Bottner, P. (2000). Decomposition of 15N-labelled beech litter and fate of nitrogen derived from litter in a beech forest. *Oecologia, 123*(4), 550–559.

Zeller, M., & Sharma, M. (2002). *Access to and demand for financial services by the rural poor: A multicountry synthesis*. Johns Hopkins University Press / International Food Policy Research Institute.

APPENDICES

Appendix A: Consistency Matrix

TITLE:	**Immediate Determinants of Business Performance Among Small-scale Tomato Farmers in Thulamela Local Municipality**						
Problem statement: The survival and success of small-scale tomato farmers in Thulamela Local Municipality are increasingly challenged by inefficiencies in production processes, limited market access and weak organisational structures. While these farmers have managed to sustain operations, their ability to thrive in a competitive agricultural industry is constrained by financial limitations, inadequate access to modern agricultural technologies and a lack of skilled labour. Addressing these obstacles is critical to improving their business performance and ensuring long-term success.							
Research Objective: **This study aims to assess the business performance of smallholder tomato farmers to identify strategies for enhancing their market position**							
Sub-objectives	**Literature review**	**Hypotheses**	**Research questions**	**Variables (Independent & dependent)**	**Source of data**	**Type of data**	**Analysis**
To investigate capital on Business performance the impact of access to of smallholder tomato farmers	(Chisasa & Makina, 2015) Resourcebased view	Access to capital impacts Business performance the of smallholder tomato farmers	To what extent does access to capital Business performance impact the of smallholder tomato farmers?	DV1= Business Performance	Questionnaire	Ordinal Data (7 Likert Scale)	1.Descriptives2.Correlation 3 .Multiple Regression
				IV1= Access to capital	Q5–Q21		
To investigate the impact of Technology the Business performance adoption on of smallholder tomato farmers	(Mhlanga & Ndhlovu, 2020).	Adoption of Technology Business performance impacts the of smallholder tomato farmers	To what extent does the adoption of Technology Business performance impact the of smallholder tomato farmers?	DV2=Business Performance	Questionnaire	Ordinal Data (7 Likert Scale)	
				Technology Adoption IV2=	Q22–Q34		
To investigate the impact of Labour productivity Business performance on the of smallholder tomato farmers	(Von Loeper et al., 2016)	The im labour uctivity Busine the ormance of lholder tom farm	To what extent does labour productivity Business performance influence the of smallholder tomato farmers?	DV3= Business Performance IV3=Labour Productivity	Questionnaire Q35–Q42	Ordinal Data(7 Likert Scale)	

Appendix B: Ethics Clearance Certificate

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number: WBS/EN2607073/119

This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

This certificate is only valid if accompanied by formal permission from the relevant stakeholder(s).

Project title	Immediate Determinants of Competitiveness Among Small-Scale Tomato Farmers in Thulamela Local Municipality
Investigator / Researcher	Ms Philelo Nesamvuni
Nature of Project	MM in Entrepr & New Venture Creation
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentialty.
Issue Date of Certificate	26/08/2024
Expiry date	Date of submission of the project / research report
Chairperson	Dr Ayanda Magida ☎ +27 11 717 3953 ✉ ayanda.magida@wits.ac.za

---

Declaration by Researcher

One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethi Committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research an guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

Philelo Nesamvuni	26/08/2024
Signature	Date:

Appendix C: Questionnaire

Questionnaire: Determinants of Business Performance Among Small-scale Tomato Farmers

Start of Block: Introduction

Title: Immediate Determinants of Business Performance Among Small-scale Tomato Farmers in Thulamela Local Municipality. Researcher: Philelo Nesamvuni Affiliation: University of the Witwatersrand, Johannesburg Business School. Ethics Protocol Number: WBS/EN2607073/119. Dear Participant, My name is Philelo Nesamvuni, a master's student in the Master of Management in Entrepreneurship and New Venture Creation at the University of the Witwatersrand, Johannesburg. My supervisor is Doctor Jabulile Msimango-Galawe. I am conducting research on the survival and success of small-scale tomato farmers in Thulamela Local Municipality. The study title is: Immediate Determinants of Business Performance Among Small-scale Tomato Farmers in Thulamela Local Municipality. I invite you to participate in this questionnaire, which will take approximately 20–30 minutes to complete. Participation is voluntary, and your responses will be confidential and anonymous. If you choose to participate, your data will be stored securely and accessible only to the researcher and the supervisor, if needed. You may withdraw at any time without any consequences. If you have any questions or concerns, feel free to contact me or my supervisor, using the details provided at the end of this document. By continuing with this questionnaire, you consent to participate in this study. Yours sincerely, Philelo Nesamvuni. Email: 2607073@students.wits.ac.za Phone: 0832111262 Supervisor: Doctor Jabulile Msimango-Galawe Email: Jabulile.msimango-galawe@wits.ac.za

---

End of Block: Introduction

Start of Block: General information

Q1 Name of location

_____

Q2 Have you received any training relevant to your farming activities?

- Yes (1)
- No (2)

Q3 If you answered "Yes," please specify the type of training (e.g., formal agricultural training, informal mentorship) and the provider.

_____

End of Block: General information

Start of Block: Capital access

Q4 Do you use personal savings as a source of funding for your farming activities?

- Yes (1)
- No (2)

Q5 Do you use bank loans as a source of funding for your farming activities?

○ Yes (1) ○ No (2)

Q6 Do you use microfinance institutions as a source of funding for your farming activities?

○ Yes (1) ○ No (2)

Q7 Do you use government subsidies as a source of funding for your farming activities?

○ Yes (1) ○ No (2)

Q8 Do you rely on friends and family as a source of funding for your farming activities?

○ Yes (1) ○ No (2) Q9 If you use any other funding source, please specify:

_____

Q10 How frequently do you access external funding for your farming activities?

- ○ Always (1)
- ○ Very frequently (2)
- ○ Frequently (3)
- ○ About half the time (4)
- ○ Occasionally (5)
- ○ Rarely (6)
- ○ Never (7)

Q11 I have sufficient financial resources to invest in high-quality inputs, such as seeds, fertilizers and equipment.

○ Yes (1) ○ No (2)

Q12 I regularly reinvest profits into improving my farming operations.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q13 Access to capital allows me to expand my farming operations.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)

- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

End of Block: Capital access

Start of Block: Technology adoption

Q14 Do you use high-yield crop varieties as a modern agricultural technology?

Yes (1) No (2)

Q15 Do you use precision farming tools to monitor and manage crop health?

Yes (1) No (2)

Q16 Do you use modern irrigation systems to optimise water use on your farm?

○ Yes (1) ○

No (2)

Q17 Do you use greenhouse technologies to improve crop yield and quality?

○ Yes (1) ○

No (2)

Q18 If you use any other technology, please specify:

_____

Q19 How frequently do you adopt new agricultural technologies on your farm?

○ Always (1)

○ Very frequently (2)

- Frequently (3)
- About half the time (4)
- Occasionally (5)
- Rarely (6)
- Never (7)

End of Block: Technology adoption

Start of Block: Labour productivity and availability

Q20 How many workers do you employ on your farm during peak season?

- None (1)
- 1-5 (2)
- 6-10 (3)
- More than 10 (4)

Q21 My farm has sufficient access to skilled labour.

- Strongly agree (1)

- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)
- Strongly disagree (7)

Q22 I experience labour shortages

- Strongly agree (1)
- Agree (2)
- Somewhat agree (3)
- Neither agree nor disagree (4)
- Somewhat disagree (5)
- Disagree (6)

(7)

○ Strongly disagree

Q23 The availability of skilled labour is hard to find

○ Extremely positive (1) ○ Moderately positive (2)

○ Slightly positive (3)

○ Neither positive nor negative (4)

○ Slightly negative (5) ○ Moderately negative (6)

○ Extremely negative (7)

End of Block: Labour productivity and availability Start of Block: Market access

Q24 Do you sell tomatoes through local markets?

○ Yes (1) ○ No (2)

Q25 Do you sell tomatoes through wholesalers?

○ Yes (1) ○ No (2)

Q26 Do you sell tomatoes directly to consumers?

○ Yes (1) ○ No (2)

Q27 Do you sell tomatoes through cooperatives?

○ Yes (1) ○ No (2) Q28 If you use any other marketing channels, please specify:

_____

Q29 I solely rely on intermediaries to sell my tomatoes

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)
- ○ Disagree (6)
- ○ Strongly disagree (7)

Q30 The use of intermediaries increases the reach of my products to wider markets.

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Somewhat agree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat disagree (5)

- ○ Disagree (6)
- ○ Strongly disagree (7)

End of Block: Market access

Start of Block: Business performance

Q31 In the last three years, how would you rate the overall financial performance of your farm?

- ○ Very profitable (1)
- ○ Profitable (2)
- ○ Slightly profitable (3)
- ○ Neutral (4)
- ○ Slightly unprofitable (5)
- ○ Unprofitable (6)
- ○ Very unprofitable (7)

Q32 How would you assess the productivity of your farm over the past year?

- Very productive (1)
- Productive (2)
- Slightly productive (3)
- Neutral (4)
- Slightly unproductive (5)
- Unproductive (6)
- Very unproductive (7)

Q33 How would you rate your farm's market reach over the past year?

- Extremely satisfied (1)
- Moderately satisfied (2)
- Slightly satisfied (3)
- Neither satisfied nor dissatisfied (4)

Slightly dissatisfied (5)

Moderately dissatisfied (6)

Extremely dissatisfied (7)

Q34 How would you rate the profitability of selling through intermediaries?

Far above average (1)

Moderately above average (2)

Slightly above average (3)

Average (4)

Slightly below average (5)

Moderately below average (6)

Far below average (7)

End of Block: Business performance

Start of Block: Demographics

Q35 Gender

○ Male (1) ○ Female (2)

○ Non-binary / third gender (3)

○ Prefer not to say (4)

Q36 Age group

○ 18-24 (1)

○ 25-34 (2)

○ 35-44 (3)

○ 45-54 (4)

○ 55-64 (5)

○ 65+ (6)

Q37 Highest education level

○ No education (1)

○ Matric (2)

○ Bachelor's degree (3)

- ○ Honours/B-tech/Postgraduate diploma (4)
- ○ Master’s degree (5)
- ○ PhD (6)

End of Block: Demographics